
LEAVENING, NORTH YORKSHIRE.

FLUXGRADE GRADIOMETER SURVEY REPORT.
OSA REPORT No: OSA06EV17.

SEPTEMBER 2006.

OSA

ON SITE ARCHÆOLOGY LTD

25A Milton Street • York • North Yorkshire • YO10 3EP
telephone • 01904 411673 • fax • 01904 414522 • mobile • 07767 385766
e-mail • mail@onsitearchaeology.co.uk
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Fern Archaeology, 10 Aspen Way, Slingsby,
N. Yorkshire, YO62 4AR. Tel. 01653 628071
Mob: 07974 269134 Email: cjrf100@aol.com



Registered Charity No. 326710

Old Bridge Barn
Yedingham
N. Yorkshire
YO17 8SL

Report Summary.

REPORT NO: OSA06EV17

SITE NAME: Leavening, North Yorkshire

NATIONAL GRID REFERENCE: SE 479300 463376

ON BEHALF OF: Matthew Groom
Brierley Groom & Associates
2 Holly Tree House
Harwood Road
Northminster Business Park
York
YO26 6QU

TEXT: Chris Fern & James Lyall

GRAPHICS: Chris Fern

FIELDWORK AND RESEARCH: Chris Fern & Landscape Research Centre

TIMING: September 2006

ENQUIRIES TO: Nick Pearson
On Site Archaeology
25A Milton Street
York
YO10 3EP

tel (01904) 411673
fax (01904) 414522
mobile (07767) 385766
e-mail mail@onsitearchaeology.co.uk

Table of Contents.

1.0 Summary.....	3
2.0 Site Location and Description.....	3
3.0 Methodology.....	5
4.0 Gradiometer Results and Interpretation.....	5
5.0 Conclusion.....	9
6.0 Bibliography.....	9
7.0 The Plates.....	10

List of Figures.

Figure 1. Site Location (SE 479300 463376).....	4
Figure 2. Areas of fluxgate gradiometer survey (Scale 1:1000).....	7
Figure 3. Interpretation of magnetic anomalies (Scale 1:1000).....	8

List of Plates.

Plate 1. Site, looking north, illustrating terrain and vegetation.....	10
Plate 2. Site, looking southwest, illustrating terrain and vegetation.....	10

1.0 Summary.

Fern Archaeology, in affiliation with the Landscape Research Centre (LRC), carried out a fluxgate gradiometer magnetometry survey, on behalf of *On Site Archaeology*, at Leavening, North Yorkshire, in September 2006. A full survey of the entire field was not possible, due to the severe terrain, incorporating dense pockets of vegetation and very steep inclines. In places the survey was also affected by modern ferrous material. A number of other anomalies are interpreted as geological, although a small number of features suggest possible archaeology, some of which may be related to quarrying at the site.

2.0 Site Location and Description.

The site is located at the western edge of the Yorkshire Wolds, 600m east of the village of Leavening, North Yorkshire, on the north side of Pocklington Lane End. The field under survey is centered at National Grid Reference (NGR) SE 479300 463376 (see Figure 1). This field is sub-trapezoidal in plan and situated on a steep slope, that rises from approximately 123.00mAOD (*Above Ordnance Datum*) at its southern entrance to 168.38mAOD at its northern gate. This terrain is undulating and punctuated with severe inclines, depressions and in places dense vegetation (see Figures 4 and 5). The field is divided by a winding track that runs north-to-south. Given the severe rise and the undulating terrain, it is likely that the field has never been cultivated. For the recent past this is evidenced by spreads of mature trees. The total area of the field is approximately 3.4hectares.



Figure 1. Site Location (SE 479300 463376).

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3.0 Methodology.

The method of survey was magnetometry, conducted using a *Bartington Grad 601-2* fluxgate gradiometer. The zig-zag traverse method was used within 30m x 30m grids, with readings recorded every 25cm along the north-south axis and every metre along the east-west axis (3600 readings for each grid) (see Figure 5). The survey was carried out on 18th September 2006. The surveyors were Chris Fern, Will Hinchcliffe and James Lyall. The sensitivity of the machine was set to detect ground magnetic variation in the order of 0.1 nanoTesla (nT). The data has been processed using *G-Sys*, a Geographic Database Management Program developed by the LRC. The survey is geographically located in Figures 2 to 3 and is presented as a greyscale map with the upper and lower limits confined within a range of ± 12.8 nT. A grey plastic peg has been left in the northeast corner of the survey to aid location on the ground by a third party. The raw data from which the grayscale plot is produced can be made available upon request in ASCII file format.

The character of the terrain meant that some areas of the field were non-traversable. Very steep inclines, areas of dense bush canopy (comprising very long grasses, nettles and thistles) and trees all prevented survey.

4.0 Gradiometer Results and Interpretation.

The aim of the survey was to attempt to locate and interpret any archaeology. An interpretation of results is given in Figure 3.

The areas surveyed are presented in Figure 2 at ± 12.8 nT, to a scale of 1:1000. A 'destripe' filter has been applied to the results. The survey was in places considerably constrained by vegetation growth, including mature trees and dense patches of nettles, thistles and grasses, as well as a pond feature (Figure 4). It appeared that some areas of vegetation growth were situated upon disturbed areas of ground, which may relate to quarry pitting or dumping. Vegetation was particularly pronounced around the field boundary, along the middle section of trackway, and in the western part of the field. The very severe escarpments of the slope were also impossible to traverse in survey.

A number of modern environmental factors affected the survey. The very strong magnetic readings, visible as false-positive ovate dipoles, are the result of surface and sub-surface modern ferrous materials, such as horse-shoes and nails etc. The strongest of these relate to collections of iron fence poles and dumps of modern iron materials within observed depressions. In places the collections of fence poles were visible, but proved unmovable. In the southern half of the survey the graveled trackway has also created a masking noise. At the southern boundary further distortion to the survey resulted from the wire fence and a static caravan.

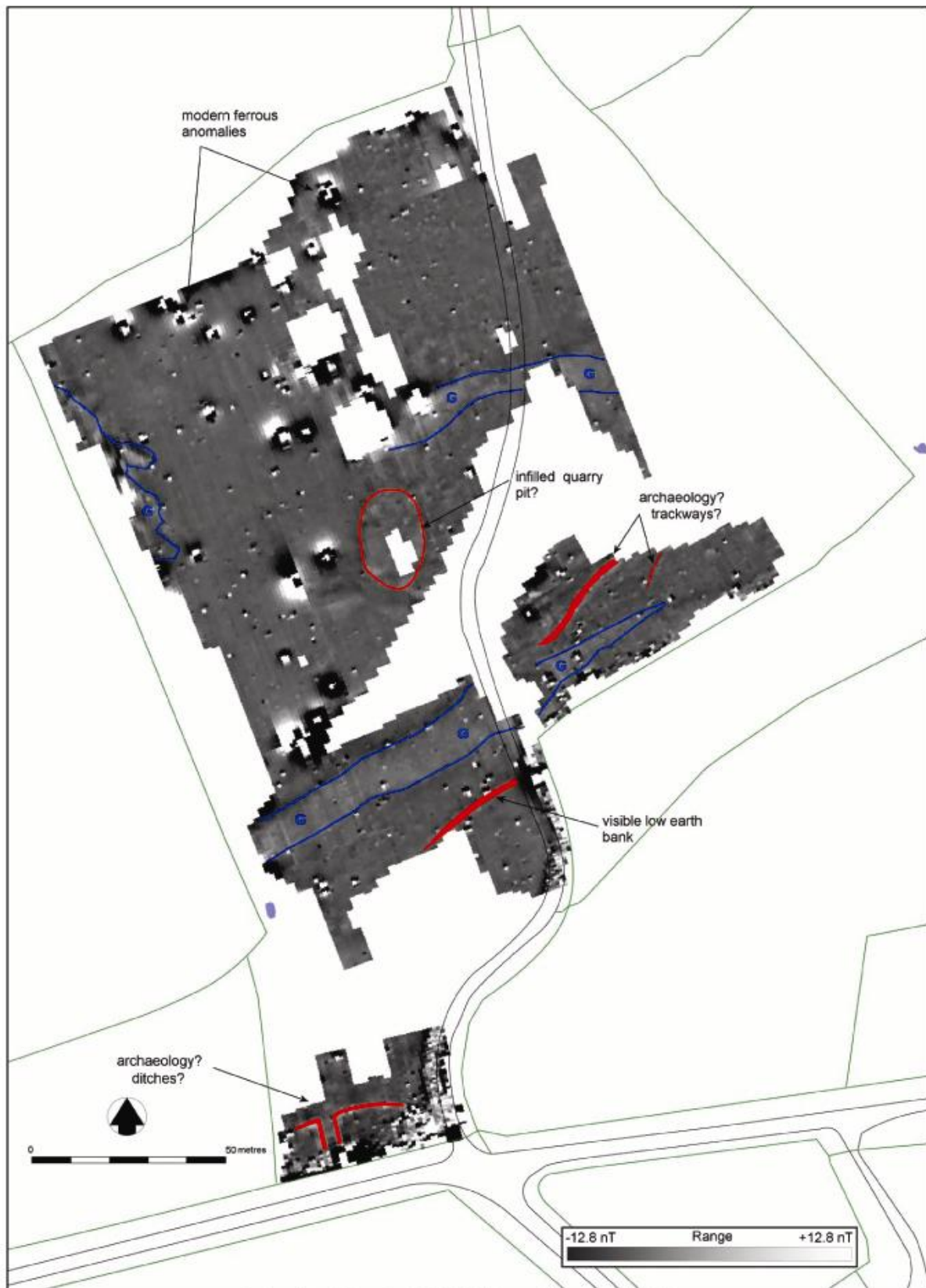
Despite the modern ferrous disturbance and terrain obstacles, a number of magnetic anomalies were identified by the survey. Broad bands and areas of drift geology are suggested in several areas. These are shown in blue in Figure 3.

A number of possible archaeological features are indicated in red. Some of these anomalies may relate to quarrying activity. Indeed, some of the depressions, knolls, hollow-way, and escarpment earthworks, visible during survey, may have resulted from such action. A backfilled quarry pit is suggested, together with two possible trackway features. It is not possible to know the date of these, or to know if the quarrying and trackways are contemporary. A further anomaly accords with a low chalk bank which is visible as an earthwork. This bank is aligned with part of the modern field boundary, and this may be its origin. The last feature, which projects from the southern boundary of the site would suggest a curvilinear ditch, possibly with an entranceway. The form of this feature is not diagnostic of a date. It is possible, however, that it is associated with the series of linear earthworks known from aerial photography in areas adjacent and to the south and east of the survey site (Stoertz 1997).



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Figure 2. Areas of fluxgate gradiometer survey (Scale 1:1000).



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Figure 3. Interpretation of magnetic anomalies (Scale 1:1000).

5.0 Conclusion.

Although in part obstructed by the difficult terrain, and affected by modern ferrous materials, the survey revealed a small number of potential man-made anomalies. Some, or all, may relate to the use of the site for quarrying activities, although one ditch feature is highlighted as possibly being of greater archaeological potential.

6.0 Bibliography.

Stoertz, C. 1997. Ancient Landscapes of the Yorkshire Wolds: Aerial Photographic Transcription and Analysis, RCHME, Swindon

7.0 The Plates.



Plate 1. Site, looking north, illustrating terrain and vegetation.



Plate 2. Site, looking southwest, illustrating terrain and vegetation.