LAND AT
HIGH STREET
NASEBY
NORTHAMPTONSHIRE

GEOPHYSICAL SURVEY

Work undertaken for
Francis Jackson Homes

Report produced by
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November 2013

National Grid Reference: SP 6893 7760
OASIS Reference No.: archaeol1-163815

APS Report No: 136/13

ARCHAEOLOGICAL
PROJECT
SERVICES

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1. SUMMARY

Detailed magnetic gradiometer survey was undertaken in connection with proposed development on land to the rear of the Roma Works, High Street, Naseby, Northamptonshire. The survey area totalled 1.6ha.

The survey plot is dominated by strong linear responses, some likely to be indicative of ditched features, others reflecting the presence of extant ridge and furrow. This ridge and furrow is well preserved in the eastern and northern part of the field. To the west (south of the Roma Works), there is the impression on the ground of a platform with a small hollow (?pond) just to the north. However, the strong magnetic response over this area suggests that there has been recent disturbance or dumping here (perhaps when the Roma Works was built) and these apparent earthwork features may not be of any antiquity.

Linear features of possible archaeological origin are present in the northern part of the field potentially earlier than the ridge and furrow here. These are visible where running on a different alignment to the ridge and furrow but no clear pattern can be discerned and all tend to peter out, perhaps masked by the ridge and furrow as they change alignment.

2. INTRODUCTION

2.1 Definition of an Evaluation

Geophysical survey is a non-intrusive method of archaeological evaluation. Evaluation is defined as *'a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site. If such archaeological remains are present Field Evaluation defines their character and extent, quality and preservation, and it enables an assessment of their worth in a local, regional, national or international context as appropriate'* (IFA 2008).

2.2 Background

Archaeological Project Services was commissioned by Paul Johnson of Francis Jackson Homes to undertake detailed magnetometer survey totalling some 1.6ha on land to the rear of the Roma Works, High Street, Naseby, Northamptonshire in connection with proposed development of the area. The survey was carried out on the 4th November 2013.

2.3 Topography and Geology

Naseby is located 17km northwest of Northampton in the Daventry District of Northamptonshire (Fig. 1). The site lies on the southeastern fringe of the village, 500m south of the church of All Saints, to the rear of the Roma Works on the east side of the High Street at its junction with Cottesbrooke Road, at National Grid Reference SP 6893 7760 (Fig. 2).

The survey area lies on relatively level ground at c. 185m AOD. Local soils are calcareous clayey soils of the Hanslope Association developed on chalky till (Hodge *et al*. 1984, 351; BGS 50000 scale digital geology).

3. GEOPHYSICAL SURVEY

3.1 Methods

Location and layout of the survey areas is shown in Figure 2. The survey area comprised a single field under rough pasture and in generally good condition for survey.

Survey was undertaken in accordance with English Heritage (2008) and IfA (2011) guidelines and codes of conduct.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. This records subtle

changes in the magnetic field resulting from differing features in the soil. Changes as small as 0.2 nanoTesla (nT) in an overall field strength of c. 49,000nT can be accurately detected using this instrumentation, although in practice instrument interference and soil noise can limit sensitivity.

Magnetometers measure changes in the Earth's magnetic field. With two sensors configured as a gradiometer the recorded values indicate the difference between two magnetic measurements separated by a fixed distance. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame with a 1m separation between the sensing elements giving a strong response to deep anomalies.

The mapping of anomalies in a systematic manner allows interpretation of the type of material present beneath the surface. Strong magnetic anomalies are generated by buried iron-based objects or by kilns or hearths, usually resulting in a bipolar (positive/negative) response. More subtle positive anomalies representing pits and ditches can be seen where these contain more topsoil which is normally richer in magnetic iron oxides and provides a contrast with the natural subsoil (but this can vary depending on the nature of the underlying deposits). A negative anomaly may result from upcast bank material. Wall foundations can also show as negative anomalies where the stone is less magnetic than the surrounding soil, or as stronger positive and negative anomalies if of brick, but are not always responsive to the technique.

It should be noted that not all features will be responsive and absence of anomalies does not necessarily indicate absence of archaeological features.

Sampling interval and data capture
Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid. The Grad 601 has a typical depth of penetration of 0.5m to 1.0m although a greater range is possible where strongly magnetic objects have been buried in the site.

Processing and presentation of results
Processing is performed using specialist ArcheoSurveyor software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves flattening the background levels with respect to adjacent traverses and adjacent grids (Destripe or zero mean traverse). Despiking is also performed to reduce the effect of the anomalies resulting from small iron objects often found on agricultural land. Further processing can then be carried out which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following are the processing techniques carried out on the processed gradiometer data used in this report:

1. DeStripe (sets the background mean of each traverse within a grid to zero and is useful for removing striping effects)

2. Despike (useful for display and allows further processing functions to be carried out more effectively by removing extreme data values)
Parameters: X radius = 1; Y radius = 1; Threshold = 3SD; Spike replacement = mean

3. Clip (excludes extreme values allowing better representation of detail in the mid range): -5 to 5nT.

The minimally processed greyscale plots are clipped for display, but otherwise unprocessed. Trace plots are destriped before clipping as the effects of heading errors can produce noticeable offsets in this method of display.

3.2 Results

The presentation of the data for the site involves a print-out of the raw or minimally processed data as greyscale and trace plots (Figs 3, 4), together with greyscale plots of the processed data (Figs 5, 7). Magnetic anomalies have been identified and plotted onto an interpretative drawing (Fig. 6) and are described below.

Positive linear anomalies
The survey plot is dominated by strong linear responses, some likely to be indicative of ditched features, others reflecting the presence of extant ridge and furrow. This ridge and furrow pattern is clearest in the southern and eastern part of the plot with broad, but quite diffuse, bands of positive response shadowed by negative response running on a NW-SE alignment and spaced about 8m-10m apart. In the northern part of the field a more SW-NE trend is evident, again reflecting extant ridge and furrow, here with a narrower 5m spacing. These were not as pronounced as those to the south and do not show as clearly in the survey plot (although this will be partly due to their alignment very close to that of the survey transects; the destripe filter will tend to lessen the effects of regular parallel variations along this axis).

Other positive linear responses possibly reflect linear features earlier than the ridge and furrow. **A** runs NW-SE, curving slightly at its northwestern end, becoming less distinct to the southeast. A short curving anomaly at **B** may also represent a ditched feature, but becomes less clear to the north and west. Positive anomaly **C** in the northern part of the field possibly forms the corner of a small ditched enclosure, perhaps with **D** forming part of the southeastern edge, although once again this cannot be traced far.

Negative linear anomalies
A band of negative response **E** can be seen curving west and north from the southeast corner of the field, interrupting the pattern of ridge and furrow. This might represent the line of a former track running across the field, but it does not match the currently used gateways into and out of the field.

Magnetic disturbance
Strong bipolar response is apparent over much of the southwestern corner of the field and in more discrete areas in the eastern half. The wider areas suggest disturbance to much of this part of the field with metallic and/or highly fired material widespread (although none is visible at the surface). Similar response more generally around field margins reflects the presence of metallic elements within fencing and gates. The rather more intense response at **F** and **G** perhaps indicates the presence of larger buried items. Strong negative responses at **H** and **I** reflect the presence of reinforced concrete fence posts here, part of some former fenceline. A roughly east-west alignment of strong bipolar response at **J** just to the north may also reflect some former boundary here (it is rather too discontinuous to reflect the route of a service/pipe, consisting of a series of strong individual point responses).

Iron spikes (discrete bipolar anomalies)
Iron items within the topsoil give a distinctive localised bipolar (strong positive with associated strong negative) response. Such items usually derive from relatively recent management or agricultural use of the land – broken or discarded pieces of agricultural machinery or other modern debris. One or two isolated items are noted, but these are generally subsumed into wider areas of magnetic disturbance.

4. DISCUSSION

Detailed magnetic gradiometer survey was undertaken in advance of proposed development at the site. The survey plot is dominated by strong linear responses, some likely to be indicative of ditched features, others reflecting the presence of extant ridge and furrow. This ridge and

furrow is well preserved in the eastern and northern part of the field. To the west (south of the Roma Works), there is the impression on the ground of a platform with a small hollow (?pond) just to the north (approximate locations shown on Fig. 6). However, the strong magnetic response over this area suggests that there has been recent disturbance or dumping here (perhaps when the Roma Works was built) and these apparent earthwork features may not be of any antiquity.

Linear features of possible archaeological origin are present in the northern part of the field potentially earlier than the ridge and furrow here. These are visible where running on a different alignment to the ridge and furrow but no clear pattern can be discerned and all tend to peter out, perhaps masked by the ridge and furrow as they change alignment.

5. ACKNOWLEDGEMENTS

Archaeological Project Services wishes to acknowledge Paul Johnson of Francis Jackson Homes who commissioned the project and arranged access. The work was coordinated by Dale Trimble who edited the report along with Tom Lane.

6. PERSONNEL

Project coordinator: Dale Trimble
Geophysical Survey: Steve Malone, Jonathon Smith
Survey processing and reporting: Steve Malone

7. BIBLIOGRAPHY

English Heritage, 2008 *Geophysical Survey in Archaeological Field Evaluation.*

Hodge, CAH., Burton, RGO., Corbett, WM., Evans, R., and Seale, RS, 1984 *Soils and their use in Eastern England*, Soil Survey of England and Wales 13

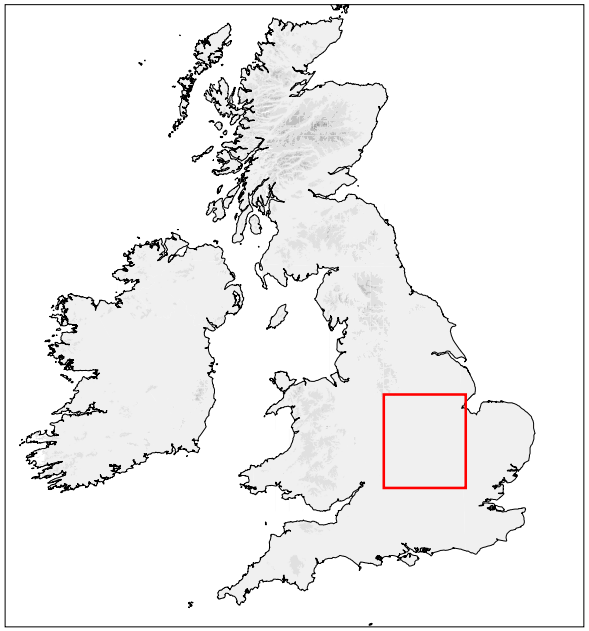
IfA, 2008 *Standard and Guidance for Field Evaluation.*

IfA, 2011 *Standard and Guidance for Geophysical Survey.*

8. ABBREVIATIONS

BGS British Geological Survey

IfA Institute for Archaeologists



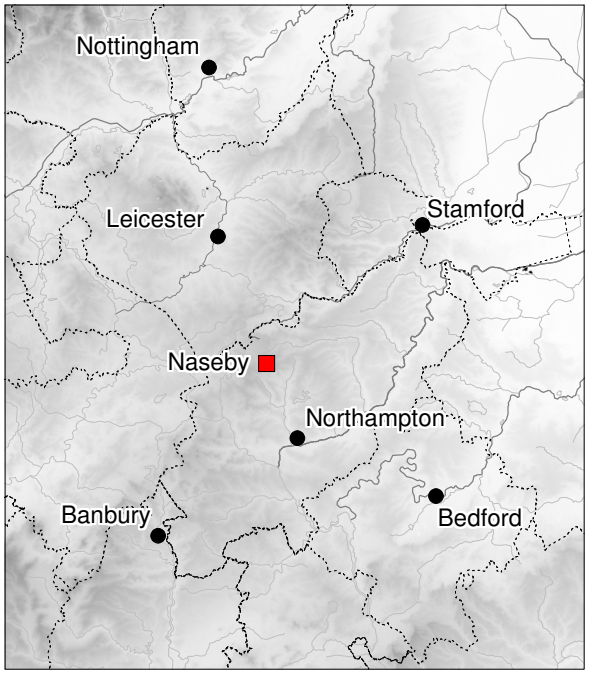


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Figure 1 Site location map

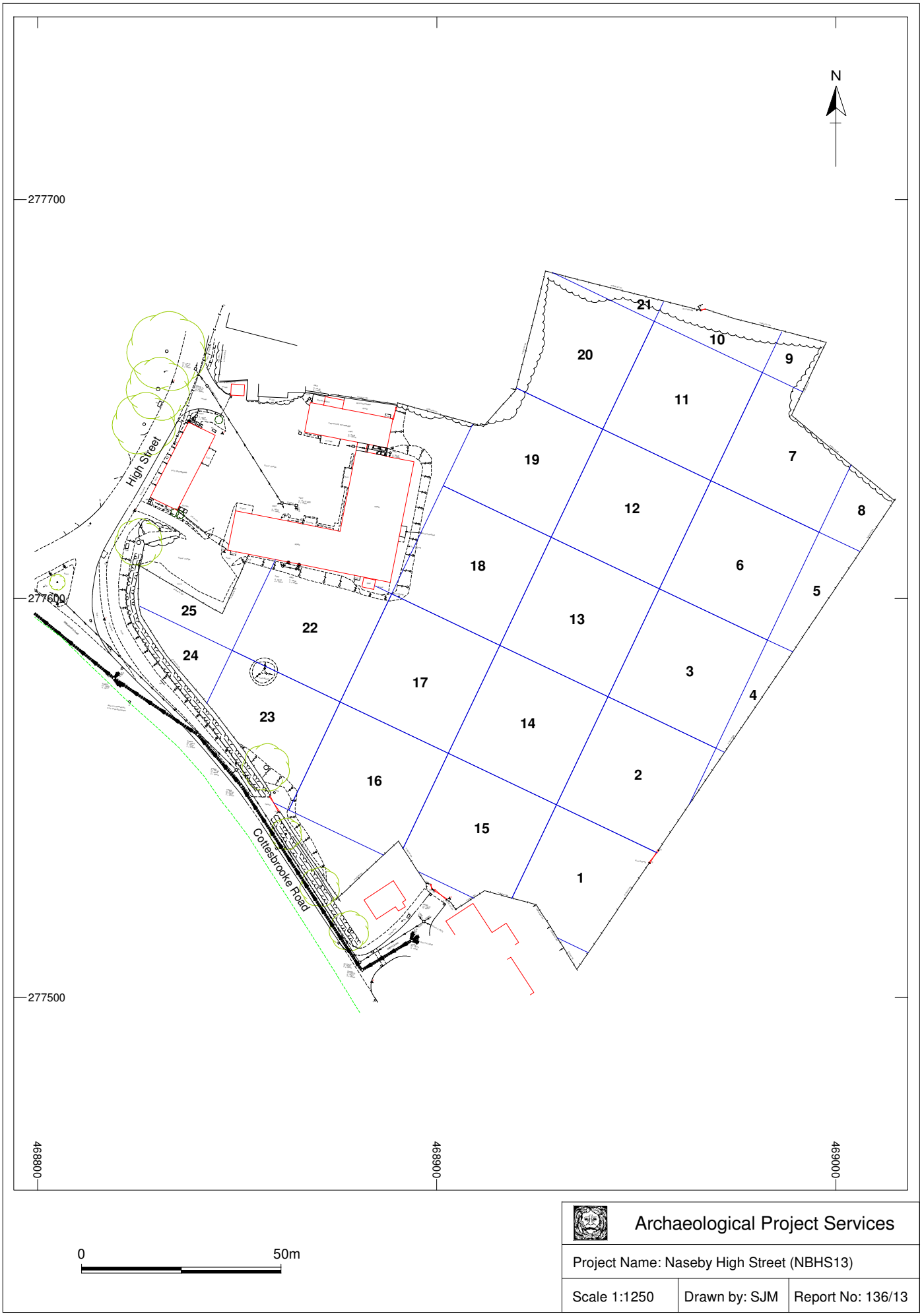

Figure 2 Location and layout of survey area

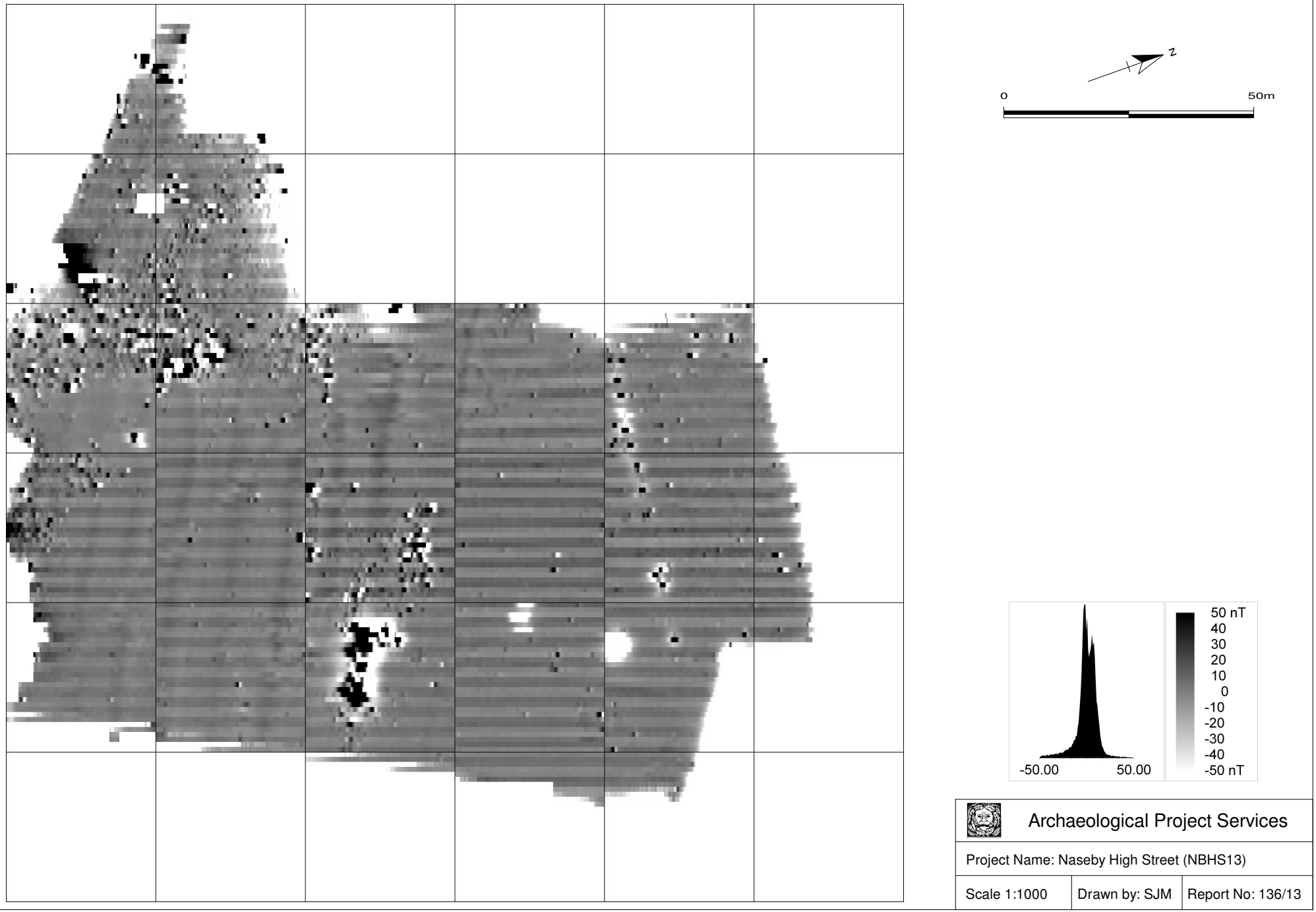

Figure 3 Minimally processed data greyscale plot

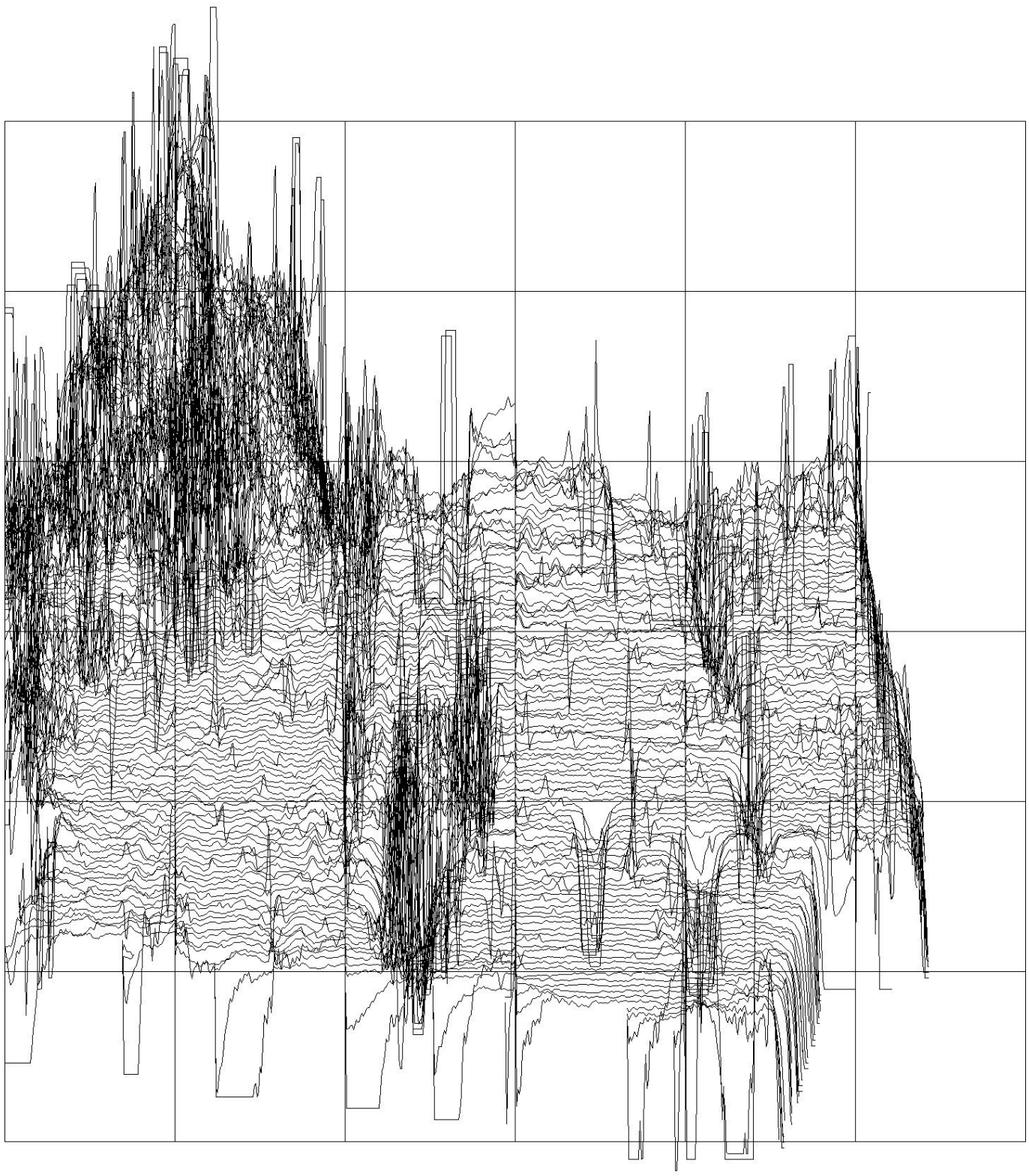

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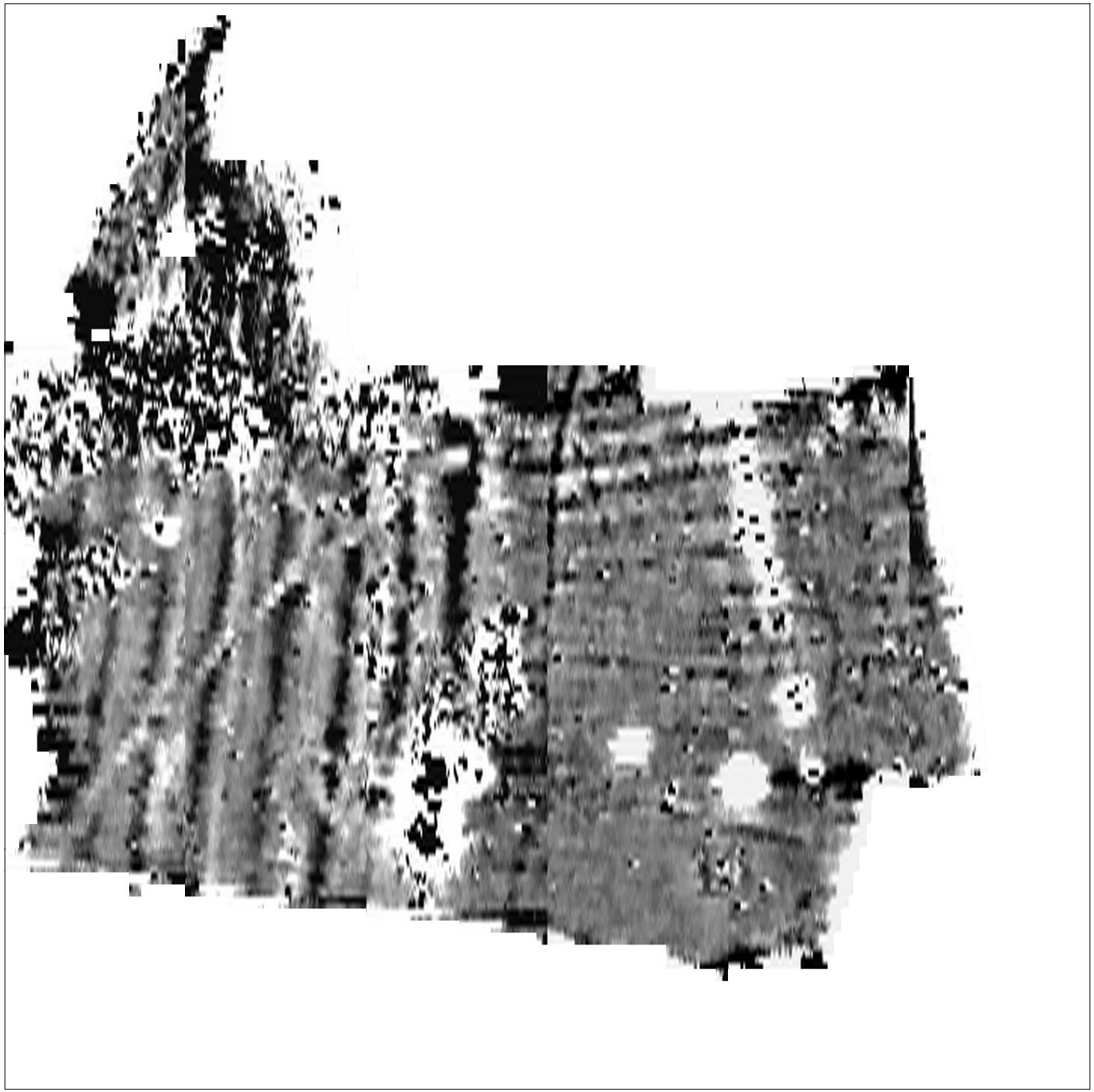
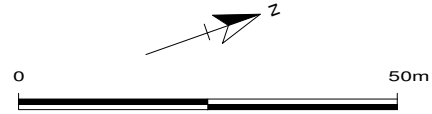
Figure 4 Minimally processed data trace plot





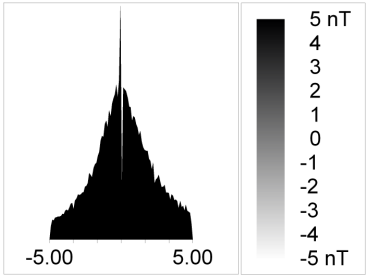


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Figure 5 Processed data greyscale plot

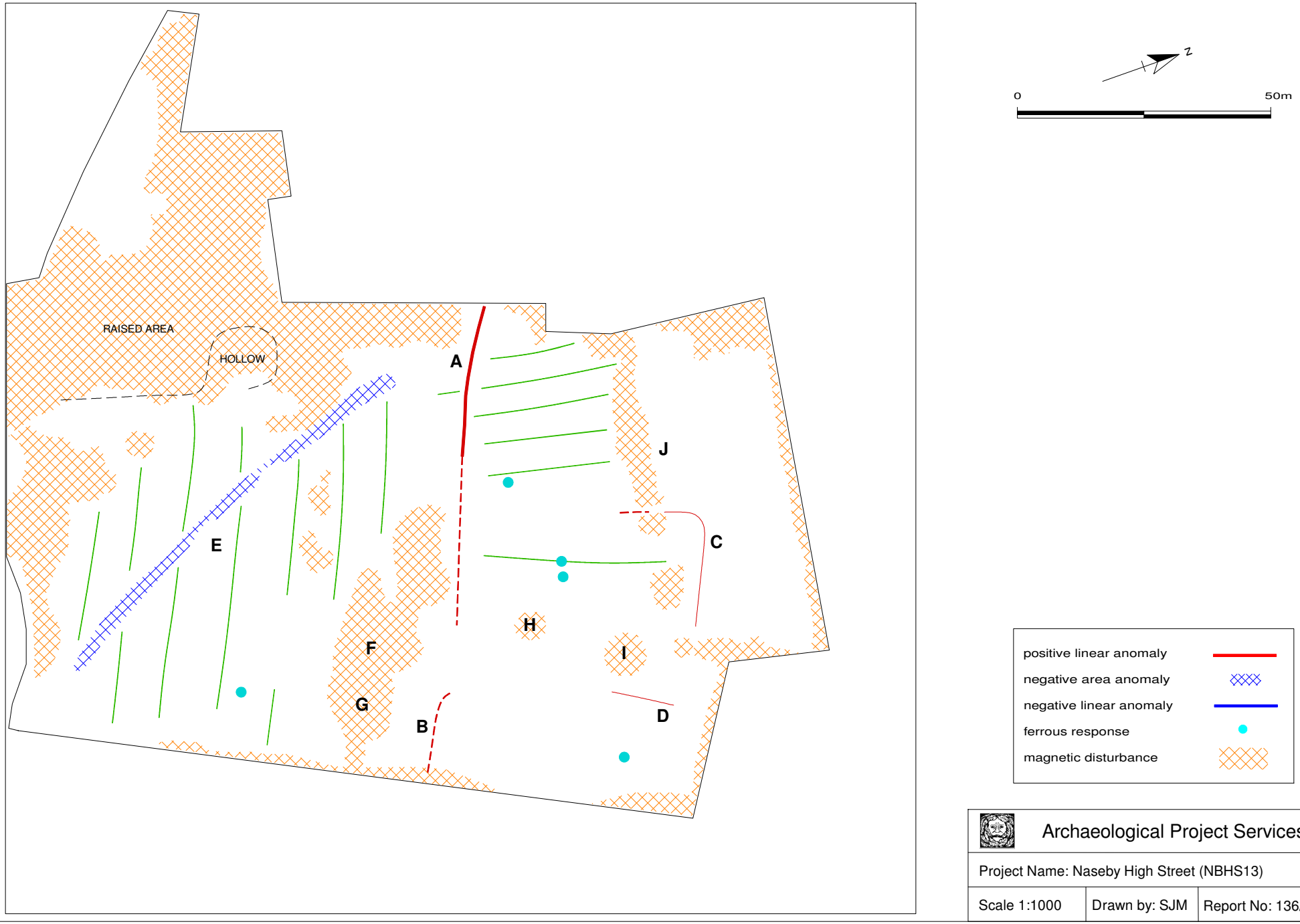

Figure 6 Interpretative plot

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Figure 7 Processed greyscale overlain on base map

Appendix 1
THE ARCHIVE

The archive consists of:

1 Daily record sheets
1 Report text and illustrations
Digital data

File names	Grid files sequentially numbered: NBHS 13-1.xgd to NBHS 13-25.xgd		Composite files NBHS13-c1.xcp
Explanation of codes used in file names	xgd files are magnetometer grids, named with site code and number in the order surveyed. xcp files are composites containing record of all the data and processes used to produce the end product		
Description of file formats	All files are in plain text xml format with header data defining survey and processing parameters		
List of codes used in files	D indicates a "dummy" value within the composite data		
Hardware, software and operating systems	ArcheoSurveyor 2.5.19 running under Windows 7		
Date of last modification	23/10/13		
Indications of known areas of weakness in data			

All primary records are currently kept at:

Archaeological Project Services, The Old School, Cameron Street, Heckington, Sleaford, Lincolnshire NG34 9RW

There is currently no archive repository for the area of the investigation. The archive will be held at the offices of APS until permanent deposition of the archive in an appropriate store can be arranged.

Archaeological Project Services Site Code: NBHS13

OASIS Record No: archaeol1-163815