

<u>Archaeological Services & Consultancy Ltd</u>

GEOARCHAEOLOGICAL RECORDING: BELLINGDON BUCKINGHAMSHIRE: PHASE 3

NGR: SP 9380 0616

on behalf of H.G. Matthews Ltd



Jonathan R Hunn BA PhD MIFA

June 2011

ASC: 953/BBW/02

ISO 9001:2008 REGISTERED FIRM Letchworth House Chesney Wold, Bleak Hall Milton Keynes MK6 1NE Tel: 01908 608989 Fax: 01908 605700

Email: office@archaeological-services.co.uk Website: www.archaeological-services.co.uk



Site Data

ASC project code:	BBW		ASC Project No:	953		
OASIS ref:	Archaeol2-	104277	Event/Accession no:	AYBCM:2007.158		
County:		Buckinghamshire				
Village/Town:		Bellingdon				
Civil Parish:		Chartridge				
NGR (to 8 figs):		SP 938 0616				
Extent of site:		4.1 ha				
Present use:		Arable and pastoral land				
Planning proposal:		Extraction of brickearth				
Planning application ref/date:		CH/2009/0891/BCC				
Local Planning Authority:		Chilterns District Council				
Date of fieldwork:		5/7/07 to 24/5/11				
Commissioned by:		Jim Matthews				
Client:		H.G. Matthews Ltd				
		Brickworks				
		Bellingdon				
		Chesham				
		Bucks				
		HP5 2UR				
Contact name:		Jim Matthews (01494-758077)				

Internal Quality Check

Primary Author:	Jonathan Hunn	Date:	29/06/11
Revisions:		Date:	
Edited/Checked By:		Date:	

No part of this document is to be copied in any way without prior written consent.

Every effort is made to provide detailed and accurate information. However, Archaeological Services & Consultancy Ltd cannot be held responsible for errors or inaccuracies within this report.

 $\ \, \mathbb C$ Ordnance Survey maps reproduced with the sanction of the Controller of Her Majesty's Stationery Office. ASC Licence No. AL 100015154

[©] Archaeological Services & Consultancy Ltd

CONTENTS

Su	ımmary	4
1.	Introduction	4
2.	Aims & Methods	8
3.	Archaeological & Historical Background	9
4.	Results.	11
5.	Conclusions	15
6.	Acknowledgements	16
7.	Archive	16
8.	References	17
Aį	ppendices:	
1.	List and extract taken from monitoring sheets	19
2.	List of images relating to individual extraction pits	20
3.	Models of deposition as proposed by Dr Scott Jackson (2000)	21
4.	ASC OASIS Form	24
Fi	gures:	
1.	General location	3
2.	Extent of Phase 3 application area	6
3.	Location of individual extraction pits	7
4.	Simplified diagram of hilltop and plateaux deposits in relation to Palaeolithic sites	21
5.	Wood Hill model showing the relationship of Palaeolithic sites to solution hollows	22
Pl	ates:	
Ca	over: Brickearth extraction in pit A	
1.	View ESE across pits B & C	14
2.	Looking SW across pits D & E	14
3.	View NE across pit F	14
4.	View NE across pit G & H	14
5.	View ENE across pit I in the NE field	14
6.	Looking SW across pit J in the NE field	14



Figure 1: General location (scale: 1: 25,000)

Summary

A programme of geo-archaeological recording was undertaken at Bellingdon Brickworks, near Chesham, Buckinghamshire between July 2007 and May 2011. This consisted of the observation of the removal of the A-horizon (topsoil) and the subsequent monitoring of each extraction pit. After an initial machine cut trench was made across the first deposit of 'brickearth' a series of intermittent site visits were made to observe and record the individual extraction pits.

1. Introduction

1.1 Between July 2007 and May 2011 *Archaeological Services and Consultancy Ltd* (ASC) carried out a programme of geoarchaeological recording at Bellingdon Brickworks, near Chesham, Buckinghamshire. The project was commissioned by Jim Matthews, and was carried out according to a brief (Radford 2007) prepared on behalf of the Minerals Authority (Bucks County Council), by their archaeological advisor (AA), the *Buckinghamshire County Archaeology Service*, and a project design prepared by ASC (Hunn 2007 & 2009). The relevant planning application reference is CH/2009/0891BCC.

1.2 Planning Background

This watching brief was required under the terms of PPG16 which has since been superseded by *Planning Policy Statement 5* (PPS5), as a condition of planning permission for the development of the site.

1.3 Archaeological Services & Consultancy Ltd

ASC is an independent archaeological practice providing a full range of archaeological services including consultancy, field evaluation, mitigation and post-excavation studies, historic building recording and analysis. ASC is recognised as a *Registered Organisation* by the Institute for Archaeologists and is also accredited ISO 9001, in recognition of its high standards and working practices.

1.4 The Site

1.4.1 Location & Description

The site lies c.4km northeast of Chesham in the administrative district of the Chilterns, Buckinghamshire (NGR SP 9383-0616). The northern field is arable while the southern one is down to grass and comprises two fields covering an area totalling 4.1ha. They are mostly hedged and predominantly rectangular in shape (Figure 1).

1.4.2 Geology & Topography

The site lies on an interfluvial plateau between the valleys of the rivers Misbourne and Bulbourne, at an elevation of c.175 m OD. The plateau is divided into a series of dry valleys that radiate from Chesham. The site is flat and the land falls away to the north east and to a lesser extent to the south west.

The soils belong to the *Batcombe Association*, which are derived from Plateau drift and Clay-with-flints (Soil Survey 1983). The term 'Clay-with-flints' was first applied in the mid 19th century (Avery 1964, 13-17). At that time a distinction was made between Clay-with-flints and 'brick-earth' with the latter concentrated on the ridge tops (*ibid.*). However, due to the difficulties of determining its location the term 'brickearth' has now been subsumed into the broader category of Clay-with-flints (*ibid.*). The term 'brickearth' is limited to 'more or less weathered, loamy or silty superficial deposits with few stones' (*ibid.*). These deposits are considered to be redeposited Clay-with-flints with an element of wind-borne particles (Cornwall 1958, 25-8). In recent years our understanding of the formation processes of these deposits has been considerably advanced by a series of important studies in the Chilterns (Avery *et al* 1982; Catt 1978; Catt *et al* 1978; Catt 1986; Bridgland & Harding 1989; Wymer 1980).

This evidence was discussed fourteen years ago in an important paper by White (1997). White suggested that the deposition of brickearth took place within funnel or basin-shaped dolines which had been created by the dissolution and collapse of the Chalk. It is proposed that these voids or dolines were created by the melting of the permafrost after glaciation or by heavy rainfall in wet temperate phases. Continuous high run-off levels caused erosion and secondary deposition of surrounding deposits into these depressions. It is believed that these dolines formed semi-permanent lakes, which attracted early hominid activity (Catt et al 1978). Lower Palaeolithic artefacts survive in the upper levels of the brick earth deposits which 'represent the fillings of separate lakes and ponds formed in dolines, while the land-surfaces that once existed between them are largely missing – presumably stripped and truncated by later slope activity. Indeed, many of the ochreous and abraded artefacts from the contorted drift at Caddington and other Chiltern sites may represent artefacts discarded on the original land-surface and later incorporated into this solifluction deposit' (White 1997, 917).

1.4.3 Proposed Development

The development consists of extracting brickearth for the purposes of making bricks and tiles. 'Bellingdon Brickworks is a long-established traditional industry and a valuable supplier of local bricks needed to maintain vernacular buildings, particularly in Conservation Areas' (EAU Woolerton Truscott 1993, 113).

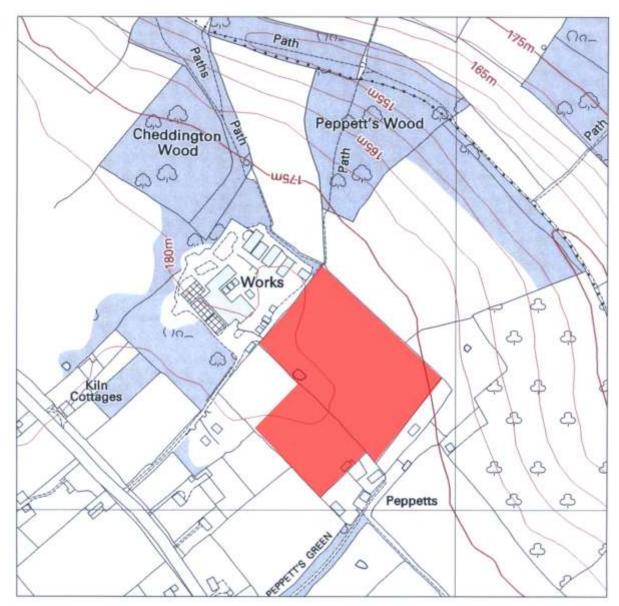


Figure 2: Extent of Phase 3 extraction area shown in red (*scale 1: 5000*)

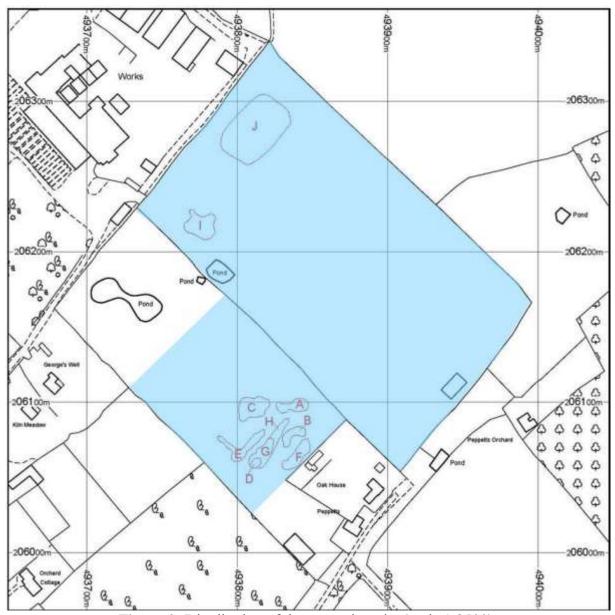


Figure 3: Distribution of the extraction pits (scale 1:2500).

2. Aims & Methods

2.1 *Aims*

As described in the project design (Section 6), the aims of the watching brief were:

- To establish and document the potential of the Chiltern Brickearth deposits to preserve archaeological remains and associated palaeoenvironmental deposits of lower Palaeolithic date.
- To identify significant deposits and appropriate mitigation measures to ensure their preservation or investigation.

2.2 Standards

The work conformed to the project design, to the relevant sections of the Institute for Archaeologists' *Code of Conduct* (IFA 2000) and *Standard & Guidance Notes* (IFA 2001), and to the relevant sections of ASC's own *Operations Manual*.

2.3 *Methods*

The work was carried out according to the project design (Section 8), which required:

- Observation and recording of the location and extent of brickearth deposits
- Establishment of a transect through each deposit of brickearth where feasible.
- Preparation of a photographic record and sketch section made of each transect
- Where *in situ* artefact assemblages are identified an overlying 300mm depth of brickearth will remain unexcavated.
- Any loose and disturbed artefacts will be retained for subsequent analysis and reporting.
- Review of procedures after the first season of extraction

2.4 *Constraints*

Broadly speaking, there were no constraints imposed on the implementation of this project. However, it was not always feasible to inspect the trench transects for each individual extraction pit. Nevertheless, the majority of pits were inspected either during or after extraction was completed.

3. Archaeological & Historical Background

3.1 The following section provides a summary of the readily available archaeological and historical background to the development site and its environs. The site lies within an area of archaeological and historical interest, and has the potential to reveal evidence of a range of periods.

The sources used have been derived from both published and unpublished material such as the Historical Environment Record (HER).

3.2 **Prehistoric** (before 2000BC)

The main focus of the present project concerns the potential for the survival of lower Palaeolithic deposits at the site. The survival of *in situ* sites (camp sites and working floors) are extremely rare (Evans 1975, 15; Mellars 1974, 56) and if such remains should be present on the site, they may be regarded as being of national importance.

The site at Bellingdon lies on similar terrain and geology to others in the region, including Luton, Caddington (Bedfordshire) and Gaddesden Row that have yielded Palaeolithic artefacts (Sumbler 1996, 132; White 1997, 913). Caddington is of particular significance as it has yielded evidence for the survival of apparently undisturbed Palaeolithic deposits (Evans 1975, 15-16; White 1997, 912-31). The site at Caddington affords the closest parallel to Bellingdon. The Caddington site was only located because the brickearth was manually extracted. Modern mechanised extraction techniques make it more difficult for such sites to be identified.

Relatively little is known of this period in the Chesham area. Two middle Acheulian hand axes were recorded during fieldwalking at Copperkins Lane, 6.5km south of the site (Stainton 1990), and excavations at Stratford's Yard, Chesham, revealed four postholes, a large Mesolithic flint assemblage and quantities of animal bone (Stainton 1989). From the latter a radiocarbon date of 3940±100bc (BM 2404) was obtained. The evidence suggests a seasonal occupation site, with activities taking place such as leather processing and the manufacture of bone artefacts.

3.3 Bronze Age and Iron Age (2000 BC – AD43)

Evidence of settlement and activity in the environs of the site in the Bronze and Iron Ages is even sparser. Current knowledge suggests that human activity during these periods was limited to the Chiltern scarp, 8km to the north-west. The nearest monument belonging to either period is the Iron Age hillfort at Cholesbury, 1km to the north.

3.4 **Roman** (AD43-c.450)

During the Roman period the site lay within the tribal area of the *Catuvellauni*, with its capital at *Verulamium* (St Albans). Branigan (1967) identifies four sites in the Chess valley. Three of these, Sarratt, Chorleywood and Latimer, are villas, while the fourth, in Chesham itself, is identified by Branigan as 'a small village, rather than a villa'.

Roman pottery has been recovered from a number of sites in Chesham, including Blucher Street, Wright's Mill and 23 Missenden Road.

Roman period sites or artefacts are not known from the site or its immediate vicinity of, but a number are known in the surrounding area. Roman pottery has been discovered c.2.5km south of the site at Chartridge (SMR: 0207801001) and further material has been recorded at Ley Hill and Hyde Heath (Stainton 1985, 128). This relative dearth of material probably reflects a lack of fieldwork rather than a real absence of settlement.

3.5 **Saxon** (c.450-1066)

The present settlements of Chesham and Bellingdon are probably of late Saxon origin, though no finds of Saxon date have as yet been recorded. The name *Bellingdon* is probably derived from Old English, *Bellingdenu* or 'Bella's valley' (Mawer & Stenton 1925, 224). The name is one of several in the area derived from Anglo-Saxon landholders. The others were *Hunda*, *Caerda and Botta* (Hunt 1997, ix).

3.6 *Medieval* (1066-1500)

During the medieval period Bellingdon was an integral part of Great Chesham, which was by far the largest parish in Buckinghamshire. The area formed part of an agrarian landscape and as such only passing references are made to it in the documents of the period.

The manufacturing of brick and tiles in the Chilterns probably originated during the medieval period, but little is known of the early development of the industry. Improvements in the transport infrastructure (canals and railways) during the 19th century led to a dramatic increase in the movement of building materials.

3.7 *Post-Medieval & Modern* (AD1485 – present)

The earliest reference to brickworks at Bellingdon occurs in the late 19th century. The first cartographic reference to brickmaking at Bellingdon is the 1898 edition Ordnance Survey map, where a 'brickworks' but no actual extraction pits are shown.

The first brickworks were started by J. Mead Esq in 1891. The Kellys Directory for 1899-1903 mentions 'Bellingdon Brick company' (SMR 5345). The brickworks were acquired by H.G. Matthews in 1923 and have continued in family ownership to the present day. A small quantity of clay is imported from the former Froghall Brickyard at Bottrells Lane (*ibid.*). A further brickyard was situated at Gyles Croft *c.*300m west of the site. This was operated by Dunton Bros. and functioned between 1936 and 1962 (SMR 5346).

The brickworks are shown on the Ordnance Survey maps but the extraction pits are almost never represented. However, there is a fine sequence of aerial photographs from 1945-88. Pits are generally sub-circular in shape and their distribution appears random.

4. Results

4.1 General

This section is a description of the individual brick pits, arranged in alphabetical order but not necessarily in the order of extraction. They were excavated over a period of four years between mid 2007 to mid 2011. The quality and circumstances of each sequence of extraction varied from phase to phase. This was inevitable given the relatively long time period and episodic nature of the extraction process.

The following pits can be located on Fig. 3. These were originally sketched and planned in association with the individual monitoring sheets (see archive).

4.2 Extraction process

At the south eastern end of the southernmost field an area of c. 0.3ha was observed after the plough soil horizon had been removed. This was undertaken with a toothless ditching bucket and the top of the subsoil were clearly visible. No archaeological features or artefacts were noted. However, there specific areas of 'brickearth' present which were later extracted (Pits A-H). The outlines of these were not immediately apparent and the method of excavation was as follows:

An initial machine cut is made into the potential brickearth deposit. This is then expanded in all directions until the edge is found, defined by a greyer and stonier deposit of Clay-with-flints. The brickearth shears away from the edge of the extraction pit or 'doline'. The upper levels of the pit are excavated down to an average depth of 3.5m across its entire extent. Of those pits that were observed very few ever exceeded a 4m depth below the reduced ground level.

The excavation machine is able to avoid the non-brickearth deposits, particularly flints. The author was informed that in the 14 years of extracting clay the driver had not seen many flint inclusions in the brickearth deposits. However, there are flint deposits around the periphery of the extraction pits or 'dolines' which, if of ancient origin, would be difficult to distinguish without close scrutiny. The problem with the current extraction method is that the process appears to be more intuitive than scientific. There is no opportunity to stand back and review what is left *in situ* by way of a control such as the retention of a vertical section. Nevertheless, this need not be so critical in the light of current observations and theoretical models of deposition.

4.3 Extraction pits

Pit A

In July 2007 a trench was located about 22m south-west from the corner of the field and was orientated east-west. An initial cut was made from the eastern edge of the 'doline' for 20m to where the western edge was located. This was then deepened to just under 2m. With the south facing section retained the area to the north was then extracted. This developed into an irregular shape with the brickearth shearing away from the pit edge. To the north of the E-W section the clay was taken down to a depth of 3.75m. The brickearth was a more sandy yellowish red clay (Mun 5 YR 5/8) with light grey mottling which sometimes assumed the form of a thin, almost vertical vein.

The northern edge of the pit was denoted by very smooth light grey clay (Mun 5 YR 7/1) from which the brickearth had sheared away. Along the top outside edge of the pit there were loose fragments of flint with a creamy white patina. These flints were between 15mm to 120mm in size and consisted of both nodular and tabular shapes, suggesting they could be the result of frost shattering (gelifraction). The distribution of the flints produces a sort of halo effect around the periphery of the pit. These flints did not appear to dip down into the pit, which if so would be at variance with the observations at Caddington, where Bradley and Sampson asserted that the white patinated flints were found in the brickearths (White 1997, 916). This 'halo effect' is probably more apparent than real, since these flints appear to be found throughout the adjacent Clay-with-flints. To judge from the character of the flints they must be the result of periglacial conditions. The flints have small scallop-like indentations and sharp angles. They are almost comparable to fire cracked flints except they have a creamy white patina. What is quite evident is that these flints cannot have experienced any significant lateral movement due their often sharp angles. Apart from these weathered flints no other deposits were present to suggest early hominid activity, nor were any gravel deposits noted to be present.

By August, 2007 Pit A had been fully extracted. Its final dimensions were approximately 20m long with an average width of 8m and maximum depth of 3.75m (see front cover)

Pit B

In April 2008 an irregular kidney shaped pit some 19m in length and about 8m in width and 2.5m deep was inspected (Plate 1). Its sides were composed of cream, frost shattered flint amongst a greyish matrix of clay. The brickearth is a relatively smooth, stoneless dark reddish grey (Mun 2.5 YR N4). It was almost certainly deepened at a later date. No man made features or artefacts were observed.

Pit C

At the same time that Pit B was being extracted, Pit C had already been completed (Plate 1). It had an irregular ovoid shape and measured 22.5m E-W by 15m N-S. It had an overall depth of 4.5m of which the lower 3m was obscured by rain water. No man made features or artefacts were observed.

Pit D

This was contemporaneous with Pit E. It was an initial excavation which amounted to an extraction area of no more than 9m x 6m x 1.8m deep (below reduced level). The usual plateau deposits were present around the periphery. This was later expanded into Pits G and H (see below and Plate 2).

Pit E

This was observed in July 2007. It was a roughly L-shaped pit consisting of a dominant N-S trench c. 27m long by 6m wide. At its southern end another trench extended off it. This measured c. 12m long with a width that varied between 1.6m (i.e one bucket width) to almost double that. At its western end it was 3.3m deep below the reduced ground level. In addition to the topsoil having been removed the clay had also

been reduced by 0.45m. The typical white shattered flint surrounded the pit (Plate 2). The sides of the pit were a mostly greyish hue. No artefacts or features were noted.

Pit F

This was observed in July 2009 and was situated adjacent to the weather boarded barn on the south eastern periphery of the extraction area. It measured 23.7m long by approximately 12m wide and a depth (Plate 3). Close by was the weathered remains of another pit (D) which revealed ferruginous deposits and the occasional pocket of sandy clay. A solution hollow 1m wide by 0.8m deep was noted.

Pit G

This was an extension of Pit D to the north east. It measured 22m NE-SW by 15m NW-SE and 3.5m deep (Plate 4).

Pit H

This was a further extension to Pits D and G (Plate 4). It had an overall length of 35m and a maximum width of 16m. It was between 3 and 4m deep and tapered away at its north east end. A clay filled solution hollow was noted on its northern edge. It measured c. 2m wide by 1.2m deep). No artefacts were noted.

Pit I

This had already been fully extracted by the time of the commencement of this project (Plate 5). It was approximately 20m in diameter and over 3m deep. Its sides had been well weathered with numerous sharp angled flints in evidence.

Pit J

In May 2011 a well weathered pit was observed at the north east corner of the application site, adjacent to the existing brickworks. It was rectangular with rounded corners. It measured 47m (SW-NE) by 31m (NW-SE). Its 'lower floor' extent was 40m x 25m and average depth 3.5m below existing ground surface (Plate 6). Its sides were 45° and contained numerous flint nodules (mostly between 70 to 150mm, though some were upto 250mm square. A few flint pebbles were present. No features or artefacts noted.



Plate 1: View ESE across Pits B & C



Plate 2: Looking SW across Pits D & E



Plate 3:View NE across Pit F



Plate 4: View NE across Pit G & H



Plate 5: View ENE across Pit I in the NE field



Plate 6: Looking SW across Pit J in the NE field

5. Conclusions

5.1

The observations undertaken over a period of almost 4 years were not able to establish the presence of early human activity in the Bellingdon area. It was established, fairly early on that were no obvious archaeological features in the area of the 'strip, map and record'. However, the focus was always intended to be on the brickearth deposits in the form of their 'doline' morphology. These sediments are generally associated with Lower and Middle Palaeolithic archaeology. The proposed model has been set out by Scott Jackson (2000, 17, 156-7: Appendix 3). Here the dominant element is the hill top plateau with asymmetric valley side slopes on which Palaeolithic implements may be found. There appears to be a preference for hill top/plateau edges from which the movement of wild animals could be observed (Scott Jackson 2000, 170). There was readily available flint material from which tools could be manufactured. However, it was the proximity of water that played a pivotal role in determining the presence of occupation sites (*ibid.*).

- 5.2 Lower Palaeolithic artefacts have been recorded from solution hollows such as those at Wood Hill (Kent), Hackpen (Wilts) and around Dunstable and Luton (Beds) (Scott Jackson 2000, 171). It has been noted that the hollows left from brickearth extraction retain water for long periods (*ibid*.). This was a characteristic of those observed at Bellingdon. This is in accordance with the theory that it was the collapse of the underlying chalk that created these 'doline' depressions (Catt *et al* 1978).
- 5.3 The absence of early hominid activity on the brickearth deposits at Bellingdon raises several questions. Either there is an absence of such deposits in this particular area, or the methods employed to identify them were inadequate. Only Pit A was adequately observed by the author during the trial trenching. Nevertheless, the preferred method of extraction is to avoid, if at all possible, the inclusion of stones when removing the brick earth deposits from the former 'solution hollows'. The resulting hollows (from the extraction process) were carefully examined and in all cases were surrounded by the remains of gelifractured flint. While this does not demonstrate a clear absence of Palaeolithic activity it does at least suggest that such an interpretation is more likely than not.
- 5.4 The present geo-archaeological recording strategy is somewhat uneven in its application. However, whether an alternative 'strip, map and record' approach would be any more cost effective (from the client's point of view) and yield more positive results (from an archaeological point of view) remains to be demonstrated. Given the importance and significance of these deposits, as argued by Scott Jackson (2000) it is reasonable that some form of monitoring is undertaken in order to mitigate the threat to these potential deposits.

6. Acknowledgements

The project was commissioned by Jim Matthews on behalf of H.G. Matthews Ltd. The project was monitored by Buckinghamshire County Archaeology Service on behalf of Buckinghamshire County Council. Thanks are also due to David Bridgland, John Catt and Julie Scott-jackson for their advice.

The project was managed for ASC by Jonathan Hunn BA, PhD, MIFA. Fieldwork was carried out by the author and edited by Bob Zeepvat BA, MIFA.

7. Archive

- 7.1 The project archive will comprise:
 - 1. Brief
 - 2. Project Design
 - 3. Initial Report
 - 4. Site Monitoring Sheets
 - 5. List of photographs
 - 6. B/W prints & negatives
 - 7. CDROM with copies of all digital files.
- 7.2 The archive will be deposited with Buckinghamshire County Museum

8. References

Standards & Specifications

- EH 1991 *The Management of Archaeological Projects, 2nd edition.* English Heritage (London).
- IFA 2000a Institute of Field Archaeologists' Code of Conduct.
- IFA 2000b Institute of Field Archaeologists' Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology.
- IFA 2001 Institute of Field Archaeologists' Standard & Guidance documents (Desk-Based Assessments, Watching Briefs, Evaluations, Excavations, Investigation and Recording of Standing Buildings, Finds).

Secondary Sources

- Avery, B. W. 1964: *The Soils and Land Use of the District around Aylesbury and Hemel Hempstead*. London. HMSO.
- Avery, B.W., Bullock, P., Catt, J.A., Rayner, J.H. & Weir, A. H. 1982: Composition and origin of some brickearths on the Chiltern Hills, England. *Catena* 9, 153-74.
- Bradley, B.A. and Samson, C.G. 1978: 'The Cottage site', in Sampson (ed), 83-138.
- Branigan K. 1967 'The Distribution and Development of Romano-British Occupation in the Chess Valley', *Records of Buckinghamshire* **18.2**, 136-149.
- Bridgland, D.R. & Harding, P.1989: Investigations at Gaddesden Row Brickpit, Hertfordshire. *Quaternary Newsletter* **59**, 2-4.
- Catt, J.A. 1978: 'Sediments from the Rackley Site', in Sampson (ed), 39-46.
- Catt, J.A., Hubbard, R.N.L. & Sampson, C.G. 1978: 'Summary and conclusions', *in* Sampson 1978 (ed), 139-50.
- Catt, J.A., 1986: The nature, origin and geomorphological significance of Clay-with-flints. In G. de G. sieveking and M.B. Hart (eds), The Scientific Study of Flint and Chert. *Proceedings of the Fourth International Flint Symposium*, Cambidge University Press, 151-156.
- Cornwall, I.W. 1958: Soils for the Archaeologist. Phoenix House (London).
- Holgate R (ed) 1995 *Chiltern Archaeology: Recent Work. A Handbook for the Next Decade.* The Book Castle (Dunstable).
- Evans, J.G. 1975: The Environment of Early Man in the British Isles, London: Paul Elek.
- Mawer, A. and Stenton, F.M. 1925: *The Place-Names of Buckinghamshire*. Cambridge University Press (Cambridge).
- Mellars, P.A. 1974: The Palaeolithic and Mesolithic, in Renfrew, C. (ed) *British Prehistory*. Duckworth (London).
- Hunt, J. 1997: Chesham: A pictorial history. Phillimore (Chichester).

- Sampson, C.G. (ed) 1978: *Palaeoecology and archaeology of an Acheulian site at Caddington, England*. Dallas (TX). Southern Methodist University.
- Scott-Jackson, J.E. 2000: Lower and Middle Palaeolithic artefacts from deposits mapped as Clay-with-flints. Oxbow Books (Oxford).
- Soil Survey 1983 1:250,000 Soil Map of England and Wales, and accompanying legend (Harpenden).
- Stainton B 1989 'Excavation of an Early Prehistoric Site at Stratfords Yard, Chesham', *Records of Buckinghamshire* **31**, 49-74.
- Stainton B 1990 'Two Palaeolithic Hand Axes', Chess Valley Archaeological. & Historical Society Journal, 24-25.
- Stringer, C. 2006: Homo Britannicus. Allen Lane (London).
- Sumbler, M.G. 1996: *London and the Thames valley*. British Geological Survey. HMSO (London).
- White, M.J. 1997: The earlier Palaeolithic occupation of the Chilterns (Southern England): reassessing the site of Worthington G. Smith. *Antiquity*, **71** 912-31.
- Woolerton Truscott, EAU. 1993: *The Chilterns AONB Draft Management Plan. Prepared for the Chilterns Standing Conference*. Unpublished report (Kendal).
- Wymer, J.J. 1980: The excavation of the Acheulian site at Gaddesden Row. *Bedfordshire Archaeological Journal* 14, 2-4.

Appendix 1: Schedule of monitoring sheets (see archive for original sheets)

Sheet no.	Date	Duration	Sketch	Pit no.	Notes
1	6/7/07	1 day	yes	A	2 nd visit
					made on
					9/8/07
2	8/4/08	Half day	See below	B & C	
3	8/4/08		yes	B & C	
4	23/7/08	Half day	See below	D & E	
5	23/7/08		yes	D & E	
6	20/7/09	Half day	yes	F	
7	20/7/09	Half day	See above	F & G	Solution pipe
					present
8	8/9/09	1.5 hr	No		
9	16/11/09	Half day	See below	G & H	Solution pipe
					present
10	16/11/09	Half day	yes	G & H	
11	24/5/11	Half day	See below	J	
12	24/5/11	Half day	yes	J	

Appendix 2: List of images relating to individual extraction pits

Extraction pit	View	Date	Image no.	Dimensions
I	ENE	24.6.07	1579	20 m x 20m
I	SE	24.6.07	1580	
I	N	24.6.07	1581	
I	SE	24.6.07	1583	
Reduced area	W	6.7.07	1660	c. 63m x 62m
Reduced area	WSW	6.7.07	1661	
A	various	5.7.07	1663-78	20 x 8m
С	W	8.4.08	4356	23 x 15m
В	S	8.4.08	4357	19 x 8m
С	ENE	8.4.08	4359	23 x 15m
B & C	ESE	8.4.08	4360	Ditto
D & E	SW	23.7.08	5208	1-shaped pit 27.5m x 7.5m +
	<u> </u>			19m x 4m
E	various	23.7.08	5210-17	Ditto
F	NE	20.7.09	9045	22 x 15m
F	various	20.7.09	9046-54	Ditto
F	NE	8.9.09	9508	Ditto
Various in SW field	various	8.8.09	9509-513	
С	NW	16.11.09	0396	23 x 15m
H & G	NE	16.11.09	0397	35 x 16m
H & G	SE	16.11.09	0398	Ditto
G	NE	16.11.09	0399	Detail of
				solution hollow
G	NE	16.11.09	0401	ditto
D, G, & H	S	16.11.09	0402	35 x 16m
Restored field	various	24.5.11	2207-09	
J	SW	24.5.11	2211-12	47 x 31m
J	NW	24.5.11	2213	detail

Appendix 3: Models of clay-with-flints deposition

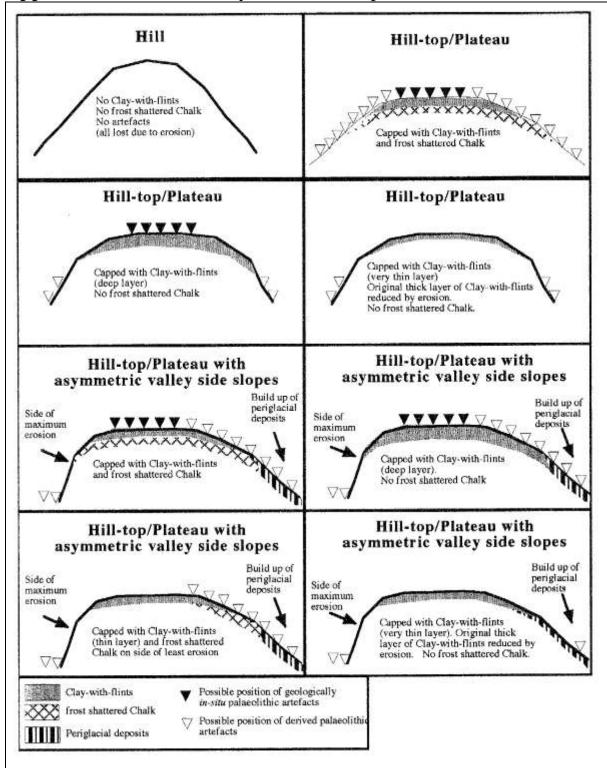
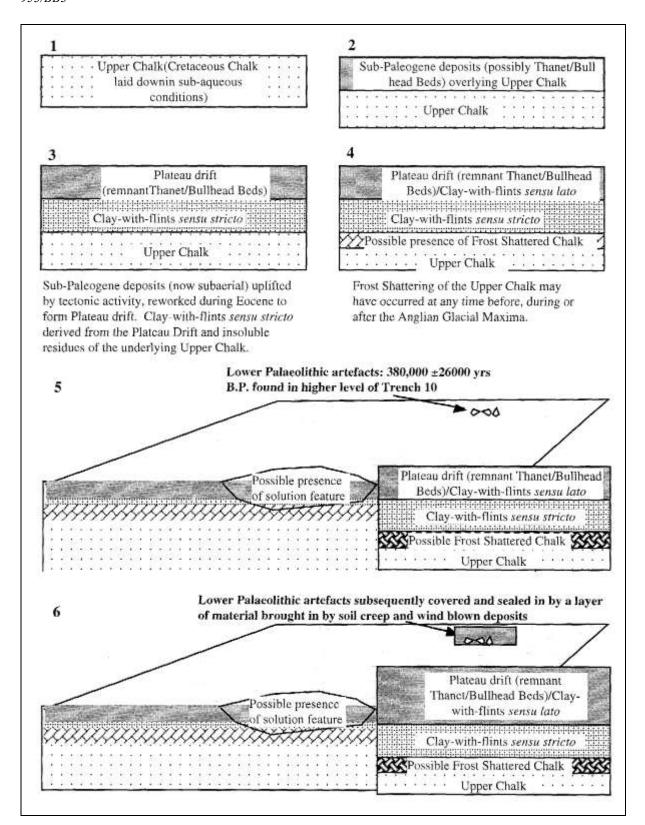


Figure 4: Simplified diagram of hilltop and plateaux deposits in relation to Palaeolithic sites (after Scott Jackson 2000, Fig. 8 p. 17)



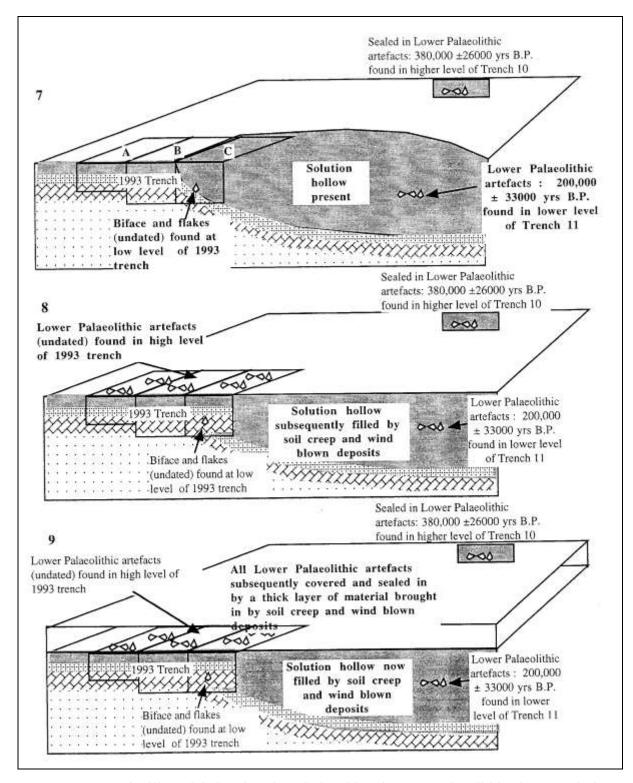


Figure 5: Wood Hill model showing the relationship of Lower Palaeolithic sites to solution hollows (after Scott Jackson 2000 Fig. 76, 156-57)

Appendix 4: ASC OASIS Form

PROJECT DETAILS						
Project Name:	Bellingdon Brick		OASIS reference:	TBC		
Short Description: A programme of geo-archaeological recording was undertaken at Bellingdon Brickworks. This consisted of the observation of the removal of the A-horizon (topsoil) and the subsequent monitoring of each extraction pit (no's A-J). An initial machine cut trench was made across each deposit of 'brickearth' and then intermittent site visits were undertaken to observe and record the Pleistocene geology.						
Project Type:	Geo-archaeological recording					
Previous work: (eg. SMR refs)	none		Site status: (eg. none, SAM, listed)	None		
Current land use:	Arable land		Future work: (yes/no/unknown)	no		
Monument type:	none		Monument period:	none		
Significant finds: (artefact type & period)	none		I			
	PROJECT	LOCATIO	ON			
County:	Buckinghamshire	OS reference: (8 figs min)		SP 9380-0616		
Site address: (+ postcode if known)	H.G. Matthews Ltd, Brickworks, Bellingdon, Chesham, Bucks, HP5 2UR					
Study area: (sq. m. / ha)	4.1 ha	Height (DD: (metres)	175m AOD		
PROJECT CREATORS						
Organisation:	Archaeological Services & Consul	Itancy Ltd				
Project brief originator:	David Radford	Project design originator: J.R		J.R. Hunn		
Project Manager:	J.R. Hunn Director/Supervisor:		/Supervisor:	J.R. Hunn		
Sponsor / funding body:	H.G. Matthews Ltd					
		T DATE				
Start date:	6.7.07	End dat	e:	24.5.11		
	PROJECT					
	Location (Accession no.)	Content (eg. pottery, animal bone, files/sheets)				
Physical:	Buckinghamshire County Museum	No finds				
Paper:	ividocum	Monitoring sneets & B/W prints & negatives				
Digital:		Images				
BIBLIOGRAPHY (Journal/monograph, published or forthcoming, or unpublished client report)						
Title:	Geoarchaeological recording, Bell	lingdon, n	r Chesham, Bucks, Pl	hase 3		
Serial title & volume:	ASC Ltd Report ref. 953/BBC/02					
Author(s):	Jonathan R Hunn					
Page nos	25	Date: 29.6.11				