

Beaulieu: Zone R



Topographic Survey



May 2017

Client: Countryside Zest

OA East Report No: 2038

OASIS No: oxfordar3-276789

NGR: TL 7359 1056

Beaulieu: Zone R.

Topographic Survey

By Gareth Rees BA MA ACIfA

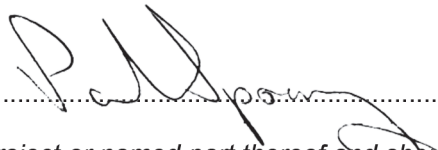
Editor: Richard Mortimer MICfA

Illustrator: Gillian Greer BSc MICfA

Report Date: May 2017

Report Number: 2038
Site Name: Beaulieu Zone R
HER Event No: -
Date of Works: November 2016
Client Name: Countryside Zest
Client Ref: -
Planning Ref: -
Grid Ref: TL 7359 1056
Site Code: SPBP16
Finance Code: XEXBEP14
Receiving Body: Chelmsford Museum
Accession No: -
Prepared by: Gareth Rees
Position: Project Officer
Date: 8th May 2017

Checked by:
Position: Paul Spoerry
Date: Regional Manager
Signed: 8th May 2017



Disclaimer

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Oxford Archaeology being obtained. Oxford Archaeology accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person/party using or relying on the document for such other purposes agrees and will by such use or reliance be taken to confirm their agreement to indemnify Oxford Archaeology for all loss or damage resulting therefrom. Oxford Archaeology accepts no responsibility or liability for this document to any party other than the person/party by whom it was commissioned.

Oxford Archaeology East,
15 Trafalgar Way,
Bar Hill,
Cambridge,
CB23 8SQ

t: 01223 850500
f: 01223 850599
e: oaeast@thehumanjourney.net
w: <http://thehumanjourney.net/oeast>

© Oxford Archaeology East 2017
Oxford Archaeology Limited is a Registered Charity No: 285627

Table of Contents

Summary.....	5
1 Introduction.....	7
1.1 Location and scope of work.....	7
1.2 Situation and Topography.....	7
1.3 Archaeological and historical background.....	7
1.4 Acknowledgements.....	7
2 Aims and Methodology.....	8
2.1 Aims.....	8
2.2 Methodology.....	8
3 Results.....	9
3.1 Introduction.....	9
3.2 Ridge and Furrow.....	9
3.3 Feature 1.....	9
3.4 Feature 2.....	9
3.5 Feature 3, Feature 4 and Feature 5.....	10
3.6 Feature 6.....	10
3.7 Feature 7.....	10
3.8 Feature 8.....	11
3.9 Feature 9.....	11
4 Discussion and Conclusions.....	12
4.1 Chronology.....	12
4.2 Condition.....	12
4.3 Conclusion.....	12
4.4 Significance.....	13
4.5 Recommendations.....	13
Appendix A. OASIS Report Form.....	14

List of Figures

- Fig. 1 Site location map
- Fig. 2 Interpretive plan of earthworks
- Fig. 3 Contour map of earthworks
- Fig. 4 Digital terrain model

List of Plates

- Plate 1 View of Feature 5, facing south-west along ditch
- Plate 2 Features 6, facing south towards Feature 7

Summary

Between the 1st November and 8th November 2016 Oxford Archaeology carried out a topographic survey of a field of earthworks located in Zone R of the Beaulieu Park Development, Chelmsford, Essex (TL 7359 1056). The survey covered a total area of 1.50ha of short grazed pasture land.

The earthworks consisted of eight major features identifiable to type including four ditches, two with associated banks, ridge and furrow cultivation, a levelled area and several hollows. The maximum depth of the earthworks was 0.80m.

The earthworks may be dated by the medieval ridge and furrow which appear to be the earliest features, with all other features overlying and being later than these.

1 INTRODUCTION

1.1 Location and scope of work

- 1.1.1 An archaeological topographic survey was conducted at Zone R, Beaulieu Park, Chelmsford, Essex (Figure 1; TL 7359 1056).
- 1.1.2 This topographic survey was undertaken on the direction of Iain Williamson of AECOM consultants, supplemented by a Specification prepared by OA East.
- 1.1.3 The work was designed to assist in defining the character and extent of any archaeological remains within the proposed redevelopment area, in accordance with the guidelines set out in *National Planning Policy Framework* (Department for Communities and Local Government March 2012). The results will enable decisions to be made by Essex County Council and AECOM, on behalf of the Local Planning Authority, with regard to the treatment of any archaeological remains found.
- 1.1.4 The site archive is currently held by OA East and will be deposited with the appropriate county stores in due course.

1.2 Situation and Topography

- 1.2.1 The site lies at the eastern part of the Beaulieu Park development which is located to the north of Chelmsford, Essex. The geology consists of London Clay overlain by Lowerstoft Formation superficial deposits consisting of chalky till with sands and gravels (<http://mapapps.bgs.ac.uk/geologyofbritain>). The site sloped from down from a maximum height of 46.60m O.D. in the west to 44.60m O.D. in the north-east. The site was bounded by Generals Lane to the east and pastures fields demarcated by hedges to the north and west. The southern boundary consisted of a dirt track leading west from an entrance on Generals Lane.

1.3 Archaeological and historical background

- 1.3.1 Research into the archaeological background of the site was conducted for a desk based assessment of the Beaulieu Park development.

1.4 Acknowledgements

- 1.4.1 The author would like to thank Iain Williamson of AECOM for commissioning and funding the work. Richard Mortimer managed the project. The survey was directed by the author whilst the un-manned aerial Vehicle (UAV) survey was conducted by Lindsey Kemp. Thanks also to Gillian Greer who produced the illustrations.

2 AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The objective of this survey was to determine as far as reasonably possible the location, nature, extent, quality and condition of any surviving earthwork features within the development area through the measurement of topographic data.

2.2 Methodology

2.2.1 The earthwork survey consisted of three parts: A UAV survey, A dGPS survey and a photographic survey.

2.2.2 The UAV survey was conducted using a DGI f550 Hexacopter flying at 20m above the site in transects approximately 10m apart. Overall site photos were taken from a height of 50m. Photographs were taken at 10m intervals along these transects. A photogrammetric model and digital terrain model (DTM) was created from these photos.

2.2.3 This survey was complimented by an interpretive survey carried out using a survey grade Leica GS08 dGPS connected to the Leica SMARTNET RTK network. Lines were recorded at the top and bottom of slopes of all features visible on the ground. Four profiles were recorded across the features by measuring points between 1m and 2m apart (Figure 2).

2.2.4 All of the earthworks were also recorded photographically from ground level using a fixed lens Nikon SLR camera.

2.2.5 The data was processed using AgiSoft Photoscan Pro, AutoCad Map 2016 and Surfer.

3 RESULTS

3.1 Introduction

3.1.1 The results below are presented by the Feature number assigned to each identified earthwork. The ridge and furrow are discussed first since they appear to be the earliest feature. All other features are discussed from north to south. Feature location are shown on Figure 2 along with profiles showing relative heights across the site. The surviving topography is illustrated by way of a contour map (Figure 3), whilst the results are illustrated three-dimensionally in a DTM (Figure 4).

3.2 Ridge and Furrow

3.2.1 Three areas of earthworks were identified that are thought to be the remains of medieval ridge and furrow cultivation. These were located to the north-west, west and east of the site (Figure 2). All of these features survived only as shallow earthworks which had been subject to large amounts of erosion and truncation by later features.

3.2.2 Two probable furrows were located at the north-west of the area. The northernmost ridge measured 22m long from east to west and survived to a maximum of 0.10m in height. An other feature which may have been the remains of a ridge located 4.25m to the south and measured 10.30m. This features survived to a maximum height of 0.10m and was truncated by later activity on its southern edge.

3.2.3 A group of three features, located 34m to the south, may also have been the remains of ridge and furrow cultivation. The northernmost of these ridges, measuring 16.50m long from east to west, 3.80m wide and surviving to a maximum height of 0.15m, was truncated by a later feature to the east. The ridge located 11.50m to the south measured 21m long, 6.40m wide and up to 0.20m high. The southernmost feature was located 5.50m to the south. The ridge measured 25m long, a maximum of 5m wide and up to 0.25m high.

3.2.4 These features were truncated by a later feature to the east but it is possible that they continued to the east of the site where two further ridges were located. The northernmost of these two ridges measured 6.30m long, 5.50m wide and up to 0.15m high. The southern ridge was located 3.70m away. Measuring 9m long and 4m wide, it survived to a height of 0.15m. Both of these ridges appeared to terminate before they reached the eastern boundary of the field.

3.3 Feature 1

3.3.1 The northernmost feature identified was a broad sub-rectangular hollow measuring 47m from east to west and 19m from north to south. Figure 4 illustrates that the south-eastern edge of this feature was formed by bank material associated with Feature 3. There was also a slight bank to the south-west of the feature that could be the remains of upcast. The feature measured up to 0.30m deep and the base sloped from 45.75m OD in the west to 45.10m OD in the east.

3.4 Feature 2

3.4.1 This feature was located in the north-east corner of the site. A slight rise in the ground level separated this hollow from Feature 1 to the west. Two narrow ridges were located on a raised sub-rectangular area which was surrounded on its western, northern, eastern and south-eastern sides by a sharp slope. To the north and east this slope

continued beyond the field boundary. The ridges, running north to south, were barely perceptible whilst the raised area was clearly defined and measured 14.80m from west-southwest to east-northeast and 19m from north to south. The cut feature which surrounded it measured up to 0.40m deep and continued south beyond this feature to join ditch Feature 5 21m to the south.

3.5 Feature 3, Feature 4 and Feature 5

- 3.5.1 Three well preserved ditches were identified demarcating a trapezoidal area (Feature 6)
- 3.5.2 A linear earthwork (Feature 3), located to the south of Feature 1 and to the west of Feature 2 ran from south-east to north-west for 55m. The south-western end was truncated by a later ditch whilst the north-eastern end terminated at the point between Features 1 and 2. Measuring between 5.20m and 5.50m wide and up to 0.25m deep, this ditch was skirted by banks measuring up to 0.20m high on both sides. The ditch became shallower to the north-west where it terminated in the hollow associated with Feature 1.
- 3.5.3 Feature 4 was 'L' shaped in plan and appeared to truncate the south-western end of Feature 3. The longest segment was aligned south-east to north-west and measured 73m long, between 3.5m and 6.50m long and up to 0.30m deep. It turned to the south-west at its north-western end and continued for another 13m before intersecting with the western site boundary. This ditch appeared to have drained in to a large hollow (Feature 7) at its south-eastern end. A low bank, up to 0.1m high was visible on the north-eastern side of this ditch (Figure 4).
- 3.5.4 Another ditch (Feature 5) was located at the west of the site (Plate 1). This ditch, measuring 77m long, between 4m and 6.50m wide and up to 0.32m deep, was orientated south-west to north-east and appeared to have drained in to an area around Feature 2 to the north-east. This ditch also narrowed at its north-eastern end. A bank may have been present on the north-western side at its northern end (Figure 1, Profile 1).

3.6 Feature 6

- 3.6.1 An area (Feature 6) surrounded by these ditches (Features 3, 4 and 5) appeared to have been levelled along its western side adjacent to the bank material of Feature 4. This area, measuring 82m from north to south and 52m from east to west, contained an internal bank along its eastern edge (Figure 2 and Figure 4). This bank, measuring up to 8m wide and less than 0.10m high, appeared to respect the location of that associated with Feature 3 to the north. The ground in this area sloped gently from south to north and dropped away sharply to the east of the internal bank (Plate 2). Several small depressions were located in this area.

3.7 Feature 7

- 3.7.1 A large and irregularly shaped hollow was located in the central southern part of the site. Measuring 21m from north to south, 32m from east to west and up to 0.30m deep, this feature may have been a pond (Figure 1, Profile 3). Both ditches Features 4 and 8 were sloped to drain towards this hollow. There was no connection between this hollow and ditch Feature 4. An area of high ground was located to the east and south-east that may have been formed by the up-cast from the this feature (Figure 4).

3.8 Feature 8

- 3.8.1 A ditch (Feature 8), orientated south-west to north-east, drained in to Feature 7 at its north-eastern end. This ditch, measuring in excess of 47m long, between 5m and 6m wide and up to 0.40m deep appeared to continue to the south beyond the limit of the surveyed area. This ditch narrowed at its lowest points at the intersection with Feature 7. A low earthwork, measuring 5.5m wide, located to the south-east of the ditch may have formed an associated bank (Figure 1, Profile 4; Figure 4).

3.9 Feature 9

- 3.9.1 An area of irregular earthworks were located in the south-eastern corner of the site. These features had a broad north to south alignment however no individual features could be identified. This area may have been partially covered by upcast from Feature 7.

4 DISCUSSION AND CONCLUSIONS

4.1 Chronology

- 4.1.1 The relationships between the surviving earthworks on this site present the possibility to assign at least three phases of activity, the dating of which is based on type apparent stratigraphy. Further field work would be required to assign absolute dates to these features.
- 4.1.2 The earliest features on the site appeared to be the three areas of probable ridge and furrow. Features such as these often date to the Medieval period. The apparent continuation of the ridge and furrow cultivation from the east to the west of the site implies that all other activity, including Features 3, 4, 5 and 6, truncated it.
- 4.1.3 It is likely that the next phase of activity here was evidenced by the two south-west to north-east aligned ditches (Features 3 and 5). Both of these ditches narrowed and were sloped towards their north-eastern ends where they met Feature 1 and Feature 2 respectively. This is illustrated clearly on Figure 4. These low areas may have been a natural depression, however the rectangular shape of Feature 1 and raised internal ridges in Feature 2 imply that this area was landscaped to fulfil a specific function. The origin of both Feature 3 and 5 was truncated by later activity and so it is not possible to establish a function from what remains on the surface.
- 4.1.4 Feature 3 and Feature 5 appeared to have been truncated by a ditch (Feature 4) and a hollow (Feature 7). Feature 7 was a large hollow or pond in to which ditches ran from the north-west (Feature 4) and south-west (Feature 8). Feature 9 may also relate to the construction of this hollow which was probably man-made. The sharp right angle turn at the north-eastern end of Feature 4 may indicate that it was a boundary or enclosure ditch which may have continued beyond the limit of the current survey area. Feature 8 also continued south-west beyond the limit of the survey area. The orientation of these ditches indicates that they almost certainly pre-date the enclosure of the extant fields in this area.
- 4.1.5 The function of the area (Feature 6) lying between the ditched earthwork features (Features 3, 5 and 5) is not clear. The low bank identified to the east of this area may indicate an attempt to demarcate it for a specific purpose. It was also unclear which phase of activity this area related to.

4.2 Condition

- 4.2.1 The earthworks on this site survived in various states of preservation. The best preserved were ditch Features 3, 4, 5 and 8, along with hollow Feature 7. Earthworks derived from upcast were barely perceptible on the ground but are clearly visible after modelling of the photogrammetric data (Figure 3 and Figure 4). No features survived to greater than 0.40m. The greatest measured variation of 0.80m was between the eastern part of Feature 6 and the base of ditch Feature 5. All of the earthworks were covered by pasture and as such are currently stable. Some degradation were apparent due to a track running from a gate in the western boundary of the field to a gate in the northern boundary.

4.3 Conclusion

- 4.3.1 The topographic survey of this site has shown there to be significant earthwork features present most likely relating dating to the Medieval period and later. Landscaping of this

type could have been related to agricultural or industrial activity. They may be associated with water management for the Beaulieu estate to the south.

4.4 Significance

4.4.1 Earthworks identified in Zone R of the Beaulieu Park development will add to the overall site narrative and will also add to local histories of the parish of Boreham.

4.5 Recommendations

4.5.1 Recommendations for any future work based upon this report will be made by the County Archaeology Office.

APPENDIX A. OASIS REPORT FORM

Project Details

OASIS Number	oxfordar3-276789		
Project Name	Zone R Beaulieu Topographic survey		
Project Dates (fieldwork) Start	01-11-2016	Finish	08-11-2016
Previous Work (by OA East)	Yes	Future Work	No

Project Reference Codes

Site Code	XEXBEP14	Planning App. No.	
HER No.		Related HER/OASIS No.	

Type of Project/Techniques Used

Prompt	Direction from Local Planning Authority - PPS 5
Development Type	Rural Residential

Please select all techniques used:

<input type="checkbox"/> Aerial Photography - interpretation	<input type="checkbox"/> Grab-Sampling	<input checked="" type="checkbox"/> Remote Operated Vehicle Survey
<input type="checkbox"/> Aerial Photography - new	<input type="checkbox"/> Gravity-Core	<input type="checkbox"/> Sample Trenches
<input type="checkbox"/> Annotated Sketch	<input type="checkbox"/> Laser Scanning	<input type="checkbox"/> Survey/Recording Of Fabric/Structure
<input type="checkbox"/> Augering	<input checked="" type="checkbox"/> Measured Survey	<input type="checkbox"/> Targeted Trenches
<input type="checkbox"/> Dendrochronological Survey	<input type="checkbox"/> Metal Detectors	<input type="checkbox"/> Test Pits
<input type="checkbox"/> Documentary Search	<input type="checkbox"/> Phosphate Survey	<input checked="" type="checkbox"/> Topographic Survey
<input type="checkbox"/> Environmental Sampling	<input checked="" type="checkbox"/> Photogrammetric Survey	<input type="checkbox"/> Vibro-core
<input type="checkbox"/> Fieldwalking	<input checked="" type="checkbox"/> Photographic Survey	<input type="checkbox"/> Visual Inspection (Initial Site Visit)
<input type="checkbox"/> Geophysical Survey	<input type="checkbox"/> Rectified Photography	

Monument Types/Significant Finds & Their Periods

List feature types using the [NMR Monument Type Thesaurus](#) and significant finds using the [MDA Object type Thesaurus](#) together with their respective periods. If no features/finds were found, please state "none".

Monument	Period	Object	Period
Earthworks	Medieval 1066 to 1540		Select period...
Earthworks	Post Medieval 1540 to 1901		Select period...
	Select period...		Select period...

Project Location

County	Essex	Site Address (including postcode if possible)	
District	Chelmsford	1460a Generals Ln, Boreham, Chelmsford CM3 3HJ, UK	
Parish	Boreham		
HER	Chelmsford		
Study Area	1.58ha	National Grid Reference	TL 7359 1056

Project Originators

Organisation	OA EAST
Project Brief Originator	Iain Williamson
Project Design Originator	Richard Mortimer
Project Manager	Richard Mortimer
Supervisor	Gareth Rees

Project Archives

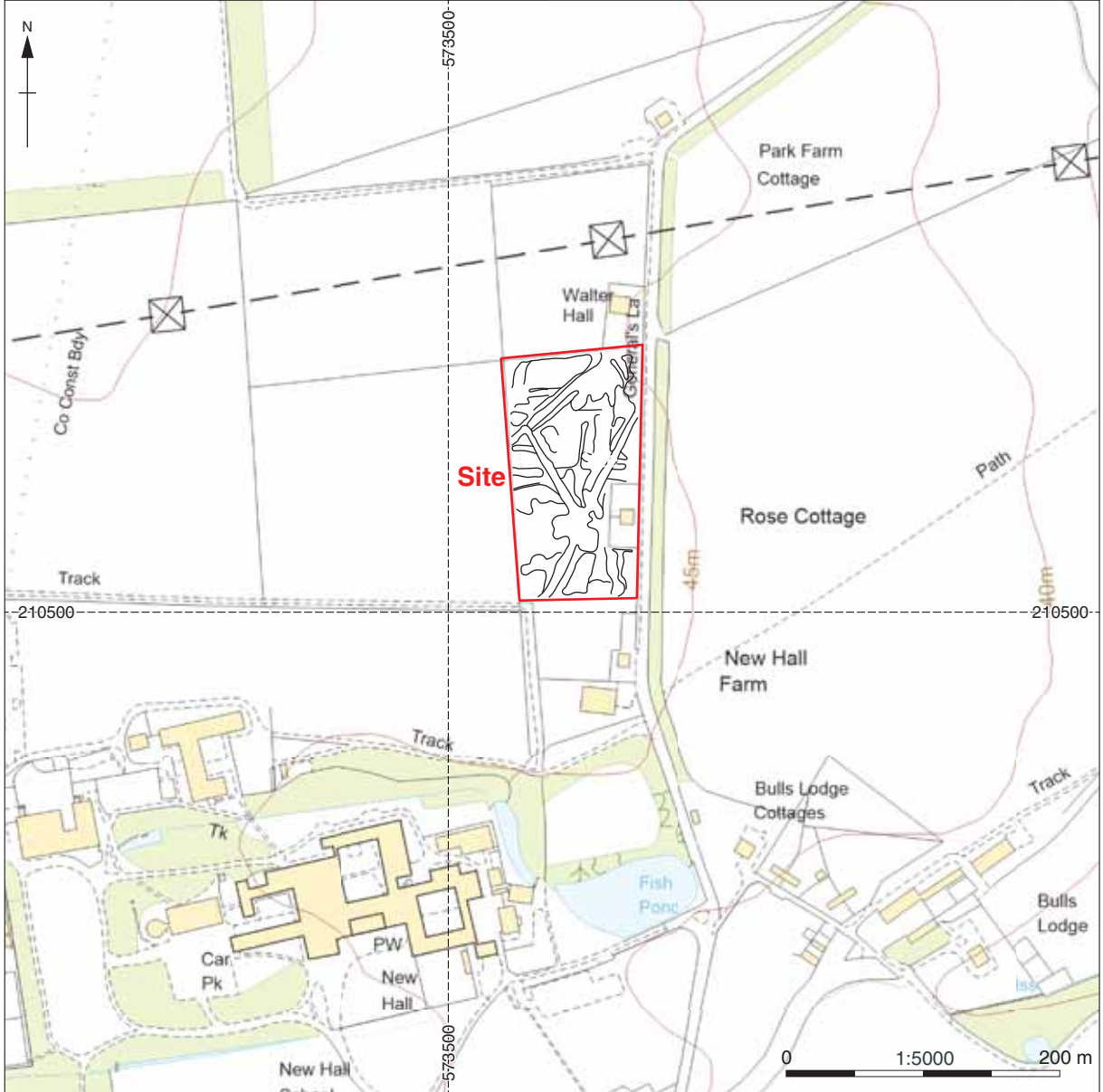
Physical Archive	Digital Archive	Paper Archive
OA East	OA East	OA East
XEXBEP14	XEXBEP14	XEXBEP14

Archive Contents/Media

	Physical Contents	Digital Contents	Paper Contents
Animal Bones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ceramics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human Bones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stratigraphic		<input type="checkbox"/>	<input type="checkbox"/>
Survey		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Textiles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked Bone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked Stone/Lithic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Digital Media	Paper Media
<input type="checkbox"/> Database	<input checked="" type="checkbox"/> Aerial Photos
<input checked="" type="checkbox"/> GIS	<input type="checkbox"/> Context Sheet
<input type="checkbox"/> Geophysics	<input type="checkbox"/> Correspondence
<input checked="" type="checkbox"/> Images	<input type="checkbox"/> Diary
<input checked="" type="checkbox"/> Illustrations	<input type="checkbox"/> Drawing
<input type="checkbox"/> Moving Image	<input type="checkbox"/> Manuscript
<input type="checkbox"/> Spreadsheets	<input type="checkbox"/> Map
<input checked="" type="checkbox"/> Survey	<input type="checkbox"/> Matrices
<input checked="" type="checkbox"/> Text	<input type="checkbox"/> Microfilm
<input type="checkbox"/> Virtual Reality	<input type="checkbox"/> Misc.
	<input type="checkbox"/> Research/Notes
	<input checked="" type="checkbox"/> Photos
	<input type="checkbox"/> Plans
	<input checked="" type="checkbox"/> Report
	<input type="checkbox"/> Sections
	<input checked="" type="checkbox"/> Survey

Notes:



Contains Ordnance Survey data © Crown copyright and database right 2017. All rights reserved. Centremaps reference 10001998

Figure 1: Site location showing archaeological features (brown) in evaluation area (red)

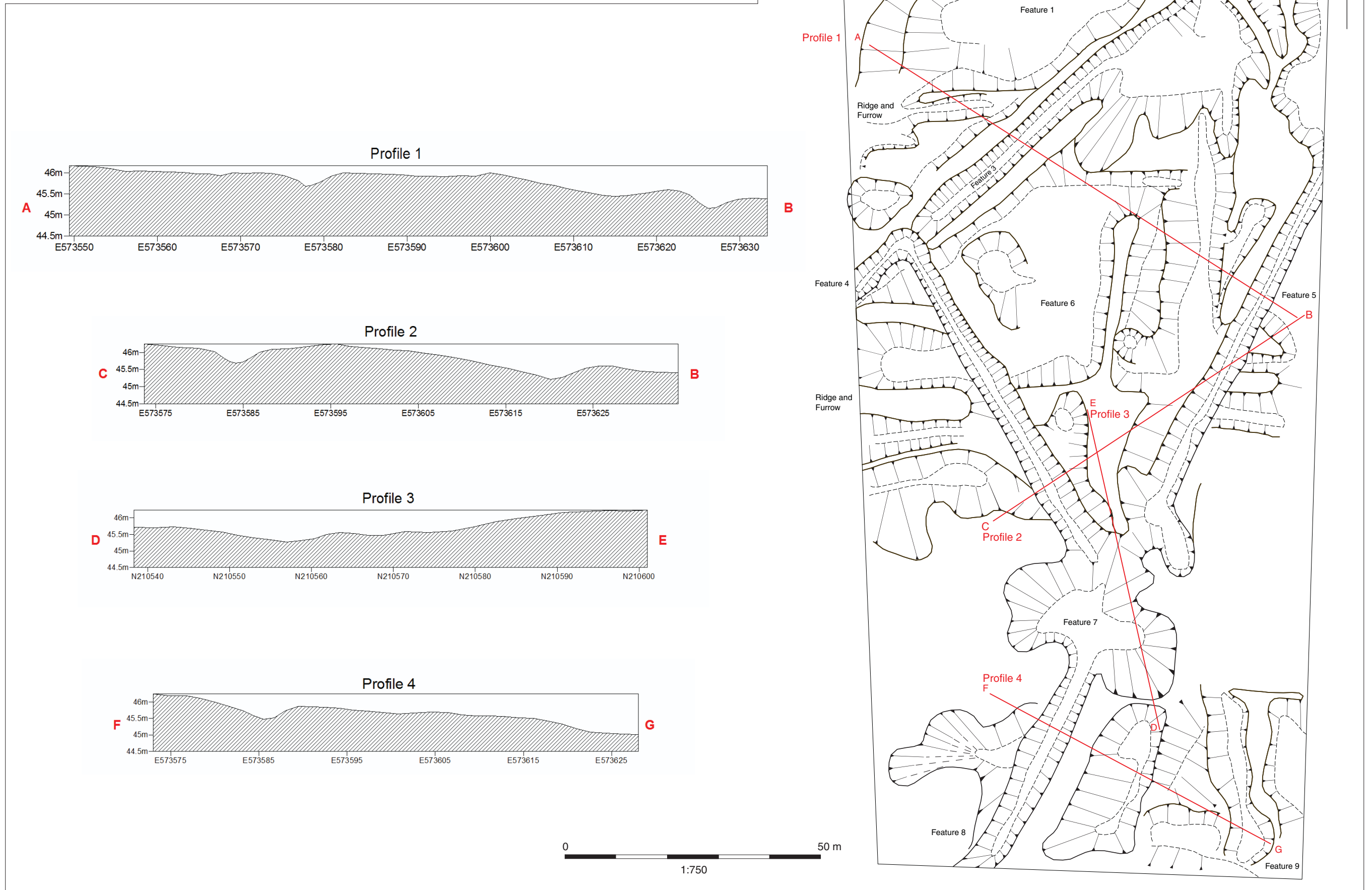


Figure 2: Interpretive plan of earthwork features and associated profiles



Figure 3: Contour map

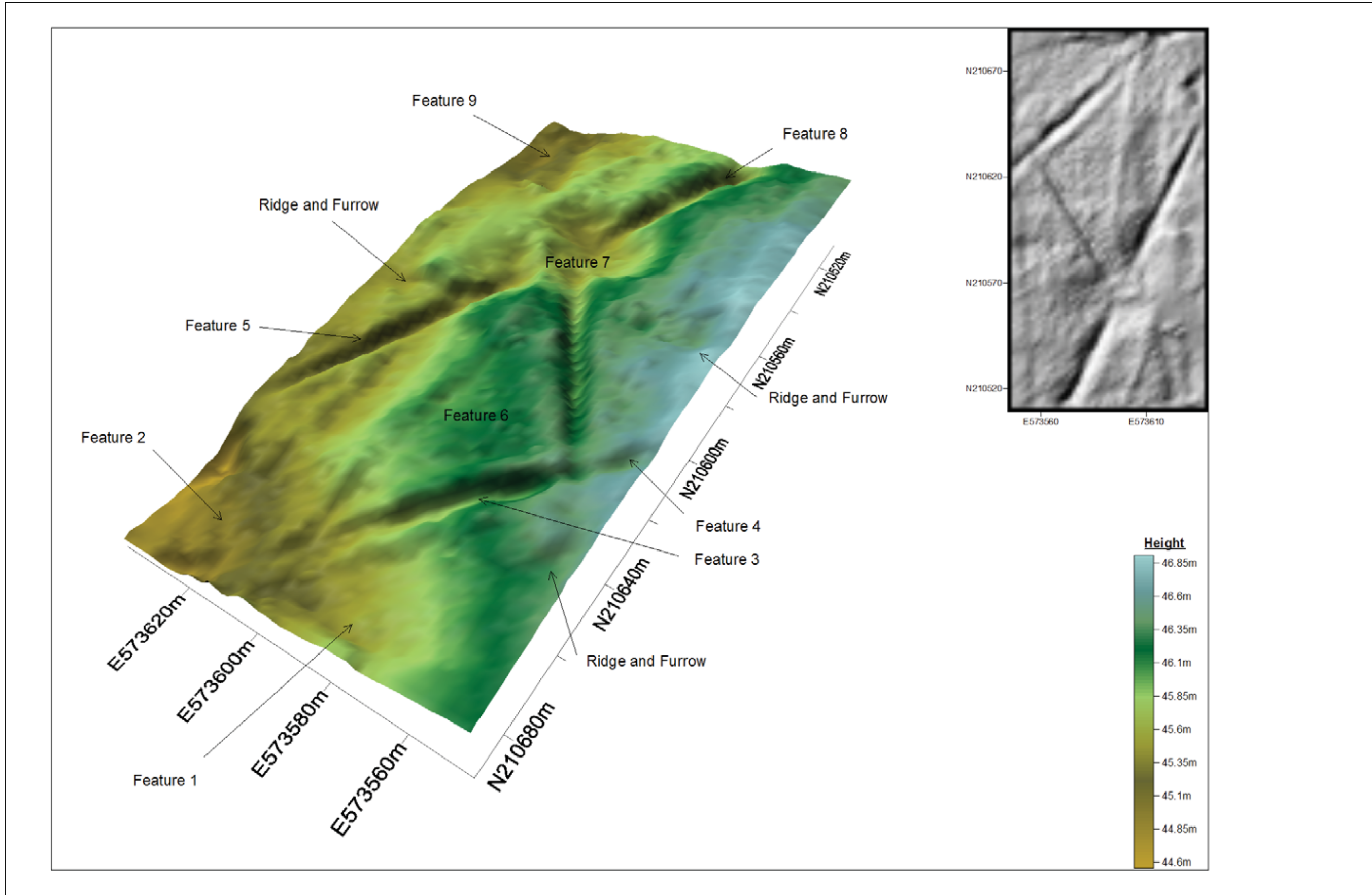


Figure 4: Digital terrain model



Plate 1: View of Feature 5, facing south-west along ditch



Plate 2: Feature 6, facing south towards Feature 7



Head Office/Registered Office/ OA South

Janus House
Osney Mead
Oxford OX2 0ES

t: +44 (0) 1865 263 800
f: +44 (0) 1865 793 496
e: info@oxfordarchaeology.com
w: <http://oxfordarchaeology.com>

OA North

Mill 3
Moor Lane
Lancaster LA1 1QD

t: +44 (0) 1524 541 000
f: +44 (0) 1524 848 606
e: [oanorth@oxfordarchaeology.com](mailto: oanorth@oxfordarchaeology.com)
w: <http://oxfordarchaeology.com>

OA East

15 Trafalgar Way
Bar Hill
Cambridgeshire
CB23 8SQ

t: +44 (0) 1223 850500
e: [oaeast@oxfordarchaeology.com](mailto: oaeast@oxfordarchaeology.com)
w: <http://oxfordarchaeology.com>



Director: Gill Hey, BA PhD FSA MCIFA
*Oxford Archaeology Ltd is a
Private Limited Company, N^o: 1618597
and a Registered Charity, N^o: 285627*