An Archaeological Evaluation at Land at Newlands House, Arundel Road, Fontwell, West Sussex

(Stage 1)

ARUN: Walberton

Planning Ref: WA/56/06

NGR 495349 107078

ASE Project no. 2657
Site Code: ARU 06

By

Michelle Collings MA AIFA

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Archaeology South-East
1 West Street
Ditchling
East Sussex
BN6 8TS

Tel: 01273 845497
Fax: 01273 844187
Email: fau@ucl.ac.uk

Archaeology South-East

Archaeology South-East is a division of University College London Field Archaeology Unit. The Institute of Archaeology at UCL is one of the largest groupings of academic archaeologists in the country. Consequently, Archaeology South-East has access to the conservation, computing and environmental backup of the college, as well as a range of other archaeological services.

UCL Field Archaeology Unit and South Eastern Archaeological Services (which became Archaeology South-East in 1996) were established in 1974 and 1991 respectively. Although field projects have been conducted world-wide, Archaeology South-East retains a special interest in south-east England with the majority of our contract and consultancy work concentrated in Surrey, Hampshire, Sussex, Kent, Greater London and Essex.

Drawing on experience of the countryside and towns of the south east of England, Archaeology South-East can give advice and carry out surveys at an early stage in the planning process. By working closely with developers and planning authorities it is possible to incorporate archaeological work into developments with little inconvenience.

Archaeology South-East, as part of the Field Archaeology Unit, is a registered organisation with the Institute of Field Archaeologists and, as such, is required to meet IFA standards.

Abstract

An archaeological evaluation was undertaken on Land at Newlands House, Arundel Road, Fontwell, West Sussex. The work was undertaken between 1st and 3rd November 2006 on behalf of Antler Homes. Eight trial trenches were excavated to a cumulative length of 125m. Two burnt tree throws were investigated however; no archaeological features or finds of archaeological significance were encountered. In conjunction with the archaeological evaluation geoarchaeological investigations were undertaken on the 2nd November 2006 by Chris Pine of Development Archaeology Services (DAS), this work comprised the excavation of three geoarchaeological test pits within three of the evaluation trenches. Sediments associated with a Raised Beach were identified, however it was not possible to clearly identify this with the Aldingbourne Raised Beach or the Goodwood-Slindon Raised Beach. Further investigation involving purposive drilling may allow the stratigraphic sequence to be more closely compared with these known raised beach sequences. However, the proposed development would not impact on preservation in situ unless it was to exceed depths of 2.25m below ground level. Whilst no remains of archaeological significance were encountered the geoarchaeological investigation provides further data for the study of raised beaches and landscape change.

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1.0 INTRODUCTION

1.1 Archaeology South-East (ASE), (a division of University College London Field Archaeology Unit), was commissioned by Antler Homes to undertake an archaeological evaluation in advance of the construction of a proposed new housing development at Newlands House, Fontwell, West Sussex (centred NGR 495349 107078) (Figure 1).

1.2 An application for planning permission for the residential development of the site has been granted by Arun District Council (Planning ref. WA/56/06). Following the advice of the West Sussex County Council's Archaeologist (in the County Council's capacity as advisor to Local Planning Authorities (LPA's) on archaeological planning matters), a planning condition (Condition 7) has been imposed on the planning permission. The applicant is required to carry out a programme of archaeological work on the site before the development commences. The first stage (Stage 1) of this work will ascertain the character and quality of archaeological remains on the site.

1.3 Mark Taylor (WSCC) decided that archaeological evaluation trenches would be the appropriate response to assess the archaeological potential of the site. Further, it was deemed pertinent to undertake a geoarchaeological survey due to the site's potential location on a palaeo raised beach (see appendix 1 for a full copy of the report of this investigation).

1.4 A Written Scheme of Investigation (WSI) outlining the requirements was prepared by Neil Griffin of ASE and was submitted and duly approved by Mark Taylor of WSCC prior to the archaeological works taking place. The WSI indicated the possibility of the need for a further programme of archaeological investigation, subject to the results of the Stage 1 evaluation.

1.5 The site is approximately 0.5ha in area, and is bounded to the south by Arundel Road and on all other sides by existing residential development. The development will entail the demolition of the existing 'Newlands House', outbuildings and swimming pool, followed by the construction of eleven houses with associated services, parking and vehicular access

1.6 The fieldwork was undertaken by Michelle Collings, Dave Yates and Dave Dunkin on 1st to 3rd November 2006. The project was managed by Neil Griffin.

1.7 A site TBM was set up using an OS benchmark situated on the northeast corner of The Old Police House, at the junction with London

Road. The value of the site TBM at the front of the property was 31.92mAOD and 33.46nAOD at the rear. The British and Geological Survey Sheet 317 shows the site lies predominantly on Valley Gravel.

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 The site lies within an area of archaeological potential, the Sites and Monuments Records (SMR) for the vicinity of the site are summarised in Table 1 below and shown on Figure 1. Most notably, the Museum of London Archaeology Service (MoLAS) undertook a field evaluation, followed by a full excavation in Arundel Road in 2000.The results of this fieldwork are summarised in table 1 and indicate the archaeological potential of the land at Newlands House (SMR number 6932 - MWS6977 and SMR number 6931 - MWS6976).

2.2 Further, the site lies in an area of significant geoarchaeological potential. Raised beaches have been identified within a fairly close vicinity of the site at Slindon and between Aldingbourne and Arundel. The study of raised beaches and associated deposits has provided an insight into past coastlines and sea levels facilitating a wider understanding of landscape change. This in turn has enhanced the understanding of the Palaeolithic period in Sussex. Traces of a shingle bank at an elevation of C. 25m OD between Aldingbourne and Arundel represents a temporary pause in the regression of the sea (Woodcock 1978).

2.3 A geoarchaeological investigation was carried out 120m west of the study site by Chris Pine of Development Archaeology Services (DAS) and Keith Wilkinson, as an element of MoLAS's fieldwork (summarised in table 1) in 2000. This work produced some significant results for the study of raised beaches and these are summarised in detail in appendix 1. Thus, it was anticipated that deposits associated with a raised beach may be identified within the site at Newlands House and that a geoarchaeological investigation would be pertinent, providing a better insight into wider landscape change within the vicinity (see appendix 1 for site specific geoarchaeological background).

Table 1: Summary of SMR data (produced using data provided by West Sussex SMR)

SMR Number	National Grid Reference	Site Name	*Classification and* Monument Types	Description
6422 - MWS7988	SU 95330 06915 (point)	Morelands Cottage, Arundel Road, Fontwell.	Ditch (Roman - 43 AD to 409 AD) Occupation Site (Roman - 43 AD to 409 AD)	In digging a soakaway, a V-shaped ditch c. 1 m deep and 0.5 m wide was revealed, running WNW-ESE c. 5 m west of the west wall of the bungalow. The ditch produced very large quantities of Roman coarse greyware sherds, some very worn samian and a few colour coated sherds, together with some fragments of tegula and imbrex and a possible fragment of water pipe. There were no examples of tesserae or flue tile. None of the greywares was particularly late, so a tentative dating of c. late 2nd - 3rd century is suggested. (2004, Kenny, J pers.comm).
7026 - MWS7077	SU 95188 07020 (point)	Balls Hut Inn, Fontwell	Inn (Post Medieval - 1540 AD to 1900 AD)	The site of the former Balls Hut Inn before it was demolished.
6932 - MWS6977	SU 95497 07014 (point)	Arundel Road, Fontwell.	Ditch and medieval pottery	Results of MoLAS fieldwork: A shallow linear feature runs north-east to south-west, forming a right-angled corner at the northern extent of trench 2. It might be a field boundary or drainage ditch. Medieval pottery was recovered from the northern area of the ditch (MoLAS 2000 Evaluation report). A further investigation established a fuller extant of the ditch and recovered a relatively large quantity of BA pottery and only small amounts of medieval pottery. The ditch is therefore thought to be of LBA to LIA date (MoLAS 2000 Excavation report).
6931 - MWS6976	SU 95492 06996 (point)	Arundel Road, Fontwell.	Ditch (Late Bronze Age to Early Iron Age - 1000 BC to 401 BC)	Part of a linear ditch was exposed in trench 2. Some LBA or EIA pottery was present in the fill. Some posthole like features were also exposed but unfortunately no datable material was recovered but they are thought to be of more recent date. (MoLAS 2000 Evaluation report). A further investigation established a fuller extent of the ditch and recovered relatively large quantity of BA pottery and only small amounts of medieval pottery. The ditch is therefore thought to be of LBA to LIA date. (MoLAS 2000 Excavation report).

3.0 ARCHAEOLOGICAL METHODOLOGY

3.1 Eight trial trenches were excavated, positioned to provide the best possible coverage of the site (Figure 2). The trial trenches were excavated under constant archaeological supervision. They were cut by a 13 ton 360° tracked excavator fitted with a 1.8m wide toothless

ditching bucket. Three of the trenches were 20m in length and 1.8m wide, 4 of the trenches were 15m in length and 1.8m wide and one trench comprised of 2 sections measuring 10m collectively (7m and 3m each) and 1.8m wide.

3.2 The excavations were taken down to the top of the underlying geology or to the surface of any significant archaeological deposit; whichever was the higher. Revealed surfaces were manually cleaned in an attempt to identify individual archaeological features. The sections of the trenches were selectively cleaned to observe and record their stratigraphy. The removed spoil was scanned for the presence of any stray, unstratified artefacts.

3.3 All encountered archaeological deposits, features and finds were recorded according to accepted professional standards in accordance with the approved ASE Written Scheme of Investigation using ASE pro forma context record sheets. Archaeological features and deposits were planned at a scale of 1:50 and a general site plan was kept at 1:250. Deposit colours were verified by visual inspection and not by reference to a Munsell Colour chart. The spoil from site clearance prior to development was inspected by the archaeologist to recover any artefacts of archaeological interest.

3.4 A full photographic record of the work was kept (monochrome prints, colour slides and digital), and will form part of the site archive. The archive is presently held at the Archaeology South-East offices at Ditchling, and will in due course be offered to a suitable museum.

3.5 Three geoarchaeological test pits were mechanically excavated under the supervision of Chris Pine (DAS), within three of the archaeological evaluation trenches. The main objective of the Geoarchaeological survey was to record and log key sedimentary units that were associated with the Aldingbourne Raised Beach and/or had moderate to high palaeoarchaeological/ palaeoenvironmental significance. The aim of the survey was to confirm characteristics of, and assess the archaeological significance of buried sedimentary units present within the site area that may be under threat of impact from the proposed development.

4.0 RESULTS

4.1 Trench 1a and Trench 1b

4.1.1 The proposed location of Trench 1 was situated diagonally across the front garden of the current property. However, this had to be moved to

account for live services. It was intended to excavate a dogleg trench however more live services were located and after repositioning the trench again two separated trenches were excavated and labelled trench 1a and trench 1b. Trench 1a was excavated to a depth of 120mm (32.02m OD). Trench 1b was excavated to a depth of 460mm at its north west end (32.04m OD) and 180mm at its south east end (32.20m OD).The stratigraphy in trench 1a and 1b comprised topsoil overlying natural. The topsoil ([1/001a] and [1/001b]) was a dark brown silty coarse sand, with frequent small stones and occasional flint nodules and occasional flecks of CBM and chalk. The natural ([1/002a] and [1/002b]) was a mid orange-brown silty clay gravel with frequent angular gravel and flint nodules 30mm to 110mm in size.

4.1.2 There were no archaeological features or deposits present in trenches 1a or 1b and no archaeological artefacts were recovered.

4.2 Trench 2

4.2.1 Trench 2 was located at the front of the current property. This trench was excavated to a depth of 590mm at its northern end (32.02m OD) and 540mm at its southern end (31.74m OD). The stratigraphy in trench 2 comprised topsoil [2/001] overlying natural [2/002], as described for trenches 1a and 1b.There was root disturbance along the eastern edge of the trench.

4.2.2 There were no archaeological features or deposits present in trench 2 and no archaeological artefacts were recovered

4.2.3 Geoarchaeological test pit number 3 was excavated in Trench 2 (see appendix 1).

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4.3 Trench 3

4.3.1 Trench 3 was located at the rear of the property. This trench was 300mm deep at its western end (32.94m OD) and 530mm deep at its eastern end (32.74m OD). The stratigraphy in trench 3 comprised topsoil [3/001] overlying natural [3/002]. The topsoil [3/001] was a dark brown silty coarse sand, with frequent small stones, occasional flint nodules and occasional flecks of CBM and chalk, as described for trenches 1a, 1b and 2. The natural [3/002] was a mid orange brown silty clay gravel with frequent angular gravel and flint nodules 30mm to 110mm in size, as described for trenches 1a, 1b and 2. There was some root disturbance along the length of the trench.

4.3.2 There were no archaeological features or deposits present in trench 3 and no archaeological artefacts were recovered

4.3.3 Geoarchaeological test pit number 2 was excavated in Trench 3 (see appendix 1).

4.4 Trench 4

4.4.1 Trench 4 was located at the rear of the property. It was excavated to a depth of 480mm at its northern end (33.14m OD) and 620mm at its southern end (33.06m OD). The stratigraphy in trench 4 comprised topsoil [4/001] overlying natural [4/002] as described for trench 3. The topsoil was deeper to the south western end of the trench. There was heavy root disturbance from recently felled tress along the entire length of the trench.

4.4.2 Trench 4 contained a burnt tree throw, however, there were no archaeological features or deposits present and no archaeological artefacts were recovered

4.5 Trench 5

4.5.1 Trench 5 was located at the rear of the property. It was excavated to a depth of 500mm at its western end (33.11m OD) and 440mm at its eastern end (32.88m OD). The stratigraphy in trench 5 comprised topsoil [5/001] overlying natural [5/002] as previously described.

4.5.2 There was some brick and concrete rubble (from a demolished greenhouse) contained within the upper 200mm of the topsoil at the western end of the trench. The former greenhouse had been built in the 1930's by the previous owners and later demolished (Mr Deane, former owner's son, pers comm.). There were no archaeological features or deposits present in trench 5 and no archaeological artefacts were recovered

4.6 Trench 6

4.6.1 Trench 6 was located at the rear of the property. It was excavated to a depth of 630mm at its northern end (33.09m OD) and 420mm at its southern end (33.00m OD). The trench was deepest in the centre where it was 650mm deep. The stratigraphy in trench 6 comprised topsoil [6/001] overlying natural [6/002], as previously described. There was root disturbance across the northern end and central area of the trench.

4.6.2 There were no archaeological features or deposits present in trench 6 and no archaeological artefacts were recovered

4.7 Trench 7

4.7.1 Trench 7 was located at the rear of the property. It was excavated to a depth of 430mm at its northern end (33.11m OD) and 350mm at its southern end (33.03m OD). The stratigraphy in trench 7 comprised topsoil [7/001] overlying natural [7/002], as previously described. There was root disturbance along the length of the trench. There were no archaeological features or deposits present in trench 7 and no archaeological artefacts were recovered

4.7.2 Geoarchaeological test pit number 1 was excavated in Trench 7 (see appendix 1).

4.8 Trench 8

4.8.1 Trench 8 was located at the rear of the property. It was excavated to a depth of 600mm at its eastern end (33.32m OD) and 570mm at its western end (33.28m OD). The stratigraphy in trench 8 comprised topsoil [8/001] overlying natural [8/002], as previously described. There was heavy root disturbance along the length of the trench.

4.8.2 Trench 8 contained a tree throw and there was some associated burnt tree roots but no archaeological features or deposits were present and no archaeological artefacts were recovered

5.0 DISCUSSION AND CONCLUSIONS

5.1 The trenches did not reveal any archaeological deposits or features and no artefacts were recovered. However, the area investigated was small and confined and cannot be taken as clear evidence of the absence of surviving archaeological remains elsewhere in Fontwell or within the wider vicinity of the site.

5.2 Whilst the archaeological investigations did not reveal any features or deposits of archaeological importance the geoarchaeological works were of notable interest and will provide a source for the further study of raised beeches and associated landscape change. Sediments associated with a raised beach were identified, however it was not possible to clearly identify this with the Aldingbourne raised beach or the Goodwood-Slindon raised beach. The sediments recorded could represent a southerly extension of the Goodwood-Slindon raised beach or a northward extension of the Aldingbourne raised beach. Equally it is possible that it represents a previously unknown beach.

5.3 The results of the geoarchaeological survey undertaken by Chris Pine (DAS) and Keith Wilkinson, 120 metres west of the study site indicated the possibility that there was a previously unrecorded raised beach (MoLAS 2000) (the results of this are summarised in more detail in

appendix 1). Thus, the results of the geoarchaeological investigation at Newlands House provide significant evidence for raised beaches and associated deposits (see appendix 1 for full report discussion and recommendations).

6.0 REFERENCES

Museum of London Archaeological Service. 2000. *An Archaeological Evaluation at Arundel Road, Fontewll West Sussex.* Unpublished report commissioned by Bellway Homes. [MOLAS]

Woodcock. A. 1978. The Palaeolithic in Sussex in Drewett, P.L (ed), *Archaeology in Sussex to AD1500. CBA research report 29*. York:CBA, 8-14

ACKNOWLEDGEMENTS
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SMR Summary Form

Site Code	ARU06					
Identification Name and Address	Land at Newlands House, Arundel Road, Fontwell, West Sussex					
County, District &/or Borough	West Sussex, Arundel district					
OS Grid Refs.	Centred NGR 495349 107078					
Geology	Valley Gravel					
Arch. South-East Project Number	2657					
Type of Fieldwork	Eval. ✓	Excav.	Watching Brief	Standing Structure	Survey	Other
Type of Site	Green Field	Shallow Urban ✓	Deep Urban	Other		
Dates of Fieldwork	Eval. 1st-3rd November 2006	Excav.	WB.	Other		
Sponsor/Client	Antler Homes					
Project Manager(s)	Neil Griffin					
Project Supervisor	Michelle Collings					
Period Summary	Palaeo.	Meso.	Neo.	BA	IA	RB
	AS	MED	PM	Other	Modern	

Summary:

An archaeological evaluation was undertaken at Land at Newlands House, Arundel Road, Fontwell, West Sussex. The work was undertaken between 1st and 3rd November 2006 on behalf of Antler Homes. Eight trial trenches were excavated to a cumulative length of 125m. Two burnt tree throws were investigated however; no archaeological features or finds of archaeological significance were encountered. In conjunction with the archaeological evaluation geoarchaeological investigations were undertaken on the 2nd November 2006 by Chris Pine of Development Archaeology Services (DAS), this comprised of the excavation of three geoarchaeological test pits within three of the evaluation trenches. Sediments associated with a Raised Beach were identified however it was not possible to clearly identify this with the Aldingbourne raised beach or the Goodwood-Slindon raised beach. Further investigation involving purposive drilling may allow the stratigraphic sequence to be more closely compared with these known raised beach sequences. However, the proposed development would not impact on preservation in situ unless it was to exceed depths of 2.25m below ground level. Whilst no remains of archaeological significance were encountered the geoarchaeological investigation provides further data for the study of raised beaches and landscape change.

Appendix 1 Geoarchaeological Report

SUMMARY REPORT ON THE RESULTS OF GEOARCHAEOLOGICAL TEST PITTING UNDERTAKEN AS A COMPONENT PART OF ARCHAEOLOGICAL EVALUATION ON LAND AT NEWLANDS HOUSE, ARUNDEL ROAD, FONTWELL, WEST SUSSEX.

Application: WA/56/06

AUTHORS: C. A. PINE.

Site: Newlands House, Arundel Road, West Sussex
Site centred at: approx. NGR 495349 107078.
Commissioning Agent: Archaeology South East [ASE]
ASE Project Site code: ARU 06

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Introduction:

This summary report presents details of the findings of a programme of Geoarchaeological investigation, by test pit excavation at the study site.

The work was guided by a 'Specification' for survey works provided by Archaeology South-East [Griffin N. 20th October 2006].

It is understood this Geoarchaeological summary report is to form a component part of the archaeological investigation report to be submitted by Archaeology South-East [ASE].

Provision was made within the specification for Geoarchaeological test pit survey [section 3.7-3.13]. The specification for work allowed for the excavation and recording of stratigraphic sequences at up to 6 spaced site locations where purposive geoarchaeological evaluation might expose key sediment sequences that may correlate with raised beach deposits, specifically Aldingbourne raised beach deposits.

Although no provision / requirement was made for sample analysis, selected 'pinch' / 'sub' samples from representative sedimentary units were to be collected for laboratory based description to supplement field based descriptions.

Aims and objectives of the survey:

The primary objectives of the field evaluation were:

- Provide an initial assessment as to likely mode of deposition for sediment bodies/units at the site.
- Assess the Geoarchaeological and palaeogeographic significance / potential of sediment bodies / units present at the site.
- Determine the presence of, or potential for, undisturbed primary context archaeological remains / artefacts in the sediments encountered.
- Assess and attempt preliminary integration of the site stratigraphic model with selected key area sites of known Geoarchaeological and palaeogeographic significance.
- To establish the distribution and depth across the site of marine derived [raised beach sediment units] sediments that may be present within the site area.
- To assess the nature and significance of key sediment units at the site that may be under threat of impact from proposed development works.

Summary Review of Regional Palaeogeography [Figure 2]

The study site centred at approximately NGR SU 495349 107078 lies at an approximate surface elevation of c. + 31.00 metres OD [Ordnance Datum] within the upper area of the West Sussex Coastal Plain that forms an area of low relief delineated to the north by the truncated dip slope of the South Downs [below the 60m contour] and to the south by the present day coastline.

The plain is widest between Chichester and Selsey where it attains a width of about 17km. To the east it narrows towards Black Rock, Brighton where the South Downs reach the sea. To the west the coastal plain merges into the Solent area between the Isle of Wight and Portsdown, Hampshire.

The coastal plain can be sub-divided into two geographical regions, comprising an upper and lower area. The upper coastal plain consists of land above c. +15.0m O.D. [Ordnance Datum] and is restricted to a narrow strip of ground at the foot of the South Downs. Across much of the coastal plain the southern limit of the Upper Coastal Plain follows the east west orientated line of the A27 road. The lower coastal plain comprises the majority of the area and consists of all land below +15.0m O.D. and extends to the present day coastline. This sub-division, based on altitude, is clear between Chichester and Arundel, but to the east and west of this area the distinction between the upper and lower coastal plain is less clear.

The Pleistocene geological deposits of the West Sussex Coastal Plain fall into four discrete groups of sediments:

- Marine sands/gravels/silts associated with sea level high stands [interglacial, temperate stages] and the fine-grained sediments capping the marine sequence associated with the sea level regression phase.

- Coarse, poorly sorted angular flint gravels and silts associated with sea level low stands [periglacial, cold climate stages]. Typically these overlie and bury the interglacial marine deposits.

- Flint gravels deposited by fluvial [river] action in valleys such as the Arun and Adur.

- Sediments preserved in abandoned/buried channels such as those between Selsey and West Wittering.

These groups of sediments formed as a direct result of the changes in climate regime throughout the Quaternary. As a consequence of these temperature changes the Quaternary is marked by growth and decay of ice sheets resulting in changes in sea level of up to 150m.

The area of the coastal plain has therefore seen phases of sea-level attaining,

or exceeding, modern datums during interglacial periods [leading to the deposition of marine sediments ultimately becoming raised beaches] and phases when sea-level fall resulted in the retreat of the sea and exposure of the floor of the English Channel [leading to deposition of coarse river gravels and solifluction deposits [Bellamy, 1995].

In addition to sea-level changes the area of the coastal plain appears to have been subjected to uplift as a result of tectonic processes [Preece *et al*., 1990; Roberts and Parfitt, 1999]. The uplift is responsible for elevating the marine deposits above tidal envelopes for subsequent high sea-level events thereby preserving the deposits as raised beaches within the area [Bates *et al.,* 1997].

The unconsolidated Pleistocene deposits of the coastal plain overlie bedrock geologies consisting of Cretaceous Chalk or Tertiary clays and silts [Gallois, 1965]. The distribution of these bedrock geologies has important implications for the nature of the overlying Pleistocene deposits and, in particular, the ranges of the contained biological material.

In an early report describing the Pleistocene deposits of the West Sussex Coastal Plain, Prestwich [1859] attributed sands and gravels at Waterbeach [SU 895985], on the upper coastal plain, to marine deposition. By the early 20th century it was recognised that more than one high sea-level event had occurred in the area and attempts to subdivide the coastal plain marine sediments were made by Palmer and Cooke [1923], Fowler [1932] and Calkin [1934]. Fowler [1932] recognised that at least two, altitudinally [and, by implication, chronologically] discrete beaches were present in the area. The series of sands and gravels at heights above 30m [100 feet] O.D. [Ordnance Datum] [forming the upper coastal plain] were comparable with the sequences reported by Prestwich from Waterbeach and more recently those discovered at Amey's Eartham Pit, Boxgrove [Roberts and Parfitt, 1999]. These have often collectively been referred to as the Goodwood-Slindon or ‘100 foot’ Raised Beach [Bates *et al*., 1997]. Conventionally a Hoxnian age was ascribed to the highest 30m raised beach [Shephard-Thorn and Kellaway, 1978]. However, the recent excavations at Amey's Eartham Pit, Boxgrove have suggested an age late within the Cromerian Complex for the raised beach that occurs between 30m and 43m O.D. [Roberts and Parfitt, 1999; but see Bowen and Sykes, 1994; Bates, 1996].

Within the area of the lower coastal plain, sediments were described in the Chichester area by Hodgson [1964] and [re]mapping of the area has been undertaken by the BGS [Berry and Shephard-Thorn, 1982; Shephard-Thorn et al., 1982; Bristow and Wyatt, 1983; Lovell & Nancarrow, 1983]. To the east, deposits at comparable elevations include the sands and gravels at Black Rock, Brighton [Mantell, 1822; Martin, 1929; Shephard-Thorn and Wymer, 1977; Young and Lake, 1988]. Hodgson [1964] concluded that these low-lying aggradations were deposited during a single high sea-level stand during the Ipswichian interglacial and the sequence at Black Rock was identified as the ‘type sequence’. The beach/cliff-line is commonly known, therefore, as the Brighton Raised Beach.

Recent work in the area suggests that this sequence of events is too simplistic and that as many as five altitudinally and lithostratigraphically distinct high sea-level aggradations can now be recognised [Bates *et al*., 1997]. However, the precise number and relationship between beaches remains to be determined. For a full discussion of these deposits see Bates *et al*. [1997].

The altitude range and geographic location of the study site suggests that sequences at the study site may have the potential to correlate with higher recorded elevations of the 'Intermediate level' beach deposits [Aldingbourne / Brighton Norton]

Intermediate level beach deposits occur as marine sands and gravels outcropping proximal to the line of the A 27 between Chichester and Arundel. These deposits have been defined as the Aldingbourne Formation [stratotype: Aldingbourne Park Pit, SU931071]. The approximate elevation of marine deposits is between +22.00 to +27.00 metres O.D.] Bates *et al* [1997].

The 'Aldingbourne Formation comprises of stratified sands and well-rounded beach gravels unconformably overlain by coarse angular flint solifluction gravels and brickearth. These deposits are restricted to a maximum width of approximately 1km, between Westhampnett [SU 877065] and Fontwell [SU 953070]. Isolated outcrops have been recorded at interval locations between these areas where they appear as low topographic undulations or mounds.To the west of Chichester, gravels at Ashling Lodge [SU823067] have been compared to those at Aldingbourne Park [Shephard-Thorn et al., 1982]. The gravels have been recorded between heights of 24.3-27.4m O.D. [Calkin 1934], 20.0-25.0m O.D. [Shephard-Thorn et al.,1982] and 17.5-23.5 m. O.D. [See Figures 5 and 9 Bates *et al* 1997]

Recent observations at Brooks, Field north and south, to the east of Boxgrove roundabout on the A27 at approximate site elevation of between +21.00 to +23.00 metres O.D. record well stratified sands [Aldingbourne sands] up to 1.5 metres thick. These sands rest on Chalk [at +18.70 m. OD.] to the north and Tertiary sediments [at +17.60m] to the south. Sands are overlain by c. 2.00 metre deep bedded well rounded flint gravels [Aldingbourne gravels] overlying bedrock chalk [the former cliff line] rising between +18.70 m OD and +22.0 m O.D.

Archaeological material, predominantly bi-faces have been recovered from Aldingbourne deposits [Fowler 1932] normally as re-worked elements within flint gravels.

Site specific: The study site boundary [area approximately 0.5ha in area] lies at an elevation of c. + 31.00 to 33.00 metres OD. At time of survey the site was utilised as a garden area to the main residential dwelling that fronted on to Arundel Road. To the north the site is bounded by Orchard Way with London Road lying to the west.

The site is mapped by the British Geological Survey as lying on Pleistocene gravels, which in turn seal Upper Chalk [Cretaceous] and Reading Bed [Tertiary] strata.

The site lies at a location and altitude that suggests that the Aldingbourne raised beach [possible Hoxnian date Oxygen Isotope Stage 11] that has produced probably re-worked Palaeolithic artefacts [Bates et al., 1997] lies to the south of the site, and The Goodwood-Slindon raised beach [Cromerian – OIS 13] exists as outcrops to the north. The Goodwood-Slindon complex contains the famous Boxgrove Palaeolithic site [Roberts and Parfitt, 999].

At NGR SU 9555 0710 Approximately 120 metres to the west of the study site a survey undertaken by Development Archaeology Services and Dr. K. Wilkinson for Museum of London Archaeology Services [MOLAS] recorded stratified solifluction gravels overlying marine sands were recorded with de-calcified marine sands lying between c. +32.00m to +28.00m OD. Wilkinson hypothesised that recorded sediments suggest 'Fontwell' sand units may correlate with the Goodwood-Slindon or a previously unrecorded raised beach rather that the Aldingbourne raised beach [MOLAS 2000].

Methodology:

Three purposive test pits were excavated using a c. 12 ton 360^0 tracked excavator fitted with a 1.80m wide toothed bucket. [Note as excavation was undertaken within previously excavated archaeological evaluation trenches [For Test Pit 1-3 locations see Plan at Figure 1]. The use of a toothed bucket was considered satisfactory as the absence of archaeological features at location of test pits had been confirmed by ASE. Machining was in less than 5cm spits.

At all test pit locations selected sections were hand trowelled to section heights of less than c.1.50metres below ground level. All observations below c. 1.50meteres were made from observations from the side of test pits and from arisings.

Recording was undertaken using standard sedimentalogical terminology and colours recorded using a standard Munsell colour chart.

Whilst no provision was made at this assessment phase for controlled sample recovery, selected pinch samples [c. 1ltr] were retained for off site examination and possibly preliminary analysis.

Selected section faces at each test pit location were photographed using digital camera. [See Plate 1].

In accordance with ASE Health & Safety protocols for site investigation all tests pits were immediately back-filled on completion of recording.

The results of the survey are presented below:

RESULTS:

Table 1: Test pit: 1 Ground Level at: + 33.13 metres AOD. Test pit orientated north-south within Evaluation Trench 7.

OD	DEPTH BGL	DESCRIPTION
Unit 1 33.13-32.98	0.00-0.15	10YR 4/1 dark grayish brown friable silt supporting occasional sub angular flint clasts < 2cm diameter. The unit is moderately well rooted [modern] [Topsoil] 0.15 Moderately sharp horizontal contact [32.98m OD]
Unit 2 32.98-31.93	0.15-1.20	10YR 5/4 yellowish brown to 10YR 5/3 brown clayey silt with frequent sub angular to angular flint clasts up to 4cm diameter. In pockets clast supported. No discernable structure. [Solifluction gravels] 1.20 diffuse horizontal contact [31.93]
Unit 2 31.93-30.73	1.20 2.40	10YR 5/2 dark greyish brown clay silt with sub angular flint gravels. Matrix is dense firm and compact with pockets of clasts supported gravels. No discernable structure. Flint gravel characteristics as over lying unit with change defined by clay silt colour change only. [Solifluction gravels] 2.40 moderately sharp contact dipping at c. 10^0 from horizontal to the south [30.73]
Unit 2 30.73-30.53	2.40-2.60	Sub angular flint gravels with clasts generally < 4cm diameter with occasional small cobble sizes well rounded flint clasts with <25% cortex cover. Larger clasts show weak preferred orientation tending to a horizontal orientation about their long axis. The gravels contain pockets of 10YR 5/4 yellowish brown silt becoming fine sandy silt at base of unit. There are discrete pockets of 10YR 6/3 pale brown sands as 'sub units' throughout. Finer sediments are very weakly laminated. [Solifluction gravels] 2.60 moderately sharp horizontal contact [30.53]
Unit 3 30.53-29.63	2.60-3.50	Sub angular matrix supported flint sub rounded to well rounded gravels Matrix is 2.5 YR 6/2 light yellowish brown fine sands. [Marine sands and gravels?] 3.50 moderately sharp contact dipping at c. 20^0 to the south [29.63]
Unit 3 29.63-29.43	3.50-3.70	Clast supported massive flint gravels. Clasts are sub rounded to moderately well round with size range between c 3cm to 15cm diameter. Gravels are seen in association with 10YR 6/8 brownish yellow fine sands. [Marine sands and gravels?] 3.70 moderately sharp horizontal contact.[29.43]
Unit 3 29.43-29.33	3.70-3.80	2.5YR 5/4 fine sands. Matrix moderately firm and compact though with high moisture content. No discernable structure. [marine sands] 3.80 moderately sharp horizontal contact [29.33]
Unit 3 29.33-29.13	3.80- 4.00	10YR 5/6 yellowish brown fine sands with abundant sub rounded flint clasts up to maximum to 8cm diameter. Clast fraction in size range 2-5cm is moderately well rounded. [marine sands and gravels] 4.00 sharp horizontal contact [29.13]
Unit 3 29.13-28.33	4.00-4.80	5/6 yellowish brown silt to sandy silt. Sediments are weakly laminated. [Marine sands]
	4.80m	End of TEST PIT [+28.33m OD]

Table 2: Test pit 2 Ground Level at: + 32.93 metres AOD. Test Pit orientated east-west within Evaluation Trench 3

OD	DEPTH BGL	DESCRIPTION
Unit 1 32.93-32.68	0.00-0.25	10YR 4/2 very dark grayish brown silt. Matrix supports occasional sub angular flint clasts to 3cm diameter. [topsoil] 0.25 Moderately sharp horizontal contact [32.69]
Unit 2 32.68-31.73	0.25-1.20	10YR 5/4 to 10YR 5/3 brown clay silt with frequent sub angular to angular flint clasts up to 6cm diameter with up to c.70% cortex cover. In pockets the unit is clasts supported. Unit is dense and firmly compacted. No discernable structure. [Solifluction gravels] 1.20 Moderately sharp horizontal contact [31.73]
Unit 2 31.73-29.53	1.20-3.40	10YR 5/2 dark greyish brown clay silt with abundant sub angular flint gravels. Clasts as overlying unit. Matrix is dense firm and compact with pockets of clasts supported gravels. No discernable structure. [Solifluction gravels] 3.40 Moderately sharp horizontal contact [29.53]
Unit 3 29.53-28.83	3.40-4.10	2.5Y 5/4 light olive brown fine / medium sand seen in association with frequent flint clasts to 5cm diameter that are sub rounded with up to c. 30% cortex cover. [Marine sands and gravels] 4.10 Moderately sharp horizontal contact [28.83]
Unit 3 28.83-28.53	4.10- 4.40	10YR 5/6 yellowish brown fine sand with frequent ‘manganese, flecks. The unit is weakly laminated. At c. 4.35m there is a clearly defined thin bed of 2.5YR 4/6 red fine sand to sandy silt [Low energy marine marginal?] 4.40 Moderately sharp horizontal contact [28.53]
Unit 3 28.53-27.93	4.10-5.00	2.5Y 4/3 olive brown fine to medium weakly laminated very fine sands. Low energy marine marginal?]
	5.00	End of TEST PIT [+27.93]

Table 3: Test pit 3 Ground Level at: + 31.92metres AOD. Test Pit orientated east-west within Evaluation Trench 2 [All heights given below are depths below ground surface]

OD	DEPTH	DESCRIPTION
Unit 1 31.92-31.57	0.00-0.35	10YR 4/2 very dark grayish brown silt. Matrix supports occasional sub angular flint clasts 3cm diameter. [Topsoil] 0.35 Moderately sharp horizontal contact [31.57]
Unit 2 31.57-30.22	0.35-1.70	10YR 5/4 to 10YR 5/3 brown clay silt with frequent sub angular to angular flint clasts up to 6cm diameter with up to c.70% cortex cover. In pockets the unit is clasts supported. Unit is dense and firmly compacted. No discernable structure. [Solifluction gravels 1.70 Diffuse horizontal contact [30.22]
Unit 2 30.22-27.82	1.70-4.10	10YR 5/2 dark greyish brown clay silt with abundant sub angular flint gravels. Clasts as overlying unit. Matrix is dense firm and compact with pockets of clasts supported gravels as discrete beds. No discernable structure. [Solifluction gravels] 4.10 Sharp horizontal contact [27.82]
Unit 3 27.82-27.22	4.10-4.70	2.5 YR 6/2 light yellowish brown fine sands. [Marine sands]
	4.70	End of TEST PIT [+27.22]

Discussion: Recorded Stratigraphy

A broadly similar stratigraphic sequence was recorded at all test pit locations. The upper Unit 1 is topsoil developed on solifluction gravels. The basal contact to Unit 2 defines top of natural or surface of potential archaeological horizon, the focus of purposive archaeological investigation undertaken by ASE.

Unit 2, present at all test pit locations is considered to have been lain down under periglacial solifluction processes. Deposition is likely to have occurred in the later Pleistocene. At all test pit locations there is variation between the upper c. 1.00 metre of gravel deposits and underlying sub units that contact underlying sands. The variation is considered to have occurred due to localised variation in rates of interstitial filling between the flint clast fraction with migration and removal of finer grained 'brickearth sediments' resulting in pockets of clast supported gravels. The depth of Unit 2 deepens slightly from Test Pit 1 at the north of the site where it has a depth of c. 2.3m to Test Pit 3 in the south of the site where it is c. 3.10m deep. No artefacts or indicators of anthropic activity were recorded within Unit 2

Unit 3 is considered part of a Pleistocene raised beach. Depth of contact from unit 2 to Unit 3 dips slightly from north to south with contact recorded at c. 30.50m OD in Test Pit 1 and + 29.53m OD in Test Pit 3. The outcrop heights to sediments deposited under a marine depositional regime [Unit 3] are higher than that of the Aldingbourne raised beach and lower that the Goodwood Slindon raised beach.

In northern Test Pit 1 there is a higher frequency of flint cobbles, representing higher energy deposition, compared to Test Pit 2. At Test Pit 3 flint cobbles within sands are absent.

At no survey point was bedrock achieved so the presence or altitude of a possible wave cut platform could not be confirmed.

Within Test Pit 2 at between c. +28.33 m OD to +28.53 OD fine sands are seen in association with fine red sand to sandy silt. The depth and collapse of section sides at this depth did not allow for close examination of sediments *in situ.*

The general site stratigraphy shows close similarities to stratigraphy recorded at the Fontwell Road site recorded to the immediate east [MOLAS 2000] and equivalent modes of sediment deposition are suggested.

Considering evidence from the study site and the proximal site to the east [MOLAS 2000] the following conclusions may be made:

- **Unit 1:** Archaeological potential and significance assessed by ASE evaluation. No archaeological features or artefacts were recorded during the Geoarchaeological survey.

- **Unit 2:** 'Solifluction gravels' laid down under periglacial solifluction processes. Deposition is likely to have occurred in the later Pleistocene. No archaeological material recorded from this unit.

- **Unit 3:** Contact to upper sands and gravels is recorded at 2.60 metres below ground level [+30.53m OD] at TP1 dipping to 4.10m below ground level [+27.82m OD] at TP3. The basal sand and gravels at all test pit locations are considered to form part of a Pleistocene raised beach. Based on altitudinal correlation it is unclear whether marine sediments recorded at the study site are part of a southerly extension of the Goodwood-Slindon beach or northward extension of the Aldingbourne beach. As suggested by Wilkinson [MOLAS 2000] the marine facies recorded at the study site may represent a previously unknown fossil beach.

Recommendations for further work.

The author is unaware of final impact depths for ground works associated with the proposed development at the study site. Should impact depths associated with the proposed development be confined to depths less than c. 2.25m below ground level it may be that the following recommendations may fall within 'research design' objectives only.

1] It is recommended that retained samples from marine sands [to maximum 8 submissions] should be submitted for foraminideral study / assessment. From field observation recovered samples appear to be de-calcified but confirmation of presence of micro faunal material may allow first order bio stratigraphic correlation with proximal raised beach sequences to be attempted.

2] At all test pit locations bedrock contact [wave cut platform height] was not confirmed. Confirmation of bedrock height, lying at depths probably in excess of 5.00 metres below ground level, may only be determined by purposive drilling using percussive shell and auger survey techniques. Confirmation of bedrock profile will allow a defined model of sub surface stratigraphic architecture to be produced allowing the site's stratigraphic sequence to be more closely compared / linked with proximal raised beach sequences. Controlled sample recovery [e.g. as U4/U100 tube samples] would allow for more detailed investigation of finer grained sediment fractions [fine sand / silts] to be undertaken than was possible during the test pit survey alone.

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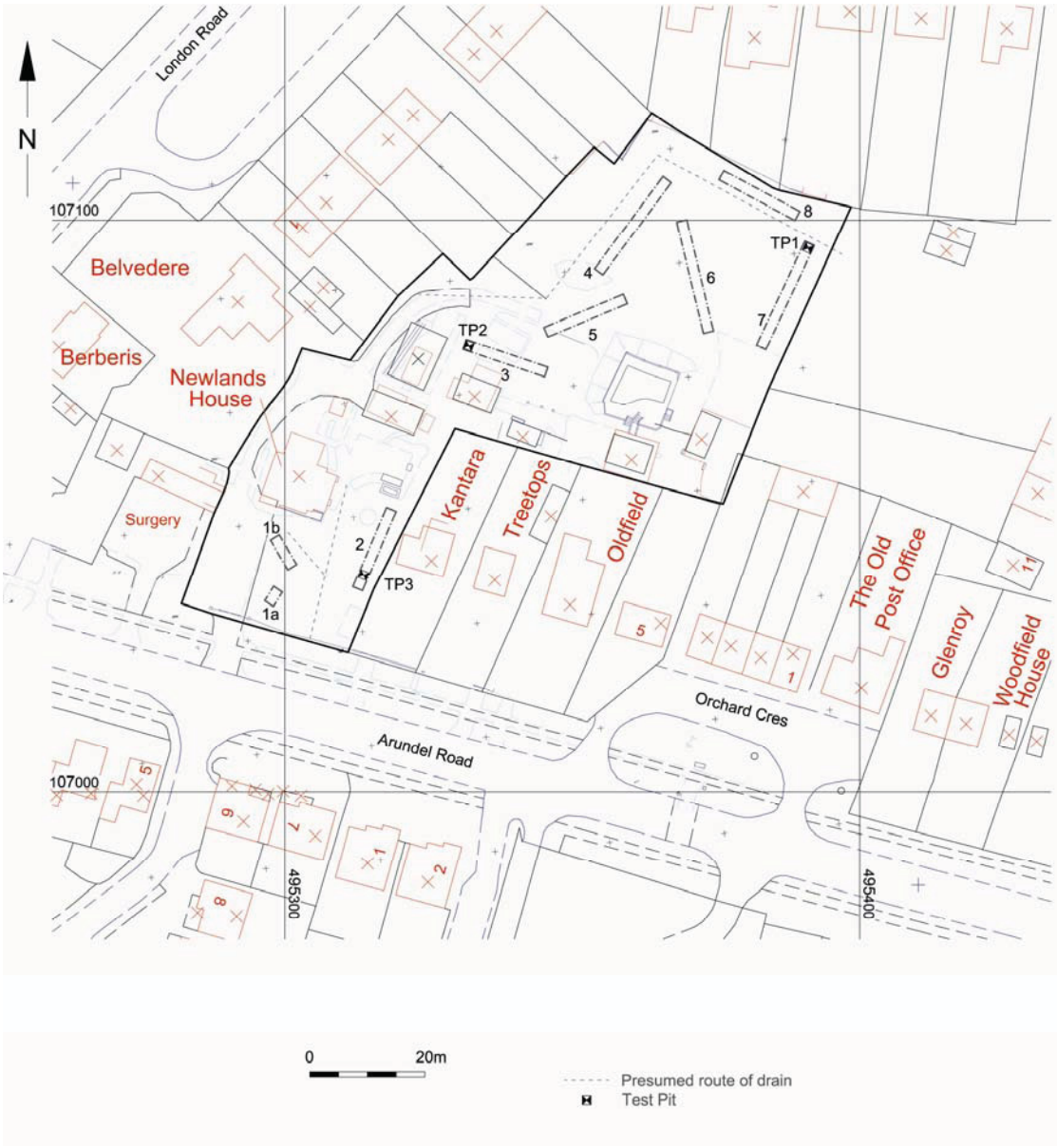
Figure 1: Site plan showing locations of Evaluation Test pits 1-2 and 3.



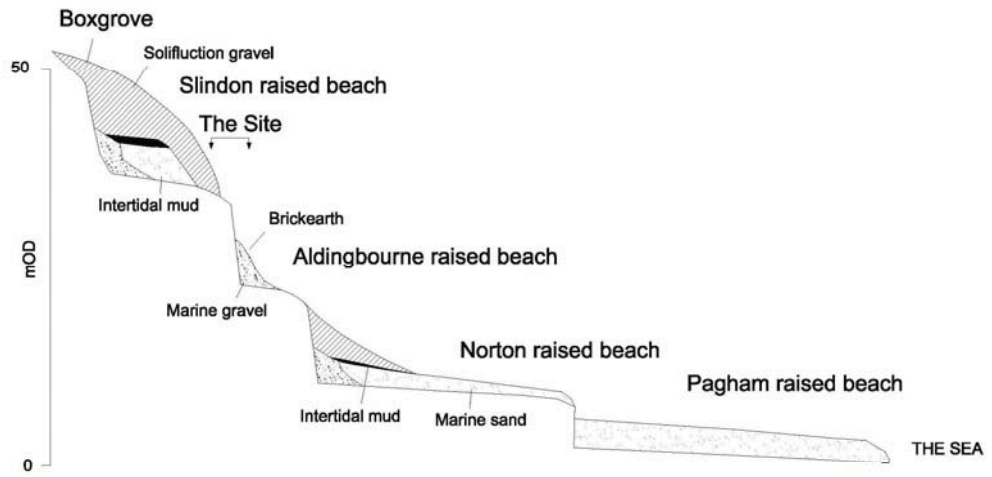


Fig. 2: Schematic representation of raised beaches on the West Sussex coastal plain. Shows location of study site (modified from Roberts, 1999).

Plate 1:
South facing section at TP1

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OASIS ID: archaeol6-24291

Project details

Project name	Land at Newlands House, Arundel Road, Fontwell, West Sussex
Short description of the project	An archaeological evaluation was undertaken on Land at Newlands House, Arundel Road, Fontwell, West Sussex. The work was undertaken between 1st and 3rd November 2006 on behalf of Antler Homes. Eight trial trenches were excavated to a cumulative length of 125m. Two burnt tree throws were investigated however; no archaeological features or finds of archaeological significance were encountered. In conjunction with the archaeological evaluation geoarchaeological investigations were undertaken on the 2nd November 2006 by Chris Pine of Development Archaeology Services (DAS), this work comprised the excavation of three geoarchaeological test pits within three of the evaluation trenches. Sediments associated with a Raised Beach were identified, however it was not possible to clearly identify this with the Aldingbourne Raised Beach or the Goodwood-Slindon Raised Beach. Further investigation involving purposive drilling may allow the stratigraphic sequence to be more closely compared with these known raised beach sequences. However, the proposed development would not impact on preservation in situ unless it was to exceed depths of 2.25m below ground level. Whilst no remains of archaeological significance were encountered the geoarchaeological investigation provides further data for the study of raised beaches and landscape change.
Project dates	Start: 01-11-2006 End: 03-11-2006
Previous/future work	No / No
Type of project	Field evaluation
Site status	Area of Archaeological Importance (AAI)
Current Land use	Residential 1 - General Residential
Methods & techniques	'Environmental Sampling','Sample Trenches'
Development type	Urban residential (e.g. flats, houses, etc.)
Prompt	Planning condition
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	WEST SUSSEX ARUN WALBERTON Land at Newlands House, Arundel Road, Fontwell, West Sussex
Postcode	BN18 0

Study area	31.00 Square metres
Site coordinates	SU 495349 107078 50.8931718872 -1.295613871530 50 53 35 N 001 17 44 W Point
Height OD	Min: 31.74m Max: 33.32m

Project creators

Name of Organisation	Archaeology South East
Project brief originator	Local Planning Authority (with/without advice from County/District Archaeologist)
Project design originator	Archaeology South-East
Project director/manager	Neil Griffin
Project supervisor	Michelle Collings
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Antler Homes

Project archives

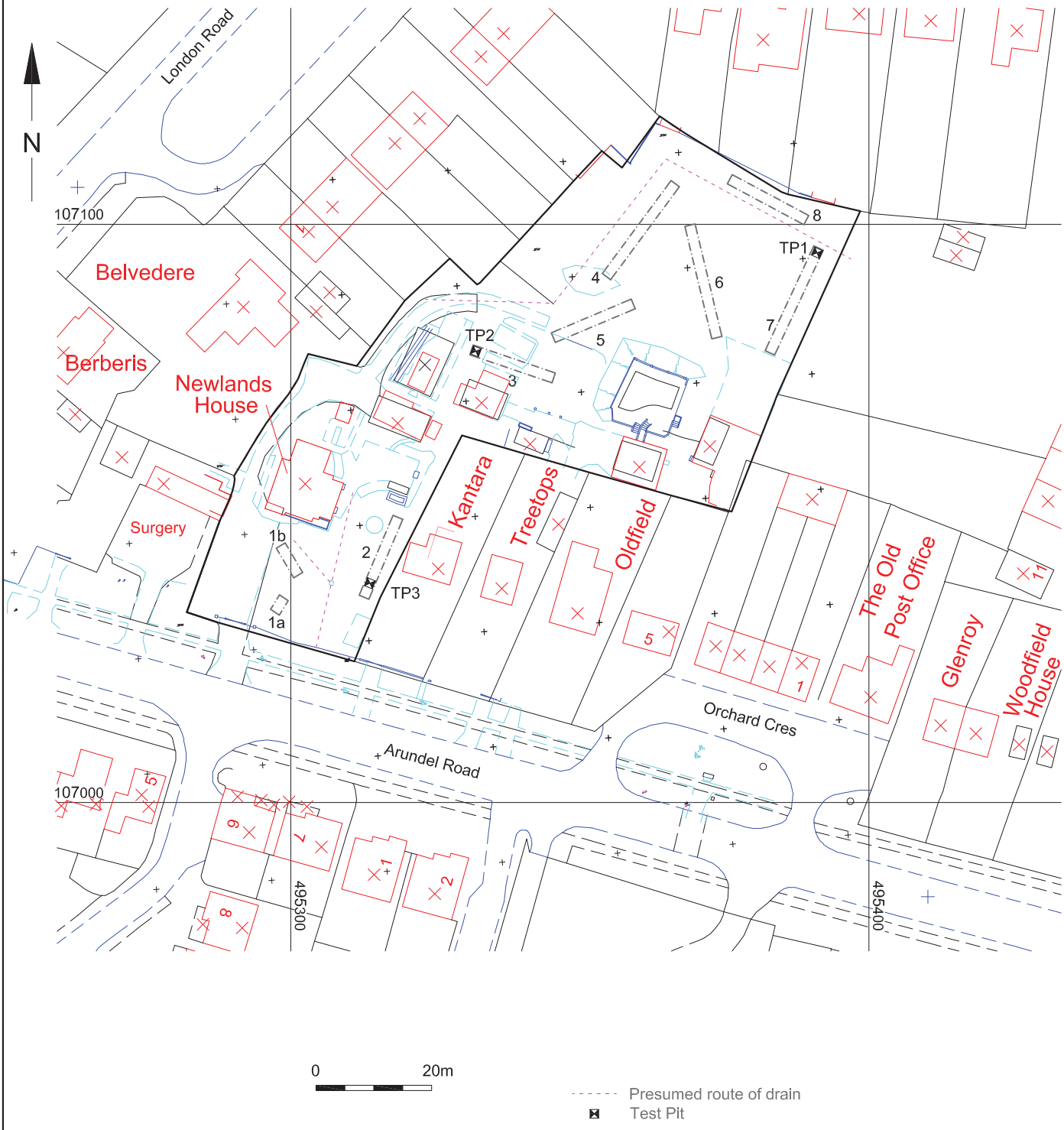
Physical Archive Exists?	No
Physical Archive recipient	n/a
Digital Archive recipient	Chichester Museum
Digital Media available	'Images raster / digital photography'
Paper Archive recipient	Chichester Museum
Paper Media available	'Context sheet','Photograph'

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	An Archaeological Evaluation at Land at Newlands House, Arundel Road, Fontwell.
Author(s)/Editor (s)	Collings, M
Other bibliographic details	Report 2657
Date	2006
Issuer or publisher	Archaeology South East

Place of issue or publication	Ditchling
Description	A4 document: Grey literature (unpublished document/manuscript)
Entered by	Michelle Collings (tcrnmcl@ucl.ac.uk)
Entered on	26 February 2007

© **Archaeology South-East**			Land at Newlands House, Arundel Road, Fontwell	Fig. 1
Ref: 2657	Nov 2006	Drawn by: FEG	Site Location Plan & SMR Data	



© Archaeology South-East			Land at Newlands House, Arundel Road, Fontwell	Fig. 2
Ref: 2657	Nov 2006	Drawn by: JLR	Trench Location Plan	