MS/11

# Witham Archaeology

A Report To Mr John Woodward Architect on behalf of
Mareham le Fen Community Centre Project Management Committee

December 2005

## PROPOSED COMMUNITY CENTRE, GLEBE FIELD, MAREHAM LE FEN, LINCOLNSHIRE

### Geophysical Survey

*R Trimble (with survey report by Geoquest Associates)*

WA Report No.: 6 ♦ Site Code: GFM05 ♦ Museum Accession No.: 2005.236

acknowledged receipt 22/12/05
jao

# PROPOSED COMMUNITY CENTRE, GLEBE FIELD, MAREHAM LE FEN, LINCOLNSHIRE.

Site Code: GFM05
LCCM Accession No.: 2005.236
Planning Application No.: S114/00864/04
NGR: TF 27880 61180

## *Geophysical Survey*

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**APPENDICES**



Cover Photograph: View including St Helen's Church, taken from the southeast corner of Glebe Field

# PROPOSED COMMUNITY CENTRE, GLEBE FIELD, MAREHAM LE FEN, LINCOLNSHIRE

## GEOPHYSICAL SURVEY


### *SUMMARY*

*This report describes the results of a Geophysical Survey carried by Geoquest Associates for Witham Archaeology on the site of the proposed new community centre at Glebe Field, Mareham le Fen, Lincolnshire. The work was commissioned John Woodward, Architect, on behalf of Mareham le Fen Community Centre Project Management Committee.*

*Glebe Field site lies at the core of the village, immediately south of the medieval church of St Helen. Previous archaeological work, on sites to the west and east of the study area, has resulted in the discovery of evidence relating to the early development of the village, while medieval tile and pottery production in the Mareham le Fen area is attested by the discovery of a roof-tile kiln immediately southwest of the village and c. 450m from Glebe Field. Pottery and tile wasters from more recent excavations in the eastern part of the village provide further evidence of this industry.*

*Anomalies of potential archaeological origin noted by the geophysical survey include a series of north-south linears interpreted as probably forming part of a ridge and furrow field system, possible silted ditches, ferrous litter (possibly attributable to slag or burning), possible ditches, and a set of potential features interpreted as wall footings or drains.*


### *1.0 INTRODUCTION*

This report describes the results of a Geophysical Survey carried out by Geoquest Associates for Witham Archaeology on the site of the proposed new community centre at Glebe Field, Mareham le Fen, Lincolnshire. The work was commissioned John Woodward, Architect on behalf of Mareham le Fen Community Centre Project Management Committee.

Outline Planning permission has been granted, by East Lindsey District Council, for a community hall and associated outdoor leisure, recreation and car parking facilities. The geophysical survey represents an initial stage of appraisal required under an Archaeological Scheme of Works outlined in a brief (dated 15 December 2004) prepared by Dr Beryl Lott, Conservation Services, Lincolnshire County Council. If necessary, the survey will be followed by a programme of intrusive trial trench evaluation.

The information in this document is presented with the proviso that further data may yet emerge. Witham Archaeology cannot, therefore, be held responsible for any loss, delay or damage, material or otherwise, arising out of this report. The document has been prepared in accordance with the Code of Conduct of the Institute of Field Archaeologists.

### *2.0 SITE LOCATION, TOPOGRAPHY & GEOLOGY*

The village of Mareham le Fen lies *c.* 10 km south of Horncastle, in the administrative district of East Lindsey (TF 27880 61180). The site, located in the core of Mareham le Fen, immediately south of St Helen's parish church comprises an approximately rectangular plot of land (Glebe Field) covering an area of approximately 0.8ha. The area, currently undeveloped and grass-covered, includes a pond situated to the southwest.

The study area is located on the southern periphery of the Lincolnshire Wolds, just below the 10m contour on drift geology of river and glaciofluvial sheet deposits (undivided), sand and gravel

(Geological Survey of Great Britain, Horncastle, Solid and Drift, Sheet 115). The ground is generally level with no immediately obvious evidence of earthworks.

## *3.0 ARCHAEOLOGICAL & HISTORICAL BACKGROUND*

*Prehistoric*
Prehistoric finds from Mareham le Fen and its immediate environs include a Bronze Age axe (HER No. 40754) found *c.* 450m to the northeast of Glebe Field. A ditch containing two Early Neolithic to Bronze Age flint flakes (HER No. 44521), and a group of undated gullies possibly belonging to the same phase of activity, was found during an evaluation further to the east of the village (Mould 1998). A flint blade, together with two flint flakes (HER No. 46345) dated early Neolithic to late Bronze Age, was found during recent archaeological investigations to the south of the previously mentioned site (Hall 2005).

*Romano-British*
There is little evidence for Romano-British activity in the immediate locality. However, a single sherd of probably residual pottery (HER No. 46344) was found during investigations at Fieldside (Hall 2005).

*Anglo-Saxon/Scandinavian*
A sherd of early Anglo-Saxon pottery (HER No. 43711) was found to the west of Glebe Field, during an evaluation off Watery Lane (Williams 1997). A late Saxon cross shaft is contained in the chancel of St Helen's church (HER No. 42967)

*Medieval (archaeological sites listed under HER No. 43632)*
Mareham le Fen is recorded as 'Marun' in the Domesday book of 1086. The place-name appears to derive from the dative plural *maerum* of the Old English *maer(e)*. The change to 'ham' and the affix le Fen are not noted before the 17th century (Cameron 1998).

The Domesday Book of 1068 records the king as owning 3 carucates of land in Mareham le Fen. Domesday Book also records 21 sokemen and 11 bordars with 4 teams, as well as 60 acres of meadow and 300 acres of underwood. A church and priest are mentioned, along with a market and fair.

The church of St Helen lies immediately north of the site. The lower part of the tower is late 13th century with Perpendicular (c. 1335/50 to 1530) above. The remainder of the church is mostly Decorated (c. 1290 to 1350) with Perpendicular elements. The church was heavily restored by Fowler in 1872-3 (Pevser, Harris & Antram 1989). A stone cross (Scheduled Ancient Monument No. 22674) with medieval base and shaft is situated in the churchyard.

In 1997, an evaluation by Lindsey Archaeological Services, on land off Watery Lane (Williams 1997), *c.* 100m west of the western boundary of Glebe Field, revealed a number of domestic rubbish pits of medieval date. There was, however, no evidence of associated buildings. These may have been located in closer proximity to the street frontage. A series of linear features were interpreted as probable field boundaries. Pottery dating suggested that this part of the village developed in the early medieval period.

Another evaluation, to the north of the above site, and *c.* 75m west of Glebe Field, at Church Lane (Preconstruct Archaeology 1998), produced further evidence of medieval occupation, in the form of five intercutting pits. These features, interpreted as refuse pits, were dated by associated pottery to the 13th / 14th century. No evidence of structural remains was found on the street frontage, and it was surmised that any buildings probably lay further to the east. The presence of rubbish pits was taken to indicate proximity to a sizeable nucleus of settlement, possibly located beneath existing buildings.

A watching brief by the City of Lincoln Archaeology Unit, on Church Lane (Wragg 2000), located a series of possible floor layers indicative of occupation. Associated pottery allowed the tentative

identification of two structural phases, dated as 13th to 15th century and late 15th to 16th century respectively. Rubbish pits provided further evidence of domestic occupation.

A number of archaeological investigations, have taken place in the village, east of Glebe Field. A geophysical survey (Geoquest Associates 1998) revealed anomalies including a possible double-ditched, east-west trackway flanked by small enclosures or yards, and a small, rectangular ditched enclosure. The survey also mapped the remnants of a possible ridge and furrow field system. Subsequent trial trenching (Mould 1998) produced no evidence of ridge and furrow, but succeeded in locating chalk surfaces interpreted as late medieval yards or floors. Pottery and tile wasters indicated a local industry continuing into the post medieval period. Two 14th to 16th century ditches were interpreted as field boundaries, and small assemblage of medieval potsherds from the northern part of the site were taken to indicate the presence of an open space during the 13th and 14th centuries.

More recent investigations, to the south of the above site, and closer to Main Street (Hall 2005), have revealed pits, postholes, ditches and finds relating to settlement from the 11th to 19th century. However, activity appears to have peaked in the mid 13th to mid 14th /15th century. Three separate plots were identified, apparently defined by boundary/drainage ditches. Structural evidence was limited to possible fencing, a possible timber workshop, and areas of metalling, leading to the conclusion that buildings probably fronted onto Main Street, further to the south. Tile from the site provides yet more indication of local production.

Firm evidence of roof-tile production, in the form of a kiln (HER 40749), was recorded during an excavation in 1966. The kiln, which was situated to the southwest of the modern village and *c.* 450m southwest of Glebe Field, was dated to c. AD 1300 to 1350. A nearby waster dump is also recorded (HER No 40750).

A moated site, to the west of the village at Moat Farm (HER No. 40751), has produced pottery of 16th to 18th century date. An earlier origin may be speculated for the monument.

The likely site of the medieval manor house (HER 43515) lies to the northeast of the village, approximately 500m from Glebe Field. A nearby ornamental moat (HER 40758) has been suggested as an early moated site but might be interpreted as a late 18th/ early 19th century garden feature.

The remains of ridge and furrow field systems (HER Nos. 44776 – 44781) have been identified on aerial photographs, occurring in areas to the north, east and southwest of the village.

*Post Medieval*
The village is notable for the survival of a number of mud-and-stud buildings dating to the *c.* 17th century (Pevsner et al 1989). The Royal Oak, which is situated on the main road, is a good example of this tradition. The existing manor house, located to the northeast of the village, is 19th century.

A disused windmill (HER No. 40777), built in *c.* 1820 lies to the east of the village.

## *4.0 AIMS & OBJECTIVES*

The principal aims and objectives of the project, as set out in a Witham Archaeology specification of 10th October 2005 were to:

- To identify any magnetic anomalies indicative of underlying archaeological remains and to assess the archaeological significance of such remains.
- Produce a project archive for deposition with the appropriate museum and from which the potential for further study and academic research could be assessed.
- Provide information for accession to the County Historic Environment Record (HER).

## *5.0 METHODOLOGY*

The geophysical survey was carried out by Geoquest Associates (for survey methodology see report, Appendix I). Research for background information was limited to a search of HER records by Witham Archaeology, with additional information obtained from readily available secondary sources.

## *6.0 RESULTS & CONCLUSION*

Although there is no record of previous archaeological work within the boundaries of Glebe Field, the position of the site, at the core of the village and in close proximity to the church St Helen, indicates a potential for late Saxon and medieval remains. Evidence relating to the early development of the village has been found during a series archaeological investigations carried out on land to the west of Glebe Field. Evidence relating to medieval occupation has also been found during excavations in the village, to the east, with tile and pottery wasters suggesting the presence of a local industry. The medieval roof-tile kiln excavated in 1966, on land *c.* 450m southwest of Glebe Field, provides more concrete evidence of this industry.

The geophysical survey by Geoquest Associates revealed a number of geophysical anomalies indicative of possible archaeological activity, include areas of ferrous litter (possibly indicative of burning or slag), possible ditches and features interpreted as wall footings or drains, and probable remnants of a ridge and furrow field system (see attached report, Appendix I, for full details).

## *7.0 ACKNOWLEDGEMENTS*

The author of this report would like to thank Mr John Woodward, Architect, for his assistance in ensuring that the survey was successfully carried out, and Professor Mark Noel of Geoquest Associates, for his promptness in providing the survey and report. Thanks are also due to staff at the Historic Environment Records Office, Lincolnshire County Council, for assistance in locating relevant information.

## *8.0 BIBLIOGRAPHY*

Cameron, K & Insley, J 1998 *A Dictionary of Lincolnshire Place-Names*. English Place-Name Society

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Mould, C 1998 *Land off Field Side, Mareham le Fen*. Birmingham University Field Archaeology Report

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Williams, M 1997 *Archaeological Evaluation on Land off Watery Lane, Mareham le Fen*. Lindsey Archaeological Services Report **270**

Williams, M 2000 *Land off Watery Lane, Mareham le Fen.* Lindsey Archaeological Services Report No. **482**

Wragg, K 2000 *Development at Church Lane, Mareham le Fen.* City of Lincoln Archaeological Unit Report No. **419**

## *9.0 PROJECT/ ARCHIVE DETAILS*

### 9.1 LHA NOTE DETAILS

WITHAM ARCHAEOLOGY CODE: GFM05

PLANNING APPLICATION No.: S114/00864/04

FIELD OFFICER: R Trimble (Survey by Geoquest Associates)

NGR: TF 27880 61180

CIVIL PARISH: Mareham le Fen

SMR No.:

DATE OF INTERVENTION: 25 November 2005

TYPE OF INTERVENTION: Geophysical Survey

UNDERTAKEN FOR: Mr John Woodward, Architect, on behalf of Mareham le Fen Community Centre Project Committee

### 9.2 ARCHIVE DETAILS

PRESENT LOCATION: Witham Archaeology, 65 Grantham Road, Sleaford, Lincolnshire, NG34 7NG

FINAL LOCATION:The City and County Museum, Friars Lane, Lincoln

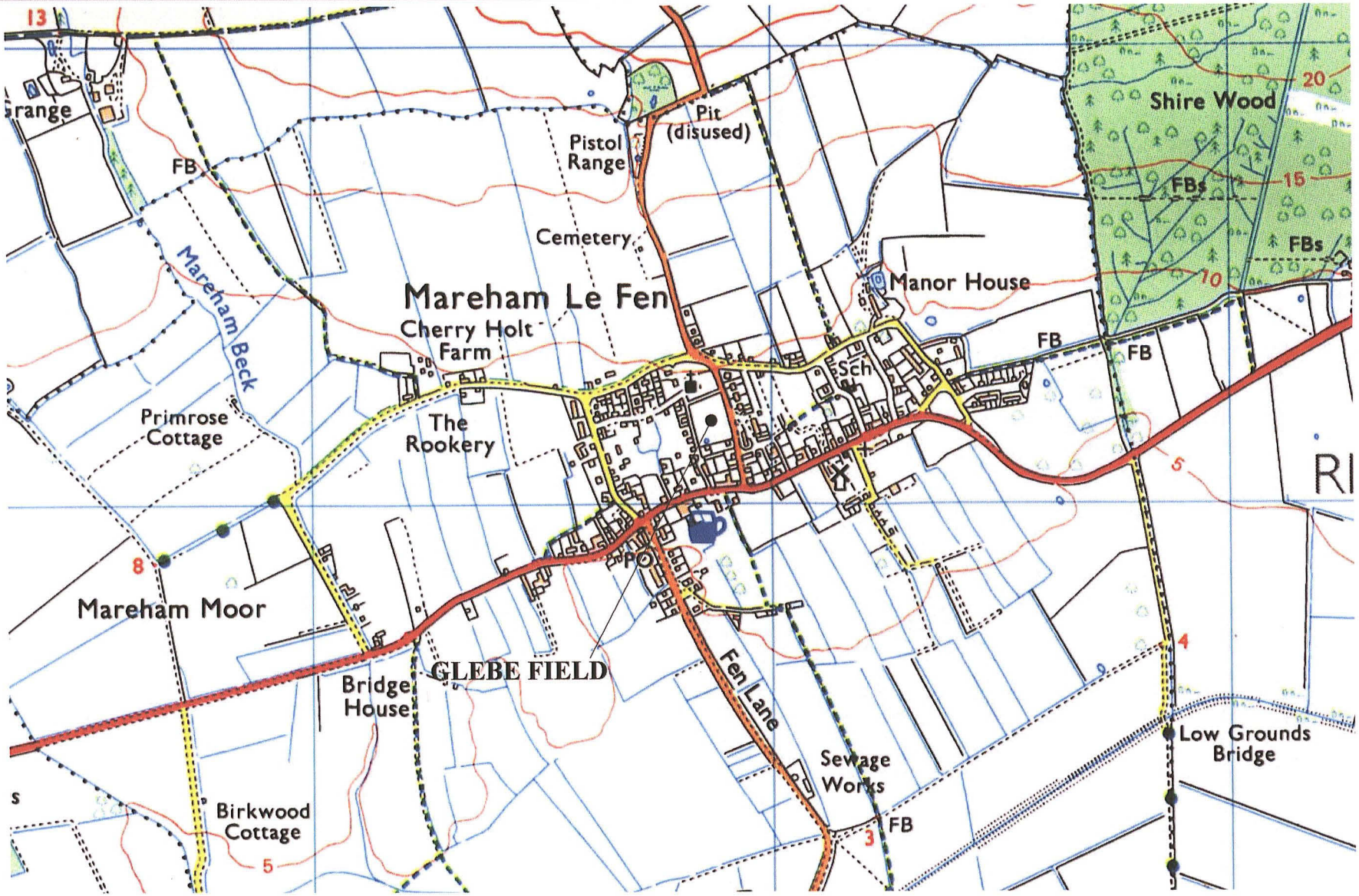
MUSEUM ACCESSION No.: 2005.236

ACCESSION DATE: -

***The Site Archive Comprises:***

*Client Report*
*Original Geoquest Associates Report*

*It is intended that transfer of the archive in accordance with current published requirements will be undertaken following completion of this project.*

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Witham Archaeology Location Map Not to Scale Fig. 1

# APPENDIX I

# REPORT BY GEOQUEST ASSOCIATES

# GEOPHYSICAL SURVEY ON THE SITE OF A PROPOSED COMMUNITY CENTRE AT GLEBE FIELD, MAREHAM LE FEN, LINCOLNSHIRE

Planning Ref.: S/114/00864/04
Grid Ref.: TF 27880 61180

A programme of research carried out on behalf of

**Witham Archaeology**

by

**GeoQuest Associates**

# 1 INTRODUCTION

1.1 This report describes the results of an archaeological geophysical survey on the Glebe Field (The Green), an area of open pasture S of St Helen's Church in the village of Mareham le Fen, Lincolnshire (Figure 1). A proposal has been submitted for the construction of a new community hall and associated outdoor leisure and car parking facilities, and the aim of the survey was to test for the presence of subsoil archaeological features for which mitigation may be required prior to the development.

1.2 The research was carried out by GeoQuest Associates on behalf of Witham Archaeology who are acting as archaeological consultants to Mr J Woodward, architect, on behalf of Mareham le Fen Community Centre Project Management Committee. The survey was conducted in accordance with a specification prepared by Mr R Trimble of Witham Archaeology and approved by Lincolnshire County Council.

1.3 The site is located within the core of the medieval settlement in an area of archaeological potential. St Helen's Church contains a number of elements dating to the 14th century, while the tower is partly late 13th century. A stone cross in the grounds S of the church is a Scheduled Ancient Monument. Previous archaeological work E of the site found evidence for pottery and tile production, while medieval refuse pits W of the site indicate the presence of medieval settlement in the area *(information provided by Witham Archaeology)*.

1.4 Hence, it is clear from existing information that considerable potential exists for subsoil features dating from the medieval periods within the proposal area. Construction of the new building, car parking and outdoor facilities may therefore impact on the archaeological resource, and geophysical investigation was hence proposed as part of a mitigation strategy.

1.5 Geophysical survey was carried out by staff from GeoQuest Associates on 25th November 2005, immediately after the grass had been cut. No significant earthworks were visible in the major part of the Glebe Field, while a silted pond and marshy area are located in the SW corner of the site.

# 2 THE GEOPHYSICAL SURVEY

2.1 A baseline for the geophysical survey was constructed parallel to the centreline of the hedge which forms the eastern field boundary. This baseline was offset to the W a distance of 2.0m to reduce interference from possible magnetic debris in the headland and service pipes beneath the pavement and road adjoining the site. Figure 1 provides an exact definition of the baseline position and the origin of the geophysical survey block. Coordinates of features detected by the survey can be determined relative to this baseline or OS detail by extraction from the associated CAD file that forms part of the site archive.

2.2 Measurements of vertical geomagnetic field gradient were recorded using a Geoscan FM36 fluxgate gradiometer with 0.05nT/m resolution. A zig-zag traverse scheme was employed and data were logged in grid units of 20x20m at 1.0x0.5m intervals, thus providing 800 measurements per grid. An area of about 0.7ha was surveyed.

2.3 Data obtained from the survey were downloaded on-site into a portable graphics computer for quality checks and initial processing. These data were subsequently transferred to a laboratory computer for final processing, interpretation and archiving.

2.4 The GeoQuest InSite® software was used to process the gridded geophysical data and thus convert the field readings into a continuous-tone grey-scale image. In Figure 2 a convention has been used that shows positive magnetic anomalies as dark grey and negative magnetic anomalies as light grey. Further details of the data processing procedures are given in Appendix A.

2.5 An archaeological interpretation of the geophysical survey is presented in Figures 3 and 4. A key defines the colours and fill styles used in these drawings, while feature codes **f1** and **f2**, etc, are included in Figure 4 for reference in the discussion below.

## 3 INTERPRETATION

3.1 **f1**: Geomagnetic anomalies in the study area were found to be fairly intense and well above the detection limit of the instrument employed. The strongest anomalies were detected along the SE field boundary, about 30m N of Carlton Cottage, suggesting that the soils here are contaminated with ferrous litter or possibly fired material such as ash and slag. As a result, it has not been possible to evaluate more subtle magnetic anomalies of possible archaeological interest in this region.

3.2 **f2**: A second concentration of strongly magnetised material is present in the area of the pond and adjoining marshy ground, suggesting that the hollow is partly infilled with ferrous litter and other magnetic debris which appears to extend a distance E along the southern field boundary.

3.3 **f3**: Two compact areas containing intense magnetic dipoles have been detected close to the northern field boundary and may mark positions of former bonfires or other fired debris.

3.4 **f4**: The geophysical image is characterised by a strong texture of N-S oriented positive magnetic lineations, spaced about 4m apart, which provides convincing evidence for ridge and furrow cultivation. Although this field system is no longer visible as earthwork remains, traces of the furrows must clearly survive as bands of thickened topsoil, cut into the subsoil horizon. Examination of the geophysical data suggests that the ridge and furrow is best preserved in the central and eastern parts of the field, since the geophysical texture becomes more diffuse in the western portion.

3.5 **f5**: A set of very weak and diffuse positive magnetic lineations have been detected in the NW corner of the site, possibly indicating the presence of several silted ditches. Alternatively, the geophysical anomalies may reflect tile land drains or tractor ruts, now infilled with topsoil.

3.6 **f6**: An extremely weak set of rectilinear negative magnetic anomalies appears to be present about 20m NE of the pond. A detailed interpretation of these features is complicated by the strong superimposed texture of ridge and furrow which appears to share a similar orientation. Nevertheless, it seems possible that the geophysical

anomalies may indicate the presence of the footings for a small stone building, beneath the ridge and furrow, with the major axes oriented approximately NNE-SSW.

3.7 **f7**: A number of strong negative magnetic lineations have been detected in the southern third of the field, on ground E and NE of the silted pond. The style and orientation of these anomalies are consistent with a system of stone or plastic land drains feeding the pond from the direction of the village road. Alternatively, the anomalies may indicate a set of stone wall footings or trackways which possibly continue E and SE beyond the area investigated.

3.8 **f8**: Finally, a cluster of rectilinear, positive magnetic anomalies have been mapped within the triangular area defined by features **f7**. Interpretation of the results is made more difficult by the existence of ridge and furrow texture, although it is tentatively suggested in Figure 4 that the anomalies may signify minor soil-filled ditches.

3.9 No further geophysical anomalies of archaeological or geotechnical interest have been detected in the sample area.

## 4 SUMMARY AND CONCLUSIONS

4.1 A fluxgate magnetometer was used to carry out an archaeological geophysical survey on the site of a proposed new community centre and associated facilities on The Green or Glebe Field, in the centre of Mareham le Fen, Lincolnshire. The site was found to be characterised by fairly strong geomagnetic anomalies, indicative of moderate and variable soil susceptibilities. Ferrous litter was detected infilling a former pond, while 2 other areas of magnetic debris were encountered. The survey has provided clear evidence for the remains of former ridge and furrow cultivation, together with possible drains (or tracks) leading to the pond. A number of other geophysical anomalies may reflect features of archaeological interest, such as silted ditches and wall footings Hence further site investigation may be warranted in order to fully characterise these features.

## 5 CONFIDENCE LIMITS

5.1 The following are the levels of confidence which we assign to the features inferred from the geophysical data:

| FEATURE | INTERPRETATION | CONFIDENCE LEVEL, % | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| f1 | Ferrous litter | | | | | | | | | | |
| f2 | Ferrous litter | | | | | | | | | | |
| f3 | Ferrous litter | | | | | | | | | | |
| f4 | Ridge & furrow | | | | | | | | | | |
| f5 | Ditches or drains | | | | | | | | | | |
| f6 | Wall footings | | | | | | | | | | |
| f7 | Drains or tracks | | | | | | | | | | |
| f8 | Ditches | | | | | | | | | | |

## 6 CREDITS

Survey & Report: M. J. Noel PhD, FRAS
Date: 28th November 2005

**Note**: Whilst every effort has been taken in the preparation and submission of this report in order to provide as complete an assessment as possible within the terms of the brief, GeoQuest Associates cannot accept any responsibility for consequences arising as a result of unknown and undiscovered sites or artefacts.

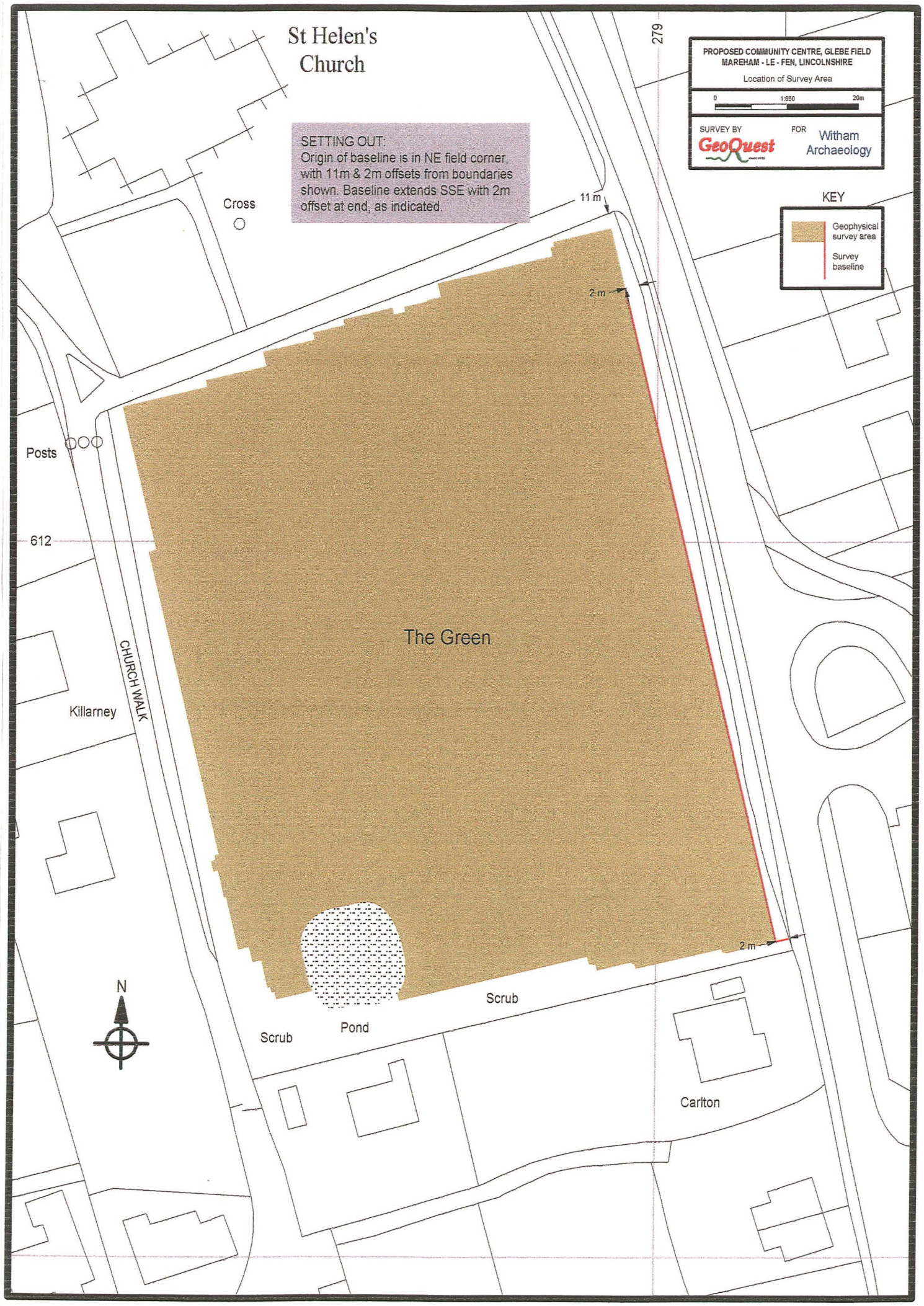

St Helen's Church
PROPOSED COMMUNITY CENTRE, GLEBE FIELD
MAREHAM - LE - FEN, LINCOLNSHIRE
Location of Survey Area
0
1:650
20m
SURVEY BY
GeoQuest
FOR
Witham Archaeology
KEY
Geophysical survey area
Survey baseline
SETTING OUT:
Origin of baseline is in NE field corner, with 11m & 2m offsets from boundaries shown. Baseline extends SSE with 2m offset at end, as indicated.
279
11 m
2 m
Cross
Posts
612
The Green
CHURCH WALK
Killarney
2 m
N
Scrub
Pond
Scrub
Carlton

FIGURE 1


PROPOSED COMMUNITY CENTRE, GLEBE FIELD
MAREHAM - LE - FEN, LINCOLNSHIRE
Results of Geophysical Survey
0
1:650
20m
SURVEY BY
GeoQuest
FOR
Witham Archaeology
ANOMALIES, nT/m
-12.4 -1.4 0.0 1.4 12.4
St Helen's Church
Cross
279
Posts
612
CHURCH WALK
Killarney
N
Scrub
Pond
Scrub
Carlton

FIGURE 2

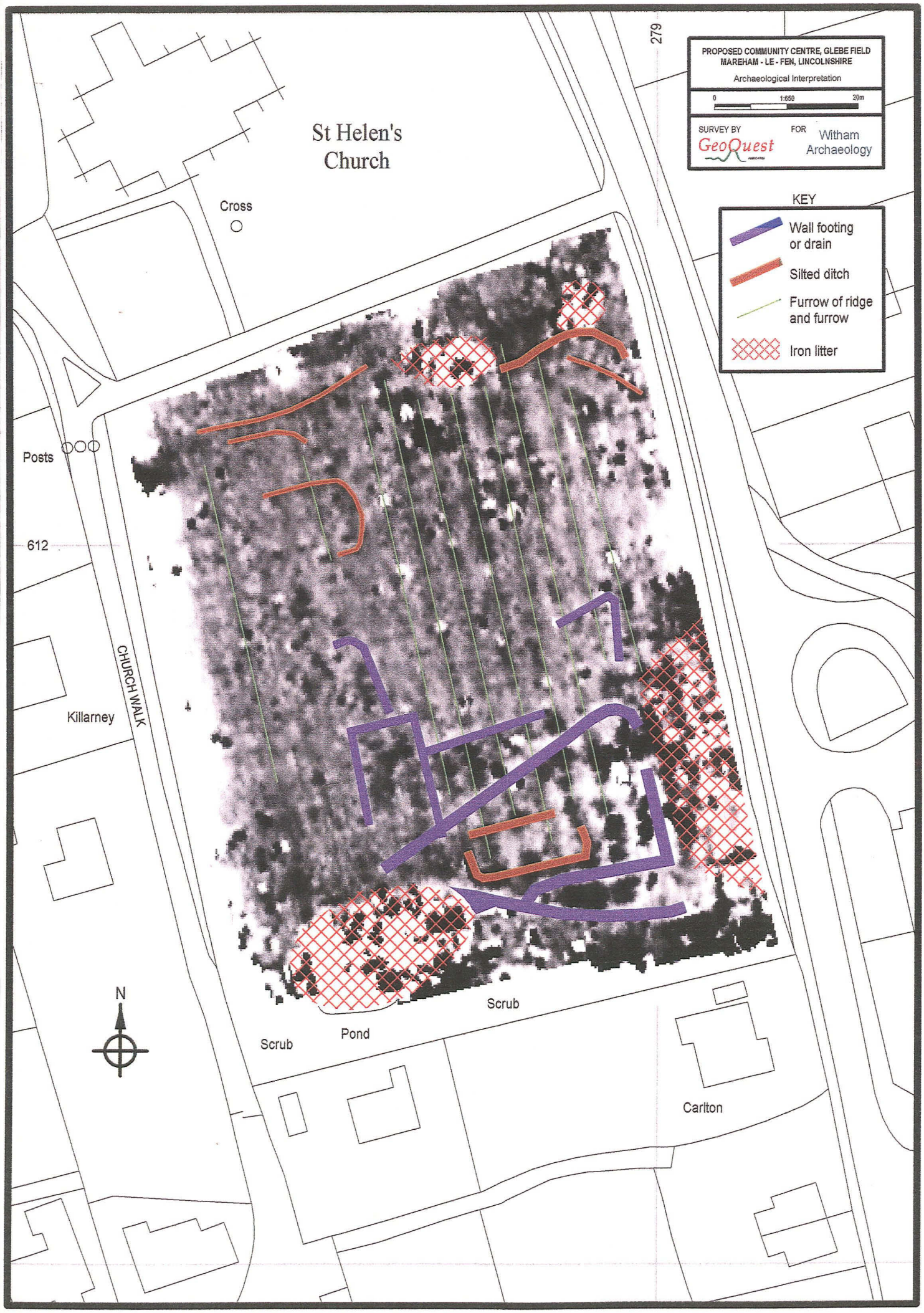

PROPOSED COMMUNITY CENTRE, GLEBE FIELD
MAREHAM - LE - FEN, LINCOLNSHIRE
Archaeological Interpretation
0
1:650
20m
SURVEY BY
GeoQuest
FOR
Witham Archaeology
KEY
Wall footing or drain
Silted ditch
Furrow of ridge and furrow
Iron litter
St Helen's Church
Cross
Posts
612
279
CHURCH WALK
Killarney
Scrub
Pond
Scrub
Carlton
N

FIGURE 3

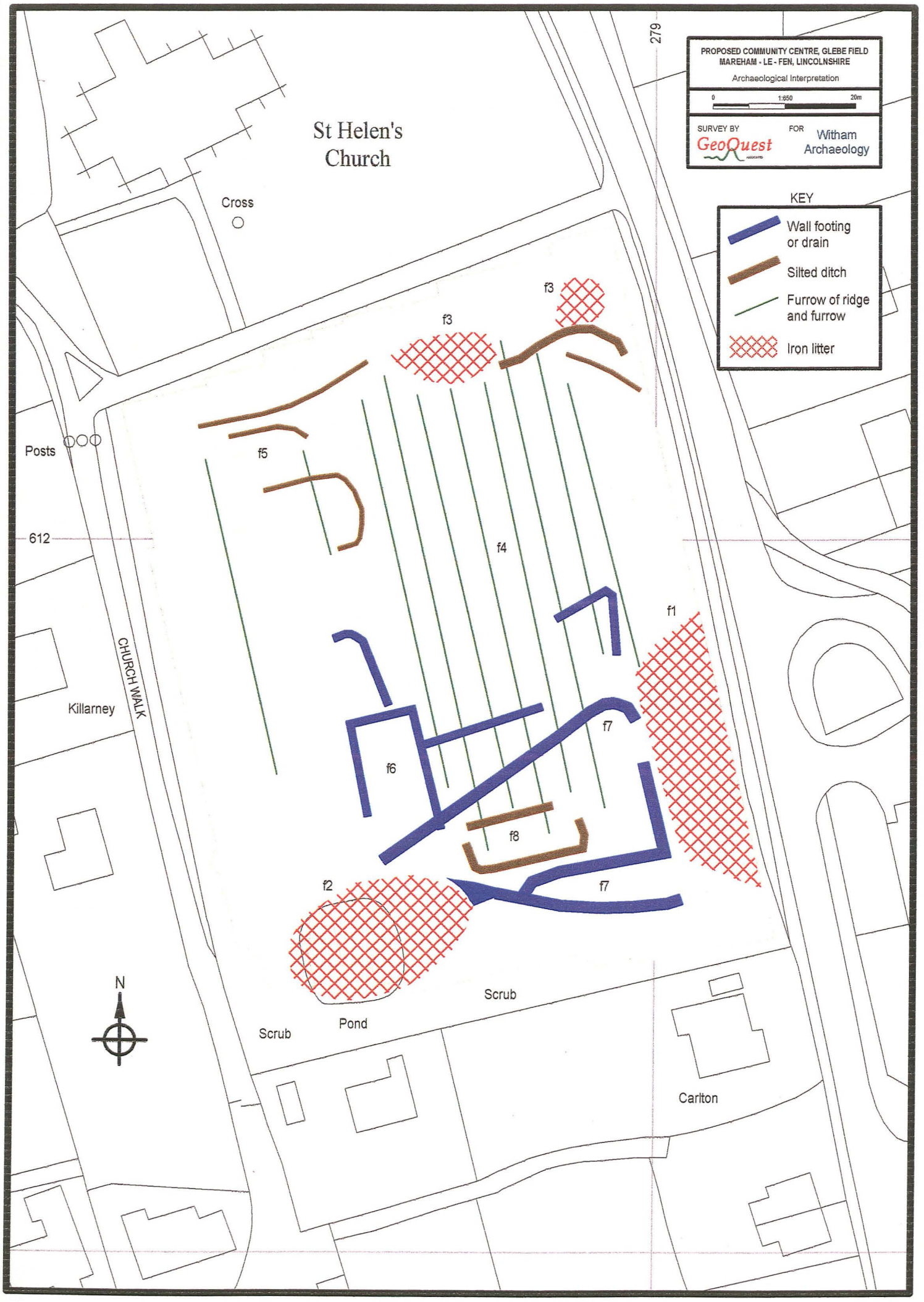

PROPOSED COMMUNITY CENTRE, GLEBE FIELD
MAREHAM - LE - FEN, LINCOLNSHIRE
Archaeological Interpretation
0
1:650
20m
SURVEY BY
GeoQuest
FOR
Witham Archaeology
KEY
Wall footing or drain
Silted ditch
Furrow of ridge and furrow
Iron litter
St Helen's Church
Cross
Posts
279
612
CHURCH WALK
Killarney
f1
f2
f3
f3
f4
f5
f6
f7
f7
f8
Pond
Scrub
Scrub
Carlton
N

FIGURE 4

# APPENDIX A

# DATA PROCESSING

## PROCESSING THE SURVEY DATA

The geophysical images contained in this report were prepared within Microsoft Windows® using the InSite® program published by GeoQuest Associates. Geophysical images were then placed onto a map which was digitised from the Ordnance Survey, edited and then plotted using a computer aided drafting (CAD) system and colour inkjet printer.

Data were downloaded from the meter to a portable computer in the field for storage, visualisation and quality control (QC) assessment. These data were then transferred to a laboratory computer for final processing, printing and archiving.

A number of process steps have been applied to the geophysical data obtained during the survey and those which have been used are linked to the main flow path by arrows. Steps were applied in the order shown and are designed to reduce artifacts in the data and enhance geophysical features of archaeological interest. The following sections describe each step in more detail.

## REMOVE STRIPING

Reduces a data artifact comprising alternating changes in level in readings logged along zig-zag traverses. This artifact is common in fluxgate magnetometer data. InSite uses a proprietary algorithm to reduce this error.

## INFILL SMALL BLANK AREAS

Fills isolated blank data cells with the mean of near-neighbours or a suitable approximation entered manually. Small blank areas will have been logged if it was not possible to obtain a geophysical reading over, for example, a manhole cover in the case of a resistivity survey.

## REMOVE SPIKES

Replaces isolated, anomalously high or low values with the mean of near neighbours or a suitable approximation entered manually. 'Spike' readings are commonly associated with ferrous litter or poor electrical contact in the case of geomagnetic and resistivity data, respectively.

## REDUCE WALK HARMONICS

Reduces a regular oscillation in traverse data caused by walking movements of the operator during a geomagnetic survey. InSite employs a fast Fourier transform to determine the optimum amplitude and phase of the walk-induced harmonic which is then subtracted from each traverse.

## REDUCE SHEAR ARTIFACTS

Corrects for apparent shear in geomagnetic anomalies surveyed by zig-zag traversing in a geomagnetic survey. The shearing effect arises from the interaction of the operator+magnetometer with the geomagnetic field and also from the lag in the instrument response to changes in the field. InSite uses a proprietary algorithm to reduce this error.

## CORRECT FOR METER DRIFT

Corrects for a linear drift in the meter calibration with time. Such drift is a common problem with fluxgate magnetometers, particularly during periods of rapid air temperature change. InSite uses least-squares regression on the mean of data along each traverse to estimate the change in calibration level across each grid. This gradient is then removed from the data.

## ADJUST GRID MEAN LEVELS

Adjusts for differences in the mean level in data grids due to changes in instrument calibration (fluxgate magnetometer survey) or alteration in remote electrode spacing (resistivity survey).

## INTERPOLATE AND COMBINE

Combines grids to form an array of regularly-spaced data on a square mesh. InSite uses bilinear interpolation to accomplish this.

## LOW PASS FILTER

If this process task is indicated then a 3x3 or 5x5 boxcar filter has been used to smooth the data and reduce noise or 'speckle' seen in the original image.

## HIGH PASS FILTER

If this process task is indicated then a 3x3 or 5x5 filter, with appropriate coefficients, has been used to pass short-wavelength information into the resulting image.

## EDGE DETECT FILTER

Signifies that a Sobel, Laplace or other specialised filter has been applied to enhance significant lateral transitions in the geophysical image.

## DIRECTIONAL FILTER

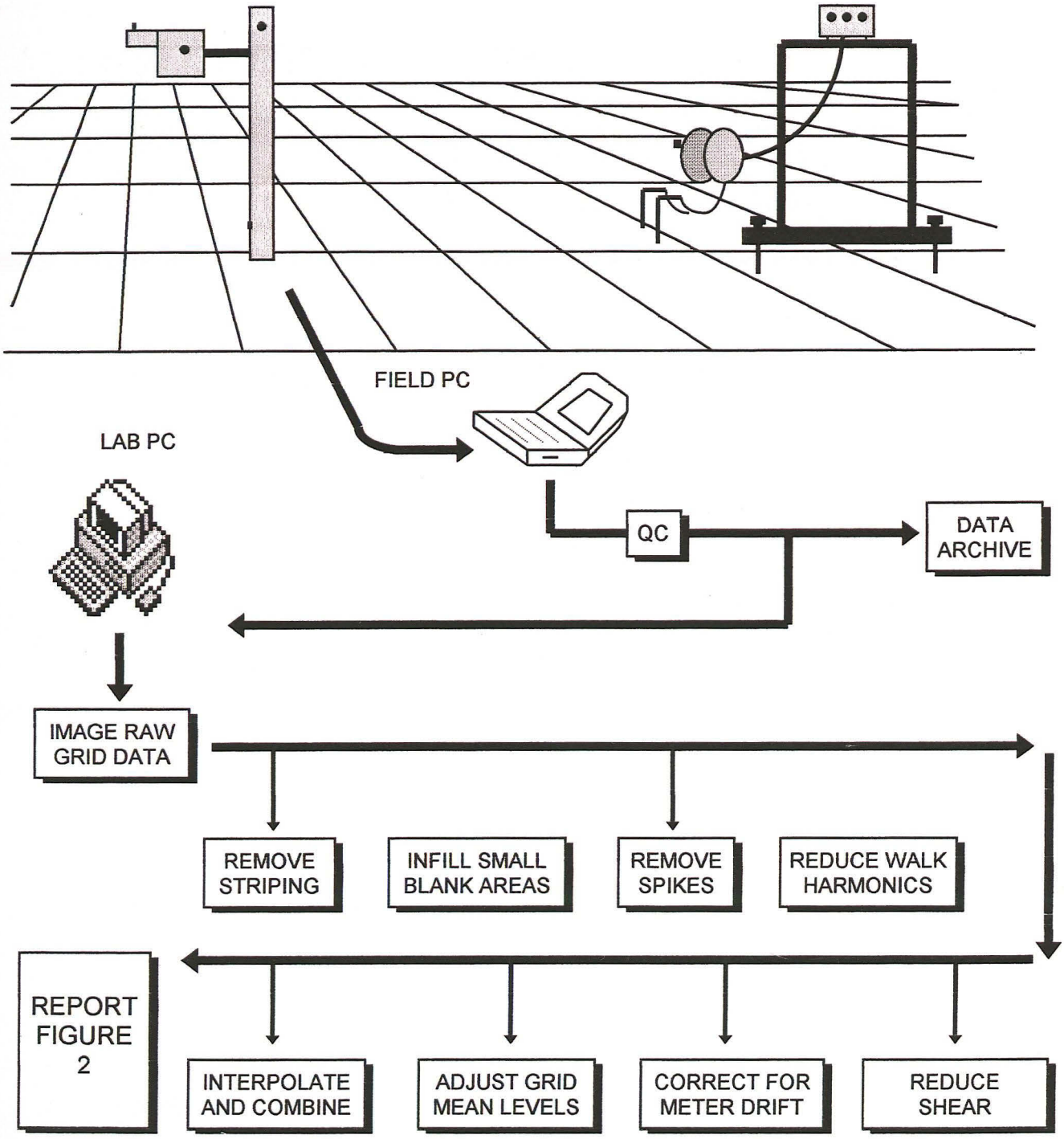
This filter is equivalent to illuminating the data from one direction to produce a pseudo-relief image. Directional filtering is usually employed to aid the identification of subtle anomalies in resistivity data. This filter highlights features trending at right angles to the direction of illumination.

## NOTE

GeoQuest Associates can supply the geophysical images presented in this report in a variety of digital formats for visualisation on microcomputers running Microsoft Windows. These formats include the TIF, BMP and PCX standards.

InSite

# APPENDIX A
# DATA PROCESSING




PROJECT: Mareham le Fen

SITE: Glebe Field

# APPENDIX II – SITES LISTED IN THE COUNTY HER

| HER No. | NGR | Description |
|---|---|---|
| 40749 | TF 2750 6090 | Roof tile kiln (dated *c.* AD 1300 to 1350) excavated in1966 |
| 40750 | TF 2740 6090 | Waster dump associated with the excavated tile kiln |
| 40751 | TF 2755 6108 | 16th to 18th C pottery from a moated site at Moat Farm |
| 40752 | TF 2823 6148 | 14th to 16 C tile and pottery from surface of 'ornamental moat' |
| 40753 | TF 2830 6140 | Medieval grotesque corbel from near 'ornamental moat' |
| 40754 | TF 2830 6140 | Bronze Age axe found near 'ornamental moat' |
| 40755 | TF 2828 6132 | 14th/15th C lead weight found with medieval pottery |
| 40756 | TF 27840 61244 | Medieval base and shaft of churchyard cross; SAM No. 22674, Grade II listed |
| 40757 | TF 2783 6125 | Medieval church of St Helen's |
| 40758 | TF 2823 6149 | Small ornamental moat; possible site of the medieval manor or garden feature constructed in the late 18th/ early 19th C |
| 40777 | TF 2814 6104 | Disused windmill built in 1820 |
| 42967 | TF 2783 6125 | Late Saxon cross shaft in the chancel of St Helen's church |
| 43515 | TF 2832 6145 | Possible site of medieval manor house; lying southeast of moated site. Also possible medieval quarry |
| 43632 | TF 279 612 | Medieval settlement of Mareham le Fen |
| 43711 | TF 2772 6114 | Single sherd of Early Anglo-Saxon pottery found during an evaluation off Watery Lane |
| 43815 | TF 2817 6126 | Undated gully found during watching brief at Mareham le Fen Primary School |
| 43845 | TF 27635 61195 | Undated ditch found during watching brief at Hawthorne Cottage |
| 43945 | TF 2775 6119 | Undated possible rubbish pits found during watching brief on Church Lane |
| 43968 | TF 2774 6113 | Two undated ditches and pits found during a watching brief on Land off Watery Lane |
| 43969 | TF 2771 6115 | Late 19th/20th century rubbish pit found during watching brief off Watery Lane |
| 44521 | TF 2805 6122 | Ditch containing two flakes and undated gullies; thought to be Early Neolithic to Late Bronze Age in date. Found during evaluation |
| 44522 | TF 2800 6125 | Three small pits containing animal bone and post-medieval pottery. Found during evaluation |
| 44776 | TF 2725 6055 | Late medieval ridge and furrow seen on aerial photos |
| 44777 | TF 2750 6054 | Late medieval ridge and furrow seen on aerial photos |
| 44778 | TF 2779 6139 | Late medieval ridge and furrow seen on aerial photos |
| 44779 | TF 2801 6140 | Late medieval ridge and furrow seen on aerial photos |
| 44780 | TF 2835 6113 | Late medieval ridge and furrow seen on aerial photos |
| 44781 | TF 2851 6115 | Late medieval ridge and furrow seen on aerial photos |
| 46344 | TF 28062 61135 | Single, residual sherd of Romano-British pottery found during investigation at Fieldside |
| 46345 | TF 28062 61135 | Prehistoric (Early Neolithic to Late Bronze Age) flint flakes (2) and a flint blade found at Fieldside |