THE FASTTRACK ROUTE AT INGRESS ABBEY, GREENHITHE, KENT.

AN ARCHAEOLOGICAL EVALUATION REPORT

APRIL 2007

National Grid Reference: TQ 5895 7484

Site Code: ABE 07

On behalf of: Crest Nicholson
Greenhithe Waterfront
London Road
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1 ABSTRACT

An archaeological evaluation was undertaken by AOC Archaeology Group in February 2007 at the Fast Track site within Ingress Park, Greenhithe, Kent on behalf of Crest Nicholson. The aim of the evaluation was to assess the impact of the proposed development on any surviving archaeological remains.

The evaluation comprised the machine excavation of five trenches, 3 nº measuring 20m x 20m, 1nº measuring 3m x 3m and 1nº measuring 2.50m x 1.0m. Two trenches (4 & 5) were shortened and one moved due to the use of heavily reinforced concrete on the road and the occurrence of deep deposits of made ground towards to northern limits of the site.

Test pits were excavated in Trenches 1 and 2 to determine the presence or absence of Palaeolithic flint artefacts within the terrace gravels and also to determine the stratigraphy of the natural deposits on site.

No significant archaeological remains or residual finds were identified in the trenches.

2 SITE LOCATION

2.1 The site is located on the south bank of the Thames estuary, immediately to the east of the village of Greenhithe, Kent, and is centred on National Grid Reference (NGR) TQ 5895 7484.

2.2 The area impacted by the Fastrack route is from The Avenue, to the present Fastrack termination point past the Cave of the Seven Heads.

3 GEOLOGY AND TOPOGRAPHY

3.1 The series of excavations at Ingress Abbey have confirmed the information published by the Geological Survey of Great Britain (England and Wales) 1:50,000 Series. Sheet 271, Dartford, (Solid and Drift) indicates that the solid geology of the site is the Upper Chalk formation of the Cretaceous period. This extends to within a short distance of the river estuary across much of the site, and is overlain by alluvium and head deposits, recent and Pleistocene in age. On the southern parts of the site, the chalk is capped with terrace gravels, in turn overlain by Tertiary deposits.

3.2 The current topography of the area has been heavily influenced by quarrying and landscaping which has been conducted on site since the medieval period. The route of Fastrack crosses land that has been partially quarried leaving a series of terraces and platforms.

4 PLANNING BACKGROUND

4.1 The local planning authority is Dartford Borough Council. Archaeological advice to the council is provided by the Heritage Conservation Group of Kent County Council.

4.2 In accordance with Planning Policy Guidance: Archaeology and Planning (PPG 16) issued by the Department of the Environment in 1990 (DoE, 1990), an archaeological investigation was placed on the development as a condition of the planning permission (Application Nos.: (DA/98/00664 & DA/06/01226, DA/06/01274, DA/06/01256 & DA/06/01235).

4.3 The first stage in the Archaeological Investigation was the production of an Archaeological Impact Assessment (AOC, 1998); the second phase was in the form of evaluation trenching. Accordingly, AOC Archaeology was commissioned to undertake the fieldwork.

4.4 The proposed development involves ground reduction for the route, including a cut and cover tunnel, that potentially impacts upon 18th century garden features, as

well as possible Roman features and potential Palaeolithic deposits. The 18th century garden features are The Grotto, the Cave of the Seven Heads and the estate wall where the route enters the parkland. These are specific elements which have their own specific protection and conservation mitigation measures but monitoring of protection measures forms part of the overall scheme of archaeological works.

4.5 This document reports on the results of the archaeological evaluation, undertaken to identify any archaeological remains that might be threatened by the proposed development.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 The following information is derived from the Results of Archaeological Excavation and Recording at Ingress Abbey, Greenhithe, Kent, (AOC 2004) and the Specification for Archaeological Work provided by Kent County Council (KCC 2007).

Prehistoric

5.2 According to current geological mapping (British Geological Survey 1998) this area contains part of the Boyn Hill/ Orsett Heath Pleistocene formation. This formation is preserved on the south side of the Lower Thames as an intermittent east–west trending band from Dartford Heath through Dartford, Stone, Greenhithe and Swanscombe to Northfleet. The deposits in the formation consist of a sequence of predominantly fluviatile loam, sand and gravel units laid down by the ancient Thames in the post-Anglian interglacial period between *c.* 430,000 and 350,000 years BP (Before Present), corresponding with late Oxygen Isotope Stage 12 to early OI Stage 10 of the global framework (Bridgland 1994). These are overlain in places by younger colluvial and solifluction deposits, cutting down through them and filling northward-trending dry valleys and minor tributaries, which sometimes also contain their own systems of post-Boyn Hill/ Orsett Heath fluvial deposits.

5.3 The Boyn Hill/Orsett Heath formation is rich in significant Palaeolithic archaeological remains, with quarrying activity at numerous locations having produced artefacts, faunal remains and other biological evidence relating to climate and environment. There are several major sites in the immediate vicinity of Ingress Abbey, the most important of which are Barnfield Pit, the Globe Pit and Dierden's Yard

5.4 Barnfield Pit is less than 1km southeast of Ingress Abbey and is recognised as a site of international archaeological significance, as well as being a designated SSSI on Quaternary geological grounds.

5.5 A Palaeolithic handaxe has been found at the Ingress Abbey site itself, by the collector Henry Stopes, whose collection is held at the National Museum of Wales, Cardiff. Stopes' catalogue (entry no. 751) records a find "in Embleton's garden at

Ingress Abbey, Old Garden". This specimen is small, pointed and with a thick, crudely worked butt, typical of handaxes from the Swanscombe Middle gravels.

Roman

5.6 A number of archaeological remains of Roman date have also been recorded in the area. Two parallel ditches were excavated in 1999 in advance of the development of Ingress Park for housing, and these are likely to have bound a settlement, either military or domestic in character. Roman building material from the ditches indicated that there had been a substantial building in the vicinity. Further Roman remains include a Roman burial (TQ 57 SE 56) found in the nineteenth century, probably in the quarry to the north of the Lodge at Ingress Abbey, and a denehole or ritual shaft (TQ 57 SE 20), found in the nineteenth century in the area to the south east of the application site. This contained large quantities of animal bone, Roman pottery and human skeletal remains. The remains of another Roman burial (TQ 56 SE 11) have been found immediately to the south.

Medieval

5.7 In 1363 Edward III founded Dartford Priory and endowed it with a farm called 'Ingryce' and a ferry at Greenhithe. It remained with the priory until the suppression of religious houses in 1538. References to the farm, chalk quarrying and ferrying and lime firing exist for this period. Unfortunately, no more detailed information survives about activity of this date in the area, or how it may have manifested itself by way of buildings or structures.

Post-medieval

5.8 The surviving historic structures at ingress Abbey largely date from the 18th century, except for the Abbey building, which was completed in 1833.

5.9 The earliest detailed illustration of the grounds at Ingress is a print by Badeslade (1720), dating to the ownership by Jonathan Smith between 1698 and 1737, who was Sheriff of Kent from 1721. A six-bay house set in a formal arrangement of walled gardens, parterres and avenues is shown.

5.10 In 1748, the house was conveyed to Viscount Duncannon, who became Earl of Bessborough in 1758. After the death of his wife and several children in 1760, the estate was sold to John Calcraft, a former army agent, later MP for Rochester. The impact on the landscape during the twelve years of Bessborough's ownership is not entirely clear from the documentary sources, but it is likely that some of the follies in the grounds were initiated by him, particularly the Cave of the Seven Heads, the south tunnel, and the Flint Cave (the grotto). Despite the differing styles of build between the rustic stonework of the Cave of the Seven Heads and the decorative flintwork of the Flint Cave, sources suggest a broad

contemporaneity, since Bessborough reportedly had a collection of Roman alters which were displayed in a folly, and the flint Cave is the only likely location for a display.

5.11 By 1763, Lancelot (Capability) Brown was involved with the estate, and undertook works to the value of £1000 in two campaigns. These works involved the landscaping of the parkland to the northeast of the estate, approaches to the house through the grounds, and the sloping of the ground around the house itself. The Lodge at the entrance off London Road appears to have been present by 1798. These structures are Grade II listed.

5.12 The wall surrounding the estate is also Grade II listed, and is variously built of squared limestone blocks, bricks, and for some sections an ornamental metal rail is present.

6 AIMS AND OBJECTIVES

6.1 The objective of the evaluation was to establish whether there are any archaeological deposits along the proposed Fastrack route which may be disturbed by groundworks or piling. The evaluation was thus to ascertain the extent, depth below ground surface, depth of deposit, character, significance and condition of any archaeological remains at the site. Specific aims of the Evaluation were defined as being:

- to assess the potential for encountering primary context Palaeolithic remains,
- to determine the presence and potential for analysis of any environmental and economic indicators preserved in the sediments encountered,
- to assess the horizontal and vertical extent and sedimentological character of Pleistocene deposits at the site (with reference to the sequences identified elsewhere in North Kent),
- to link archaeological material with interpretations of depositional or erosional processes for stratigraphic units,
- to assess, in local, regional and national terms, the archaeological and geological importance of the Pleistocene deposits and their potential to fulfil current research objectives.

General aims of the investigation were:

- to enable the Archaeology Advisor to make an informed decision on the status of the condition on the planning permission, and any possible requirement for further work in order to satisfy that condition.

- to make available to interested parties the results of the investigation in order to inform the mitigation strategy as part of the planning process.

7 METHODOLOGY

ARCHAEOLOGY

7.1 The archaeological evaluation consisted of five machine-excavated trenches, three measuring 20m x 2m and one measuring 3m x 3m and one measuring 2.50m by 1.0m. The original scheme of works involved the excavation of three 20m x 2m trenches and two 10m by 2m trenches however due to the presence of reinforced concrete measuring 0.50m thick in the location of Trench 4 and the presence of a modern service pipe and over 3m of made ground in Trench 5, both trenches were reduced in size. Trench 4 was also moved onto the pavement to the south-west of the proposed location, where a pre-existing geotechnical test pit was re-excavated to avoid the reinforced concrete on the road. Before excavation the entire site was visually inspected and all trenches were scanned with a Cable Avoidance Tool (CAT) to check for live services.

7.2 All overburden was removed down to the top of the natural deposits in Trenches 1 & 3-5 as no archaeological horizon was present. Trench 2 was also reduced to the top of the natural horizon which was also the height at which a brick lined soakaway was observed. The trenches were excavated using a JCB excavator with a 1.8m wide toothless ditching bucket.

GEOARCHAEOLOGY

7.3 Four deep test pits (1–2 & 4-5) were excavated (Figure 2) within the machine excavated trenches in accordance with the WSI. Each test pit was dug by a JCB mechanical excavator with a 1.8m wide toothless ditching bucket. Each test pit was 1.80m wide, 3–4m long and up to 4m deep. Excavation ceased at a shallower depth when it was clear that pre-Quaternary deposits had been reached.

7.4 Each test pit was taken down in horizontal spits of 5–10cm, respecting the interface between sedimentary units when unit changes were encountered. The work was directed by a recognised specialist in Palaeolithic archaeological, Francis Wenban-Smith, (Department of Archaeology, University of Southampton) who recorded and numbered the sequence of sedimentary units following standard AOC practices. Test pits were entered at the maximum safe depth to record the upper stratigraphy. After excavation had progressed beyond this depth, recording took place without entering the trench.

Spit-samples of at least 150 litres were set aside at regular 25cm intervals as excavation progressed through Pleistocene deposits. 100 litres from each spit-sample was dry-sieved on site through a 12mm mesh for recovery of lithic artefacts and faunal remains. In total, 500 litres of Pleistocene gravel were sieved, all from context 2/004 in Test Pit 2.

7.5 No sediments with potential for OSL dating or palaeo-environmental remains were encountered, so no samples were taken for evaluation/assessment of these aspects.

LISTED BOUNDARY WALL

7.6 The boundary wall has been photographed by representatives of Crest Nicholson Estates, in advance of it being dismantled, and each element is to be numbered to enable accurate reconstruction.

GENERAL

7.7 All machining was carried out under direct control of an experienced archaeologist. The site and spoil heaps were scanned visually for finds.

7.8 After recording, the trenches were backfilled with excavated material.

7.9 A Temporary Bench Mark (TBM) was set up on site (Figure 2), transferred from a spot height London Road. This BM had a value of 29.80mOD.

7.10 The evaluation work was undertaken in three days by Catherine Edwards, Project Supervisor, under the overall project management of Ron Humphrey, Project Manager.

8 RESULTS

8.1 Tables of results

Trench 1 (Figures 3, 4 and 5).

Context	Height of deposit (mOD)	Thickness	Description
1/001	29.92 – 28.37	1.50m	Made ground
1/002	28.37 – 27.62	0.75m	Green Sand – Thanet Sands
1/003	27.62 – 27.42	0.20m	Bullhead Bed flint cobbles
1/004	27.42	-	Chalk Bedrock

No significant archaeological remains or finds were identified in Trench 1.

Trench 2 (Figures 3, 4 and 5).

Context	Height of deposit (mOD)	Thickness	Description
2/001	29.25 – 28.70	0.55m	Made ground
2/002	28.70 – 28.15	0.55m	Made ground
2/003	28.15 – 28.00	0.15m	Light yellow sand and gravel – Subsoil?
2/004	28.00 – 27.45	0.55m	Light yellow gravel and sand – Natural
2/005	27.45	0.20m+	Chalk Bedrock

Trench 2 contained 2/006 a brick and flint constructed well measuring approximately 2.50m in diameter and 2.20m deep. The domed roof of the well was constructed from yellow frogged bricks, whilst the main walls were constructed out of flints and cut directly into the bedrock. Only 0.40m of the well was recorded in plan and section so its true extent, size and shape could not be established.

Trench 3 (Figures 3, 4 and 5).

Context	Height of deposit (mOD)	Thickness	Description
3/001	26.39 – 25.79	0.60m	Tarmac surface and make up
3/002	25.79 – 25.44	0.35m	Chalk Bedrock

Trench 3 contained 3/003 a modern pipe trench which ran the length of Trench 3 and measured approximately 0.60m wide.

Trench 4 (Figures 3, 4 and 5).

Context	Height of deposit (mOD)	Thickness	Description
4/001	23.08 – 21.58	1.50m	Green sand – Backfill of geotechnical pit
4/002	21.58 – 21.08	0.50m	Brown sandy silt – Backfill
4/003	21.08 – 20.68	0.40m	Loose fragmentary chalk
4/004	20.68	-	Chalk bedrock

No significant archaeological remains or finds were identified in Trench 4. This trench was excavated within close proximity to the flint lined grotto, mentioned in the historical background. The entrance to the grotto (a vertical section) clearly shows the natural chalk bedrock in section at a height greater than the current road level, which suggests that when the current road was established, the natural chalk bedrock and all subsequent natural deposits were truncated away.

Trench 5 (Figure 3).

Context	Height of deposit (mOD)	Thickness	Description
5/001	21.02 – 20.02	1.00m	Road surface and make up
5/002	20.02 – 19.72	0.30m	Road surface and make up
5/003	19.72 – 19.22	0.50m	Concrete road surface
5/004	19.22 – 18.92	0.30m	Brown silty clay made ground
5/006	18.92	0.40m+	Chalk bedrock

Trench 5 contained 5/005 a modern pipe trench which ran the length of Trench 5 and measured approximately 0.60m wide.

9 GEOARCHAEOLOGICAL RESULTS

By Francis Wenban-Smith PhD, MA, BA

SUMMARY

9.1 Pleistocene gravel is present at the southwest end of the site, proven at Trench 2 and likely in the vicinity of Trench 1. The gravel produced a flint flake. The gravel is thought to be a fluvial/solifluction deposit associated with climatic deterioration towards the end of MIS 11 or early in MIS 10, c. 350,000 BP. The gravel, and any contained artefacts, is most likely reworked from the Swanscombe Lower Middle Gravel and Upper Middle Gravel. Therefore further sieving for artefacts is not recommended in light of the likely derived provenance of any that might be found. However, it is recommended that monitoring of any further works that impact the gravel take place, to record information on their nature and geometry, and so understand better their date, mode of formation and their correlation with other important deposits recorded in the vicinity at Barnfield Pit, Swanscombe and Globe Pit, Greenhithe.

INTRODUCTION

PROJECT CIRCUMSTANCES AND SCOPE OF WORK

9.2 The Dartford Fast-track transport scheme is being extended to Ingress Park, Greenhithe. Part of the extension route crosses a mapped patch of Pleistocene gravel in the vicinity of previous finds of Palaeolithic artefacts. It was therefore deemed necessary that the archaeological evaluation of this part of the route included a number of test pits aimed at investigating Palaeolithic/Pleistocene potential.

PALAEOLITHIC BACKGROUND

9.3 According to current geological mapping (British Geological Survey 1998) the site contains, in its upper southwest part (Figure. 2), part of the Boyn Hill/ Orsett Heath Pleistocene formation. This formation is preserved on the south side of the Lower Thames as an intermittent east–west trending band from Dartford Heath through Dartford, Stone, Greenhithe and Swanscombe to Northfleet. The deposits in the formation consist of predominantly fluviatile loam, sand and gravel units laid down by the ancient Thames in the post-Anglian interglacial period between *c.* 430,000 and 350,000 years BP (Before Present), corresponding with late Marine Isotope (MI) Stage 12 to early MI Stage 10 of the global framework (Bridgland 1994). These are overlain in places by younger colluvial and solifluction deposits, cutting down through them and filling northward-trending dry valleys and minor tributaries, which sometimes also contain their own systems of post-Boyn Hill/ Orsett Heath fluvial deposits.

9.4 The Boyn Hill/Orsett Heath formation is rich in significant Palaeolithic archaeological remains, with quarrying activity at numerous locations having produced artefacts, faunal remains and other biological evidence relating to climate

and environment (Wymer 1968; Wessex Archaeology 1993). There are several major sites in the immediate vicinity of Ingress Abbey, the most important of which are Barnfield Pit (Figure 6, site 1), the Globe Pit, Greenhithe (Figure 6, site 2) and Dierden's Pit/Yard (Figure 6, site 5).

9.5 Barnfield Pit is less than 1km to the southeast, and is recognised as a site of international archaeological significance, as well as being a designated SSSI on Quaternary geological grounds. It was one of the first Palaeolithic sites in Britain to be excavated in a controlled manner (Smith & Dewey 1913), and has been regularly reinvestigated subsequently (Swanscombe Committee 1938; Ovey 1964; Conway *et al.* 1996). The deposits at the site contained lithic and faunal remains in stratified fluvial sand and gravel units, accompanied by biological palaeo-environmental evidence (Table 1). Undisturbed horizons preserving intact evidence of Lower Palaeolithic activity were present in one of the lower deposits — the Lower Loam. And one horizon within the middle phase of the sequence — the Upper Middle Gravel — produced an early human fossil skull (the Swanscombe Skull) making it one of only two sites in England with Lower or Middle Palaeolithic hominid skeletal evidence.

Phase	MI Stage	Stratigraphic unit	Height OD	Palaeolithic archaeology
III	10–8?	Upper Gravel	*c.* 33–34 m	Occasional ovate handaxes reported, often with twisted profiles and tranchet sharpening, debitage — "Acheulian"
	11	Upper Loam	*c.* 32–33 m	
II	11	Upper Middle Gravel	*c.* 28.5–32 m	Pointed handaxes with thick partly trimmed butts (often large and well-made but also frequently small and crude), occasional cores, *ad hoc* flake-tools and abundant debitage — "Acheulian" (Swanscombe Skull level)
		Lower Middle Gravel	*c.* 26.5–28.5 m	
I	11	Lower Loam	*c.* 25–26.5 m	Cores, debitage, *ad hoc* flake tools, and very occasional crude proto-handaxes — "Clactonian"
		Lower Gravel	*c.* 22–26.5 m	

Table 1. *Stratigraphic and archaeological summary of Barnfield Pit sequence, Swanscombe*

9.6 The Globe Pit was immediately to the southwest of the site, on the other side of the A226 London Road. Although not subject to the same intensity of investigation or detail of recording as Barnfield Pit, it has also produced numerous artefacts, including a series of ovates differing from the pointed types characteristic of the Middle Gravels at Barnfield Pit (Smith & Dewey 1913; Dewey 1932; Wymer 1968). The stratigraphy at the site is complicated, and was never properly recorded. The artefacts seem mostly to have come from a thick deposit of brickearth, overlying a contorted sand and gravel deposit. It is uncertain how the Globe Pit deposits relate to the Barnfield Pit sequence. They are most likely younger, and represent colluvial/solifluction deposits from the second half of MIS 11 or MIS 10.

9.7 The site at Dierden's Pit/Yard was *c.* 500m to the east, roughly halfway between the site and Barnfield Pit. The site is best known for the presence of a "Shell-bed" discovered by Henry Stopes in the late 19th century, rich in molluscan and faunal remains (Stopes 1900; Smith & Dewey 1914). Many Palaeolithic artefacts were also recovered from the site, including finely made ovates (many with a twisted profile) and a Clactonian industry. The absence of reliable records means it is uncertain what the full stratigraphic sequence at the site was, and how the various artefacts found relate to the Shell-bed. Smith & Dewey recovered a Clactonian industry dominated by cores and flakes and concluded that the Shell-bed was equivalent to the lower phase of deposits at Barnfield Pit (the Lower Gravel and Lower Loam). However Kerney's (1971) analysis of the mollusc fauna concluded that there were numerous Rhenish species, making it equivalent to the Middle Gravels at Barnfield Pit. It is possible that there was more than one shell-rich deposit at the site, which might explain these apparent contradictions.

9.8 In addition to these major sites, there are a number of smaller sites in the vicinity:

Ingress Park (Figure 6, site 3). Work carried out in 1999 by AOC Archaeology and Francis Wenban-Smith (AOC 1999 & 2004) recorded a complex sequence of Pleistocene colluvial/solifluction deposits overlain by minor fluvial gravels. The deposits probably date to the second half of MIS 11 or MIS 10. The deposits produced six technologically undiagnostic flakes.

Embleton's Garden, Ingress Abbey (Figure6, site 4). A small, pointed handaxe with a thick, crudely worked butt, typical of handaxes from the Swanscombe Middle gravels was found c. 1900 by Henry Stopes (Wenban-Smith 2004). The precise find location and stratigraphic context are unknown. The handaxe is quite rolled, suggesting recovery from a fluviatile or reworked deposit.

Craylands Lane East (Dewey 1932) (Figure 6, site 6). Dewey (1932) recorded a sequence of (from the bottom) gravel, sand/gravel and clayey gravel deposits in the southwest corner of this quarry extension to the east of Craylands Lane. A collection of white-patinated twisted ovates was recovered from one horizon in the sequence (the surface of the lower gravel bed); and several flakes and flake-tools, possibly including some Levalloisian flakes, were recovered from the upper clayey gravel.

Craylands Lane East (Persimmon 1999) (Figure 6, site 7). The southern face of the Craylands Lane East quarry was investigated by Francis Wenban-Smith in 1999, in conjunction with housing development by Persimmon Homes and a new series of Pleistocene fluvial deposits was noted and recorded (Wenban-Smith 1999). These occurred between 24 and 27 m OD, lower than most other Thames fluvial deposits in the neighbourhood, and produced a single, technologically undiagnostic flint flake.

DEVELOPMENT IMPACT

9.9 The proposed Fast-track development will involve widening the existing track and removing the existing road asphalt and underlying made ground down to, and beneath in places, the current junction with natural deposits. The works are likely to have a major impact upon any Pleistocene sediment that is preserved (a) close beneath the present road surface; or (b) adjacent to the present road edge.

RESULTS

STRATIGRAPHY AND DISTRIBUTION OF SEDIMENTS

9.10 Two groups (I-II) of Quaternary deposit were found, as well as modern made ground and Palaeocene/Cretaceous bedrock (Table 2). The overall stratigraphic sequence across the site is summarised as a diagram (Figure 5).

9.11 The only test pit with any Quaternary deposits was Test Pit 2, which contained a thin bed (variably 30 to 60 cm thick) of Pleistocene sandy flint gravel (deposit I), in the top 10 cm of which a loamy subsoil was developed (deposit II). The sandy flint gravel was present along most of the length of the evaluation Trench 2, although cut into (and removed altogether in some places) by modern activity.

9.12 The gravel deposit I was not present in Test Pit 1, where undisturbed Thanet Sand was present at the level where one would expect the gravel to occur (and where it is mapped by the BGS). However, the gravel may be present in places/patches under the present road surface to the south of Trench/Test Pit 1.

9.13 No Pleistocene deposits were present in Test Pits 3, 4 and 5, which all revealed various modern deposits coming straight down onto Chalk bedrock.

9.14 Overall, the evaluation indicates that a thin bed of Pleistocene gravels is likely to be present in places between 50 cm and 1.50 m below the present ground surface at the southeast end of the site, in the vicinity of Test Pits 1 and 2, as highlighted in Figure 4.

Group	Period	Deposit	Description	Interpretation	Test pits present
-	Modern	Made Ground	Asphalt road surfaces, concrete, chalk-rich silt/sand/gravel with modern CBM, plastic and metal	Modern made ground associated with various road building, pipe laying and ground levelling works in 19th and 20th centuries	1–5
II	Holocene	Subsoil	Soft and loose very gravelly and sandy loam, dark brown and slightly humic	Truncated topsoil	2
I	Pleistocene	Sandy gravel	Mod. soft and loose, reddish-brown moderately/poorly sorted M-VC flint gravel in M-C sand matrix	Fluvial/solifluction gravel, probably representing minor local fluvial event associated with climatic deterioration late in MIS 11 (Hoxnian) or in MIS 10, similar to fluvial gravels seen in previous Ingress Park investigations (AOC 1999 and 2004)	2
-	Palaeocene	Thanet Sand	Firm, slightly silty VF-F sand, greenish/greyish-brown; reddish-yellow stained in bottom 20 cm; contains layer of large, green-coated flint nodules (Bullhead Bed) in bottom 10 cm	Tertiary bedrock	1
-	Cretaceous	Chalk	Variably firm, dry white crumbly Chalk	Cretaceous bedrock	1–5

Table 2. *Major sediment groups*

PALAEOLITHIC FINDS

9.15 In total, 500 litres of Pleistocene gravel were sieved, all from the Pleistocene sandy gravel (deposit I, context 2/004) in Test Pit 2. One Palaeolithic flint flake, moderately rolled and technologically undiagnostic, was recovered from the gravel (deposit I) in Test Pit 2. The flint flake was not retained.

BIOLOGICAL/PALAEO-ENVIRONMENTAL REMAINS

9.16 No biological/palaeo-environmental remain were found, nor any deposits potentially suitable for their preservation.

DATING

9.17 No information was recovered to provide direct dating evidence for the gravel deposit. Nor was it of a type suitable for application of any chronometric dating methods as it was insufficiently sandy for dating by optically stimulated luminescence (OSL).

9.18 The gravel's altitude (between 27.5m and 28.5m OD) is exactly the same as the similar minor fluvial gravel patches seen a short distance to the east in the adjacent plot of land investigated in 1999 (AOC, 2004), and it is likely they are of similar age. The Ingress Fastrack and Ingress Park gravel deposits are probably broadly equivalent to the basal gravel in the Globe Pit, a short distance to the southwest. This is clearly predominantly a solifluction deposit rather than a fluvial gravel, although was likely predominantly fluvially laid in its bottom part.

9.19 These gravel deposits probably relate to climatic deterioration following the deposition in MIS 11 of the Swanscombe Upper Middle Gravel, and therefore probably date to late MIS 11 or early MIS 10, c. 350,000 BP.

DISCUSSION AND CONCLUSIONS

STRATIGRAPHY, CORRELATION AND DATING

9.20 The only Pleistocene deposit encountered was a thin fluvial gravel in the southwest end of the site, in the vicinity of Test Pits 1 and 2. It was directly under made ground relating to modern activity, and overlies Chalk bedrock. As discussed above it probably correlates with the basal gravel at the nearby Globe Pit, and relates to a minor phase of fluvial and solifluction activity associated with climatic deterioration in late MIS 11 or early MIS 10, c. 350k BP.

LITHIC ARTEFACTS: RECOVERY AND DEPOSITIONAL HISTORY

9.21 A single flint flake was found (Table 3). The sandy gravel (deposit I) it was found in is probably mostly reworked from deposits of Phase II of the main Barnfield Pit sequence (Lower Middle Gravel and Upper Middle Gravel). Therefore artefacts in this deposit are likely to be of low integrity, and of limited analytical potential.

Test pit	Context	Deposit	Artefacts
2	2/004	I – Pleistocene sandy gravel	One flint flake, moderately rolled, technologically undiagnostic

Table 3. *Palaeolithic artefact recovery*

PRESENCE OF/POTENTIAL FOR UNDISTURBED REMAINS

9.23 There is no potential for undisturbed remains in the deposits seen, and a very low possibility that other deposits with such potential are present at the site.

SIGNIFICANCE, POTENTIAL AND PRIORITIES FOR FURTHER INVESTIGATION

9.24 Fourteen core framework objectives can be identified for national Palaeolithic research (Appendix B, N 1–14). Within the context of this framework, the only area of potential for the site is:

> **N 3** Developing understanding and dating of regional Pleistocene environmental, climatic and litho-stratigraphic frameworks

9.25 Improved understanding of the sandy gravel at the site can contribute to the overall picture of the Pleistocene landscape history in the Swanscombe region. It is desirable to recover the maximum information possible on the nature and geometry of the Pleistocene sediments present, to improve our understanding of their age, mode of formation, and correlation with the recorded sequences from Barnfield Pit and the Globe Pit. Consequently two regional framework objectives (R 1–2) can be defined for further investigation:

> **R 1** How does the sandy gravel at the Ingress Fastrack site correlate with the recorded sequence from Globe Pit?
>
> **R 2** How do the Ingress Fastrack and Globe Pit sequences correlate with the Barnfield Pit sequence?

This information is summarised below (Table 4).

Area	*Nature of evidence*	*Palaeolithic significance*	*Framework objectives*		*Priorities for investigation*
			National	Local/Regional	
TP 1 TP 2	• Pleistocene sandy gravel (deposit I)	Low/moderate	N 3	R 1 R 2	• More data on distribution, internal sedimentary structure and geometry • Monitoring for recovery of further artefacts

Table 4. *Areas of significance and research potential/priorities*

10 CONCLUSIONS AND RECOMMENDATIONS

ARCHAEOLOGICAL

10.1 No evidence for archaeological activity was recorded on site. No further archaeological work is recommended for this site.

GEOARCHAEOLOGICAL

10.2 Construction of the Fast-track route is likely to expose the Pleistocene gravels present at the southwest end of the site. Works may, depending upon the depth of impact, reach the base of the gravels and expose a good section through them. It is recommended that monitoring of construction works take place if impact is of sufficient depth to expose the gravels (which are present at depths of between 27.5m and 28.5m OD) and records are made of the exposures seen. Monitoring should also take place for the recovery of lithic artefacts and the unexpected exposure of the artefact-rich brickearths that overlay the gravels at Globe Pit. Further sieving for artefacts is not recommended, since the deposit is probably substantially reworked from the Barnfield Pit sequence, therefore any artefact assemblage recovered will be too imprecisely provenanced to make a useful contribution to research.

10.3 Publication of the results will be through the ADS OASIS form (Appendix C) with a short report submitted to *Archaeologia Cantiana*.

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Figure 1 – Site Location

Figure 2 – Detailed Site location

Figure 3: Evaluation Trench and Test Pit Location Plan

Figure 4: Location of Test Pits and Palaeolithic Potential

Figure 5: Test Pit Stratigraphy

APPENDIX A: CONTEXT REGISTER

Context No.	Context Description	Length	Width	Depth
1/001	Made ground	Trench	Trench	1.50m
1/002	Green Sand – Thanet Sands	Sondage	Sondage	0.75m
1/003		Sondage	Sondage	0.20m
1/004	Chalk Bedrock	Sondage	Sondage	-
2/001	Made ground	Trench	Trench	0.55m
2/002	Made ground	Trench	Trench	0.55m
2/003	Light yellow sand and gravel – Subsoil?	Trench	Trench	0.15m
2/004	Light yellow gravel and sand – Natural	Trench	Trench	0.55m
2/005	Chalk Bedrock	Sondage	Sondage	0.20m+
2/006	Brick and flint constructed well	2.50m	2.50m	2.20m
3/001	Tarmac surface and make up	Trench	Trench	0.60m
3/002	Chalk Bedrock	Trench	Trench	0.35m
3/003	Modern pipe and associated trench	Trench	0.60m	-
4/001	Green sand – Backfill of geotechnical pit	Trench	Trench	1.50m
4/002	Brown sandy silt – Backfill	Trench	Trench	0.50m
4/003	Loose fragmentary chalk	Trench	Trench	0.40m
4/004	Chalk bedrock	Trench	Trench	-
5/001	Road surface and make up	Trench	Trench	1.00m
5/002	Road surface and make up	Trench	Trench	0.30m
5/003	Concrete road surface	Trench	Trench	0.50m
5/004	Brown silty clay made ground	Trench	Trench	0.30m
5/005	Modern pipe and associated trench	Trench	0.60m	-
5/006	Chalk bedrock	Trench	Trench	0.40m

APPENDIX B: NATIONAL PALAEOLITHIC RESEARCH FRAMEWORK

Aim	Details
N 1	Documentation of regional sequences of material cultural change
N 2	Dating of artefact-bearing deposits within regional, national and international Quaternary frameworks
N 3	Developing understanding and dating of regional Pleistocene environmental, climatic and litho-stratigraphic frameworks
N 4	Explanation of diachronic and synchronic patterns of material cultural variability
N 5	Behaviour of Archaic (pre-anatomically modern) hominids (a) at specific sites, (b) across the wider landscape
N 6	Behaviour of anatomically modern hominids (a) at specific sites, (b) across the wider landscape
N 7	Extent of contrasts in Archaic and anatomically modern human behaviour and adaptations, and in fundamental cognitive capacities
N 8	Patterns of colonisation, settlement and abandonment through the Pleistocene
N 9	The climatic and environmental context of Archaic settlement, and the relationship between climate/environment and colonisation
N 10	The history of isolation/connection between Britain and the continental mainland, and the relationship/implications for Palaeolithic settlement and cultural development/expression
N 11	Improved documentation and understanding of hominid physiological evolution
N 12	Investigation of the relationship between evolutionary, behavioural and material cultural change
N 13	Social organisation, behaviour and belief systems
N 14	Models for cultural transmission and learning

APPENDIX C: OASIS FORM

OASIS ID: AOCARCHA1-26693

Project details

Project name	Fast Track at Ingress Abbey
Short description of the project	An archaeological evaluation was undertaken by AOC Archaeology Group in February 2007 at the Fast Track site within Ingress Park, Greenhithe, Kent. The evaluation comprised the machine excavation of five trenches, 3 nº measuring 20m x 20m, 1nº measuring 3m x 3m and 1nº measuring 2.50m x 1.0m. Two trenches (4 and 5) were shortened and one moved due to the use of heavily reinforced concrete on the road and the occurrence of deep deposits of made ground towards to northern limits of the site. Test pits were excavated in Trenches 1 and 2 to determine the presence or absence of Palaeolithic flint artefacts within the terrace gravels and also to determine the stratigraphy of the natural deposits on site. No significant archaeological remains or residual finds were identified in the trenches.
Project dates	Start: 13-02-2007 End: 15-02-2007
Previous/future work	Yes / Not known
Any associated project reference codes	ABE 07 – Site code
Type of project	Field evaluation
Site status	Area of Archaeological Importance (AAI)
Current Land use	Transport and Utilities 1 - Highways and road transport
Methods & techniques	'Sample Trenches', 'Test Pits'
Development type	Road scheme (new and widening)

Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	KENT DARTFORD SWANSCOMBE AND GREENHITHE Ingress Abbey
Study area	0.41 Hectares
Site coordinates	TQ 5893 7481 51.4494444444 0.2875 51 26 58 N 000 17 15 E Point
Height OD	Min: 18.92m Max: 28.37m

Project creators

Name of Organisation	AOC Archaeology
Project brief originator	Local Authority Archaeologist and/or Planning Authority/advisory body
Project design originator	AOC Archaeology Group
Project director/manager	Les Capon
Project supervisor	Catherine Edwards
Name of sponsor/funding body	Crest Nicholson

Project archives

Physical Archive recipient	Dartford Museum
Digital Archive recipient	Dartford Museum
Digital Contents	'Stratigraphic','Survey'
Digital Media available	'Database','Images raster / digital photography','Survey','Text'
Paper Archive recipient	Dartford Museum
Paper Media available	'Context sheet','Drawing','Map','Matrices','Microfilm','Plan','Report','Unpublished Text'

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Fastrack at Ingress Abbey, Greenhithe, Kent. An Archaeological Evaluation
Author(s)/Editor(s)	Edwards, C
Date	2007
Issuer or publisher	AOC Archaeology
Place of issue or publication	London

Description	Bound report with illustrations and text.
Entered by	Catherine Edwards (catherineedwards@aocarchaeology.co.uk)
Entered on	3 May 2007

APPENDIX D: KCC FIELDWORK NOTIFICATION FORM

SECTION D - COMPLETION OF POST-EXCAVATION ANALYSIS & REPORTING

Reports Submitted (Titles)	Copies to: (Number)						
	KCC	LPA	Arch Soc	Client	EH	Other	Digital Copies
Fastrack at Ingess Abbey, Greenhithe, Kent. An Archaeological Evaluation Report	1			1			

SMR Data

SMR Summary Form?	**Y**	Notes:
Digital images?	**Y**	Oasis Form completed
Digital Mapping Data?	**N**	

Location and Destination of Archive: Dartford Museum

Name: Catherine Edwards

On behalf of: AOC Archaeology Group

Signed: **Date:** 03/05/2007