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Engineering Archaeological Services Ltd

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*Burgh le Marsh, Hall Lane
Geophysical Survey*

June 2000

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EVENT L11737

SOURCE L16505

PA15 40583 440583
43810 L180563

*Survey Commissioned
by
Archaeological Project Services*

*Surveyed
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*registered in England
N° 2869678*

00/18

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Geophysical Survey*

June 2000

Lincolnshire County Council
Archaeology Section

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Burgh le Marsh, Hall Lane Geophysical Survey - Introduction:

NGR

Centred on TF 4997 6486

Location and Topography

The area surveyed was the southern end of a field to the north of Hall Lane, Burgh le Marsh, Lincolnshire and to the east of Burgh Hall. The field sloped slightly to the south and was under pasture with a few trees surrounded by wooden fences.

Archaeological Background

The site was recognised when an access road was cleared in advance of a housing development. A number of linear archaeological features were recognised during the watching brief of this phase construction. Whilst carrying out this survey a few sherds of possible Roman pottery were also collected.

Aims of Survey

It was hoped that detailed magnetometry would detect the extent of the archaeological features already recorded, help to clarify their nature and test for the presence of further archaeological features.

SUMMARY OF RESULTS

A number of archaeological, and potentially archaeological features were located. Some of which relate to archaeological features recorded in the ground.

Burgh le Marsh, Hall Lane Geophysical Survey -Results:

Survey Results:

Area

An area of approximately 0.5 Ha. was surveyed in detail.

Display

The results are displayed as Grey Scale Image and as X-Y Trace Plots (Figures 2 and 3).

Results:

Complicating Factors

The developer had left a back-acting excavator, dump truck, digging bucket and mobile diesel tank within the survey area. Unfortunately it was not possible to get these objects moved before the survey took place. The survey area also contained a reinforced concrete cattle trough and stock fences surrounding young trees. All of which produced strong ferromagnetic responses which distorted and left gaps in the grey scale plots. These are marked in blue on the interpretation diagram (Figure 4).

The access road produced by the developer was cut to a depth of approximately 0.50 m in places which also made the survey tricky to carry out in these areas. The approximate position of this feature is shown in Figure 1.

Detailed Survey

Fourteen 20 x 20m grids were investigated. The layout of the grid is shown on the location diagram (Figure 1).

A notable linear feature is visible on the plots running in an approximate east - west direction parallel to the northern edge of the survey area (Figures 2 and 3). This feature runs through Grids 1, 2, 3, 4, and 5. To the east, through Grids 1 and 2 a second parallel linear feature is noted. These are marked in red on the interpretation diagram (Figure 4). These features correspond closely to those recorded in the excavated trench. A number of fainter, linear magnetic anomalies

were defined throughout the survey area. Whilst some of these probably represent the modern drainage pattern in the field others probably represent archaeological features. It is noticeable that some of these features are roughly parallel to that identified along the northern edge of the survey area and are therefore possibly of archaeological origins. Those running approximately SW - NE are possibly drainage features.

Magnetic Susceptibility

Soil samples were taken from the survey area in order to assess the magnetic susceptibility of the soils. Three subsoil sample were taken for comparison .

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Grid 1	32	53.3
Grid 2	33	50.0
Grid 3	31	40.3
Grid 4	25	35.7
Grid 5	23	31.9
Grid 6	39	48.1
Grid 7	32	44.4
Grid 8	29	37.7
Grid 9	21	37.5
Grid 10	31	45.6
Grid 11	38	51.4
Grid 12	26	44.8
Grid 13	28	37.3
Grid 14	26	44.1
Grid 3 Sub soil	38	40.4
Grid 8 Sub soil	27	24.3
Grid 12 Sub soil	33	28.4

Burgh le Marsh, Hall Lane Geophysical Survey - Results:

Within the survey area the results are generally consistent and fairly low. Additionally there is little difference between the magnetic susceptibility of the sub soil samples and the topsoil samples. Thus suggesting that the field is unlikely to produce a particularly clear magnetic survey.

Conclusions

It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area only that the techniques used have not detected it.

Some clear linear features were detected corresponding with features recorded in the excavated trench. Additionally a number of other features of possible archaeological significance were detected..

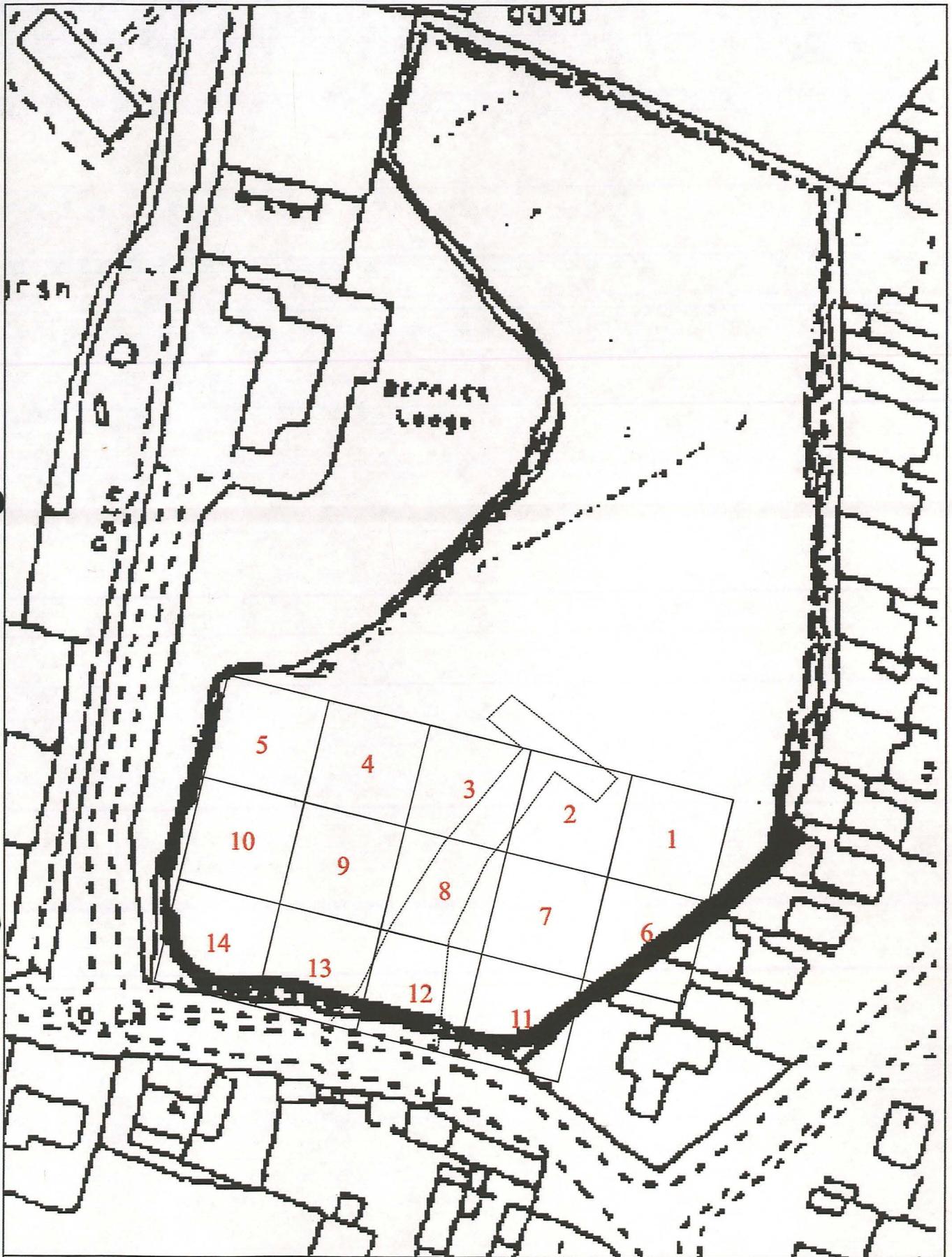
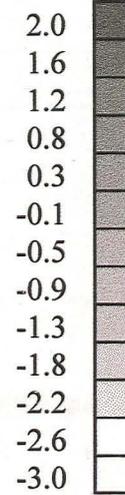
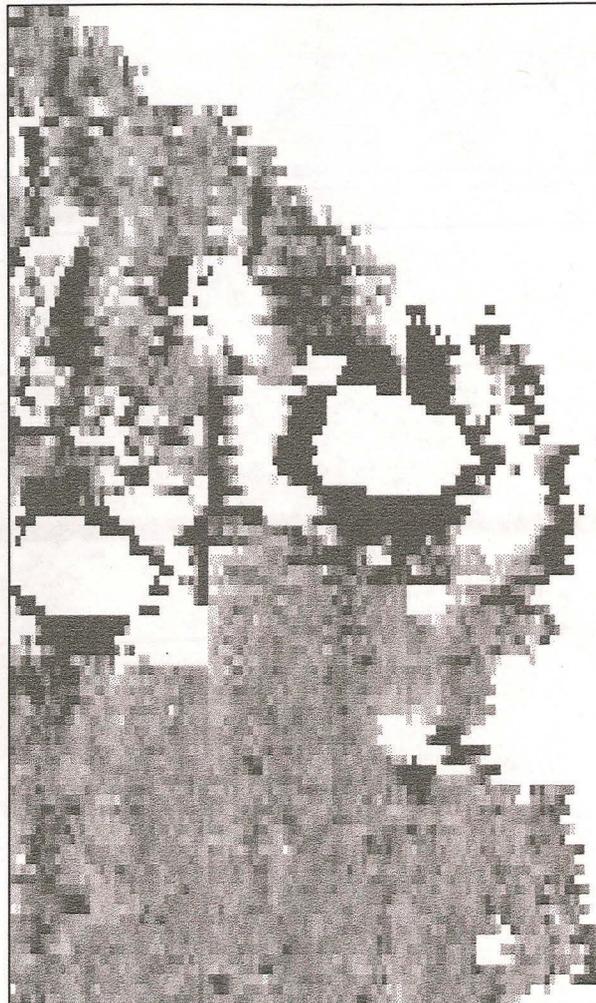


Figure 1: Burgh Le Marsh, Hall Lane:
 Location
 Scale 1:1000

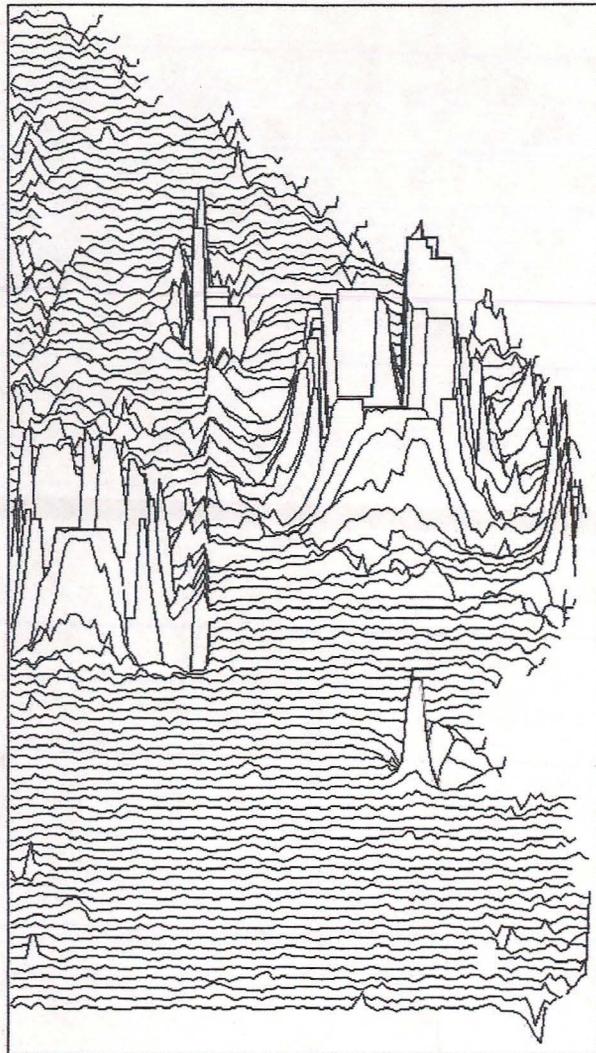
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Figure 2: Burgh Le Marsh, Hall Lane:
Grey Scale Plot. Scale 1:750



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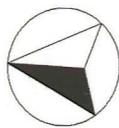


Figure 3: Burgh Le Marsh, Hall Lane:
X - Y Plot. Scale 1:750

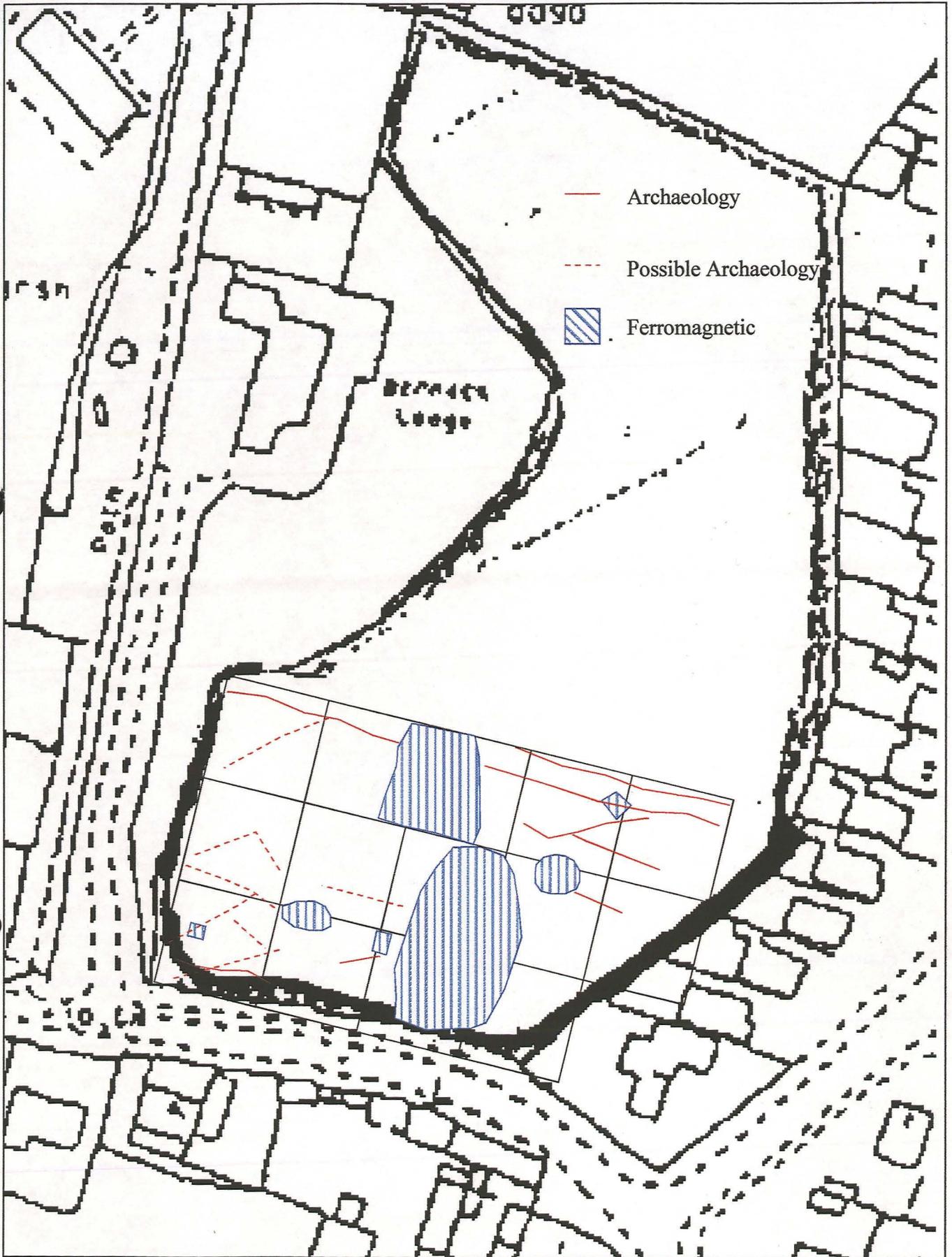


Figure 4: Burgh Le Marsh, Hall Lane:
 Interpretation
 Scale 1:1000

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Burgh le Marsh, Hall Lane Geophysical Survey - Technical Information:

Techniques of Geophysical Survey:

Magnetometry:

This relies on variations in soil magnetic susceptibility and magnetic remanence which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.

Resistivity:

This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.

Resistance Tomography

Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings

Magnetic Susceptibility:

Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.

Instrumentation:

- 1. Fluxgate Gradiometer - Geoscan FM36***
- 2. Resistance Meter - Geoscan RM4/DL10***
- 3. Magnetic Susceptibility Meter - Bartington MS2***
- 4. Geopulse Imager 25 - Campus***

Methodology:

For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is downloaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.

For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.

For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.

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Lincolnshire County Council
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