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SERVICES
WYAS

Land at Old Malton Road
Malton
North Yorkshire

Geophysical Survey

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CLIENT
Malton and Norton Sports Association

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Contents

Summary

Detailed magnetometer survey of approximately 14 hectares north-east of the Scheduled Ancient Monument of Derventio Roman fort has identified two areas interpreted as having high or significant archaeological potential. The first area, towards the northern end of the site, encompasses a trapezoidal enclosure that is thought to be the western limit of a ditch defined settlement containing stone structures of Roman date. The main area of interest is at the other end of the site where anomalies indicative of a whole range of activity are thought to locate a vicus attached to the Roman fort

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1. Introduction

1.1 Archaeological Services WYAS was commissioned by Mr John Denton of Lightly and Lightly, on behalf of Malton and Norton Sports Association, to carry out a geophysical (fluxgate gradiometer) evaluation of a large parcel of land on the eastem edge of Malton where it is proposed to develop new sports facilities. The site is centred at SE 794 722 (see Fig. 1).

1.2 The site comprised two large fields at the southem end of the site that were under stubble at the time of survey and an existing cricket and rugby pitch and a smaller field at the northern end of the site, in total encompassing an area of approximately 14.4 hectares. Old Malton Road formed the north-westem limit of the site, a cricket pitch and rugby ground the south-eastern extent and the Roman fort and Scheduled Ancient Monument of Deventio the south-western limit (see Fig. 2).

1.3 Topographically the majority of site slopes gently down from Old Malton Road towards the River Derwent at about 25m Above Ordnance Datum. The solid geology comprises Cretaceous chalk overlain with an unknown depth of chalky drift topsoil on the higher ground and river alluvium on the lower ground nearer the River Derwent. The non-alluvial soils are classed in the Grove Soil Association and are described as moderately permeable, fine loamy, calcareous soils. The majority of the survey was undertaken in September and October 2003 with the final element completed in early February 2004 following the harvest of a sugar beet crop. No problems were encountered during the survey.

2. Archaeological Background

2.1 The requirement for geophysical survey over the entire proposal area stems from the very high archaeological potential of the site. At the southem end of the site this potential relates to the proximity of the Roman Fort of Derventio, a Scheduled Ancient Monument (NY 285). The Scheduled Area includes not only the upstanding earthwork remains of the fort complex to the west of the disused railway line in Orchard Field but an adjoining area of approximately 2 hectares that is currently under cultivation. The current proposal area extends up to the edge of the Scheduled Area (see Fig. 2). In recent years fieldwalking has produced numerous finds in this field which suggest the presence of an extra-mural settlement (a vicus), and possibly a temple or shrine, in the vicinity.

2.2 A Roman Road is known to have issued from the eastem gate of the fort heading on a north-easterly bearing towards the area now occupied by the remains of Old Malton Priory, its route therefore extending across most of the site en-route. Roman roads often became the preferred locations for graveyards as, under Roman law, burials were not permitted within settlement boundaries. There is therefore archaeological potential along the route of the road.

2.3 Further to the north the potential is focussed on a trapezoidal enclosure, centred at SE 7947 7227, identified as a cropmark and partially identified by an earlier geophysical survey (GSB 1992) undertaken prior to the creation of a

rugby club-house and associated facilities. This survey also located other ditch features to the east although the Roman Road was not identified either by magnetometry or resistivity. Subsequent rescue excavation during the ensuing groundworks (MAP 1992) did locate the road but also identified three stone buildings aligned within, and with respect to, the ditches located by the geophysical survey. Burials and high status finds were also uncovered during these excavations.

3. Methodology and Presentation

3.1 The general aim of the geophysical survey was to define the pattern or distribution of archaeologically produced geophysical anomalies across the survey area.

3.2 More specifically the objectives were:-

- to establish the presence or absence of any archaeological anomalies within the proposed development area
- to characterise, if possible, any such anomalies

3.3 The survey methodology and report use the recommendations outlined in the English Heritage Guidelines (David 1995) as a minimum standard. All figures reproduced from Ordnance Survey mapping are done so with the permission of the controller of Her Majesty's Stationery Office. © Crown copyright.

3.4 A general site location plan, incorporating the 1:50000 Ordnance Survey mapping, is shown in Figure 1. Figure 2 is a site location plan, showing the processed greyscale gradiometer data, superimposed onto an Ordnance Survey digital base map at a scale of 1:5000. The results of the survey are displayed in greyscale format, at a scale of 1:2500, in Figure 3 with a summary interpretation at the same scale in Figure 4. Figure 5 shows the site broken down into areas of archaeological potential. Processed greyscale plots and interpretations are shown at a scale of 1:1250 in Figures 6 to 9 inclusive with the unprocessed 'raw' data presented in greyscale format in Figure 10 and as X-Y trace plots in Appendix 4.

3.5 Technical information on the equipment used, data processing and magnetic survey methodology are given in Appendix 1. Appendix 2 details the survey location infomation and Appendix 3 describes the composition and location of the archive.

3.6 For descriptive purposes the site has been divided into three sections from north to south. The northem section comprises the existing cricket and football pitches and the sugar beet field, the central section comprises the arable field between Old Malton Road and the new rugby ground and cricket pitch and the southem section comprises the arable field adjacent to the Scheduled Area.

The figures in this report have been produced following analysis of the data in 'raw' and processed formats and at a number of different display levels. They have been presented to most suitably display and interpret the data from this site based on the experience and knowledge of the Archaeological Services staff.

4. Results

4.1 Non-Archaeological Anomalies (see Fig. 4)

4.1.1 Numerous parallel, linear anomalies have been identified parallel with, or perpendicular to, the current field boundaries, being particularly prevalent across the cricket and football pitches and in the arable field in the central section of the site. These linear trends in the data are a reflection of the strong magnetic susceptibility of the topsoil and are caused by recent ploughing regimes or tractor wheelings.

4.1.2 At the southern end of the site other, more widely spaced, broader and slightly curving linear anomalies have been identified. In this case the anomalies are characteristic of the medieval practice of ridge and furrow ploughing. Although now ploughed out the magnetic vestiges indicative of the former agricultural practice are still visible due to the magnetic contrast between the infilled furrows and former ridges.

4.1.3 Common to all parts of the site are linear dipolar anomalies caused by ferrous utility pipes. One such pipe extends the full length of the site parallel and adjacent to Old Malton Road. A second crosses the central part of the site towards the rugby club and can also be seen further to the south and a third can be seen partly crossing the cricket ground.

4.1.4 Numerous isolated dipolar anomalies ('iron spikes' - see Appendix 1) have been identified across all parts of the site. These 'iron spike' anomalies are indicative of ferrous objects or other magnetic material in the topsoil/subsoil and, although archaeological artefacts may cause them, they are more often caused by modern cultural debris that has been introduced into the topsoil. There is no apparent clustering to these anomalies and consequently they are not considered to be archaeologically significant. However, given the potential of the site it may be that some of these anomalies may be due to archaeological artefacts. Only the strongest of these responses have been shown on the interpretation figure.

4.1.5 Other small areas of magnetic disturbance and large discrete dipolar anomalies have been identified, again being particularly common in the northern part of the site and around the periphery of the survey blocks. These anomalies are also thought to have a non-archaeological origin being caused by the accumulation of modern ferrous rubbish in the hedge boundaries and by surveying adjacent to wire-strand fencing.

4.2 Archaeological Anomalies - Northern Section

4.2.1 Other than the non-archaeological anomalies discussed above no potentially archaeological anomalies have been identified in this part of the site. Consequently all of this part of the site is considered to have a low archaeological potential although it is recognised that there could be surviving sections of the Roman road that is thought to cross this part of the site.

4.3 Archaeological Anomalies - Central Section

4.3.1. In the northern half of this field a series of conjoining, positive, linear anomalies can be seen. These magnetic anomalies are interpreted as infilled archaeological ditches forming a trapezoidal shaped enclosure (Fig. 7 – A) measuring 70m in length and 50m in width at its broader, northern, end. This

enclosure has also been identified as a cropmark and was partially located by a previous geophysical survey (GSB 1992 – see Fig. 4). The linear ditch, **B**, forming the southem end of the enclosure extends north-westwards towards Old Malton Road and to the south-east where again it was located in the earlier survey (see Figs 4 and 7).

4.3.2 Within the enclosure a single intemal ditched division has also been interpreted. However, this anomaly is on the same alignment as the numerous agricultural anomalies and so an archaeological interpretation should be seen at best as tentative. Three discrete areas of magnetic enhancement have also been identified inside the enclosure; one is on the south-eastem edge. These anomalies are also considered likely to have an archaeological origin, possibly pits or small areas of burning.

4.3.3 A much larger area of enhancement (Fig. 7 – C) can be seen approximately 10m to the north of the enclosure. Due to the proximity of the enclosure an archaeological origin for this anomaly is considered likely. It is worth noting that a cluster of pottery sherds was visible on the surface of the field close to the location of this anomaly during the survey.

4.3.4 In the southem half of this field a single positive, linear ditch type anomaly (Fig. 7 - **D**) has been identified. Here again the alignment is very similar to the agricultural trends so an archaeological origin is considered tentative.

4.3.5 Two isolated areas of magnetic enhancement are evident although without the degree of confidence afforded by the proximity to an enclosure it is difficult to be confident of an archaeological origin.

4.4 Archaeological Anomalies - Southern Section

4.4.1 It is immediately apparent that there are, except in the north-eastern third of this field, numerous magnetic anomalies indicative of archaeological activity across most of this area. Consequently, for descriptive purposes, the section has been divided into three parts based on location and the perceived level of activity.

North-west of the Roman Road

4.4.2 Overall the least amount of archaeological activity, as suggested by the number of magnetic anomalies, is in the area between the Roman Road and Old Malton Road. The route of the Roman Road itself is defined by two parallel, positive linear anomalies that cross the field on a south-west to north-east bearing (Fig. 9 – **E**). These anomalies are interpreted as ditches either side of the road that issues from the eastern side of the fort.

4.4.3 Most of the magnetic anomalies are concentrated fairly close to the road itself with the greatest density being clustered near to the edge of the scheduled area. Several discrete areas of magnetic enhancement of varying extent can be seen and the rectilinearity of the two most extensive areas (Fig. 9 – **F** and **G**) could possibly suggest the in-situ burning of a structure. Certainly the extent of these latter two anomalies would seem to preclude them being caused by pits.

South-east of the Roman Road

4.4.4 Immediately the other side of the road is evidence of more intensive activity. Numerous areas of magnetic enhancement can again be seen although in this case the activity is contained within a sub-square enclosing ditch (Fig. 9 – **H**). The extent of the two largest areas of enhancement (Fig. 9 - **I** and **J**) is such that they are unlikely to be caused by pits and are perhaps more likely to be caused by in-situ burning, perhaps of a building. Several smaller pit-type anomalies can be seen. A single short linear anomaly suggests that this enclosure may have been sub-divided and the size and linearity of one sub-rectangular positive anomaly ((Fig. 9 – **K**), towards the northern edge, is suggestive of a possible structure.

The Vicus

4.4.5 The most intense area of archaeological activity anywhere within the whole site can be seen in the extreme south-east corner where a plethora of magnetic anomalies, most of which are contained within an outer enclosing ditch (Fig. 9 – **L**), aligned from north-west to south-east, are indicative of occupational activity associated with a civilian settlement (vicus) attached to the fort. The complex and intense nature of the magnetic anomalies is such that a detailed anomaly-by-anomaly description or an attempt to interpret the cause of each individual anomaly would be both impossible and almost certainly result in erroneous conclusions. Therefore the description and interpretations have been made at a more general level.

4.4.6 Closest to the north-western edge of the surveyed area (abutting the scheduled area) the linearity and size of at least three sub-rectangular negative anomalies (Fig. 9 – **M**, **N** and **O**) is suggestive of buildings. The basic alignment of these features seems to be from south-west to north-east an alignment mirrored by the many linear anomalies further to the east. It is not clear whether these latter anomalies are infilled ditch features or whether some may be due to structural features, such as daub foundations, burnt in-situ. The numerous discrete areas of magnetic enhancement attest to the presence of pits and other small discrete features. There do not appear to be any anomalies that are likely to be indicative of any major industrial activity.

4.4.7 Just outside the north-eastern limits of the vicus several other areas of enhancement have been identified. The proximity of the settlement increases the likelihood of these anomalies also having an archaeological origin.

5. Discussion and Conclusions

5.1 Based on these survey results, previously undertaken fieldwork and the (predicted) likelihood of the presence of other, currently undetected, archaeological features the whole site has been classified into areas of potential.

5.2 The largest single area assessed as having only low potential is at the northern end of the site where no archaeological anomalies have been identified. Of course any groundworks or levelling preparatory to the creation of the football and cricket pitches may have truncated or destroyed any archaeological features or deposits here, although the preservation of the linear anomalies

attributed to former agricultural regimes might suggest that little such landscaping was required. Consequently, and given the ready identification of archaeological features less than 100m to the south (see below), it is considered that the lack of any identifiable archaeological anomalies is probably a reflection of the lack of any underlying non-structural archaeological features rather than an inability to detect any such features. However, it should be noted that the route of the Roman road is predicted to cross this part of the site and surviving metalled sections might be identifiable by resistance survey even though this method did not prove particularly successful in the two transects surveyed in advance of the rugby club development. This may have been due to the fact that the road surface, as identified in the excavations, had been laid directly onto the solid geology.

5.3 Immediately to the south the area encompassing the trapezoidal enclosure is assessed as having significant potential. It has been stated (MAP 1992) that a similarly proportioned enclosure at Langton Road, Norton has been interpreted as a Romano-British walled-cemetery although caution was advised in ascribing similarity of function purely on dimension. It is certainly the case that the long axis of the enclosure approximates to the line of the Roman road although contemporaneity cannot be assumed.

5.4 The current survey has demonstrated that the trapezoidal enclosure forms the westem end of a complex previously identified as cropmarks and located by linear magnetic anomalies detected during the earlier (1992) geophysical survey. This complex was also found to contain unexpected structural remains that, by their position and orientation, would seem to be contemporary with the ditches enclosing them. Consequently the possibility of further structures within the trapezoidal enclosure should not be discounted. A resistance survey could help in assessing this possibility although if it were an enclosed cemetery it is unlikely that any non-intrusive survey would be able to resolve such notoriously difficult targets. It is considered that there are likely to be other small, discrete features, such as post-holes or small pits, which the current survey, even sampling at 0.25m intervals, has been unable to resolve.

5.5 The area to the south of the enclosure has been ascribed a low archaeological potential as only a couple of isolated discrete anomalies and a very tentative linear anomaly have been identified. A relatively high degree of confidence can be placed in this assessment of potential as the manifestation of the major ditch features as magnetic anomalies suggests that the topsoil in this part of the site offers a sufficiently great magnetic contrast when incorporated into the fill of cut features for the ready identification of archaeological (particularly major linear) archaeological features. Therefore it is considered that the relative paucity of magnetic anomalies is probably indicative of the lack of underlying infilled features. This does not discount the possibility of structural remains or other 'difficult' targets such as graves or post-holes.

5.6 The same status is afforded the north-westem and north-eastern parts of the southem section where no archaeological anomalies have been noted.

5.7 At the southem end of the site, adjacent to the upstanding and earthwork remains of Derventio Roman fort and the extension of the Scheduled Area in the arable field, the magnetometer survey has identified magnetic anomalies

indicative of archaeological features and anthropogenic activity that are categorised as being of the highest potential.

5.8 In the extreme south-eastem comer of the site an area of more than a hectare (140m by 80m) is covered by an incredibly densely packed series of linear, recti-linear and discrete magnetic anomalies that are likely to be caused by a whole range of archaeological features including ditches, pits, hearths or areas of buming and/or industrial activity as well as possible structures. Undoubtedly the results have confirmed the opinion, first suggested as a possibility by the range of artefacts collected during fieldwalking and as spot finds over the years, that the vicus extended further to the north-east than had previously been suggested by the excavations carried out between 1968 and 1970 (Wenham and Heywood 1997). Those excavations, in the area between the southern entrance to the fort and the River Derwent prior to the construction of a bottling factory, showed that there were periods of expansion, contraction and abandonment over nearly three centuries with evidence of demolition and fire damage to both timber and stone buildings. The strength of the anomalies at the very edge of the survey area does show some signs of decreasing towards the river and this may reflect an increasing build up of soil at the lowest part of the site, nearest the river.

5.9 Further non-intrusive geophysical work may well provide a clearer picture or enable a greater understanding to be gained of the range of features and type of activities being undertaken in the vicus. A resistivity survey certainly has the potential to resolve any structural remains and it may even be worth considering a ground penetrating radar (GPR) survey across pre-selected parts of the vicus, particularly if there is reason to think that there could be a reasonable depth of stratigraphy and/or structures present. Increasing experience of interpreting GPR data and more sophisticated (particularly time-slicing) processing packages now mean that under the right circumstances this non-intrusive technique has the potential to suggest the relative phasing of structures. The value of this approach has been demonstrated during GPR surveys at Wroxeter (Nishimura and Goodman 2000).

5.10 As well as the vicus another large ditched enclosure appended to the south-eastem side of the road can be seen. The level of activity within this enclosure is not on the same scale as that within the vicus but nevertheless contains several anomalies of interest not least the two large areas of enhancement. The ditch defining the north-eastern edge of this enclosure seems to define the furthest extent of any major activity associated with the fort and by its morphology would seem to be a later expansion of, or addition to, the vicus.

5.11 To the north-west of the road the level of activity is also significantly reduced relative to that within the vicus but the potential is still assessed as being high or significant. Again several enigmatic areas of enhancement have been identified but in this case, interestingly, no linear anomalies to suggest they are located within an enclosure can be identified to this side of the road. It is not clear whether this represents a true indication of the extent of any surviving archaeology or whether plough damage on the higher ground where the depth of soil is, presumably, reduced has truncated archaeological features here.

5.12 A corridor of significant potential has been extended either side of the road and around the zone of highest potential to allow for the possibility of features, such as graves, that are very difficult to detect.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

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Appendices