Archaeology South-East

ASE

# Earth Resistance Survey at Compton & Up Marden C of E Primary School, School Lane, Compton, Chichester, West Sussex, PO18 9EZ

**NGR 477735 114688**
**(SU 77735 14688)**

**Planning Reference: WSCC/008/11/CP/SDNP**

**ASE Project No: 4855**

**ASE Report No.**
**OASIS ID:archaeol6-100313**

**John Cook BSc (Hons) AlfA**

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

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

## Abstract

*Archaeology South East was commissioned by R Durtnell & Sons Ltd, on behalf of their client, West Sussex County Council, to undertake an earth resistance survey at Compton & Up Marden C of E Primary School, School Lane, Compton, Chichester. The survey area consisted of approximately 600m$^2$ of land covered with short grass.*

*The survey aimed to identify anomalies potentially relating to medieval or early post-medieval settlement activity.*

*The resistivity survey at Compton & Up Marden School has successfully revealed anomalies of possible archaeological origin. A single high resistance rectilinear anomaly in the north-west of the survey area may relate to construction footings or an in-filled cut feature such as a reservoir.*

## CONTENTS

# 1.0 INTRODUCTION

## 1.1 Site Background

1.1.1 Archaeology South-East was commissioned by R Durtnell & Sons Ltd, on behalf of their client West Sussex County Council (WSCC) to undertake a resistivity survey at Compton & Up Marden C of E Primary School, School Lane, Compton, Chichester henceforth referred to as 'the site' (NGR SU 77735 14688; Fig. 1). The area surveyed consisted of a level L-shaped area of approximately 600m$^2$ of short grass to the north of and forming part of the grounds of Compton & Up Marden C of E School (Fig. 2).

## 1.2 Geology and Topography

1.2.1 The geology of the site consists of the Newhaven Chalk Formation (Tarrant Chalk Member) (British Geological Survey Sheets 317/332).

1.2.2 The site was bounded to the west and south by banks sloping down to footpaths, on the east by a football pitch and to the north by an area of trees and shrubs. Several tree stumps and corresponding felled trees were located in the south east of the survey area.

1.2.3 A former flower bed was located in the north east corner of the survey grid.

## 1.3 Planning Background

1.3.1 Planning permission is being sought by West Sussex County Council for the construction of a multi-purpose school hall with extension to car park (Planning reference WSCC/008/11/CP/SDNP).

1.3.2 Both the footprint of the proposed building and the terracing of the slope on the previously undeveloped grassed area may have the potential to remove buried archaeology on the site. Owing to the location of the site at the eastern edge of the historic core of Compton village, WSCC placed the following planning condition on the site:

'*No development shall be carried out on the land until the applicant, or their agents or successor in title, has secured the implementation of a programme of archaeological works (staged programme of archaeological investigation and recording) in accordance with a written specification and timetable which has been submitted to and approved in writing by the Local Planning Authority.*

*Reason: The site is of archaeological interest'.*

1.3.3 In accordance with the planning condition, a Written Scheme of Investigation for the geophysical survey was prepared (ASE 2011).

## 1.4 Aims of Geophysical Investigation

1.4.1 The aim of project, as set out in the Written Scheme of Investigation, was to carry a detailed archaeological geophysical survey of the site and produce an

interpretative report on the potential of the site for archaeological remains. The site specific objective was to answer the following question,

- Are there any features potentially relating to medieval or early post-medieval settlement activity.

## 1.5 Scope of Report

1.5.1 This report details the findings of the survey with a view to contributing to the overall and ongoing assessment of the archaeological potential of the site. The project was conducted by John Cook with the assistance of Sarah Porteus; it was project managed by Neil Griffin (fieldwork) and by Dan Swift (post-excavation).

## 2.0 ARCHAEOLOGICAL BACKGROUND

### 2.1 Overview

2.1.1 Prior to planning permission being formally sought, WSCC Local Development commented on the historical and archaeological potential of the site. The following comments were subsequently made by John Mills, Senior Archaeologist, West Sussex County Council on 2nd March 2011 to Keith Comins WSCC and reproduced below with due acknowledgement:

2.1.2 'The site is located at the eastern end of the historic village centre of Compton and may have been occupied land in the medieval period prior to 14th-century village desertion/contraction. Cartographic sources show that the site was a field in the 19th century'.

## 3.0 SURVEY METHODOLOGY

### 3.1 Summary of Methodology

3.1.1 Using a 30m x 30m grid, a RM15 resistance meter attached to a PA1 twin probe frame with 0.5m probe separation was used to record sample readings at every 0.5m along 1.0m traverses.

### 3.2 Geophysical Survey Methods Used

3.2.1 The area covered by the resistivity survey is shown Figure 2.

3.2.2 The survey grid consisted of a 30 x 30 metre grid. The grid was surveyed with 1.0m traverses and samples were taken every 0.5m. The survey was undertaken over the course of one day in dry and sunny conditions, following a prolonged period of dry weather.

### 3.3 Applied Geophysical Instrumentation

3.3.1 The resistance survey was carried out using a twin probe array fitted with a Geoscan RM15 data logger. The twin probe array is popular within archaeology and combines convenience with ease of use. The two probes of the array had 0.5m spacing and were connected to two remote probes placed at least thirty times this distance from the array (15m). This is done to lessen the effect on the results of probe separation and to improve depth penetration (Clark 1996: 44). The penetration of the survey is dependent on the probe spacing, usually reaching a depth relative to half the probe space, in this case 0.25m.

3.3.2 The resistance survey uses an electric current to measure the relative water content of buried features. Features such as pits and ditches contain looser material than the surrounding geology and have an enhanced water-bearing capacity, allowing the current to pass through them more freely. These are measured as low resistance anomalies on the results. Stone and brick wall foundations prove a barrier to the electrical current and are shown as higher resistance anomalies (Gaffney & Gater 2003: 26). Resistance survey relies on detecting differences in water content between archaeological features and the surrounding geology and are ineffective in waterlogged or highly arid conditions. The SI unit of measurement for resistance is ohms.

### 3.4 Instrumentation Used for Setting out the Survey Grid

3.4.1 It is vitally important for the survey grid to be accurately set out. The English Heritage guidelines (David 1995) state that no one corner of any given survey grid square should have more than a few centimetres of error. The survey grid for the site was set out using a Leica TCRA 1205 total station. The grid points were then geo-referenced using a Leica System 1200 Differential Global Positioning System (DGPS). The GPS base station collects satellite position to determine its position. This data is processed in survey specific software to provide a sub centimetre Ordnance Survey position and height for the base station. The survey grid is then tied in to this known accurate

position by using a roving satellite receiver that has its position corrected by the static base station. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

### 3.5 Data Processing

3.5.1 The resistance data was processed using Geoplot V3. The first step was to perform a DESPIKE to remove any spurious readings. The next step was to pass the results through a HIGH PASS FILTER which removed any low frequency spatial data and then a LOW PASS FILTER was applied, removing high frequency spatial data and enhancing larger weak features. The data was then INTERPOLATED in both the X and Y axes, improving the data presentation.

### 3.6 Survey Limitations

3.6.1 Several tree stumps, felled trees and a flower bed formed barriers to the geophysical survey. However, these were omitted from the survey and obscured only a small part of the survey area.

## 4.0 GEOPHYSICAL SURVEY RESULTS (Figs 3-5)

### 4.1 Introduction to Results

4.1.1 The results should be read in conjunction with the figures at the end of this report. The types of features likely to be identified are discussed below.

4.1.2 Positive Resistance Anomalies

These are areas where the current from the array has passed less easily due to relative scarcity of water content. They may relate to stone or brick foundations or rubble in an archaeological context.

4.1.3 Negative Resistance Anomalies

These are areas where the current from the array has passed more easily due to relatively high water content. Low resistance anomalies may equate to pits or ditches in an archaeological context.

### 4.2 Interpretation of Resistance Survey Results

4.2.1 Only one significant anomaly was identified in the results and this is described below. The high resistance anomaly appears to consist of a rectilinear feature within the North West corner of the survey area. Any relatively lower resistance data appears to be associated with this feature.

4.2.2 High Resistance Results

A significant high resistance anomaly (HR1) is observed within the results of the survey. This anomaly consists of a rectilinear area of high resistance within the north western corner of the survey grid. Due to the possible undisturbed nature of the survey area, this anomaly may relate to features of archaeological origin. However, the landscaping for the modern school buildings appears to respect the alignment of the anomaly and therefore a modern origin cannot be discounted, based upon the resistance data alone. Further discrete moderate to high resistance anomalies (HR2) are observed along the southern edge of the survey. These responses are likely to be caused by roots from the recently felled trees.

4.2.3 Low Resistance Results

No low resistance anomalies were observed within the survey.

## 5.0 CONCLUSIONS

**5.1** The resistivity survey at Compton & Up Marden School has successfully revealed anomalies of possible archaeological origin. A single high resistance rectilinear anomaly in the north west of the survey may relate to construction footings, or an in filled cut feature, such as a reservoir.

### 5.2 Statement of Indemnity

5.2.1 Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.

## Bibliography

ASE, 2011, *Compton and Up Marden: Written Scheme of Investigation for a Geophysical Survey*, Unpublished document

Clark, A. 1996. *Seeing Beneath the Soil.* (2nd edition). London: Routledge

David, A. 1995. *Geophysical Survey in Archaeological Field Evaluation.* English Heritage: Research and Professional Services Guideline no.1

Gaffney, C. & Gater, J. 2003. *Revealing the Buried Past; Geophysics for Archaeologists*. Stroud: Tempus

British Geological Survey.Chichester/Bognor. Sheets 317/332. Solid and Drift Edition. 1:5000 series

## Acknowledgements

Archaeology South-East would like to thank by R Durtnell & Sons Ltd and West Sussex County Council for commissioning this survey.

## OASIS ID: archaeol6-100313

### Project details

| | |
|---|---|
| Project name | Earth Resistance Survey at Compton and Up Marden School |
| Short description of the project | Geophysical survey using an RM15 and Pa1 at Compton and Up Marden CofE Primary School. |
| Project dates | Start: 06-04-2011 End: 06-04-2011 |
| Previous/future work | No / Not known |
| Any associated project reference codes | 4855 - Contracting Unit No. |
| Type of project | Recording project |
| Site status | None |
| Current Land use | Other 14 - Recreational usage |
| Monument type | NONE Uncertain |
| Significant Finds | NONE None |
| Investigation type | 'Geophysical Survey' |
| Prompt | Direction from Local Planning Authority - PPS |
| Solid geology | CHALK (INCLUDING RED CHALK) |
| Drift geology | Unknown |
| Techniques | Resistivity - area |

### Project location

| | |
|---|---|
| Country | England |
| Site location | WEST SUSSEX CHICHESTER COMPTON Compton and Up Marden School |
| Study area | 600.00 Square metres |
| Site coordinates | SU 77735 14688 50.9258515426 -0.893825779780 50 55 33 N 000 53 37 W Point |

### Project creators

| | |
|---|---|
| Name of Organisation | Archaeology South-East |
| Project brief originator | West Sussex County Council |
| Project design originator | West Sussex county council |
| Project director/manager | Neil Griffin |

| | |
|---|---|
| Project supervisor | John Cook |
| Type of sponsor/funding body | school |

**Project archives**

| | |
|---|---|
| Physical Archive Exists? | No |
| Digital Archive recipient | West Sussex County Council |
| Digital Contents | 'other' |
| Digital Media available | 'Geophysics' |
| Paper Archive recipient | West Sussex County Council |
| Paper Contents | 'other' |
| Paper Media available | 'Report' |

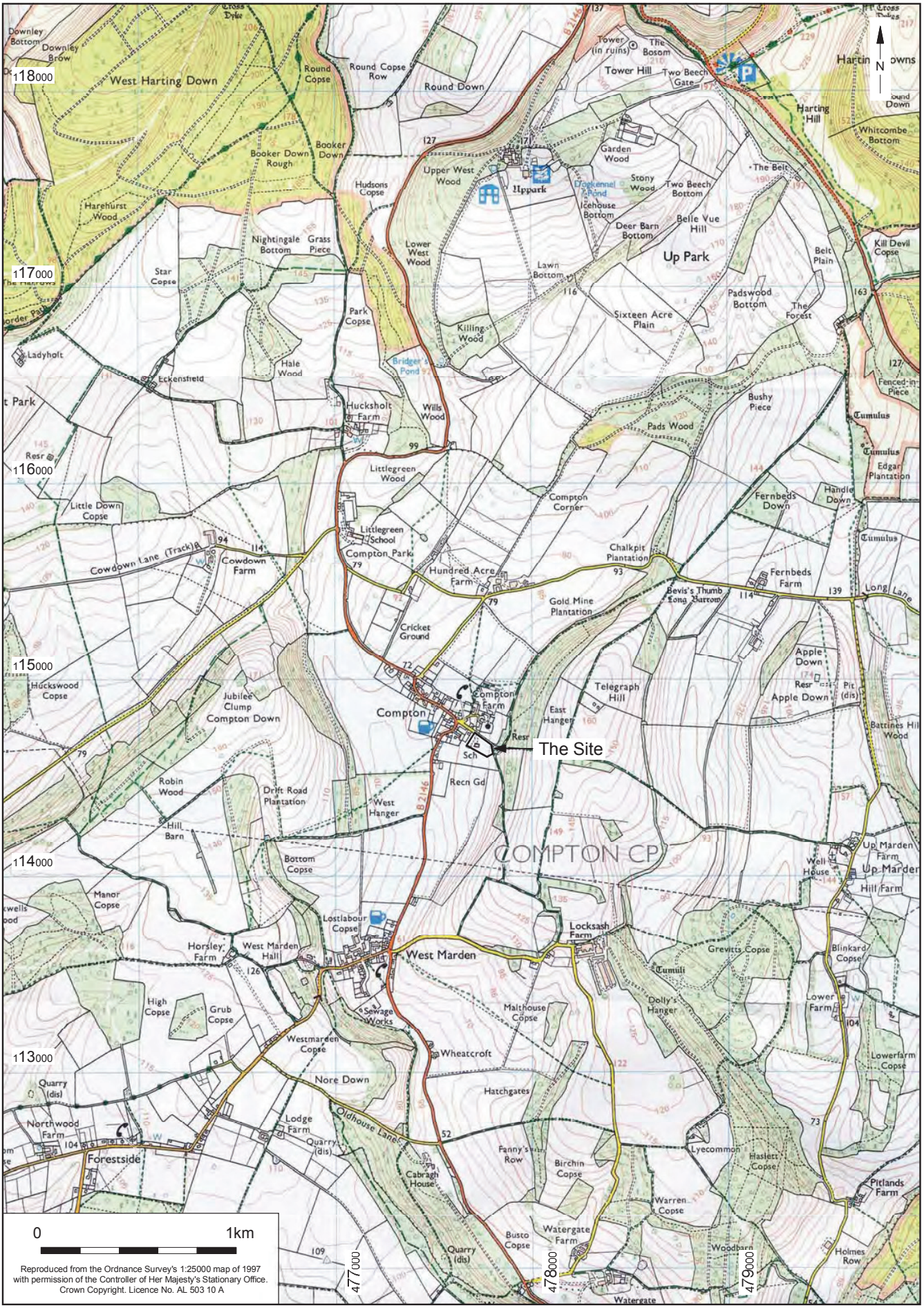
**Project bibliography 1**

| | |
|---|---|
| Publication type | Grey literature (unpublished document/manuscript) |
| Title | Earth Resistance Survey at Compton and Up Marden School |
| Author(s)/Editor(s) | Cook, J |
| Date | 2011 |
| Issuer or publisher | Archaeology South-East |
| Place of issue or publication | Portslade |

| | |
|---|---|
| Entered by | John Cook (john.cook@ucl.ac.uk) |
| Entered on | 4 May 2011 |

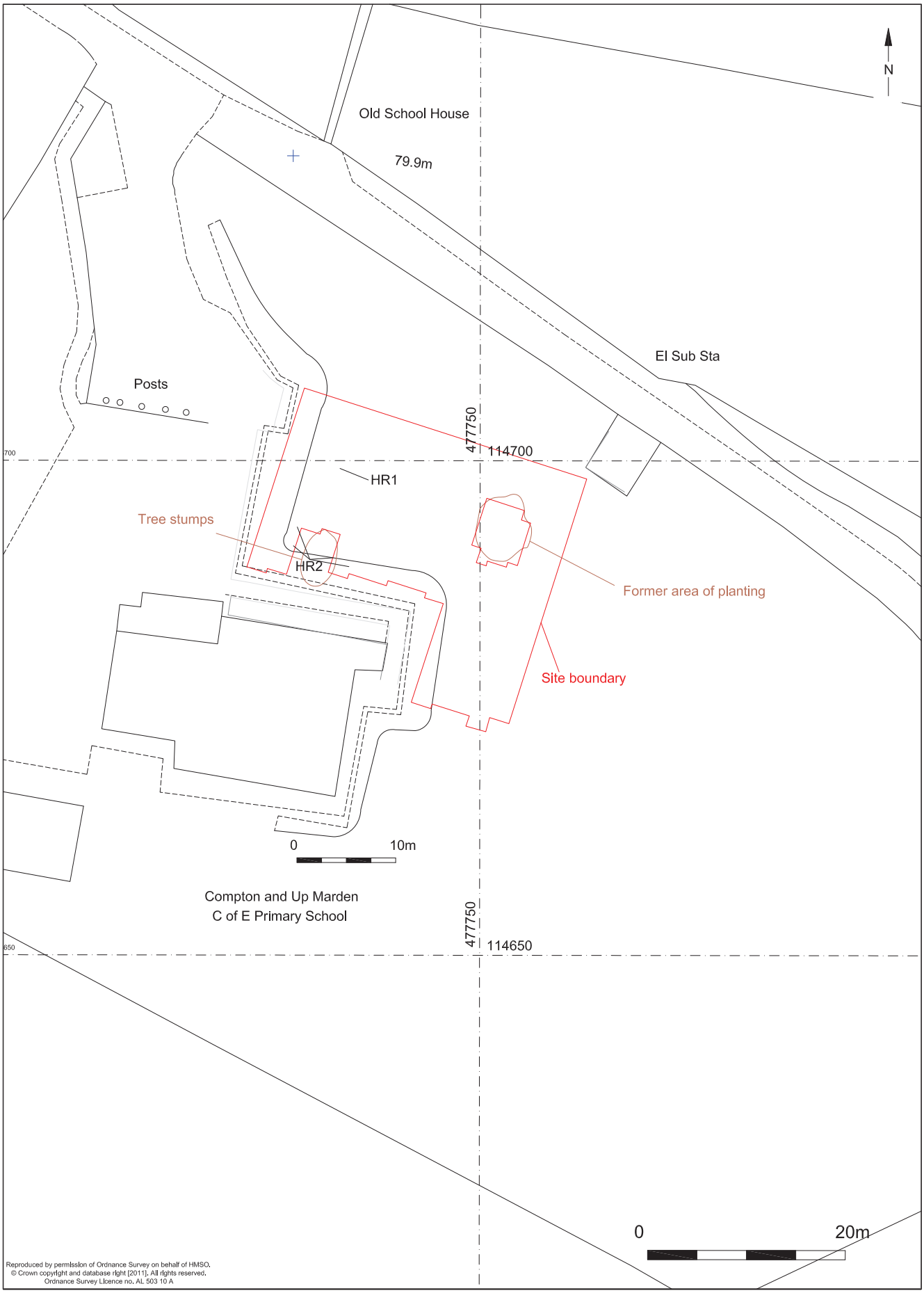
## Appendix

## Raw Resistivity Data CD



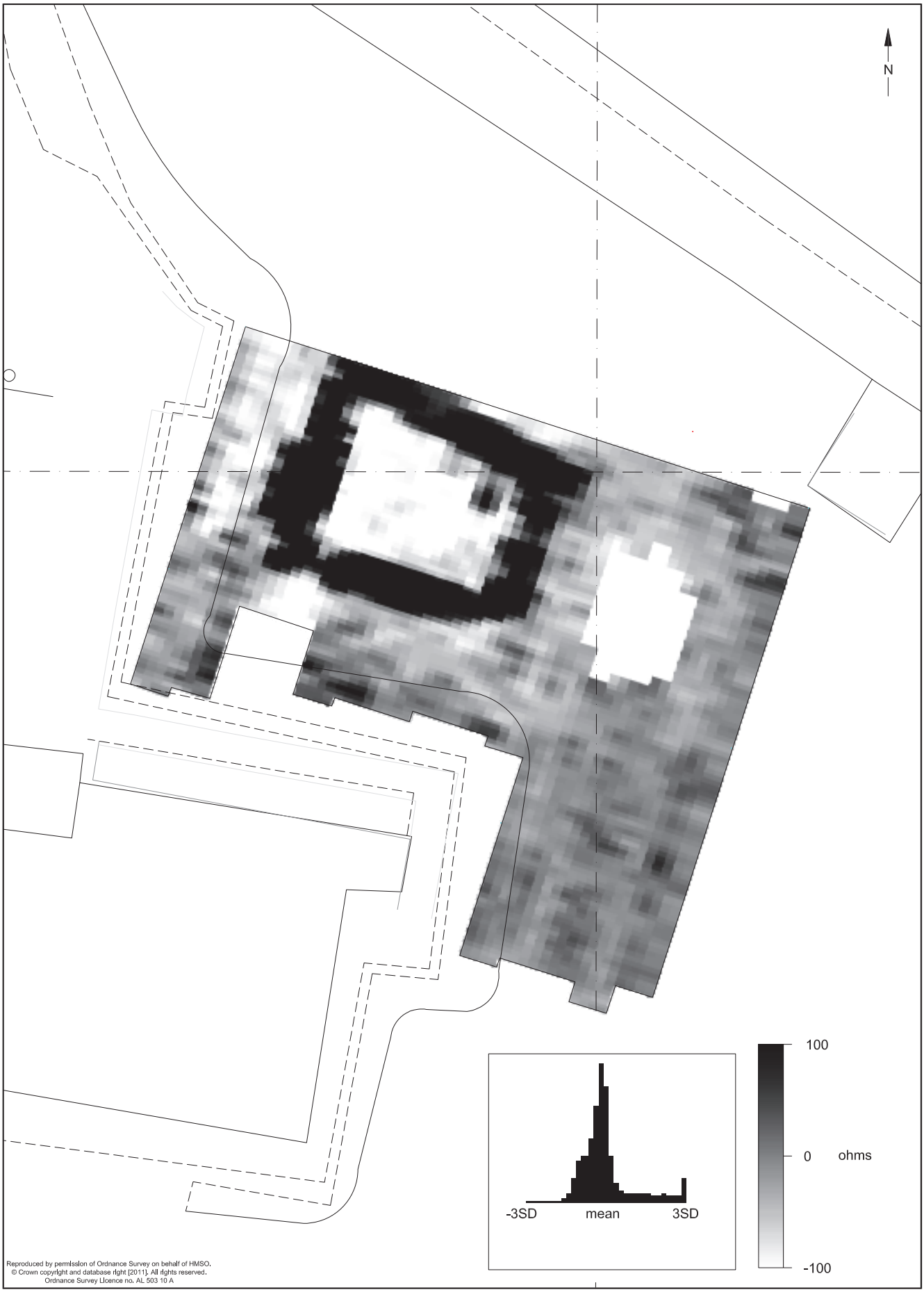



| © **Archaeology South-East** | | Compton and Up Marden C of E Primary School | Fig. 1 |
|---|---|---|---|
| Project Ref: 4855 | May 2011 | Site location | |
| Report Ref: | Drawn by: JLR | | |



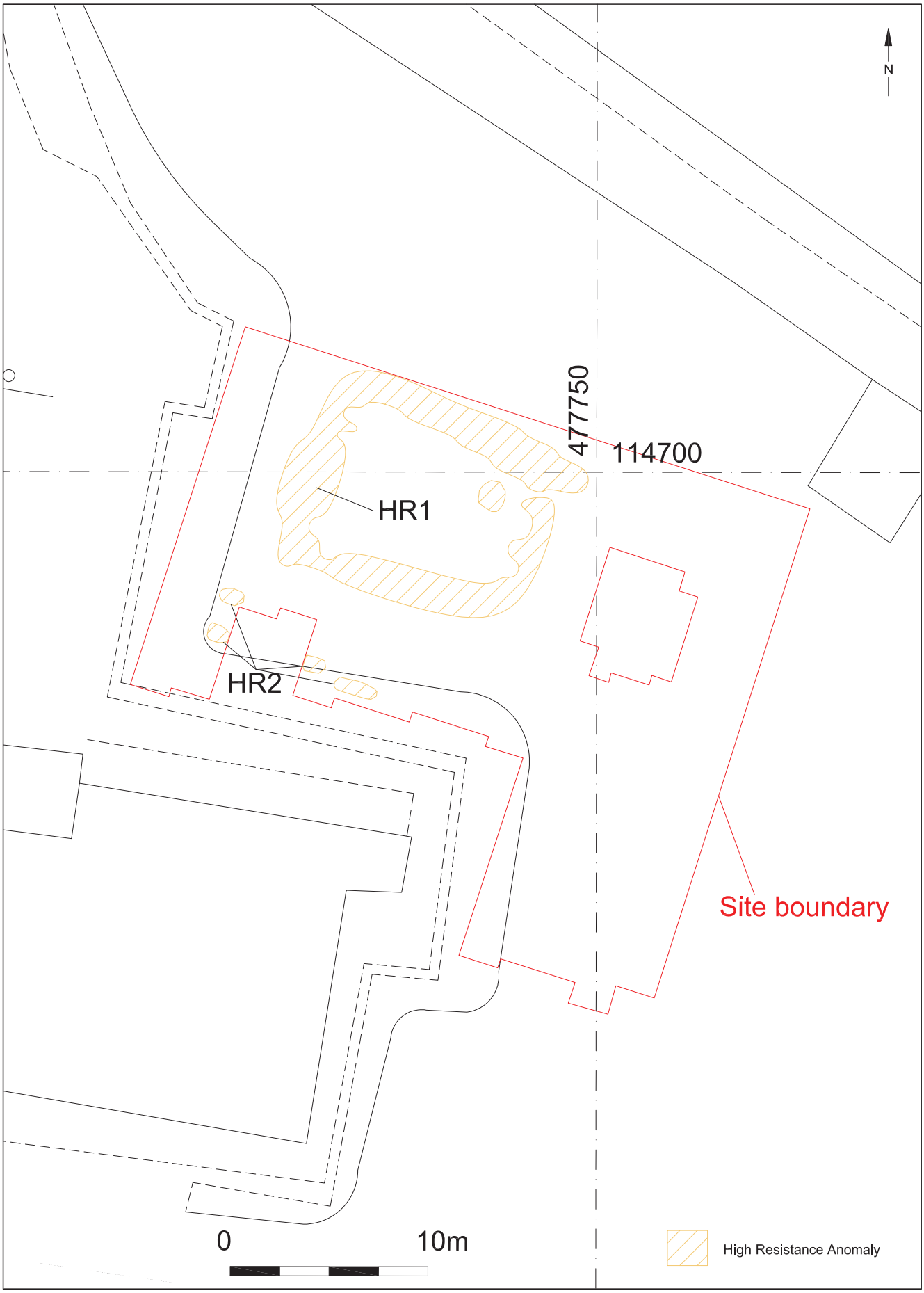

| © Archaeology South-East | | Compton and Up Marden School | Fig. 2 |
|---|---|---|---|
| Project Ref: 4855 | May 2011 | Location of geophysics | |
| Report Ref: 2011097 | Drawn by: JC | | |


| © Archaeology South-East | | Compton and Up Marden School | Fig. 3 |
|---|---|---|---|
| Project Ref: 4855 | May 2011 | Raw shade plot | |
| Report Ref: 2011097 | Drawn by: JC | | |






| © Archaeology South-East | | Compton and Up Marden School | Fig. 4 |
|---|---|---|---|
| Project Ref: 4855 | May 2011 | Processed shade plot | |
| Report Ref: 2011097 | Drawn by: JC | | |




| © Archaeology South-East | | Compton and Up Marden School | Fig. 5 |
|---|---|---|---|
| Project Ref: 4855 | May 2011 | Interpretation of results | |
| Report Ref: 2011097 | Drawn by: JC | | |

Head Office
Units 1 & 2
2 Chapel Place
Portslade
East Sussex BN41 1DR
Tel: +44(0)1273 426830  Fax:+44(0)1273 420866
email: fau@ucl.ac.uk
Web: www.archaeologyse.co.uk

London Office
Centre for Applied Archaeology
Institute of Archaeology
University College London
31-34 Gordon Square, London, WC1 0PY
Tel: +44(0)20 7679 4778
Fax:+44(0)20 7383 2572
Web: www.ucl.ac.uk/caa

The contracts division of the Centre for Applied Archaeology, University College London