Burgh Castle Roman Fort: Life outside the walls - the geophysical survey

Author:

David Bescoby MCIfA

18th August 2016

A report produced for the Norfolk Archaeological Trust.

Contents

1 Summary

In July and August of 2016, geophysical survey over two fields at Burgh castle covering an area of c. 12 ha revealed a complex pattern of magnetic anomalies relating to former land use at the site. An interpretation based on the alignment of linear elements along with reference to cropmark data suggests the *vicus* followed a planned layout aligned with the shore fort, with little evidence of pre-existing settlement in the immediate vicinity. There is reasonable evidence for post-Roman settlement at the site in the form of a large triangular enclosure to the south of the fort along with pit and SFB type features, suggesting a Saxon date. An extensive double-ditched droveway to the NE of the fort might also be post-Roman in date as it appears to cut earlier structures. A significant level of undated industrial activity was also detected in close proximity to an area of former quarrying.

2 Introduction

The shore-fort at Burgh Castle represents some of the best preserved Roman remains in East Anglia and forms part of a complex and little understood coastal landscape of the late Roman period. The site was bought by the Norfolk Archaeological Trust in 1995, including surrounding fields, occupying an area of c. 37 ha. Evidence for a sizeable vicus comes from aerial photographic evidence and the large number of finds dating to the Roman period, recovered during fieldwalking and metal detector surveys.

The geophysical field survey described within this report was undertaken in July/August 2016 over two of the fields under the ownership of the Trust, located to the NE and SE of the fort - see Fig. 1. The aim of the survey was to shed further light on the nature of surviving settlement remains surrounding the fort as part of the 'Life Outside the Walls' project being undertaken by the Trust and funded by a Heritage Lottery Fund (HLF) Sharing Heritage grant. Details of the geophysical survey have been logged with the OASIS project - see Appendix C.

Figure 1: Aerial Photograph of the study area, showing the locations of Fields 1 and 4 where geophysical survey was undertaken.

3 Geophysical methods

Archaeological geophysics provides a means of mapping surviving sub-surface remains, relying on contrasting geophysical properties between buried remains and their surrounding burial environment. In the current study, the magnetic properties of the sub-surface have been investigated by taking a number of uniform measurements of magnetic field strengths over a regular network of grids. Measured values are then plotted out as greyscale maps depicting the sub-surface along with any 'anomalous' responses that might relate to surviving archaeological features. An important point to bear in mind is that geophysical data represent a palimpsest of past activity, spanning the most recent of events to those of the distant past. This accumulated layering of geophysical responses is perhaps the greatest challenge to accurate data interpretation. The magnetic techniques employed are sensitive to sub-surface features down to a depth of c. 1.2 metres.

Geophysical techniques were deployed in adherence to guidelines for best practice issued by English Heritage[1] and the Chartered Institute for Archaeologists (CIfA) Standards and Guidance for archaeological geophysical survey (2013) [2]. Technical details of the field methods employed are provided in Appendix A, while unprocessed survey data is presented in Appendix B.

3.1 Magnetic measurements

Magnetometer survey, sensitive to minute distortions in the earth's magnetic field in the presence of buried objects, provides a rapid means of mapping sub-surface features. The interaction of the earth's magnetic field with that of buried features produces a characteristic 'dipolar' response of both positive and negative values, represented in greyscale maps as associated black and white features.

The technique is sensitive to masonry building foundations or footings constructed either from 'magnetic' materials such as fired clay brick, producing strong positive magnetic responses or non-magnetic materials such as limestone blocks which produce negatively trending magnetic responses (as they are less magnetic than the surrounding soil). Magnetometer surveys are also sensitive to archaeological features such as pits and ditches, which tend to infill with more magnetic topsoil, providing a magnetic contrast with surrounding soil. Areas of burning, burnt materials and structures relating to heating processes such as kilns and hearths all produce a strong magnetic response as heating dramatically enhances their innate magnetic properties.

3.2 Geological considerations

The soils and superficial geology of the study area consists of sandy loams developed over pockets of wind-blown, fine grained cover sands of varying thickness which in turn overlie the Corton Formation - a complex unit comprising of tills, sands and subordinate gravels, dating to the Anglian age of the Quaternary [3]. In general terms the heterogenous nature of the underlying geology is likely to contribute to the overall levels of background magnetic noise.

Topographically, the study area is located on the northerly extent of a raised tongue of land (Lothingland Uplands), with surveyed areas sitting between 7 m and 12 m above mean sea level. Excavation undertaken during the Church Loke investigations in 1995 revealed over 1 m of wind-blown overburden covering Roman deposits [4]. More recent excavations in 2009/2010 located c. 530 m to the SE revealed Roman deposits to be between 0.4 m and 1.08 m below the current ground surface [5]. It can be surmised that wind-blown deposits are likely to have contributed a potentially significant input of sediment over the past 1,500 years, particularly within depressions and low points within the local topography, with implications for both geophysics and aerial investigation in terms of feature visibility. The potential impact is assessed within the current study with recourse to recent Light Detection and Ranging (LiDAR) topographical data made available by the Environment Agency.

4 Results

The results of the magnetic surveys from are shown in Fig. 2. It can be seen that the survey was successful in detecting numerous anomalous magnetic responses, providing a complex map of sub-surface features. The intensity of detected features suggests that settlement activity at the site was relatively long lived.

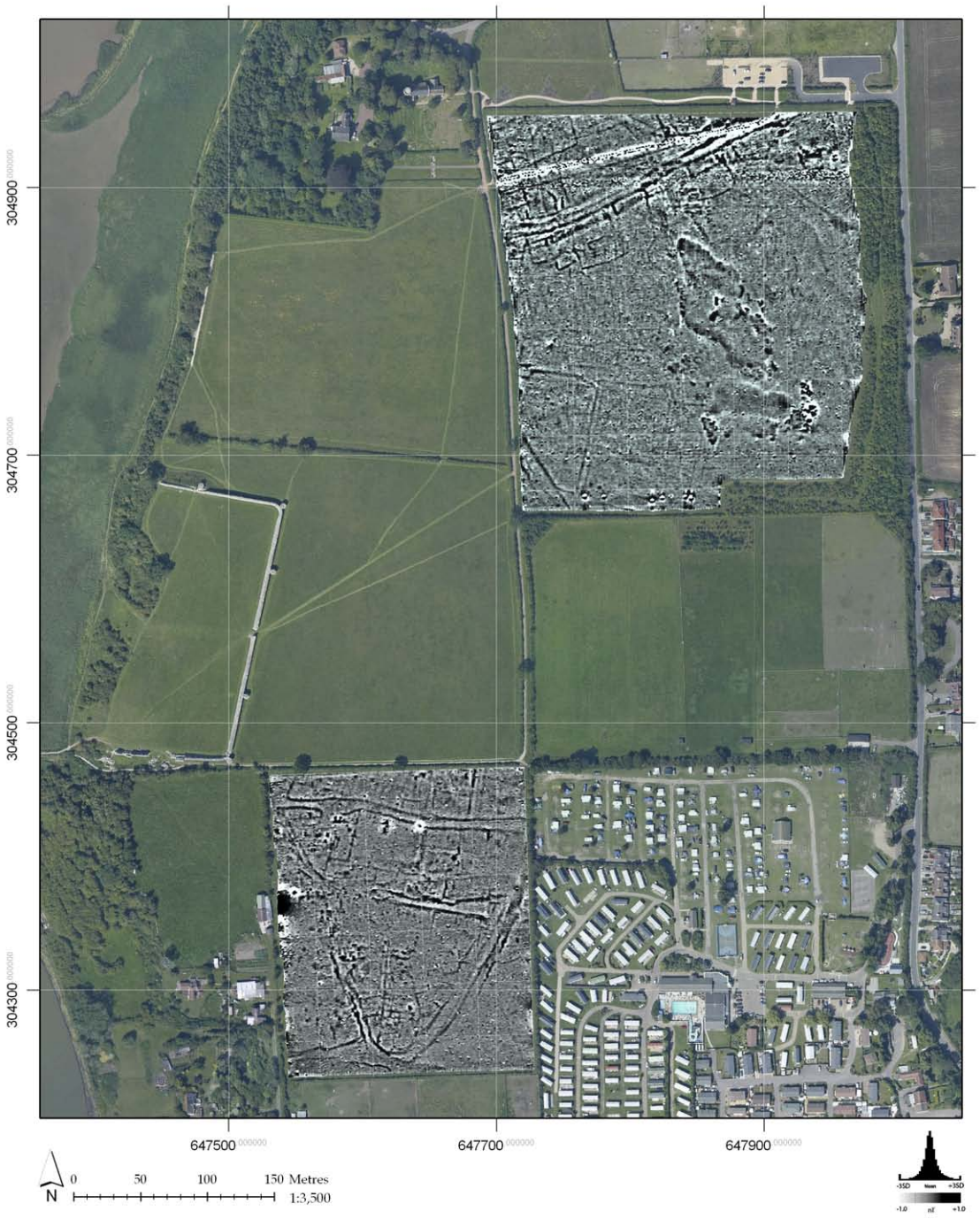

Figure 2: Magnetic measurements over Fields 1 and 4 at Burgh Castle.

To aid the interpretation of anomalous features that relate to surviving archaeological elements, it is useful to first identify and exclude any elements that are derived from more recent activity at the site. Fig. 3 highlights magnetic responses of non-archaeological origin, including the line of the pathway running from the car park westwards across the top of Field 4 - shown in grey in Fig. 3. Here strong

magnetic anomalies are caused by a large number of steel U-bolts securing a grass reinforcement mesh (D. Leese, per. comm.). Immediately to the south, traces of a former trackway can be seen running E-W, believed to have provided site access some years previous (P. Wade-Martins, per. comm.). Around the perimeter of the surveyed fields a small amount of magnetic interference is derived from steel fencing and in the case of Field 1, a line of static caravans along the eastern border along with a much larger response from a corrugated iron clad barn along the western boundary (see Fig. 3). This large response in particular has the potential to mask weaker responses derived from buried archaeological remains. A number of discrete high amplitude anomalies can also be seen within the data, principally along the southern margins of Field 4, forming a line of dipolar responses (shown in orange in Fig. 3) and likely to derive from ferrous objects in the near-surface.

Figure 3: Magnetic anomalies that relate to modern activity.

5 Interpretation

The following section provides an interpretation of the main magnetic responses revealed by the survey. An attempt is made to classify anomalies deriving from archaeological features in terms of their morphology and to contextualise these in relation to the known development of the shore fort and surrounding settlement. An integrated approach is adopted, drawing on data from the Norfolk National Mapping Programme (NMP) and high resolution topographical data from recent LiDAR survey. The nature of geophysical data makes interpretation a somewhat speculative exercise and resulting hypotheses should be used in a heuristic way, providing ideas to be tested through further archaeological investigation.

5.1 Prehistoric and Early Roman activity on the Lothingland peninsula

Survey data from the two fields at Burgh Castle are characterised by numerous linear positive magnetic anomalies likely to be derived from the surviving remains of ditch features; their infilling material being more magnetic than surrounding sediments. The remnants of such features form a ubiquitous surviving element of rural settlement and landscape organisation from the earliest times, often forming a complex network of field boundaries and enclosures. The changing alignment of such features can be useful in differentiating between periods of activity, particularly where they reveal evidence for programmes of wider scale landscape reorganisation.

The overall character of Iron Age (and earlier) settlement in East Anglia is not well understood, although the earliest Iron Age settlements seem to favour areas over lighter soils; the loamy soils developed over the former island of Lothingland are likely to have been attractive to arable farming from an early date. Evidence suggests a preference for unenclosed settlement (see Bryant, 2000)[6], although examples surrounded by a rectangular enclosing ditch also exist (i.e. Trowse NHER 9589) [7]. No convincing remains of this type, including round houses, were detected within the surveyed areas, although a number of more ephemeral linear features might have their origins in prehistoric field systems - see below.

The morphology of prehistoric sites is, however, similar to those whose occupation extended into the early Roman period, perhaps with an increasing trend to enclose domestic and agricultural sites. While dominant alignments established in the prehistoric period are likely to influence the development of the enclosed landscape (see Williamson, 2006)[8], cropmark evidence of a planned Roman system

of landscape organisation in the form of a large area of coaxial field and enclosure cropmarks can be seen c. 2.5 km to the south of Burgh Castle aligned with a probable Roman road running for 1.6 km through the parishes of Belton with Browston and Bradwell (NHER 43591) - see Albone et al. [9]. Approximately 1.6km to the southeast of the road is a further area of cropmark field boundaries which share the same orientation (NHER 43495), interpreted as evidence of landscape planning dating to the mid. or late Roman period [9].

An analysis of the alignment of linear features detected within the geophysical survey revealed a small cluster of anomalies in the northern portion of Field 4 conforming to the same angular alignment as the road to the south, indicated in blue in Fig. 4. What is clear, however, is that this alignment differs significantly to that of the fort itself and the system of ditches in the SW portion of Field 4, which appear to align with the eastern wall of the fort. It could be suggested then that the somewhat weak linear anomalies in the northern portion of Field 4 represent the remnants of a planned Roman landscape of enclosed coaxial fields that encompassed the northern extent of the Lothingland Peninsula, predating the establishment of the fort and associated settlement, whose alignment is more generally seen in the geophysics and cropmark evidence. In contrast, at Caister-on-Sea (NHER 27513) dating from the early 3rd Century AD there is clearer evidence of Iron Age and early Roman settlement nearby which may have influenced the apparently piecemeal development of the later *vicus* - see Gurney, 2002.[10, 9]

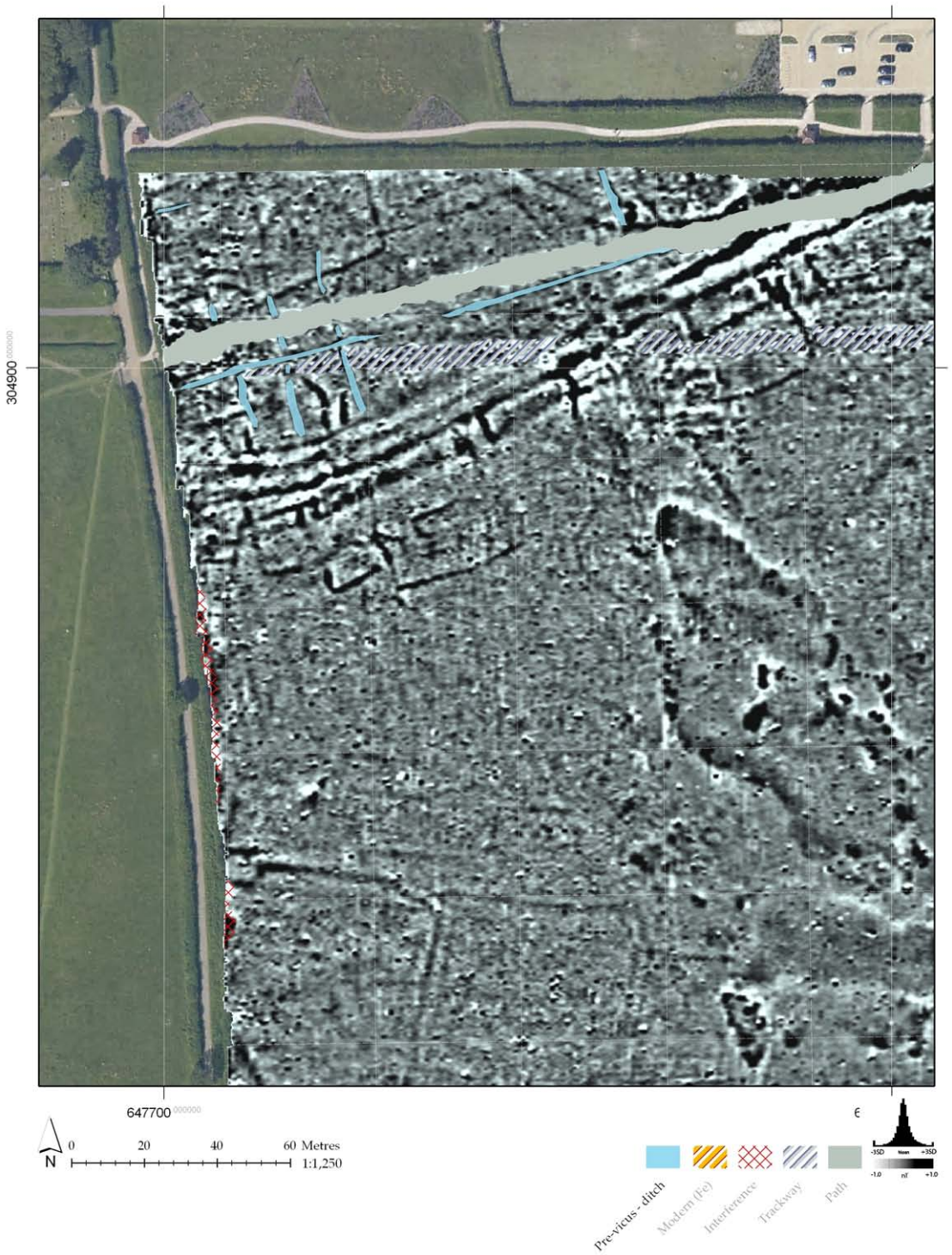

Figure 4: Linear ditch features (blue) conforming to the same alignment as Roman field systems to the south.

5.2 The shore fort and *vicus*

Evidence for the developing extra-mural settlement or *vicus* outside the defensive walls of the shore fort, established sometime after AD 260, can be seen in the apparently planned layout of large enclosures on the same alignment revealed in the SW corner of Field 4 and also in the extensive cropmark evidence to the south, shown in Fig. 5. The co-jointed enclosures revealed in the corner of Field 4 appear to have a dividing trackway(s). There is little geophysical evidence for any substantial internal structures which may suggest they functioned as stock enclosures. To the south, cropmark evidence from the adjoining field (currently paddocks) seems to show a central trackway/roadway aligned with the eastern entrance of the fort, with a further parallel trackway to the north and several interconnecting perpendicular elements, again suggestive of a formally planned layout associated with the establishment of the fort.

There were also a number of linear elements conforming to the same alignment recorded in Field 1 to the SW - Fig. 5, suggesting that the vicus also extended to the SE of the fort. These elements appear associated with evidence of building remains, discussed in the sub-section below.

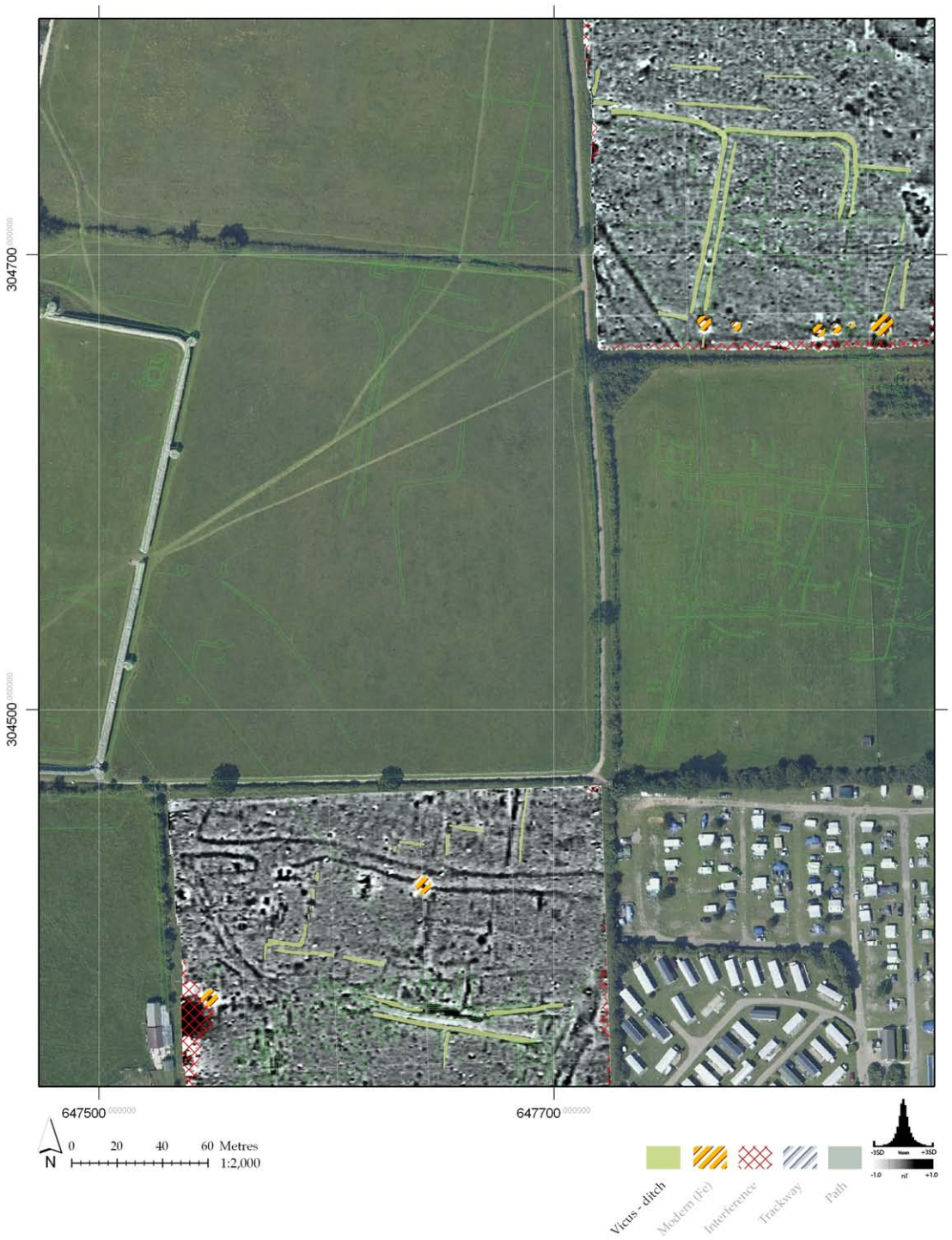

Figure 5: Large enclosures and ditches deteted in Field 4 aligned with the shore fort. Cropmark evidence from the field to the south can also be seen to aligned with fort.

5.3 Evidence for surviving building remains

There is good geophysical evidence for surviving traces of former buildings, especially in Field 1, where the faint outlines of at least 4 former structures can be identified - see Fig. 6. The clearest building outline (labelled 1 in Fig. 6) is outlined by a negative magnetic response, which is likely to indicate the presence of non-magnetic i.e. mortared flint foundations. These are contrasted with a few stronger positive magnetic responses, which could indicate either footings incorporating fired clay (brick/tile) material, giving an enhanced magnetic response or alternatively, areas where foundational material has been quarried away, leaving sections of robber trench which subsequently backfill with building debris. The latter seems more likely, given the rather random distribution of these elements within the building outline.

To the south, the outline of Building 2 forms an extensive structure with a N-S orientated range of buildings which again seems to respect the alignment of the fort. Here there is a greater quantity of short linear elements interpreted as the location of former masonry, and again these positive magnetic responses seem most likely to represent the robbing of material. What is interesting here is that some of the defined spaces between these proposed wall elements, particularly in the southern range of rooms, appear as negative magnetic responses. This may well reflect the survival of floor sub-layers comprised of non-magnetic material, providing a strong contrast. An occurrence often observed within the magnetic profiles of Roman building remains is the magnetic enhancement of these room spaces, since surviving wall stubs trap magnetic material derived from roof collapse etc. As this is not the case here, it might be concluded that these structures were cleared wholesale.

The building outline labelled 3 is less well defined that the previous two and may represent two discrete structures. Their less coherent survival might be related to their proximity to a system of ditches that appear to run through them (discussed below). The somewhat smaller building labelled 4 also lacks coherence although its overall pattern seems to again align to the walls of the fort. At all four locations a quantity of tile and mortar was observed within the numerous mole hills present.

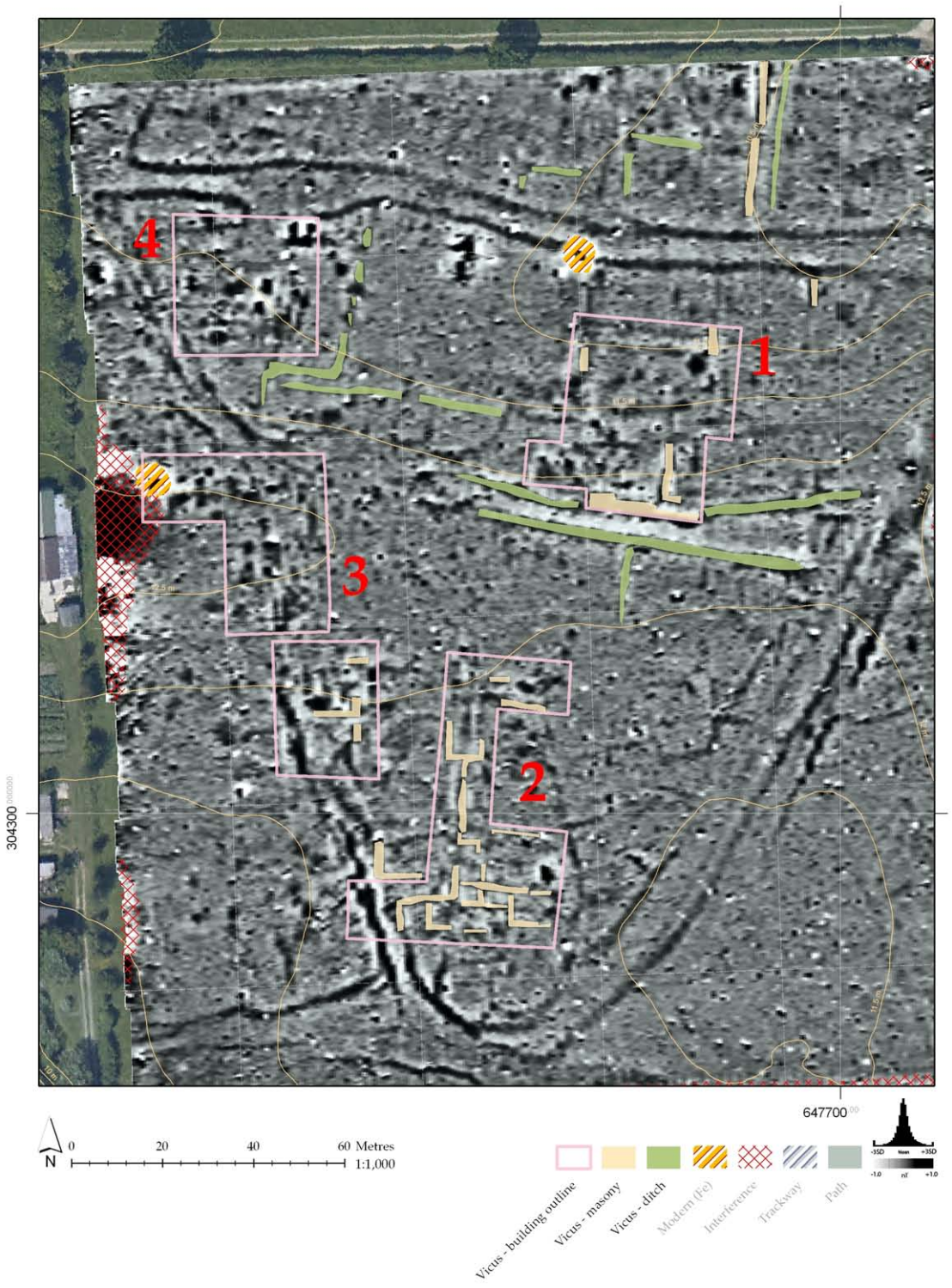

Figure 6: The remains of buildings located in Field 1.

In Field 4, a further two possible areas of building remains can be tentatively suggested, although their ground plan is not clearly delineated, as shown in Fig.

7. These locations are as much defined by the dense spread of higher amplitude anomalies, although the survival of some discrete building elements can be suggested. The structure labelled 1 again seems to conform to the alignment of the fort and may be associated with the ditch to the east also on the same alignment.

Building 2 is equally difficult to define beyond an area of concentrated higher amplitude responses and the alignment here is also ambiguous. It is possible its footprint extends further to the west, where further short positive linear anomalies on an approximate E-W alignment can be seen. Both of these building are situated close to a major ditch flanked trackway, which is discussed fully below.

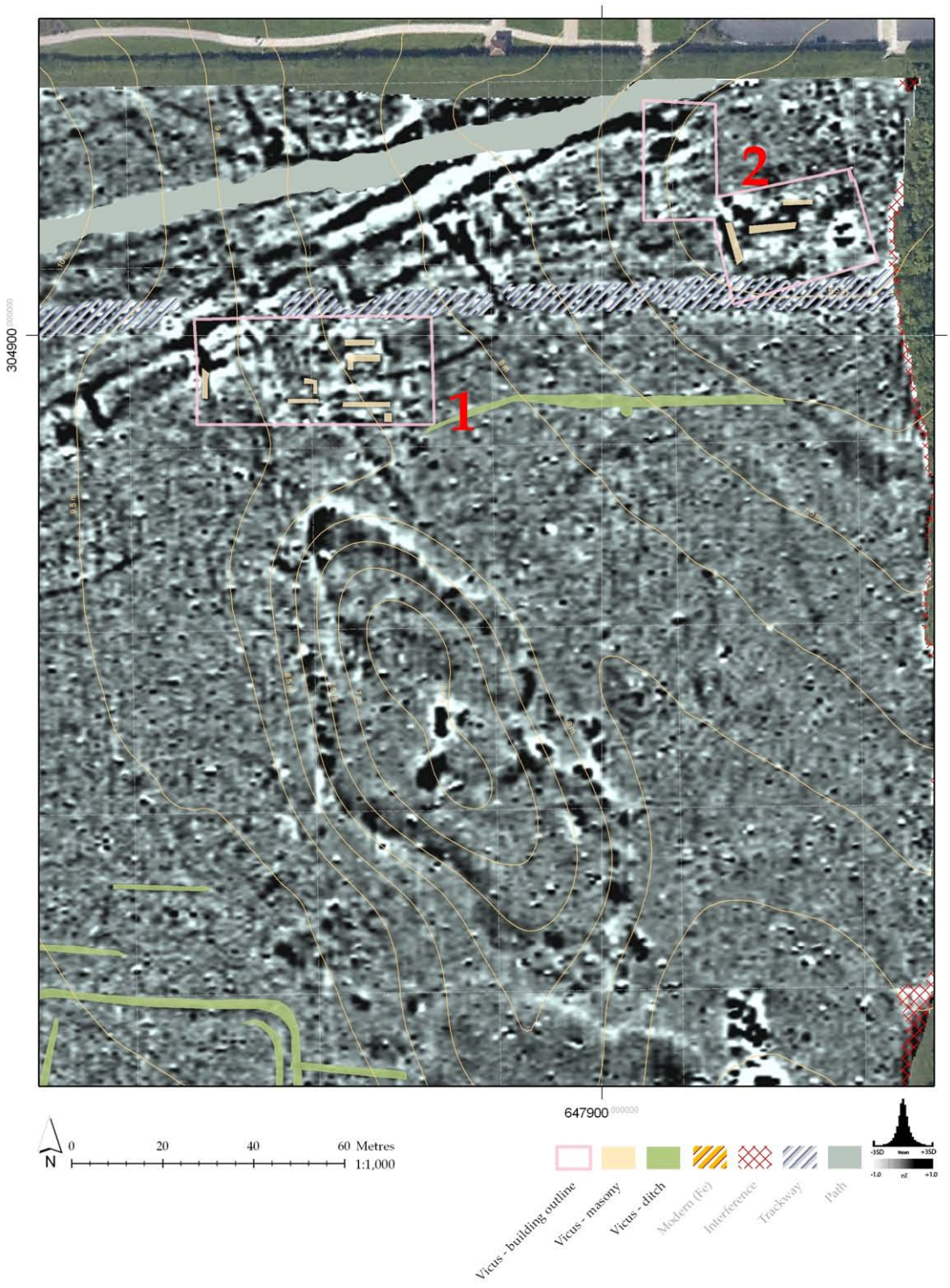

Figure 7: Possible remains of two buildings located in Field 4.

5.4 Post-Roman remains

The survey data from Field 4 is dominated by strong parallel linear responses following a approximate NE-SW orientation, as shown in Fig. 8, and interpreted as substantial ditches. There appears to be a change in their orientation at the western end, labelled 1 in Fig. 8. The spacing of these ditches suggests they lay either side of a central trackway, forming a possible droveway. The main linear responses can be seen to be flanked, particularly along the SE side, by what appear to be a series of small ditched enclosures, which could be interpreted as a network of stock pens. Anomalous responses consistent with a line of pits can be seen running parallel to the southerly ditch, labelled 2 in Fig. 8.

Dating this collection of features is difficult. A potentially post-Roman date is tentatively given on account of the apparent elevated magnetic responses of the ditch fill surrounding the building remains labelled 1 and 2 in Fig. 7. This would suggest that the ditch was cut after these structures had been abandoned, since it appears to cut through their northern extent. The ditches then become infilled through various depositional processes with magnetically enhanced materials derived from the former buildings - the habitation effect described by Gaffney and Gater (2003) [11]. This effect can be seen clearly in Fig. 8 at this location, labelled 3. However, the above is a relative sequence, and it would also be plausible that the droveway is itself late Roman, cutting through buildings of an earlier Roman date, although the buildings highlighted in Fig. 7 do seem to align with the fort and the *vicus*, while the droveway does not.

Around 120 m to the south in Field 4 (labelled 4 in Fig. 8) are faint traces of sections of a possible ditch running roughly perpendicular to the droveway, along with a collection of pits and a further pit feature whose size and magnetic profile matches that to be expected from the infilled remains of a Sunken Featured Building (SFB) - see Bescoby and Bowden (2008) [12]. The approximate E-W orientation suggests a possible alignment to and maybe reuse of the earlier Roman enclosure to the south.

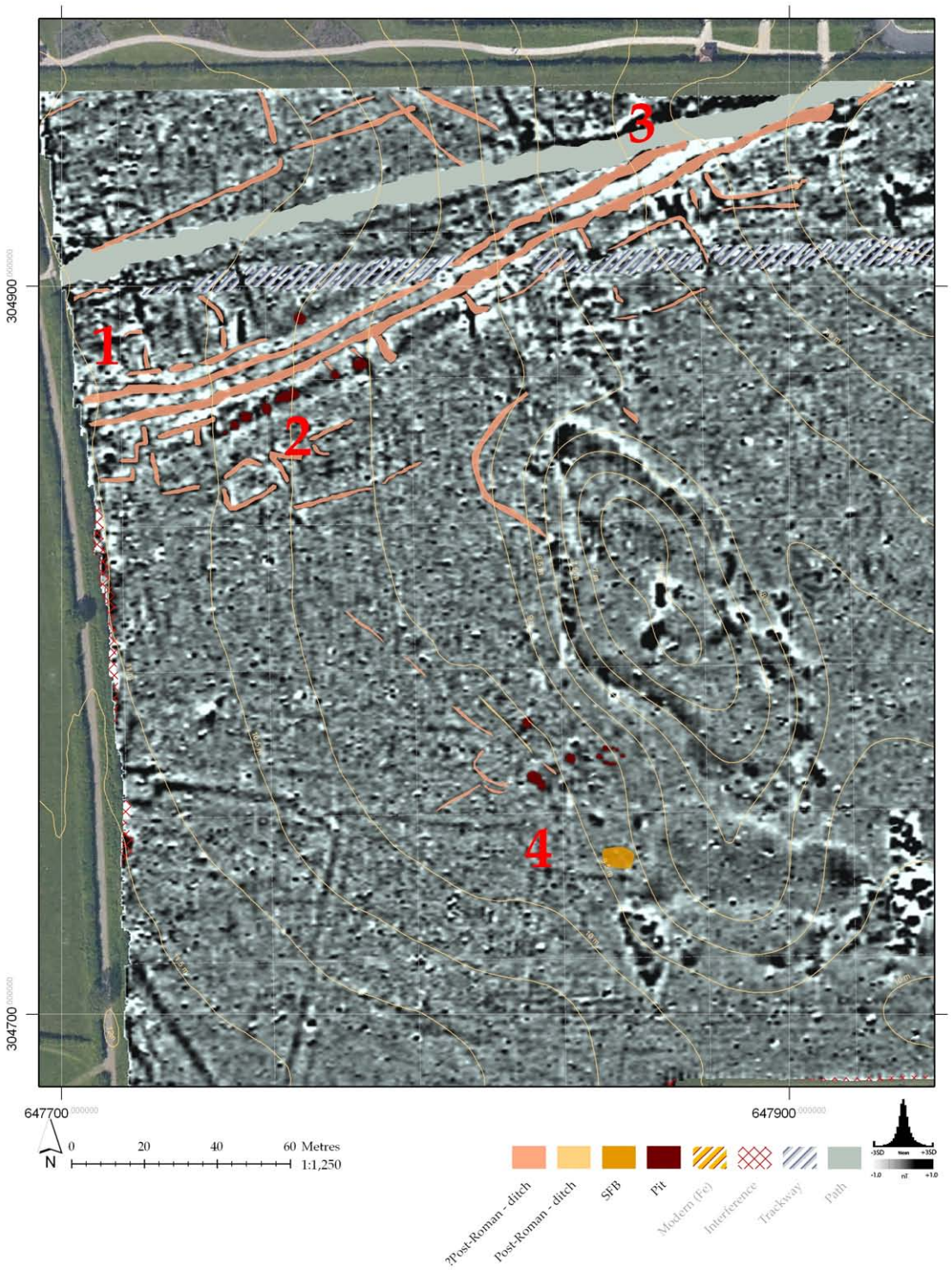

Figure 8: Droveway with associated stock enclosures and possible evidence of Saxon settlement (4).

Field 1 is dominated by what appears to be a large triangular shaped enclosed area, defined by a widely spaced double ditch arrangement, highlighted in Fig. 9.

Morphologically, the curvilinear nature of the ditches, particularly those running N-E along the northern margins of the field and the overall irregularity suggests possible Anglo-Saxon settlement activity (although their alignment along this section is not far off that of the fort). The spacing of the ditches suggests the presence of a trackway running around the enclosed area which appears to branch off at each of the three corners, running beyond the extent of the surveyed area. This wider layout is explored further below, with reference to the cropmark data.

The SW portion of the enclosing ditches seem to cut through the area formally occupied by a substantial building, illustrated in Fig. 6 (labelled 2 and 3). There is again considerable magnetic enhancement of material infilling the ditches at these locations - labelled 1 in Fig. 9, providing a strong magnetic response which to some extent confirms the former presence of the building and nearby settlement. A magnetic response of a similar magnitude is also seen along the sections of the earlier ditch aligned with the fort to the NE (labelled 2 in Fig. 9) which would also seem to confirm the presence of the building/settlement activity nearby, with the infilling of the ditches occurring either during the life of the building. Alternatively, the ditch could have remained open after the buildings demise. Along their western margins the course of the enclosing ditches are more difficult to trace (area labelled 4 in Fig. 9), although they appear to continue in a south-easterly direction, cutting through what are thought to be the remains of another former structure.

To the south, several small sub-circular anomalies are likely to represent a number of pit type features - the main ones are highlighted within the area labelled 5 in Fig. 9. Also within this area are two further anomalous responses that conform to those expected from SFB remains. Both are of a similar size, measuring c. 6 m along their long axis and c. 3.8 m wide. Taken together, the SFB features and array of pits are indicative of settlement activity dating to the Saxon period.

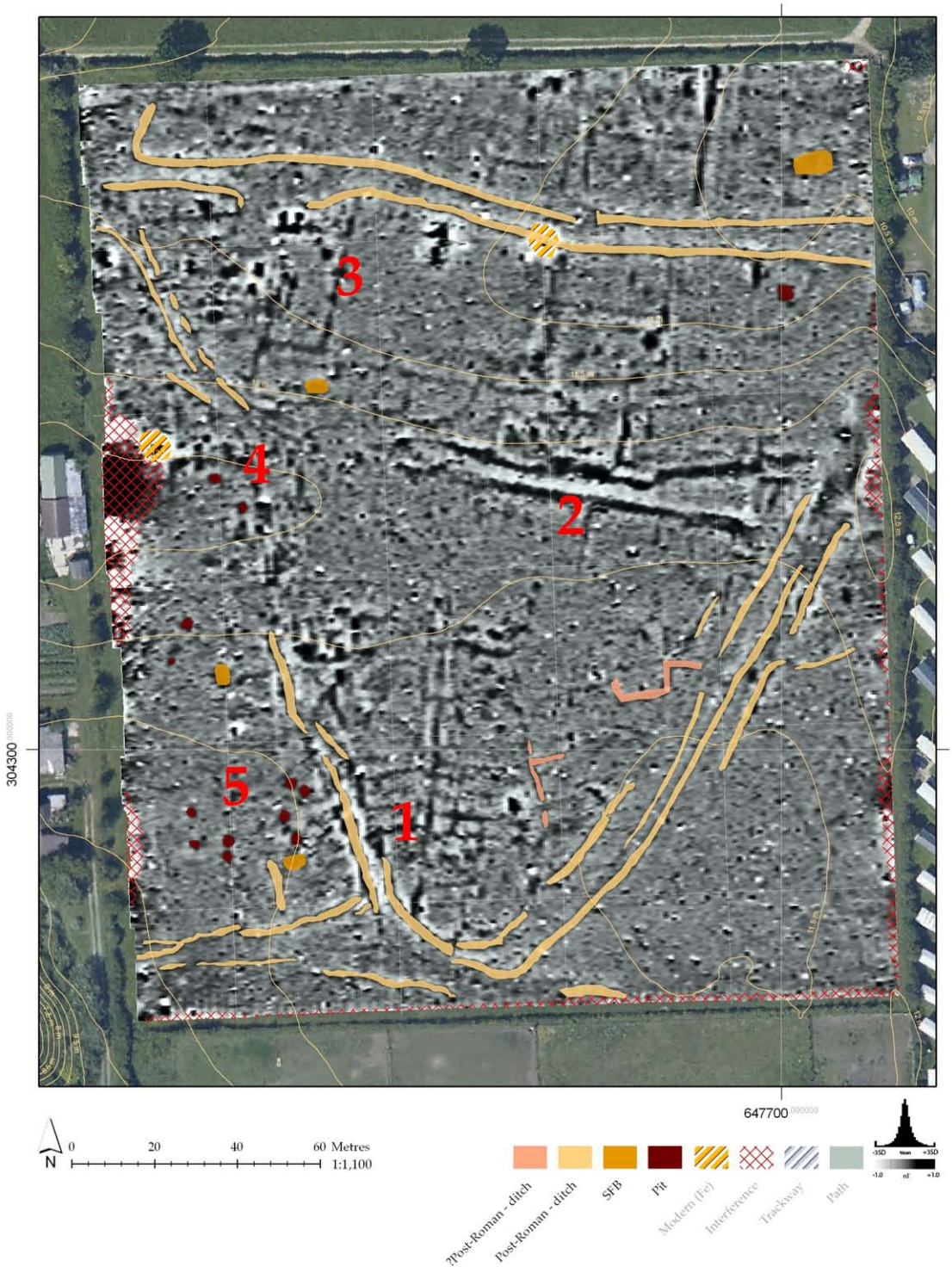

Figure 9: Large triangular enclosure detected in Field 1 with probable evidence of Saxon occupation (5).

The cropmark data from surrounding fields provides a possible interpretative framework for the large triangular enclosed area recorded in Field 1. Fig. 10 shows

cropmark data compiled for the Norfolk NMP in relation to the detected ditches. To the south, the cropmark data suggests a possible oblique crossroads of several tracks, labelled 1 in Fig. 10. A north-easterly projection of the trackway/ditches forming the eastern margins of the enclosure seems to align with a number of cropmark elements, including a dense complex of cropmarks to the east of those aligned with the *vicus*- see Fig. 10.. The alignment also fits with a nearby double row of probable post holes, interpreted within the NMP as a rectangular post-built structure (NHER 49210). While the projected continuation of this trackway has to remain a matter of speculation, it is interesting to note that a number of perpendicular alignments can be seen immediately to the SE and also to the NW, over the area to the east of the fort. A recent archaeological evaluation at Breydon Water Holiday Park trenched the area adjacent to the NE corner of Field 1 and located at least one ditch feature on this alignment, the fill of which contained late 3rd - 4th century pottery and a quantity of Ceramic Building Material (CBM) and animal bone.[5]

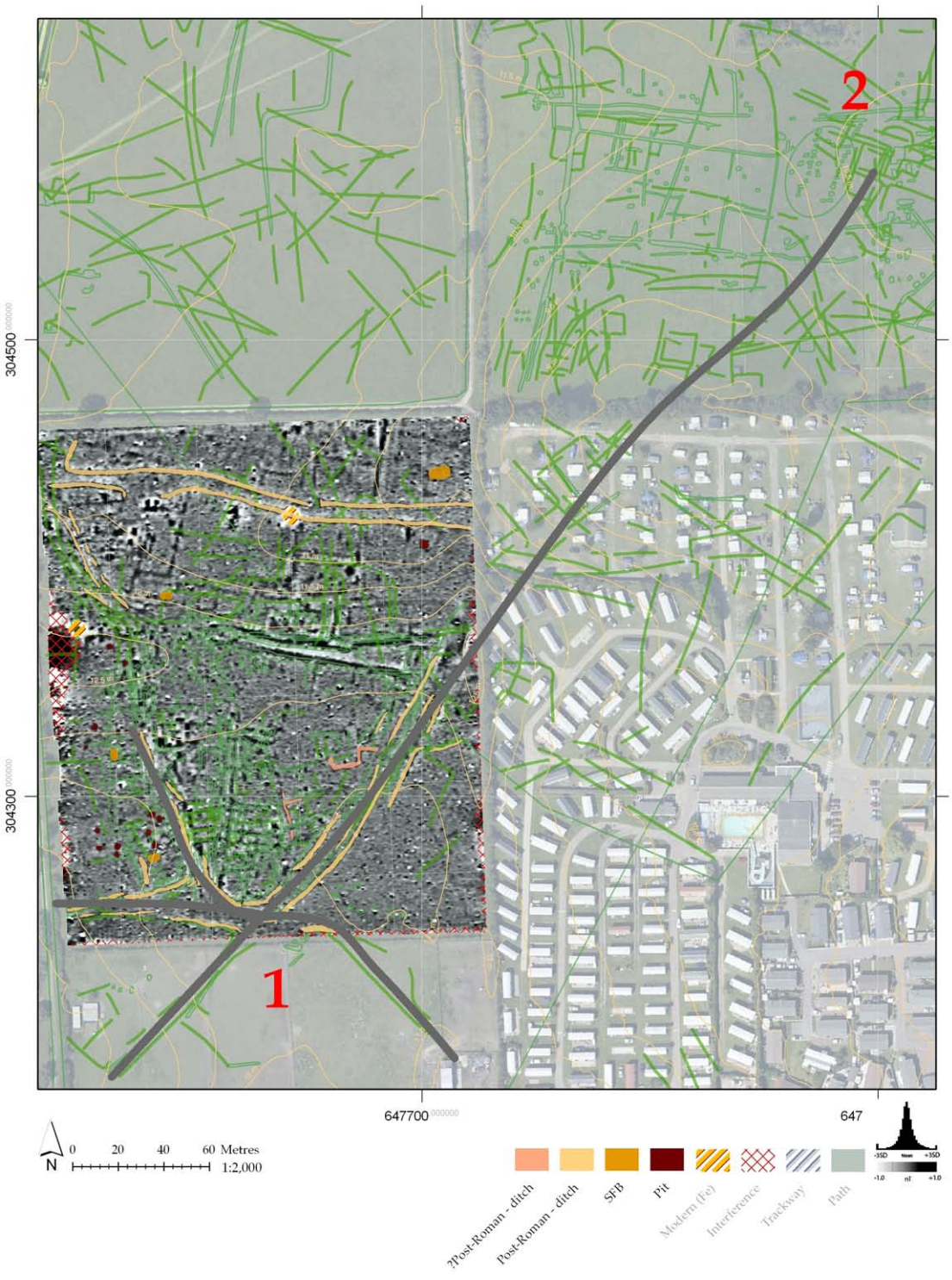

Figure 10: NMP cropmark data for adjoining fields and hypothetical extension of detected trackway to the NE.

5.5 Other features of archaeological origin

A number of features detected are not so easy to contextualise within the broad chronological framework outlined above and are discussed below.

Within the central portion of Field 4 an elongated topographical depression, reaching a depth of over 2 m below the height of the surrounding field is clearly visible - labelled 1 in Fig. 11, and is likely to be the result of former quarrying of an unknown date. In apparent association is an elongated strip of very high amplitude anomalies that are consistent with industrial activities centred around hearths or kiln type structures. It is not clear whether the quarrying and activity around the eastern margin of the resulting depression are related. Evidence for some sort of industrial activity in the centre of the depression might conceivably be taking advantage of the sheltered location.

The clearest evidence for fairly large-scale industrial activity, most likely involving kilns is located c. 30 m to the SE, labelled 2 in Fig. 11. Here a band of very high amplitude anomalies up to 16 m wide runs in a N-S orientation for c. 40 m. In the SE corner there appears to be a small rectangular adjoining structure. It is hard to ascribe a date to this type of feature, although it could conceivably be Roman; its location towards the north eastern margins of the presumed extent of the *vicus* would seem reasonable. This complex is also associated with a diffuse lobe of elevated magnetic values to the west, which seem to run down slope into the southern portion of the depression (Fig. 11). This is likely to be the result of plough activity, moving debris from the site down-slope with time. Two further discrete areas of presumed industrial type activity can be seen to the west, again seemingly flanking the southern margins of the depression.

Figure 11: Areas of industrial activity surrounding a topographical depression thought to result from quarrying activity. Also shown, linear ditch features of unknown origin.

The surveys also revealed a large number of linear and curvilinear anomalies interpreted as ditch and gulley type features that follow alignments other than

those discussed above, illustrated in Fig. 11 and Fig. 12. Overall, these do not seem to correlate particularly well with linear cropmark features from the NMP and could conceivably belong to any period. Their presence reminds us of the complexity of settlement patterns through time, with mapped features representing a palimpsest of land division and organisation, the origins of which could date back to the prehistoric period.

Figure 12: Linear ditch features of unknown origin recorded in field 1.

6 Conclusion

The geophysical survey undertaken at Burgh Castle proved effective in revealing a large number of surviving sub-surface elements relating to multiple periods of former settlement and land use. From the interpretation outlined above, which relies strongly on the alignment of linear elements and recourse to cropmark evidence, the following conclusions might be drawn:

- There is some limited evidence for the existence of Roman landscape organisation predating the establishment of the shore fort, matching in alignment an extensive arrangement of co-axial fields and road/trackways to the south. Otherwise there appears to be little evidence of Iron Age or early Roman settlement activity in the immediate vicinity.
- An appreciable number of detected ditches and associated trackways follow the same alignment as the shore fort, also matching that of extensive cropmark evidence to the south of Field 4 and these together are seen to indicate the likely planned layout of the *vicus* associated with the fort
- In Field 1 there is good evidence for the surviving remains of a number of buildings aligned with the fort and therefore thought likely to be contemporaneous with it.
- A large double ditched droveway with a number of small enclosures along its southern flank dominates the northern portion of Field 4. Based its alignment and apparent course through earlier buildings, it is assigned a probable post-Roman date, although this is somewhat tentative.
- Further post-Roman activity in the form of a double-ditched triangular enclosure and associated trackways, appear to form part of a wider landscape reorganisation and may link with similarly aligned elements along the eastern margins of the *vicus*, identified as a series of cropmarks including a possible post built structure. In the SW portion of Field 1 an area of possible Saxon settlement has been identified, including two proposed SFBs and associated pits.
- The centre of Field 4 contains topographical evidence of former quarrying and the geophysical survey has identified a belt of possibly associated industrial activity flanking the eastern margins. A more extensive concentration of industrial activity was also identified to the SE. Dating this activity remains problematic.

7 Acknowledgements

The geophysical survey at Burgh Castle was made possible through a Heritage Lottery Fund (HLF) Sharing Heritage grant (Burgh Castle Fort: Life Outside the Walls), awarded to the Norfolk Archaeological Trust. Special thanks go to Caroline Davison (Director of the Norfolk Archaeological Trust), for her logistical support and to David and Hazel Leese for much appreciated field assistance. Thanks also go to David Gurney (Norfolk Country Council Historic Environment Service) and Peter Wade-Martins (former Director of the Norfolk Archaeological Trust) for comments made on aspects of survey interpretation and to Sophie Tremlett (Norfolk Country Council Historic Environment Service) for kindly providing data from the Norfolk National Mapping Programme and for commenting on the survey results. Any errors in the resulting work remain the responsibility of the author.

References

[1] David, A. (2008). *Geophysical Survey in Archaeological Field Evaluation.* Swindon: English Heritage Publishing.

[2] CIfA (2013) Standards and guidance for archaeological survey. Available online at `http://www.archaeologists.net/codes/ifa.html`

[3] Arthurton, R. S., Booth, S. J., Morigi, A. N., Abbott, M. A. W. and Wood, C. J. (1994). *Geology of the country around Great Yarmouth. Memoir for 1:50 000 geological sheet 162 (England and Wales)* London: HMSO.

[4] Wallis, H. (1998). Excavations at Church Loke, Burgh Castle, 1993-4 *Norfolk Archaeology* 43(1), 62-78.

[5] McCall, W., (2008). *Breydon Water Holiday Park, Yare Village, Butt Lane, Burgh Castle, Norfolk NR31 9QB: An Archaeological Evaluation.* Archaeological Solutions Ltd. Grey literature report.

[6] Bryant, S., (2000). The Iron Age, in Brown, N. & Glazebrook, J. (eds), *Research and Archaeology: A Framework for the Eastern Counties 2.* Research Agenda and Strategy, E. Anglian Archaeol. Occ. Pap. 8, 14-18.

[7] Ashwin, T., (1999). Iron Age settlement in Norfolk, in Davies, J. & Williamson, T. (eds), *Land of the Iceni. The Iron Age in Northern East Anglia.* Norwich: Centre of East Anglian Studies, 100-124.

[8] Williamson, T., (2006). *Englands Landscape Volume 2: East Anglia.* London: Collins.

[9] Albone, J., Massey, S. and Tremlett, S. (2007). *The archaeology of Norfolk's Coastal Zone. Results from the National Mapping Prgramme.* English Heritage Project No: 2913.

[10] Gurney, D., (2002). *Outposts of the Empire.* Norfolk Archaeological Trust.

[11] Gaffney, C. and Gater, J. (2003). *Revealing the buried past. Geophysics for archaeologists.* London: Tempus Publishing.

[12] Bescoby, D., Bowden, W. (2013). The detection and mapping of Saxon sunken-featured buildings at Caistor St Edmund, Norfolk. *Archaeological Prospection* 20, 53-57.

A Field methods

A 40 x 40 m grid was established over the two fields surveyed, orientated N-S. The position of the grid was recorded in each of the corner points using a Topcon HyperPro GPS with real-time kinematic (RTK) corrections. Field conditions were unfortunately too rough to use a cart-based magnetometer system.

A.1 Magnetometer survey

Measurements of vertical geomagnetic field gradient were determined using a Bartington Grad601 fluxgate gradiometer with an instrument sensitivity of c. 0.1 nT/m. A zig-zag traverse scheme was employed and data were logged in discrete 40 m grid units. The measurement sample interval was 0.25 m along each traverse and the traverse interval was 1 m, thus providing 6,400 measurements per 40 m grid square.

A.2 Data processing

Data processing was undertaken using the author's own software. The following data processing routines were applied:

- Zero mean traverse correction, to remove striping caused by instrument heading errors.
- Gaussian low-pass filter.
- Polynomial interpolation of traverse (X-axis) data to 0.5 m.

A.3 Data Visualisation

Geophysical data were analysed and displayed using a Geographic Information System (GIS) database (ERSI ArchMap 9.3).

B Raw data

The following x-y trace plots show the unprocessed data from Fields 1 and 4.

B.1 Field 1

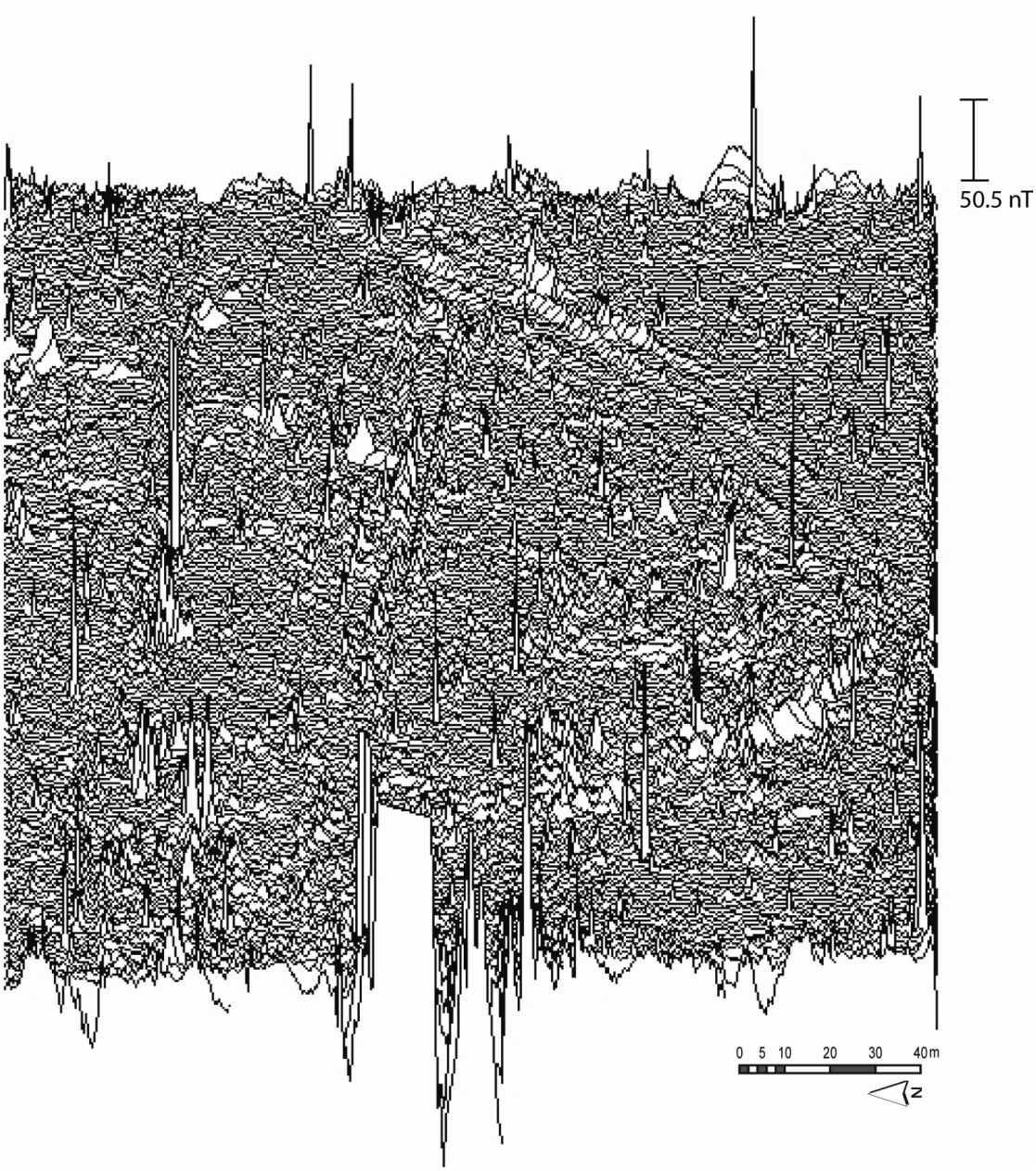

Figure 13: x-y trace plot of unprocessed data from Field 1.

B.2 Field 4

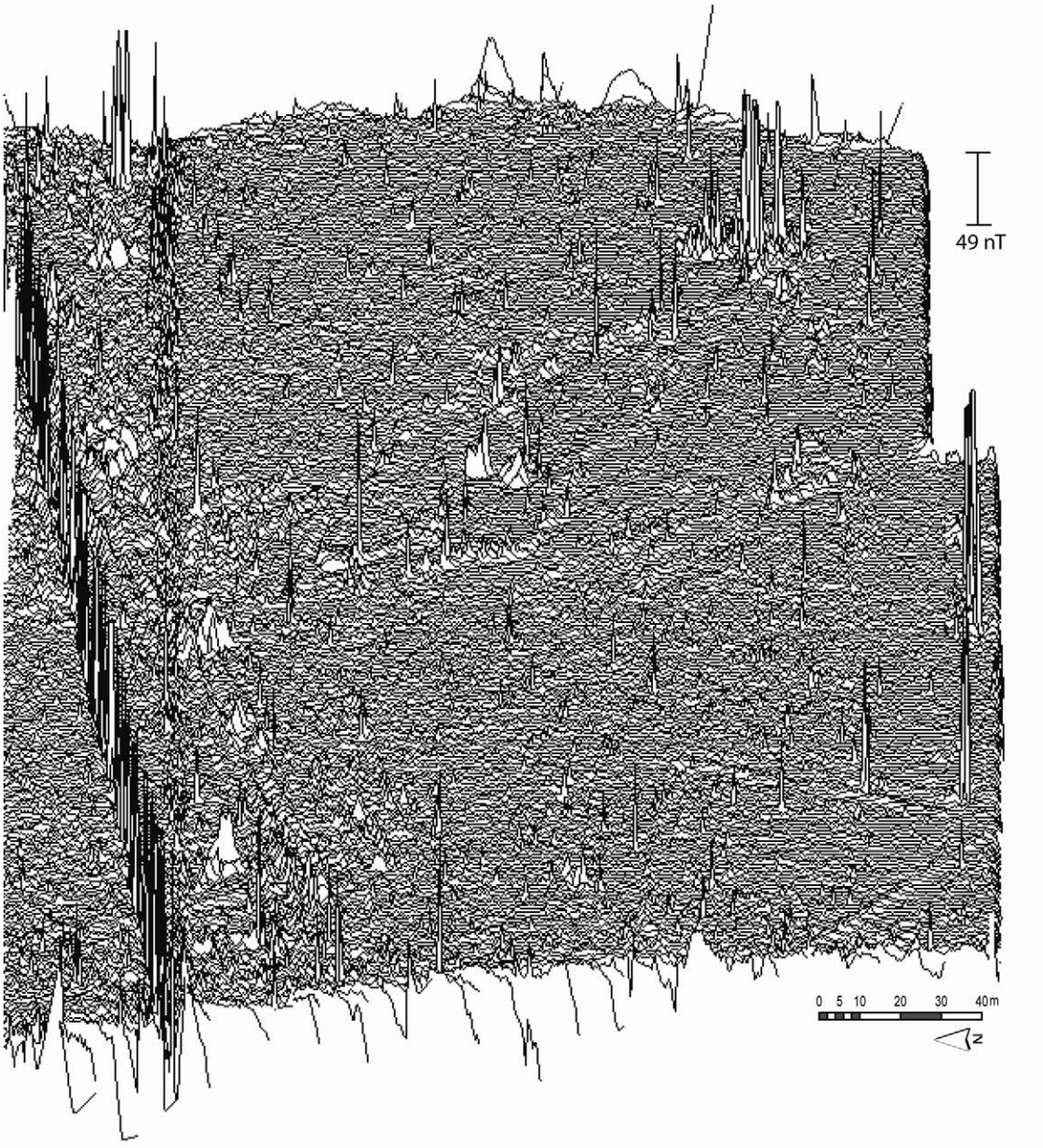

Figure 14: x-y trace plot of unprocessed data from Field 4.

C OASIS data

OASIS DATA COLLECTION FORM: England

List of Projects | Manage Projects | Search Projects | New project | Change your details | HER coverage | Change country | Log out

Printable version

OASIS ID: dbescoby1-261434

Project details

Project name	Burgh Castle 'life outside the walls' geophysical survey
Short description of the project	In July/August 2016 geophysical survey over two fields at Burgh Castle (NGR TF 475 045), covering an area of c. 12 ha, was undertaken by Dr D. Bescoby in accordance with a specification compiled by the Norfolk Archaeological Trust (dated Jan 2016). The survey revealed a complex pattern of anomalies relating to former land use at the site. An interpretation based on the alignment of linear elements along with reference to cropmark data suggests the associated vicus followed a planned layout aligned with the shore fort, with little evidence of pre-existing settlement in the immediate vicinity. There is reasonable evidence for post-Roman settlement at the site in the form of a large triangular enclosure to the south of the fort along with pit and SFB type features, suggesting a Saxon date. An extensive double-ditched droveway to the NE of the fort might also be post-Roman in date as it appears to cut earlier structures. A significant level of undated industrial activity was also detected in close proximity to an area of former quarrying.
Project dates	Start: 25-07-2016 End: 12-08-2016
Previous/future work	Yes / Not known
Any associated project reference codes	10471 - Related HER No.
Type of project	Research project
Site status	Scheduled Monument (SM)
Current Land use	Grassland Heathland 3 - Disturbed
Monument type	SHORE FORT Roman
Significant Finds	RECTILINEAR ENCLOSURES AND STRUCTURES Roman
Significant Finds	ENCLOSURES AND ?SFB Early Medieval
Investigation type	"Geophysical Survey"
Prompt	Research
Solid geology	LONDON CLAY
Drift geology	SAND AND GRAVEL OF UNCERTAIN AGE OR ORIGIN
Techniques	Magnetometry

Project location

Country	England
Site location	NORFOLK GREAT YARMOUTH BURGH CASTLE Burgh Castle
Postcode	NR31 9QF

Study area	40 Hectares
Site coordinates	TF 475 045 52.617826367833 0.17903256311 52 37 04 N 000 10 44 E Point
Height OD / Depth	Min: 6.5m Max: 12.5m

Project creators

Name of Organisation	D Bescoby Freelance
Project brief originator	Norfolk Archaeological Trust
Project design originator	Caroline Davison
Project director/manager	David Bescoby
Project supervisor	David Bescoby
Name of sponsor/funding body	Heritage Lottery Fund

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Norfolk Archaeological Trust
Digital Contents	"other"
Digital Media available	"GIS","Geophysics","Text"
Paper Archive Exists?	No

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Burgh Castle Roman Fort: Life Outside the walls. The geophysical survey
Author(s)/Editor(s)	David Bescoby
Date	2016
Issuer or publisher	Unpublished
Place of issue or publication	Unpublished

Entered by	Dave Bescoby (d.bescoby@uea.ac.uk)
Entered on	30 August 2016

OASIS:

Please e-mail Historic England for OASIS help and advice