A Geophysical Survey of Land off Leicester Lane, Desford, Leicestershire (SK 481 033) Planning Application No. 98/00992/FUL

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For

Twigden Homes

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Report No. 99/30

1 Summary

Geophysical survey was carried out over c.3ha of land off Leicester Lane, Desford, Leicestershire. Several anomalies were detected including a possible large rubble surface, two ditches and a backfilled pond.

2 Introduction

2.1 University of Leicester Archaeological Services (ULAS) were commissioned by Twigden Homes to carry out a geophysical survey over land off Leicester Lane, Desford, Leicestershire (SK 481 033).

2.2 The site is proposed for the construction of residential housing and is situated close to a Grade II listed building within the historic core of Desford.

2.3 The survey was carried out between 4th-9th February 1999.

3 Site Description, Topography and Geology

3.1 The development area is situated directly to the south of Leicester Lane, Desford, approximately 11km west of Leicester in Hinckley and Bosworth District (figure 1). The site consists of an area of *c.*3.65ha of pasture, sloping down to the south-east at an elevation of 120-130m OD.

3.2 The Ordnance Survey Geological Survey of Great Britain Sheet 155 indicates that the underlying geology of the site consists largely of sands and gravels, and Mercia Mudstone.

4 Methodology

4.1 On the basis of common current practice and the results of previous research, it was decided that the most efficient method of survey for this site would be magnetic prospection. Research has shown that fired, or cut and backfilled archaeological features such as kilns and hearths, ditches and pits often have an anomalously higher *magnetic susceptibility* than the surrounding subsoil. Magnetic susceptibility (measured in nano-tesla, nT) is a measure of the magnetisation of the iron oxides within materials in the presence of the earth's magnetic field. Many types of stone, for example limestone and sandstone, have a lower magnetic susceptibility than the subsoil. These differences (positive and negative) in magnetic susceptibility can be detected as changing magnetic flux by an instrument such as a fluxgate gradiometer. Data from this is then mapped to produce an image which may be interpreted to locate buried archaeological features.

4.2 The detailed survey was carried out over an area totalling *c.*3ha (see figure 2), utilising a Geoscan Research FM18 fluxgate gradiometer with ST1 sample trigger. Prospection was carried out in grids of 20m x 20m in a zig-zag pattern along traverses

spaced at 1m intervals, recording data points every 1m x 0.5m (a total of 800 points in each grid) to a maximum instrument sensitivity of 0.1nT. At regular intervals, the data were downloaded to a notebook personal computer for storage and assessment.

4.3 Following the completion of the survey, processing and analysis took place using Geoscan Research's Geoplot v.2.01 software. A number of standard operations were carried out to process the data. The data was mathematically adjusted to account for periodic variations caused by the zig-zag surveying style. Isolated outlying values most likely caused by the detection of ferrous debris in the topsoil were cautiously removed from the data set. The grid of data was resampled from 1.0m x 0.5m to 0.5m x 0.5m by non-linear interpolation, improving the appearance of the final image. The data was analysed 'on-screen' using a variety of viewing parameters and styles. The most useful of these was captured from the screen and manipulated using Paint Shop Pro v.5 software (©JASC, Inc. 1998). A map of the survey area was constructed in TurboCAD v.4 (©IMSI 1997) digitised from a plan supplied by the client. The greyscale images of the survey results were then overlaid onto the digital map (figures 3). Finally an interpretative diagram was generalised from the results (figure 4).

5 Results

5.1 The results of the survey are shown in figure 3, with an interpretation in figure 4. The majority of the survey area proved magnetically 'quiet' except for weak traces of the ridge and furrow crossing the site, occasional ferrous debris 'spikes' in the data and magnetic 'noise' around the edges of the site due to fences, buildings etc.

5.2 Four main areas of magnetic anomalies were identified, marked **A-D** on figure 4.

5.3 A group of intense positive and negative magnetic anomalies were detected in the south-west of the site, marked **A** in figure 4. The diameter of the anomaly group was *c.*19m. Such magnetic anomalies are likely to indicate a confused debris deposit containing some stone, brick and iron. The position of these anomalies corresponds with that of a pond known from older Ordnance Survey maps (see Chapman 1999) and it is therefore likely that they reflect the backfilling of this former pond.

5.4 A large area of intense positive and negative magnetic anomalies was detected at **B** in the west of the site. This confused set of anomalies may reflect buried stone, brick and iron also pits and ditches and is interesting in that it has a very well defined edge. Although it is tempting to identify linearities in the data, the density of anomalies precludes any decisive interpretation. The area measures approximately 36m north-east – south-west and from the field boundary 45m south-east. A former plot boundary crosses the feature north-west – south-east. This boundary is visible as an interrupted bank and several trees and bushes, the line of which has been evident since at least 1760 (Chapman 1999). Therefore the buried feature is likely to be earlier than the boundary and is on a different orientation to the nearby house plots.

5.5 Directly to the west of **B** are a number of anomalies which are considered likely to reflect modern disturbance from rubble.

5.6 Two significant positive linear anomalies were detected near to Leicester Lane. These are marked **C** on figure 4. Anomalies of this type frequently reflect buried ditches although occasionally ceramic drains are the source of the magnetic enhancement.

5.7 A cluster of positive magnetic anomalies were detected towards the east of the southern field (**D**). The lack of a defined pattern and the intensity of the anomalies suggests that they may be debris of 'bricky' or ferrous origin.

6 Conclusions

6.1 A geophysical survey was carried out over land off Leicester Lane, Desford, Leicestershire. The majority of the site was magnetically quiet with significant anomalies located only in the north, west and south-east of the site. The most intriguing of the anomalies was a large confused area, possibly representing a rubble surface, with well defined edges oriented differently to nearby building plots, and evidently pre-dating a relict field boundary. Other anomalies reflect two possible ditches and a backfilled pond.

6.2 The lack of anomalies towards the centre of the site only reflects a paucity of magnetically enhanced features. Only a scheme of archaeological evaluation will be able to confirm this absence and identify the nature of the feature(s) at **B**.

7 Acknowledgements

The geophysical survey was undertaken by Adrian Butler with the assistance of Tim Higgins of ULAS. The project was managed by Dr Patrick Clay.

8 Sources Consulted

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Clark, A J 1990 *Seeing Beneath the Soil*, Batsford.

English Heritage 1995 *Research and Professional Services Guideline No 1, Geophysical Survey in Archaeological Field Evaluation.*

Gaffney, C, Gater, J and Ovendon, S, 1991 *The Use of Geophysical Techniques in Archaeological Evaluations,* Institute of Field Archaeologists Technical Paper Number 9.

Schollar, I *1990 Archaeological Prospecting and Remote Sensing (Topics in Remote Sensing 2),* Cambridge University Press.

Figures

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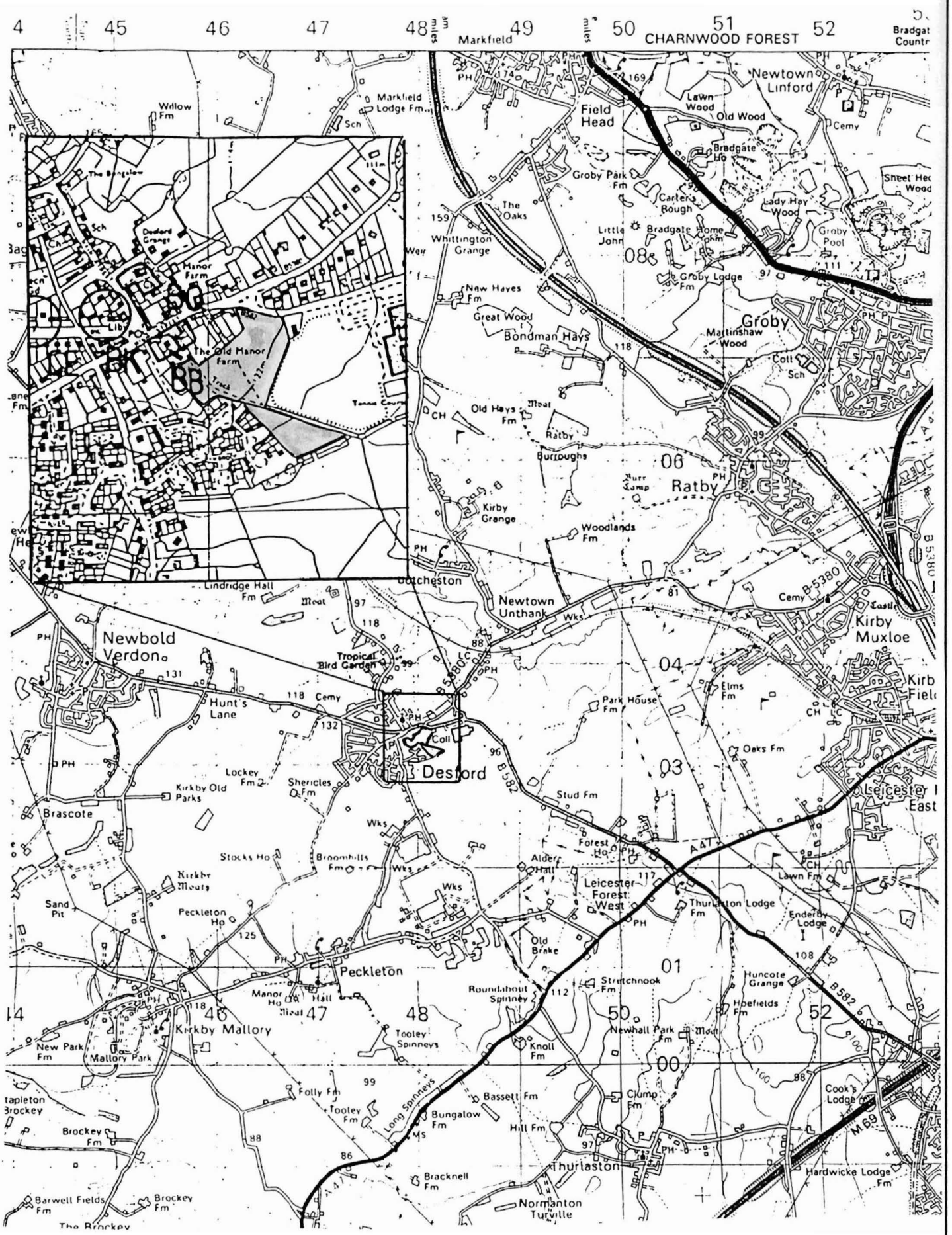

LEICESTER LANE,
DESFORD
FIGURE 1
SITE LOCATION

SCALE 1:50,000
(INSET 1:10,000)

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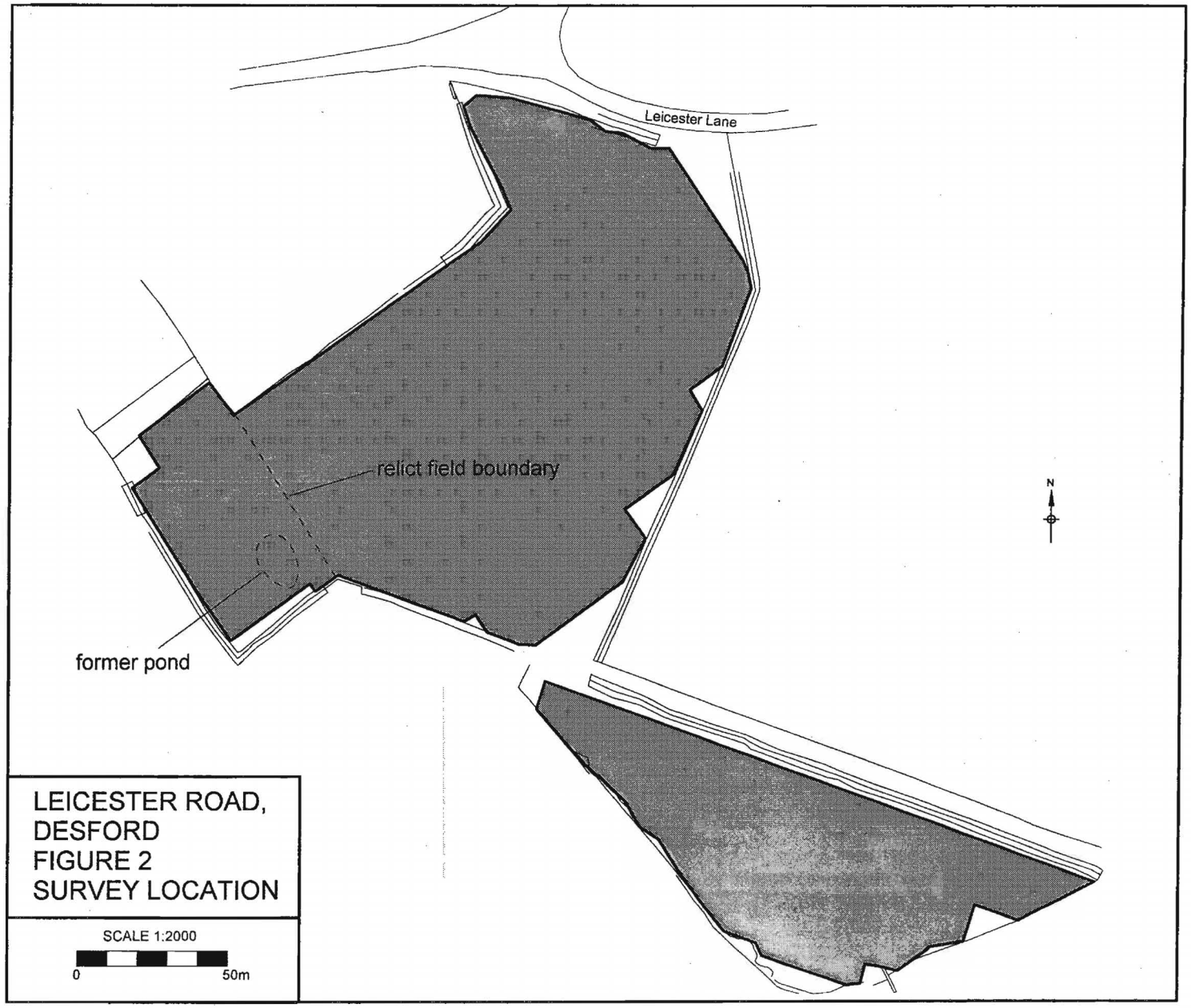
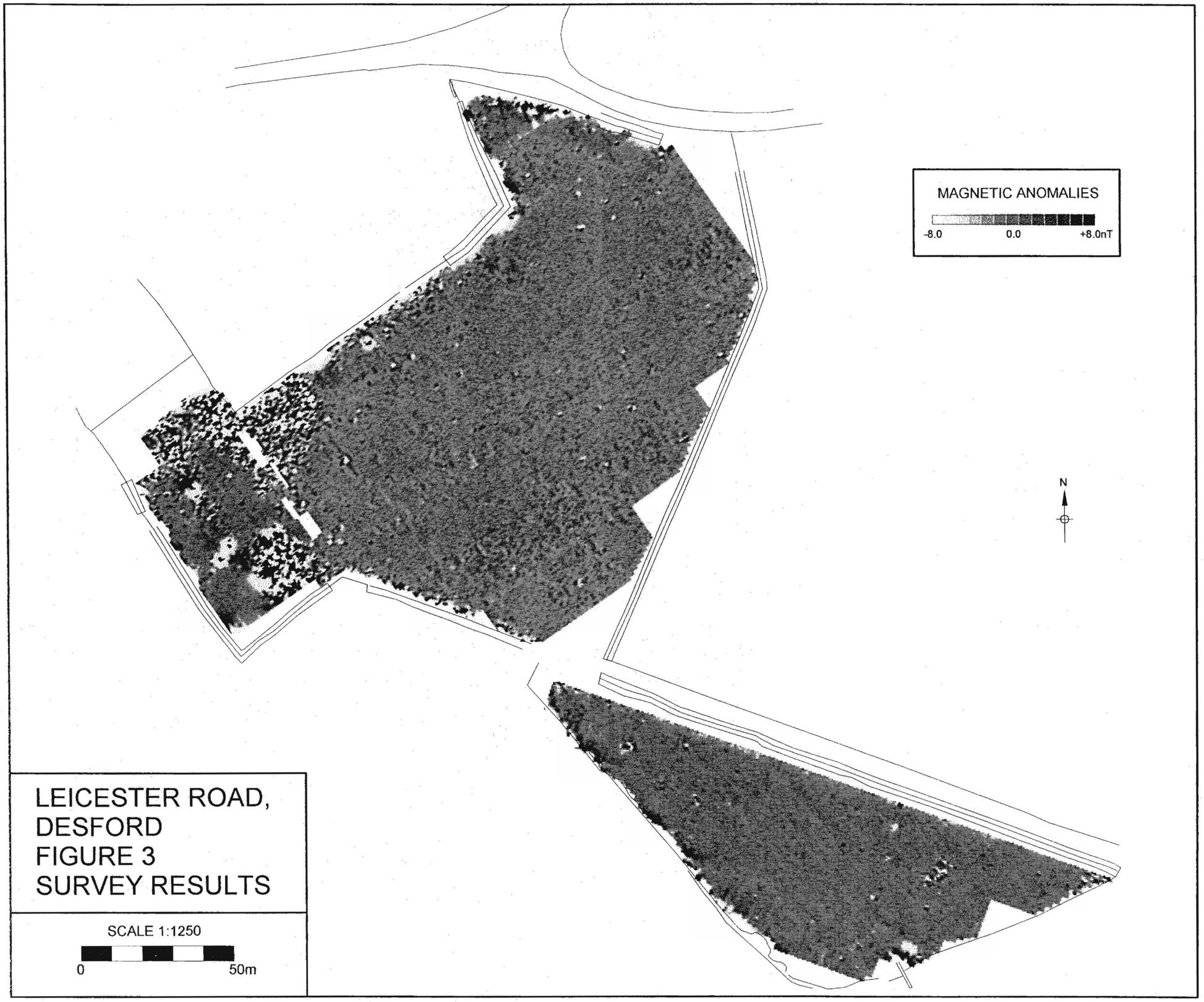
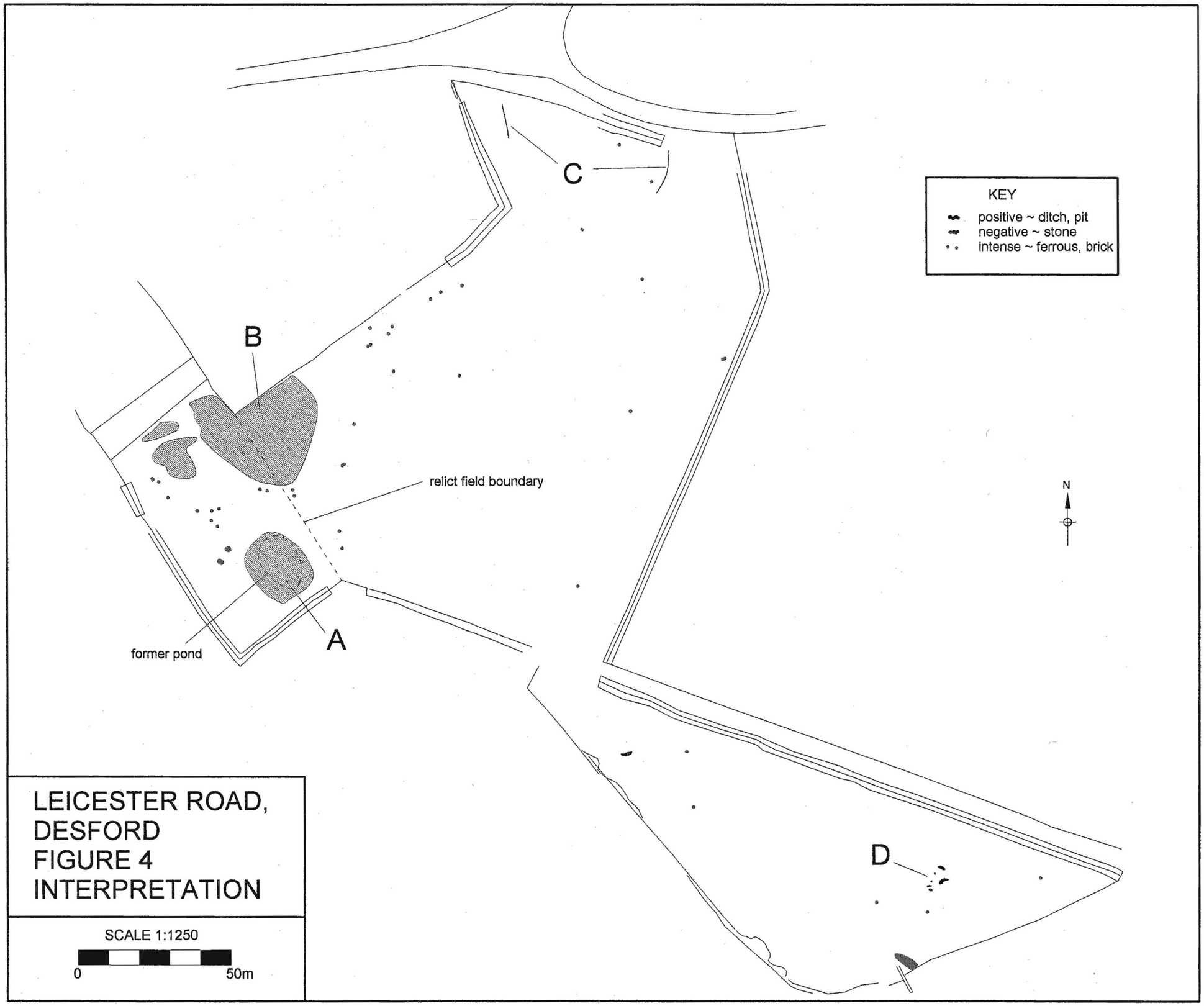

Leicester Lane
relict field boundary
former pond
N
LEICESTER ROAD,
DESFORD
FIGURE 2
SURVEY LOCATION
SCALE 1:2000
0
50m


MAGNETIC ANOMALIES
-8.0
0.0
+8.0nT
N
LEICESTER ROAD,
DESFORD
FIGURE 3
SURVEY RESULTS
SCALE 1:1250
0
50m


C
B
relict field boundary
former pond
A
D
KEY
positive ~ ditch, pit
negative ~ stone
intense ~ ferrous, brick
N
LEICESTER ROAD,
DESFORD
FIGURE 4
INTERPRETATION
SCALE 1:1250
0
50m