

**LAND NORTHWEST OF SOUTH WOOTTON SCHOOL, OFF EDWARD BENIFER
WAY, SOUTH WOOTTON, NORFOLK**

ARCHAEOLOGICAL EARTHWORK SURVEY REPORT

NGR: TF 6366 2241
Planning Ref.: 17/01151/OM
PCAS job no. 1874
Site code: SWOT 18
HES Reference: CNF47188
NHER Event number: ENF 143223
OASIS Reference: preconst3-314593

Prepared for

Larkfleet Homes

by

F. Johnson BA (Hons)

April 2018



PCAS Archaeology Ltd
47, Manor Road
Saxilby
Lincoln
LN1 2HX

Tel. 01522 703800
e-mail info@pcas-archaeology.co.uk

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Summary

PCAS Archaeology Ltd. were commissioned by Larkfleet Homes to carry out an archaeological earthworks survey in advance of development on land to the north-west of South Wootton School, off Edward Benefer Way, South Wootton, Norfolk, in support of an application for planning permission.

The earthworks survey forms part of a programme of archaeological evaluation which will be used to inform an application for planning permission for the proposed development: it follows on from the preparation of a desk-based assessment and took place in advance of evaluation trenching.

The development area lies across the medieval shoreline, with settlement on the higher, reliably dry ground to the east and former marshland to the west: medieval salt production sites have been identified from aerial photographs on the west side of the application area. Within the south-east corner of the application area, earthwork ridge-and-furrow resulting from medieval or post-medieval strip field cultivation as well as a series of field banks and ditches has been identified.

The survey identified a number of features of archaeological significance comprising an extensive area of ridge-and-furrow earthworks to the east of the site which is indicative of medieval strip farming. However, no conclusive remains of the Saltern mound, located by aerial photography to the southwest of the site, were identified during the course of these works.

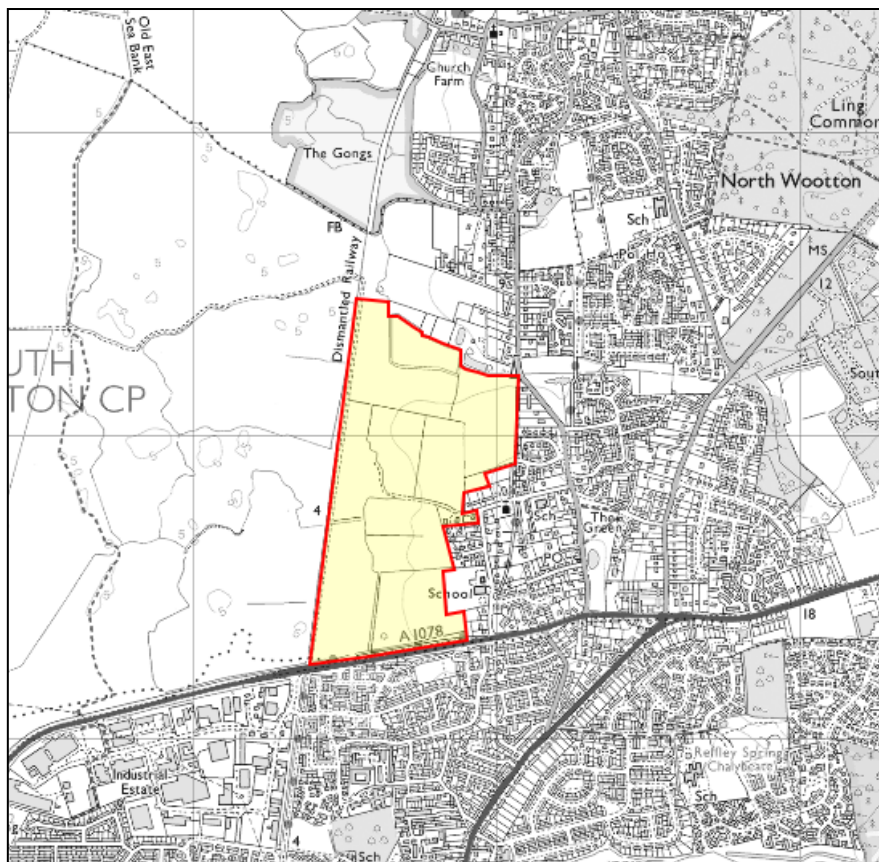


Figure 1: Location plan of the site at scale 1:25,000. OS mapping © Crown copyright. All rights reserved. PCAS licence no. 100049278.

1.0 Introduction

PCAS Archaeology Ltd. were commissioned by Larkfleet Homes to carry out an archaeological earthworks survey in advance of development on land to the north-west of South Wootton School, off Edward Benefer Way, South Wootton, Norfolk, in support of an application for planning permission.

The proposed development site incorporates earthworks identified as medieval to post-medieval ridge-and-furrow and field boundaries, and adjoins an area of former marshland containing extensive evidence of earthwork saltern mounds ranging from Anglo-Saxon to post-medieval in date. Three saltern mounds have been identified from aerial photographs within the development site: one was formerly visible as an earthwork, although it has now been levelled by ploughing. In order to preserve the earthwork remains by record prior to development, an archaeological survey is required as the first stage in a programme of archaeological works which will go on to evaluation trenching.

The standards of fieldwork, recording and reporting conform to all current best practice and all current national guidelines as set out by:

- National Planning Policy Framework, (Department for Communities and Local Government 2012);
- The Chartered Institute for Archaeologists Code of Conduct (CIfA 2014a);
- The Chartered Institute for Archaeologists '*Standard and guidance for archaeological field evaluations*' (CIfA 2014b);
- '*Management of Research Projects in the Historic Environment*' (MoRPHE; Historic England 2015);
- Standards for Field Archaeology as outlined in East Anglian Archaeology Occasional Paper 14 (Gurney 2003).
- A specifications for the works prepared by this company (Savage 2017).

2.0 Site Location and Description

The village of South Wootton is situated within the Norfolk borough of King's Lynn and West Norfolk, and lies approximately 2.5km to the north of the centre of King's Lynn. The site is located on the western edge of South Wootton village, on the north side of Edward Benefer Way (A1078).

The entire application area measures 31.14 hectares, and is bordered by the A1078 on its south side and the course of a disused railway line to the west, while the northern and eastern boundaries are variously formed by properties within South Wootton, the playing fields of South Wootton Junior School and field boundary hedges (RPS, 2017).

The area to be surveyed forms the south-east corner of the application area, and measures some 5.8 hectares, with a central National Grid Reference of TF 6366 2241.

3.0 Topography and Geology

The topography of the application area is recorded as being almost flat, but slightly lower to the east and north (Armstrong and Roseveare, 2016). The earthworks survey site is at a height of between 3 and 4m AOD, slightly higher at the southern end (EDP, 2017).

Soils on the east side of the application area, including the survey site, are recorded as naturally wet, very acid, sandy and loamy. The natural drift geology in this part of the application area is Lowestoft Formation Diamicton (a naturally deposited but poorly sorted sediment whose mixed, disturbed appearance can resemble made ground), overlying a solid geology of undifferentiated Roxham Member and Runcton Member sand. A geophysical survey carried out within the majority of the application area in 2016 noted a clear transition from the drier ground on the east side of the site to the drained marshland on the west (*ibid.*).

4.0 Planning Background

An outline major planning application for a sustainable mixed-use urban extension comprising up to 450 dwellings, a mixed-use local centre comprising Class A uses (including retail facilities and public house) and Class D1 (such as crèche/day centre/community centre) and B1 uses (such as offices), open space and landscaping, wildlife area, children's play areas, sustainable urban drainage infrastructure, access and link road and associated infrastructure, is currently under consideration (application no. 17/01151/OM).

The results of the earthworks survey and a subsequent archaeological evaluation will be presented in support of the application and used to inform any scheme of archaeological mitigation that may be required as a condition of planning consent.

The approach adopted is consistent with the recommendations of the National Planning Policy Framework (NPPF), with the particular chapter of relevance being 'Chapter 12: Conserving and enhancing the historic environment' (Department for Communities and Local Government 2012).

5.0 Archaeological and Historical Background

A detailed archaeological and historical background for the site can be found in the archaeological desk-based assessment previously prepared for the site (Evans, 2016).

In summary, the application area appears to have lain in an area of post-Roman marine transgression, suggesting that prehistoric and Roman remains are unlikely to be found there: evidence for prehistoric activity within the study area was confined to finds of struck flint, almost all of which were found on the higher ground to the north, south and east of the proposed development area; none were found within the site itself. There was even less evidence for Roman activity, with a single find of Romano-British pottery recorded to the north-east of the proposed development area, again on the slightly higher and more reliably dry ground.

Although salt manufacture is documented on this part of the Norfolk coast from the Anglo-Saxon period, no finds or other remains of Saxon date have been recorded within the application area, and the majority of the very limited amount of Saxon material found within the wider study area has again been found on the higher ground to the north and east of the proposed development area.

The area of the proposed development appears to lie across the medieval coastline, between the higher ground to the east, where the medieval villages of North and South Wootton became established, and the former saltmarsh to the west (*Figure 2*).

Salt manufacture took place in this coastal area during the Middle Ages: medieval salt extraction typically used the sand-washing technique, by which salt was extracted from the salt-rich sand deposited at the tideline, rather than by boiling sea water. Sand was collected after spring tides and stored at the saltern site, where the salt was washed out of it in a filtration

unit constructed of local materials, such as clay and turf, and the resulting brine was concentrated before the salt was crystallised by boiling, normally in lead pans. Shelter from the weather during this process was provided by a small building known as a salt-cote: along the Lincolnshire Fen coast, these were typically timber-framed, with mud walls and a reed thatch. The washed sand was dumped near the salt processing area: the mounds thus formed built up to become significant landscape features, and land reclamation along this part of the coast frequently began as a by-product of the salt industry (Grady, 1998).

A small group of saltern sites have been recorded from aerial photographs within the vicinity of the site (NHER 27129, 13784, 27130 and 27131), one of which being located development area (*Figure 2*). The easternmost of these, which is likely to be the oldest as it is furthest from the coastline, lies within the survey area although the saltern mound is no longer visible as a surface feature.

At the north-eastern edge of the application area, the remains of late medieval stone and brick buildings, interpreted as possible shipping warehouses, were encountered during excavations; medieval pottery was also found on this site.

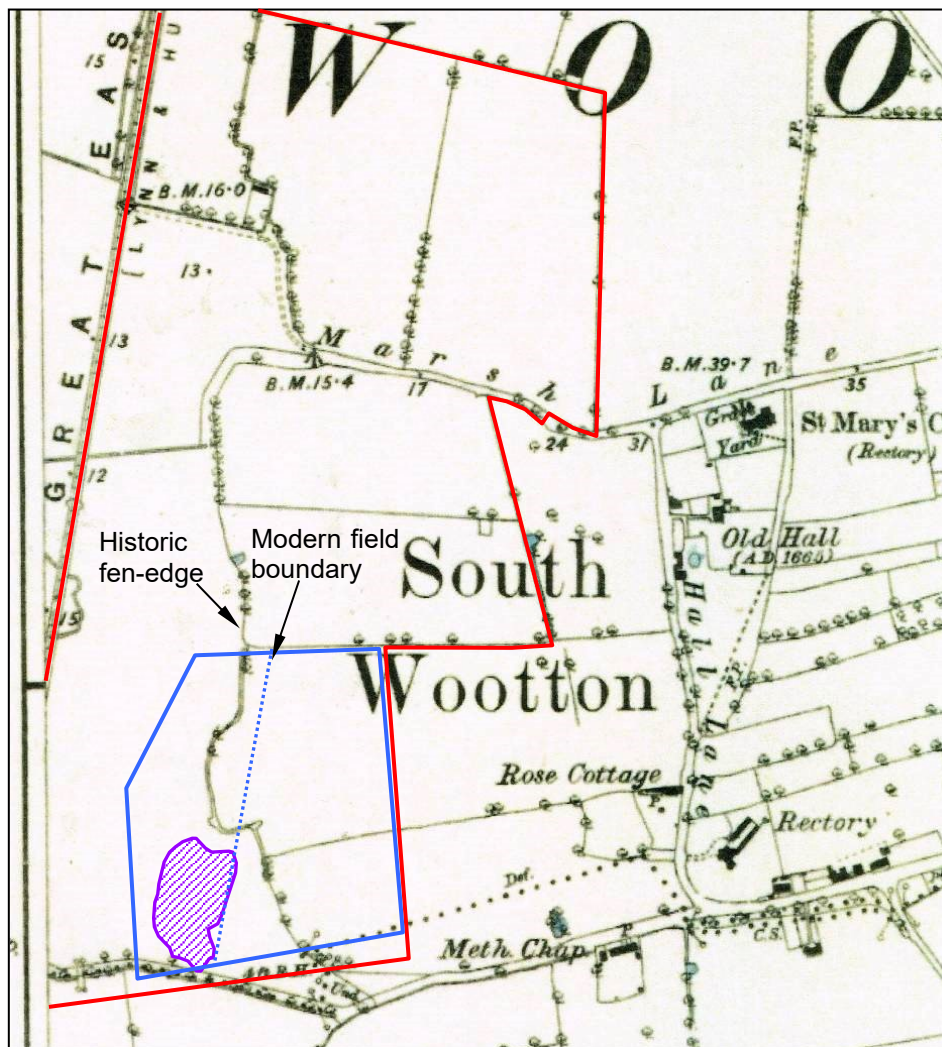


Figure 2: Extract from the 1st edition 6" to the mile Ordnance Survey map of 1884 (not reproduced to scale). Showing the application area outlined in red, the area of the earthworks survey in blue, and the known saltern site (HER number 2129) hatched purple.

On the eastern side of the proposed development area, during the analysis of aerial photographs of the area taken in 1946 undertaken as part of the desk-based assessment, a small area of strip field ridge and furrow cultivation was noted to the west of South Wootton Junior School, in an area which remains as pasture land (NHER 62316). These remains are likely to date to the medieval period, but may also be of post-medieval origin, and are a good indication of the change in land use from the settlements to the east and salt-making industry to the west. This field system may either have lain in an area between the saltmarshes and the settlements, or may have become established after the waste products from the salterns (sands and silts from which the salt had been extracted) accumulated and the ground levels were raised over the previous saltmarsh surface.

Although no heritage assets of post-medieval date are specifically recorded within the application area, at least two of the medieval salterns located in the south-west corner of the proposed development appear to have been utilised for defensive installations, either during the 16th century or the Civil War. The earthwork field system identified to the west of South Wootton Junior School may also date to the post-medieval period rather than the medieval; the relatively straight form of the furrows may indicate a late date, when ploughing was typically carried out with the more manoeuvrable horses rather than with oxen.



Figure 3: Extract from the geophysical survey, showing the area where the earthworks survey is to take place.

Not reproduced to scale: after Armstrong and Roseveare, 2016.

A geophysical survey was carried out within the majority of the application area in 2016. The survey noted a clear transition from the drier ground on the east side of the site to the drained

marshland on the west, with former shorelines and a former marine inlet being observed. A number of linear ditches were identified, some of which could be identified as field boundaries on historic mapping. The saltern site was not identified, possibly due to the masking effect of material spread on the field during recent manuring. A network of small enclosures was seen at the east side of the application area, and it was suggested that some of its characteristics may have been due to industrial activities involving heat. Within the earthworks survey area, shoreline deposits were identified along its western edge; three linear features, interpreted as field boundaries pre-dating mid-19th-century mapping, were observed, while a further linear anomaly may have been a ditch cutting the shoreline deposits, probably as the outfall of a drain (Armstrong and Roseveare, 2016).

6.0 Methodology

A Level 2 earthwork survey of the site was undertaken to pick up archaeological features and landscape details in the area to the southeast of the proposed development site (English Heritage 2007).

Surveying was initially undertaken by an experienced archaeological surveyor over a period of three working days between the 11th and 15th of May 2017 using a survey grade Leica GS08 GPS unit receiving RTK corrections to produce an accuracy of c. +/- 20mm. After a rapid walkover survey of the site was conducted, a series of transects were also surveyed in order to produce typical profiles across the areas of surviving ridge and furrow. Weather conditions were foggy early in the day with brighter spells towards the end of the day, whilst ground conditions were clear with both fields being in rough pasture.

This was later supplemented by a programme of low level oblique photography and mapping, undertaken by HexCam on Tuesday 13th of March 2018, which was then used to create a highly accurate 3D digital terrain model (DTM) of the site using an overlapping series of low-level aerial photographs via photogrammetry. The work was carried out in strict accordance with HexCam's CAA-approved Operations Manual (Permission for Commercial Operations - PfCO 117) using a DJI Matrice M210 Small Unmanned Aircraft (SUA) piloted by an experienced person. Ground control points accurately located by a surveyor from Survey Solutions. Weather conditions were cloudy with intermittent bright spells through the day.

The GPS data collected, along with the data provided by the aerial survey, was downloaded and computed using QGIS 2.18 geographical information system in order to accurately locate the data within the Ordnance Survey Network Grid and produce digital interpretation plans, including a hachure plan produced in accordance with English Heritage line conventions (English Heritage 2007, 34). Numbers in square brackets within the text (See Section 7 below) refer to earthwork features shown on Figure 4.

This data was also used to produce a detailed 3D digital terrain model (DTM) of the site to 0.1m accuracy, with additional 1m LiDAR data provided by the Environment Agency (REF) to map to surrounding terrain.

7.0 Results

The earthworks surveyed at the site largely consisted of the ridges and furrows, [1], (NHER 62316) indicative of medieval strip farming, and a series of field boundary banks and ditches. However, no conclusive remains of the Saltern mound (NHER 27129), which was located by aerial photography to the southwest of the site, were identified during the course of these works.

Across the eastern part of the survey area, running broadly northeast to southwest, 26 linear earthwork features were identified, [1], comprising a series of alternating banks and hollows consistent with the distinctive ridges and furrows of an open field agricultural system. All of these are fairly straight in form and displayed a typical slight reverse 'S' curve in plan, with the ridges (or lands) spaced approximately 6m apart, which is typical for later forms of medieval ridge and furrow.

A series of field boundary banks and ditches were also recorded during the survey, many of which seem to respect the direction of the ridge and furrow earthworks. A later field boundary, [3], is also noted, running broadly north to south through the centre of the survey area.

8.0 Discussion and Conclusions

The earthwork survey identified a number of features of archaeological significance.

The eastern part of the surveyed area is dominated by ridge and furrow earthworks, aligned broadly northeast to southwest, as well as a series of probably contemporary field boundaries on the same alignment, indicative of an open field agricultural system. Although field boundary banks and ditches are commonly found in agricultural contexts across much of Norfolk, surviving earthworks of ridge and furrow are atypical of the county and are therefore of some significance. The straight form of the earthworks does, however, infer that they maybe of late medieval to post medieval date and suggests that during this period the site would have been in an agricultural zone on the periphery of the medieval settlement.

Aerial photography of the area indicated that there were the remains of a saltern mound located to the southwest of the survey area, [2], however as a result of ongoing arable cultivation no visible earthwork remains alluding to this. Profiles of the site produced from the point data collected during the course of the earthwork survey and from the 8cm DTM and orthomosaic of the site produced by HexCam collaborate this interpretation (*Figure 6*), with no notable change in ground surface being noted in the area of the saltern mound.

9.0 Effectiveness of Methodology

The measured field survey methodology employed was suited to the nature of the project in determining the extent and preservation of any extant remains. It has allowed for a permanent record of the existing earthworks on the site to be made prior to development.

The aerial survey methodology employed was also suited to the nature of the project in determining the extent and preservation of any extant remains. It allowed for a 3D digital terrain model and orthomosaic photograph to be produced of the site, accurately mapping the landscape and all extant earthworks and thereby creating a permanent record to be made prior to development.

10.0 Project Archive

All documentation and records generated during the project, including the raw GPS data, will be converted into an appropriate format and will be prepared in accordance with all current appropriate guidelines referring to long to storage.

As there is currently no receiving museum within the borough of King's Lynn and West Norfolk, the archive will be curated by PCAS until a suitable museum of record can be appointed.

A copy of the full report will also be uploaded to the Archaeology Data Service in OASIS (Online Access to the Index of archaeological investigationS) database, where it will be publicly accessible online.

11.0 Acknowledgements

PCAS Archaeology Ltd would like to thank Larkfleet Holmes for this commission as well as Rowley Cory-Wright from HexCam Ltd for providing the programme of low level oblique photography and mapping allowing for the creation of a 3D DTM and orthomosaic photograph of the site.

12.0 References

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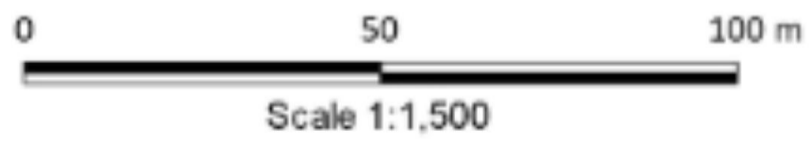
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Appendix 1: Figures

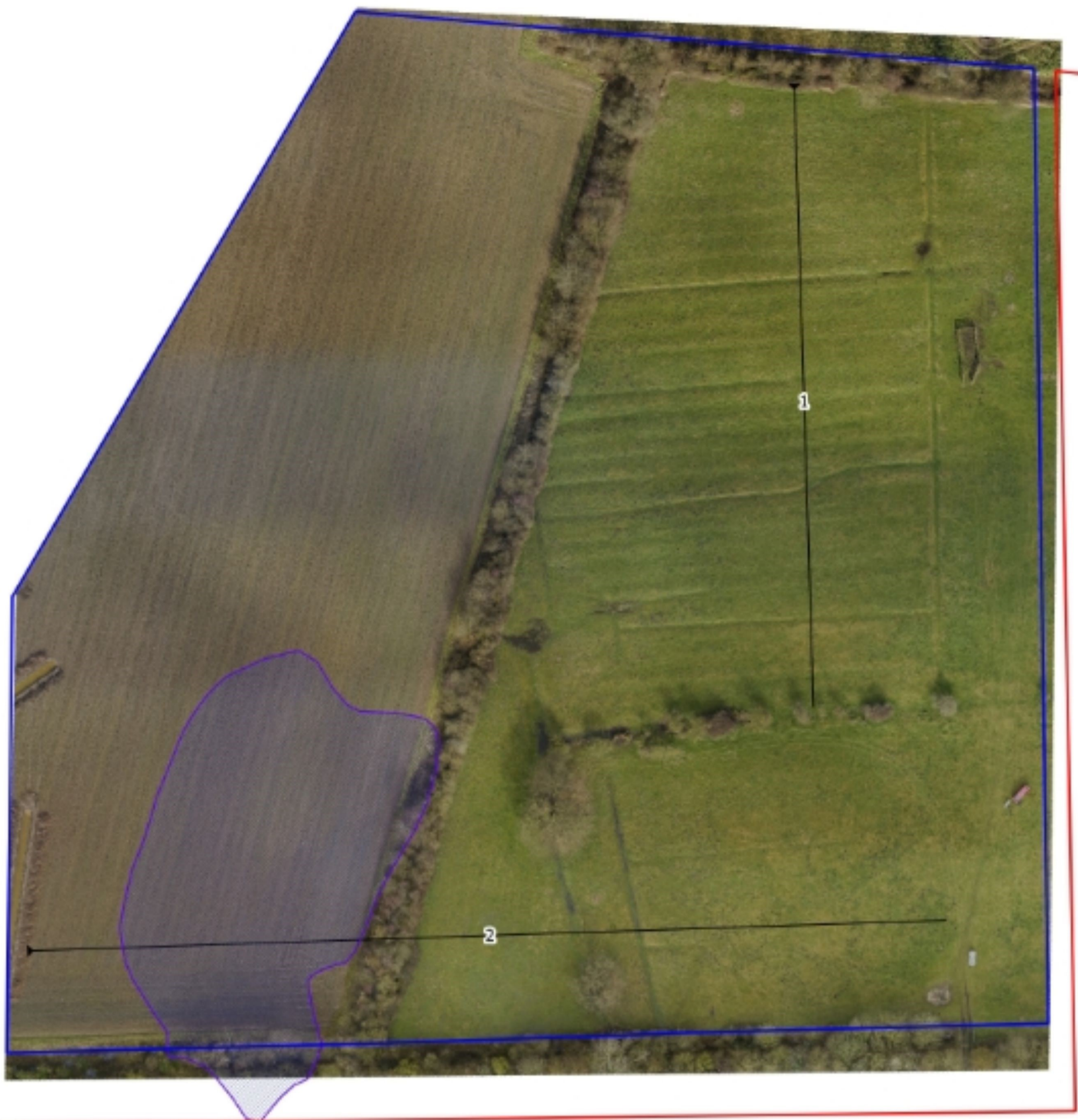


- Key**
- NHER 27129
 - Site Boundary
 - Earthwork Survey area
 - Ridge and Furrow







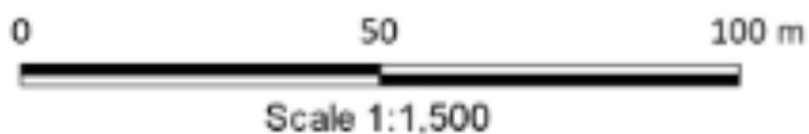
PCAS Job No: 1874 Site Code: SWOT 18	Draughter: FJ
	Scale: 1:1500 @ A3
	Date: 16/04/2018

Figure 4: Hasher plan of site showing extent of Ridge and Furrow earthworks and extant field boundaries.



Key

-  NHER 27129
-  Site Boundary
-  Earthwork Survey area
-  Transect



PCAS Job No: 1874
Site Code: SWOT 18

Draughter:
FJ

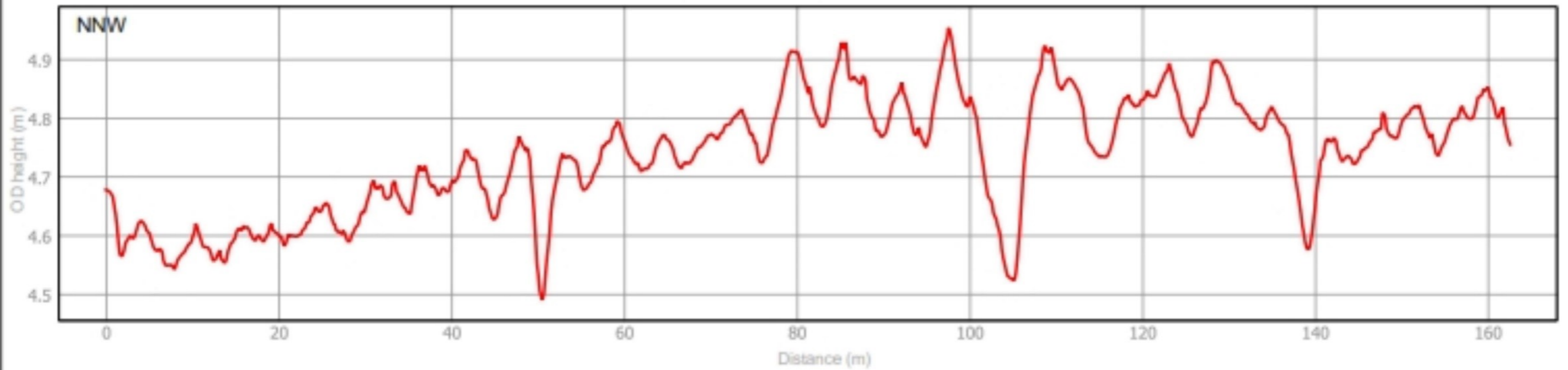
Figure 5: Plan of site showing transect locations, in black, overlaying HexCam's 8cm DTM and Orthomosaic survey.



Scale:
1:1500 @ A3

Date:
16/04/2018

North-northwest to South-southeast oriented transect 1



East-northeast to West-Southwest oriented transect 2

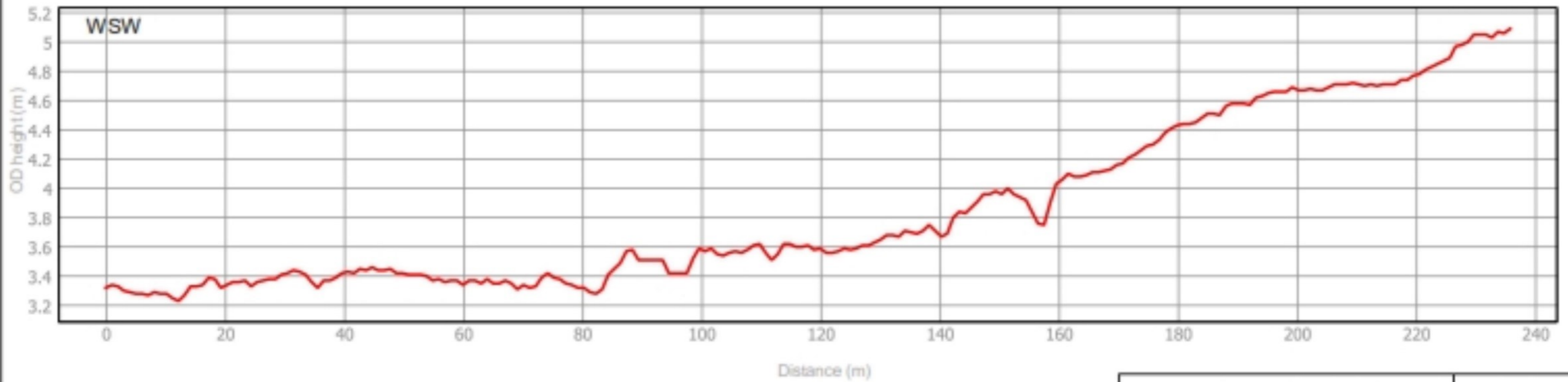


Figure 6: Site profiles

PCAS Job No: 1874
Site Code: SWOT 18

Draughter:
FJ



Scale:
- @ A4

Date:
16/04/2018

Appendix 2: OASIS summary

Summary for preconst3-314593

OASIS ID (UID) preconst3-314593

Project Name ARCHAEOLOGICAL EARTHWORK SURVEY REPORT: LAND
NORTHWEST OF SOUTH WOOTTON SCHOOL, OFF EDWARD
BENIFER WAY, SOUTH WOOTTON,

Sitename LAND NORTHWEST OF SOUTH WOOTTON SCHOOL, OFF
EDWARD BENIFER WAY, SOUTH WOOTTON, NORFOLK

Activity type MEASURED SURVEY, RECTIFIED PHOTOGRAPHIC SURVEY,
AERIAL PHOTOGRAPHY, AERIAL PHOTOGRAPH
INTERPRETATION, TOPOGRAPHIC SURVEY

Project Identifier(s)

Planning Id 17/01151/OM

Reason For Investigation: Planning: Post determination

Organisation Responsible for work PCAS Archaeology Ltd

Project Dates 11-May-2017 - 15-May-2017

Location LAND NORTHWEST OF SOUTH WOOTTON SCHOOL, OFF
EDWARD BENIFER WAY, SOUTH WOOTTON, NORFOLK

NGR : TF 63660 22410

LL : 52.7744756301732, 0.424728587206011

12 Fig : 563660,322410

Administrative Areas Country : England

County : Norfolk

District : King's Lynn and West Norfolk

Parish : South Wootton

Project Methodology PCAS Archaeology Ltd. were commissioned by Larkfleet Homes to carry out an archaeological earthworks survey in advance of development on land to the north-west of South Wootton School, off Edward Benefer Way, South Wootton, Norfolk, in support of an application for planning permission. The survey identified a number of

features of archaeological significance comprising an extensive area of ridge-and-furrow earthworks to the east of the site which is indicative of medieval strip farming. However, no conclusive remains of the Saltern mound, located by aerial photography to the southwest of the site, were identified during the course of these works.

Project Results The survey identified a number of features of archaeological significance comprising an extensive area of ridge-and-furrow earthworks to the east of the site which is indicative of medieval strip farming. However, no conclusive remains of the Saltern mound, located by aerial photography to the southwest of the site, were identified during the course of these works

Keywords RIDGE AND FURROW - MEDIEVAL - FISH Thesaurus of Monument

Types

Funder

HER Norfolk HER - unRev - STANDARD

Person Responsible for work

HER Identifiers

Archives