

**CADEBY QUARRY, LEICESTERSHIRE  
MANOR FARM EXTENSION**

**Archaeological Geophysical Survey  
2015**

**Report by:**

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**on behalf of:**

**Lafarge Tarmac**

**3 July 2015**

# CADEBY QUARRY, LEICESTERSHIRE MANOR FARM EXTENSION

## Geophysical Survey 2015

### Abstract

*This geophysical survey was undertaken as part of an archaeological evaluation of the site of a proposed extension to the existing Cadeby Quarry.*

*The survey has detected various subsurface features and disturbances including land drains and cultivation effects, but only a small number of findings of potential archaeological relevance. These include a previously unknown but probable large ring ditch, and magnetic anomalies which could indicate the presence of settlement remains within an area of previously recorded earthworks at the south-west of the site.*

### 1. Introduction

The survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by Archaeologica Ltd on behalf of Lafarge Tarmac. Fieldwork for the survey was done between 27 May and 2 June 2015. A data plot showing the survey findings has previously been supplied to the client, and is now included for the record in this report.

### 2. Topography and Geology

The proposed extension area extends across eight fields (as numbered 1-8 for reference on the enclosed plans). Fields 1-5 are in arable use, and 6-8 are pasture. The site is located to the south of Newbold Verdon, and 2km north-east of Cadeby village. It is centred at NGR SK 442 029. The evaluation area (as indicated by a red outline in the plans) amounts to 18.4ha. A proposed conveyor route extending to the south was excluded from the survey coverage.

The topography is undulating at elevations between 120-128m AOD. The ground slopes more steeply down to the south and west in fields 6-8 at the south of the site. The underlying geology consists of glacial sand and gravels overlying Mercia Mudstone. These conditions should not present any unusual difficulties for a magnetometer survey. Soils on mudstone bedrock are not always strongly responsive to a magnetometer survey, but gravel soils usually produce satisfactory results. Previous surveys in other parts of the Cadeby Quarry site have produced positive archaeological findings.

### 3. Archaeological Background

Results from the magnetometer surveys which have been undertaken in areas to the

south-west and east of the present survey were reviewed in a report by University of Leicester Archaeological services in 2005 [1]. The findings included areas of ridge and furrow cultivation, but also some well-defined potential archaeological remains in fields about 1km to the south-west of the present survey near Cadeby village. The findings here indicated a settlement or farmstead of probably Iron Age date surrounded by enclosures or paddocks.

#### 4. Survey Objectives

The usual purpose in undertaking an archaeological geophysical survey is to test for evidence of archaeological sites or remains, and to provide information which may inform further stages of the archaeological evaluation.

A geophysical survey is usually able to identify the extent and character of any archaeological remains capable of producing a magnetic response. The magnetometer will detect cut features such as ditches and pits when they are silted with an increased depth of topsoil, which usually responds more strongly than the underlying natural subsoil. Fired materials, including baked clay structures such as kilns or hearths are also likely to produce a localised enhancement of the magnetic field strength, and the survey therefore responds preferentially to the presence of ancient settlement or industrial remains. The survey is also strongly affected by ferrous and other debris of recent origin.

#### 5. Survey Procedure

The site was investigated by means of a recorded magnetometer survey. Readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect. The survey data is shown at 1:2000 scale as a grey scale plot (figure 2), and as a graphical (x-y trace) plot at 1:1250 (figures 4-6). Comparison of these alternative presentations allows the detected magnetic anomalies to be examined in plan and profile respectively. An interpretation of the findings is also shown superimposed on figures 4-6 (which permits the interpreted outlines to be compared with the underlying data). A further interpreted summary of findings is presented in figure 7.

The graphical plots in figures 4-6 show the magnetometer readings after minimal pre-processing [of the kind permitted by English Heritage (2008) *Geophysical Survey in Archaeological Field Evaluation* Section 4.8]. This includes adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and truncation of extreme values. Additional weak 2D low pass filtering has been applied to the grey scale plot to adjust background noise levels.

Colour coding has been used in the interpretation to distinguish different effects. The interpretation is intended to categorize most of the identifiable magnetic anomalies, but cannot reproduce the detail of the grey scale plots.

Magnetic anomalies which may show characteristics to be expected from features of potential archaeological interest are outlined in red. Background magnetic anomalies which may be of natural or non-archaeological origin are indicated in light brown. Stronger (and perhaps recent) disturbances are in grey. A possible pipe is indicated in blue, and probable land drains in blue/purple. Some of the more conspicuous ferrous

objects (identifiable as narrow spikes in the graphical plots) are marked in light blue.

### *Survey location*

The survey grid was set out and tied to the OS grid using a Trimble ProXRT GPS system (with VRS differential correction). The plans are therefore geo-referenced, and OS coordinates of map locations can be read from the AutoCAD version of the plans, which can be supplied with this report.

## **6. Results**

The most relevant survey findings are from the southern end of the site in fields 4, 6 and 8.

An earthwork plan (supplied to us by Archaeologica, and based on a survey done in 1968) is shown inset in figure 5. Earthwork platforms (as marked at the east of field 6) often do not respond well to a survey because raised banks are usually less detectable than infilled ditches (which contain a greater depth of detectable fill), but there appear to be some pit-like features within the earthworks. These are outlined in red and labelled (A) in figure 5. These probably represent traces of settlement remains within the earthwork platforms. Only a few other very minor and isolated pit-like features are visible elsewhere in the survey, and so it is unlikely that any other concentrations of settlement features are present in the remainder of the evaluation area.

Other findings in field 6 include dense clusters of magnetic disturbances of probably modern origin (at B and C). Similar disturbances were noted in previous nearby surveys [1], and were described as dumps or spreads of material such as brick of probably modern origin. The disturbances at B overlap with, but are located slightly to the north of a rectilinear hollow shown on the earthwork plan. The magnetic anomalies therefore appear to represent material deposited alongside rather than within the hollow.

The other most substantial finding is a circular magnetic anomaly visible in the grey scale plot, and marked in red in the interpretation at D in field 4. This could be an isolated and quite large (30m diameter) ring ditch. It is located on a level area of raised ground in the centre of the field.

Ridge and furrow has been detected in field 8 to the south of the survey (E), but not in field 7 immediately to the north (where it is indicated on the earthwork plan). Other cultivation markings as indicated in the interpretation (as in field 2) are weak and probably relate to modern ploughing. The remaining findings include a further cluster of strong recent disturbances at F in field 3. These could represent an infilled pit or pond. A nearby linear sequence of magnetic anomalies is likely to indicate a land drain. Strong magnetic disturbances (blue) at the west of field 1 could indicate an adjacent pipe, or perhaps a wire fence next to the water treatment works.

## **7. Conclusions**

It is usually the case that silted ditches or pits will respond more clearly to a survey than traces of raised earthworks or embankments. The survey has therefore detected the probable ring ditch (D) in field 4, but has not responded directly to the earthworks in field

6. It has identified probable settlement features (A) within the earthwork platforms at the east of field 6. No other concentrations of comparable features are visible elsewhere in the survey, where findings are limited to cultivation effects and recent disturbances.

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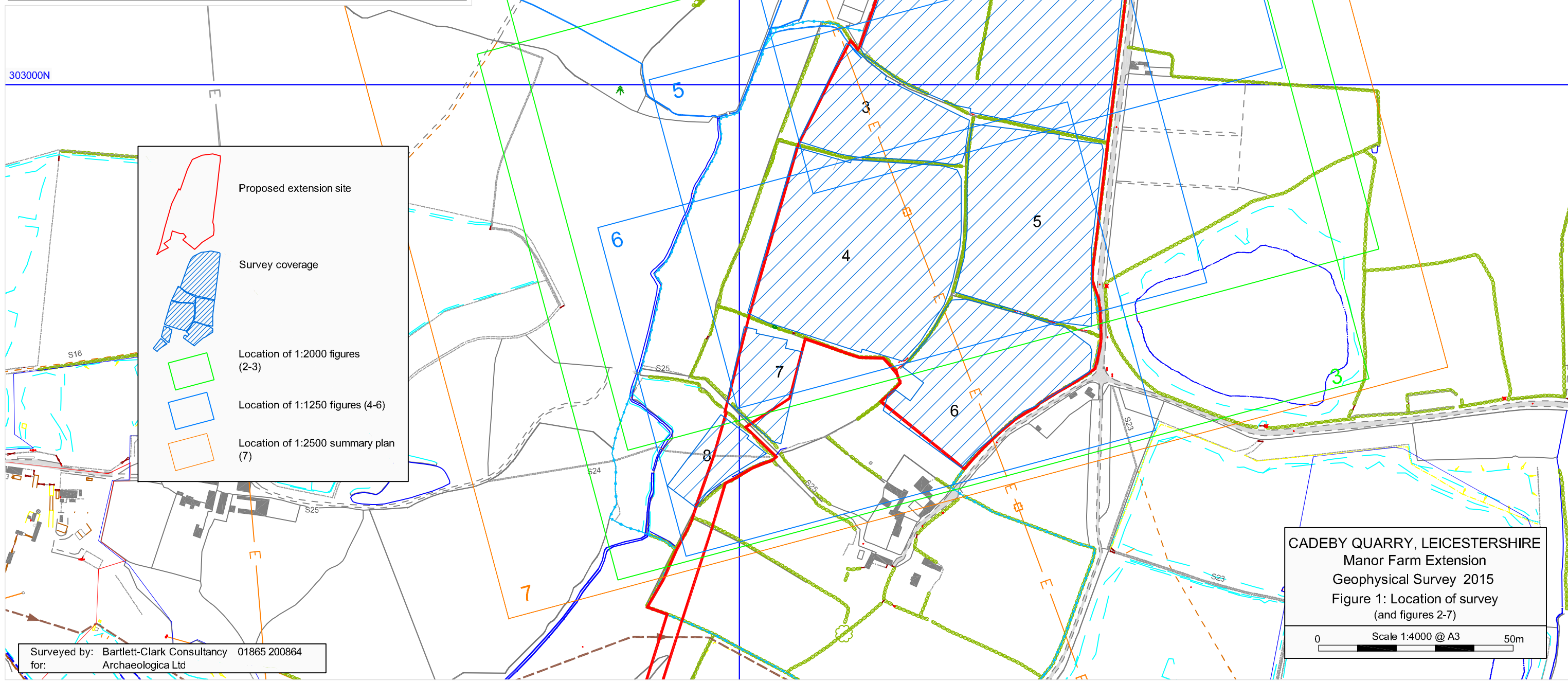
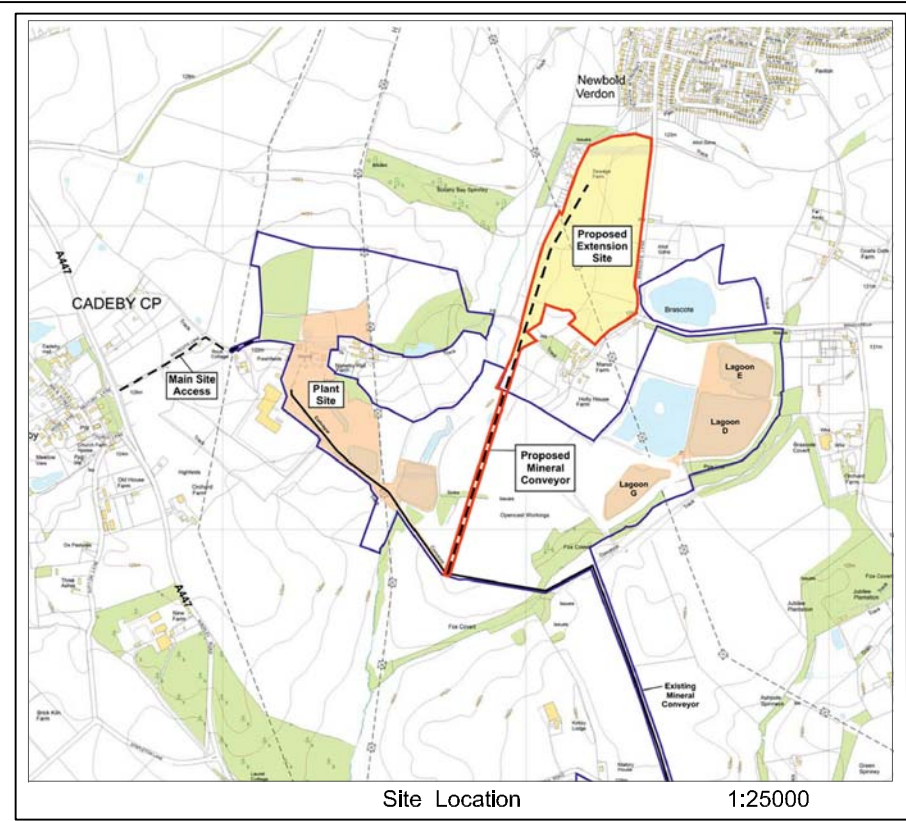
3 July 2015


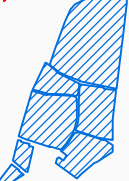



The fieldwork for this project was done by R. Organ and C. Matthews.

**Reference**

- [1] *Archaeological Desk-based Assessment for Cadeby Quarry, Leicestershire.* Report by James Meek, University of Leicester Archaeological Services for Tarmac Limited. Report No. 2005/040; 2005.

Background mapping reproduced from site plan supplied by Lafarge Tarmac



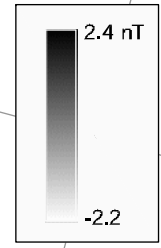
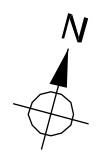
-  Proposed extension site
-  Survey coverage
-  Location of 1:2000 figures (2-3)
-  Location of 1:1250 figures (4-6)
-  Location of 1:2500 summary plan (7)

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 Geophysical Survey 2015  
 Figure 1: Location of survey  
 (and figures 2-7)

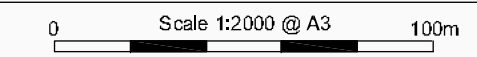
0 Scale 1:4000 @ A3 50m

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 for: Archaeologica Ltd

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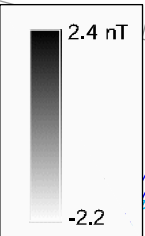
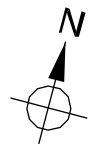


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Figure 2: Magnetometer survey  
(grey scale plot)

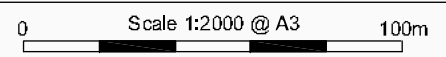


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Figure 3: Magnetometer survey  
(grey scale plot)

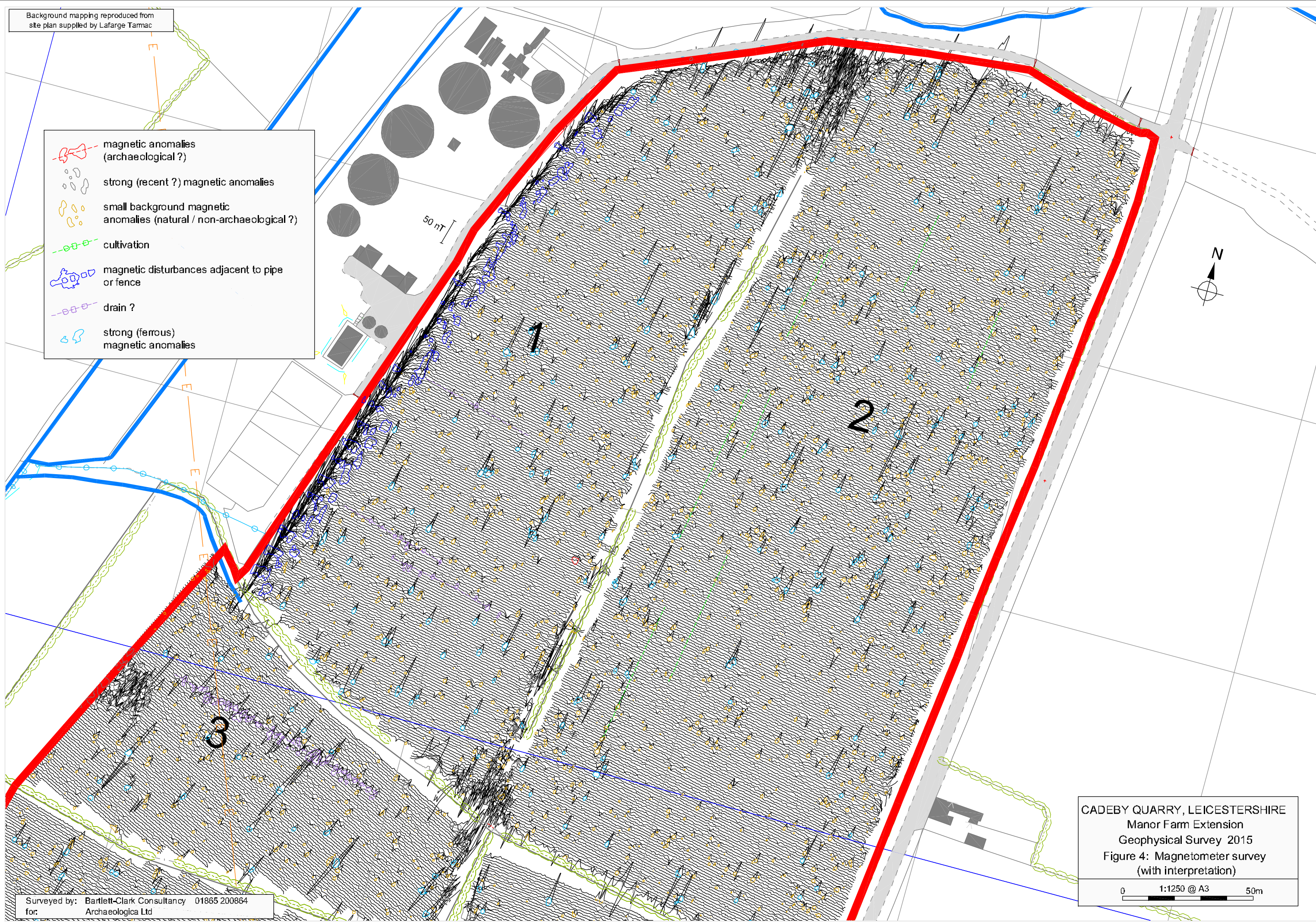


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-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic anomalies
-  small background magnetic anomalies (natural / non-archaeological ?)
-  cultivation
-  magnetic disturbances adjacent to pipe or fence
-  drain ?
-  strong (ferrous) magnetic anomalies



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Figure 4: Magnetometer survey  
(with interpretation)








0 1:1250 @ A3 50m

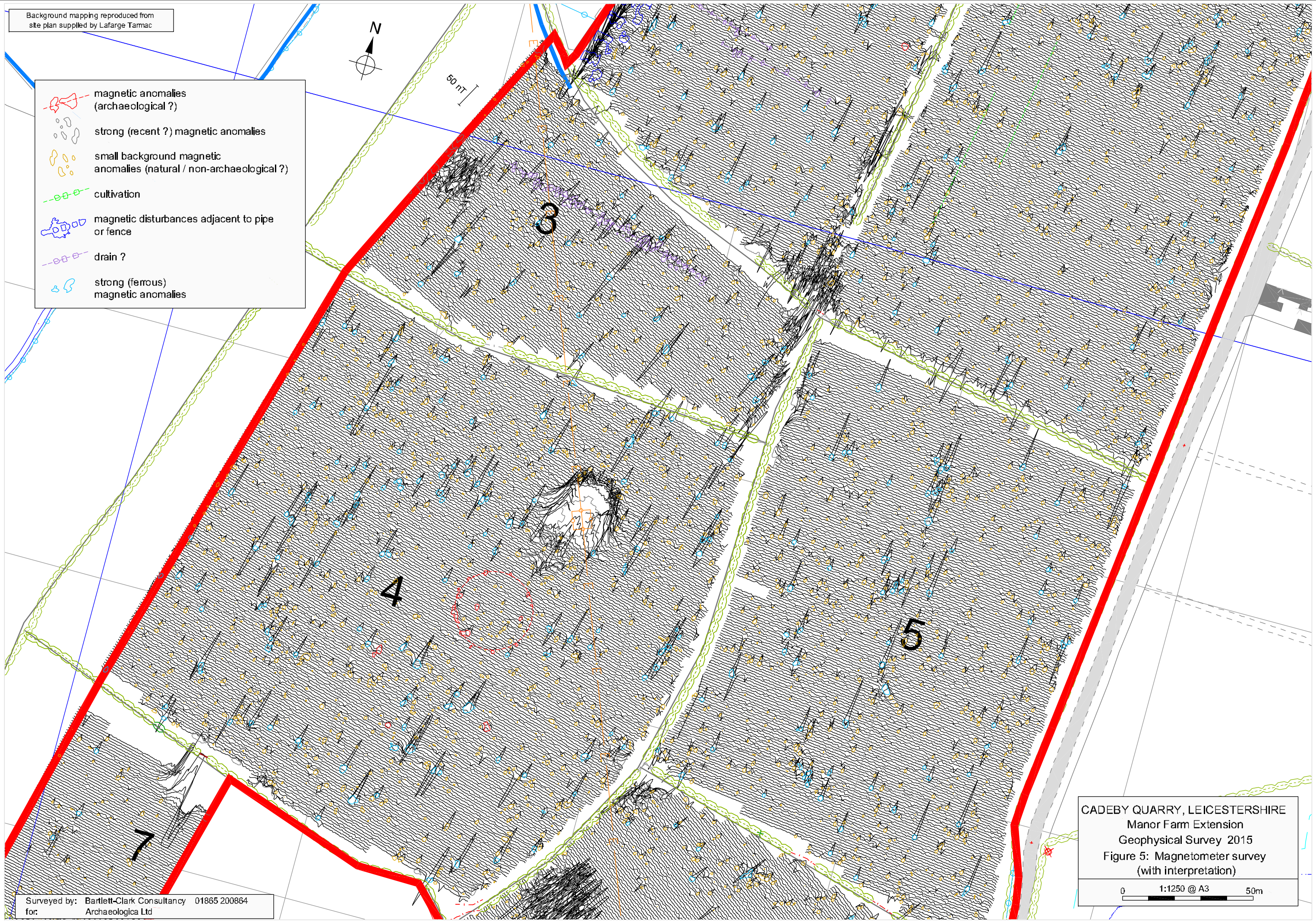
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Background mapping reproduced from site plan supplied by Lafarge Tarmac



50 m

-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic anomalies
-  small background magnetic anomalies (natural / non-archaeological ?)
-  cultivation
-  magnetic disturbances adjacent to pipe or fence
-  drain ?
-  strong (ferrous) magnetic anomalies

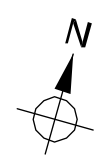


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Figure 5: Magnetometer survey  
(with interpretation)

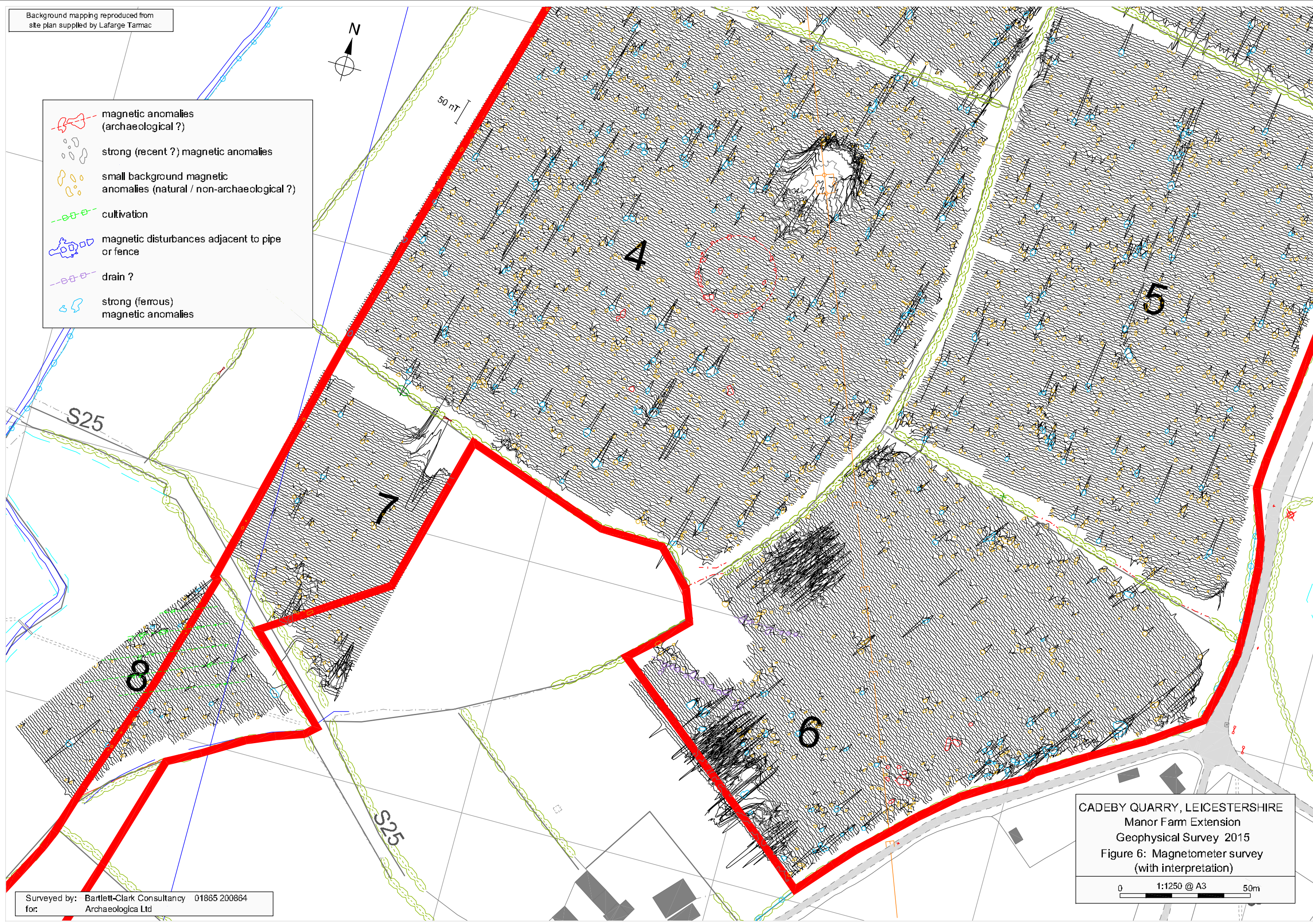
0 1:1250 @ A3 50m

Background mapping reproduced from site plan supplied by Lafarge Tarmac



50 nT

-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic anomalies
-  small background magnetic anomalies (natural / non-archaeological ?)
-  cultivation
-  magnetic disturbances adjacent to pipe or fence
-  drain ?
-  strong (ferrous) magnetic anomalies



S25

8

7

4

5

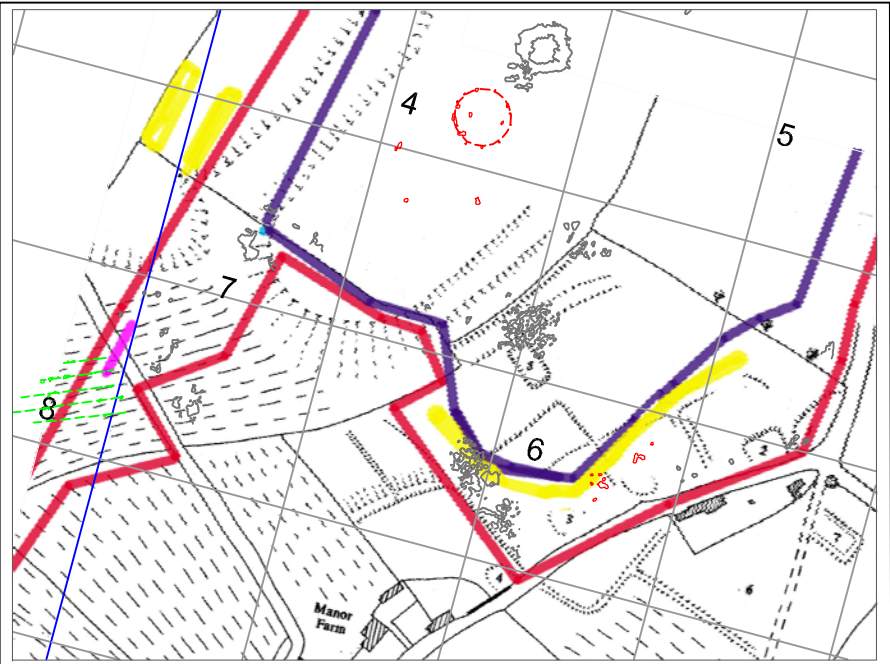
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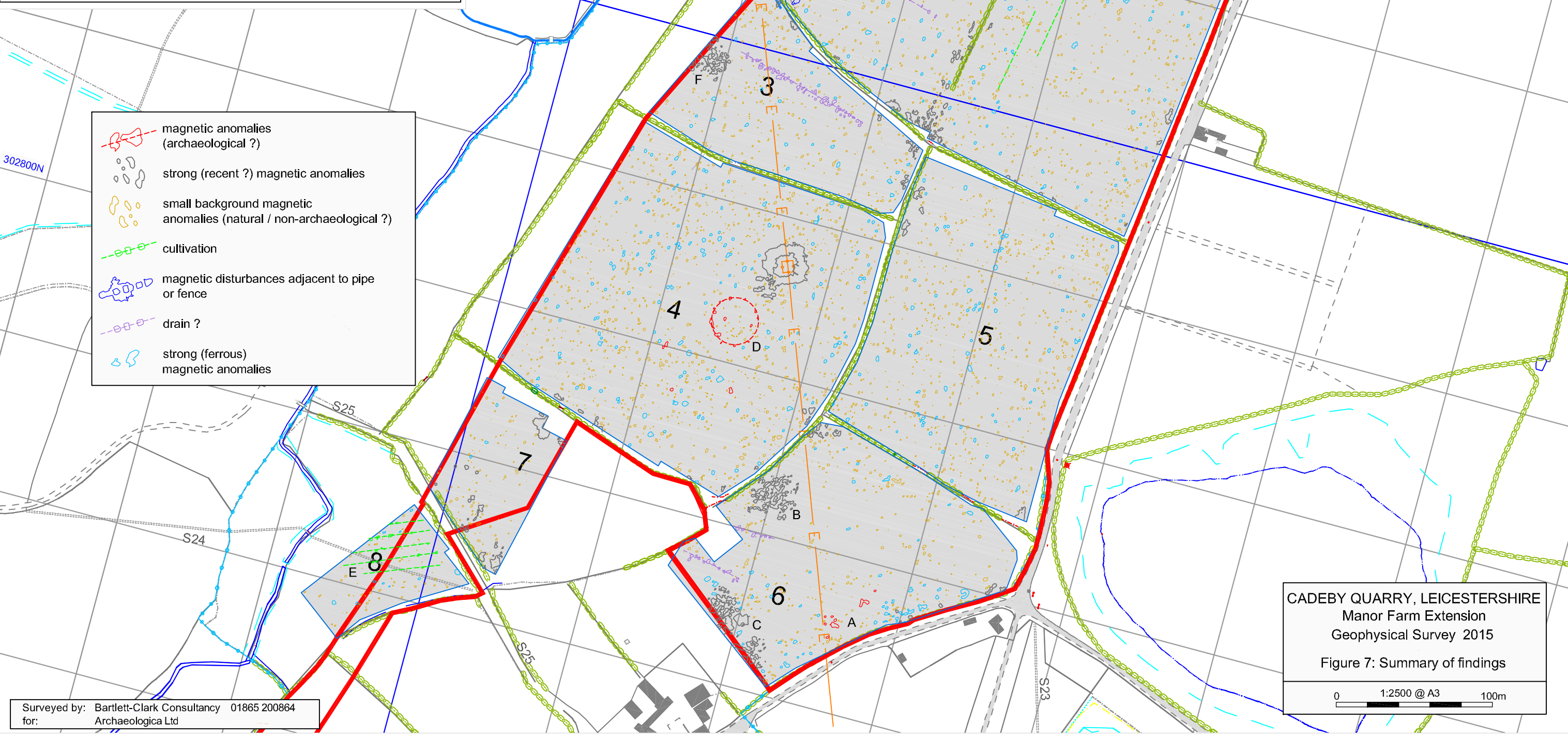
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Figure 6: Magnetometer survey  
(with interpretation)








0 1:1250 @ A3 50m

Background mapping reproduced from site plan supplied by Lafarge Tarmac

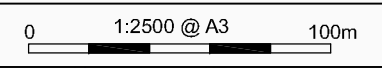


Earthwork plan (with selected magnetic anomalies) 1:4000



-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic anomalies
-  small background magnetic anomalies (natural / non-archaeological ?)
-  cultivation
-  magnetic disturbances adjacent to pipe or fence
-  drain ?
-  strong (ferrous) magnetic anomalies

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Figure 7: Summary of findings



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