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An Archaeological Desk-Based Assessment and Geophysical Survey

of land between Boston Road and Willington Road, Kirton, Lincolnshire

NGR TF 3040 3894

Planning ref : B/99/0494/FULL

prepared by

John Samuels Archaeological Consultants

on behalf of

Ashwood Homes

Holbeach Manor

Fleet Road

Holbeach

PE12 7AX

JSAC 617/00/05 *March 2000*

LCCM Accession Number 2000.29

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An Archaeological Desk-Based Assessment of land between Boston Road and Willington Road, Kirton, Lincolnshire

Contents

Summary

Ashwood Homes have commissioned a desk-based assessment of the archaeological potential of their proposed development site in Kirton, Boston, Lincolnshire (TF 3040 3894). The initial findings of the desk-based assessment, suggested the site held potential for remains of medieval settlement to be identified and a geophysical survey was also therefore commissioned and carried out by GSB Propsection. This document reports on the conclusions of that assessment and the results of the geophysical survey.

Examination of the information available in the county and district Sites and Monuments Records and archives has shown there to be no known archaeology within the limits of the proposed development site. However, it does lie on the northern edge of the medieval market town of Kirton which is alleged to have extended further north than currently recognised. A number of Roman sites are known in the wider vicinity, mainly to the west of the present site. A group of undated earthworks lie in the field immediately to the west of the proposed development site.

The geophysical survey has identified a concentration of anomalies along Willington Road, on the western edge of the proposed development site. Whilst no clear pattern can be discerned, the results are consistent with the ploughed out remains of medieval roadside settlement. Few anomalies of archaeological potential were identified in the remainder of the site.

1.0 Introduction

1.1 The study area is situated between Willington Road and Boston Road in the village of Kirton, Boston, centred on NGR TF 3040 3894. The area proposed for development covers approximately 3.25 ha of land currently a mixture of fallow and vegetable crops.

1.2 Ashwood Homes commissioned *John Samuels Archaeological Consultants* to undertake a desk-based assessment to identify any archaeological remains in advance of the development of the site. The initial findings of the desk-based assessment indicated the potential for archaeological remains to exist within the proposed development site. A geophysical survey was therefore undertaken by GSB Prospection. Their report forms Appendix C of this document and the findings have been incorporated within the main text.

1.3 This assessment is based on the requirements of *Planning Policy Guidance Note 16 : Archaeology and Planning* (DoE, 1990). It is in accordance with current best archaeological practice and the appropriate national standards and guidelines, including: *Standard and Guidance for Archaeological Desk-Based Assessments* (Institute of Field Archaeologists, 1994); *Management of Archaeological Projects* (English Heritage 1991); and *Archaeological Handbook* (Lincolnshire County Council 1998). A brief was provided by the Boston Community Archaeologist and a specification agreed based on that brief (see Appendix B).

1.4 This assessment was written by Nansi Rosenberg BA, PIFA in consultation with John Samuels BA, PhD, FSA, MIFA. Dan Shiel of GSB Prospection wrote the geophysical survey report.

2.0 Methodology

2.1 Desk-top research undertaken by *John Samuels Archaeological Consultants* comprised analysis of relevant information contained in and provided by Lincolnshire County Sites and Monuments Record (SMR) and the Boston Community Archaeologist's archive. Documentary and cartographic searches of relevant material in published and unpublished sources were undertaken at the Lincolnshire Record Office (LRO) and the Boston Community Archaeologist's archive. Information on Scheduled Ancient Monuments (SAM) and Registered Parks and Gardens was supplied by English Heritage. The National Monuments Record was consulted for details of additional aerial photographs available for the area.

2.2 A site visit and walkover survey was undertaken to examine the topography and current land use of the site, and to identify any previously unrecorded above ground archaeology. The site visit was also undertaken to establish what field evaluation techniques would be suitable and/or possible, if the assessment concluded there was a need for further evaluation.

2.3 In this instance, the potential for archaeological remains to exist within the site was considered sufficient to warrant further work, prior to the submission of the final desk-based assessment. A specification for carrying out a geophysical survey was agreed with the Boston District Archaeologist (JSAC 617/00/04). The work was carried out by GSB Prospection in February 2000.

2.4 Following the assessment and survey, conclusions were drawn and an indication provided of the archaeological potential of the proposed land for development and the importance of any sites directly affected or where their setting may be a consideration. An assessment has been made of the potential of a variety of field evaluation techniques for investigating buried archaeological remains on the site.

2.5 At the time of writing there is no nationally agreed method of measuring the relative importance of archaeological monuments. PPG16 (paragraph 8) draws a distinction between nationally important remains and those of lesser distinction. On this basis it is possible to distinguish between monuments of national, regional local or negligible importance.

National Monuments that are scheduled and protected under the Ancient Monuments and Archaeological Areas Act (1979), those suitable for scheduling, or considered to be of national importance but not covered by the Secretary of State's criteria for scheduling.

Regional Sites listed in the Sites and Monuments Record (SMR) or other sources which are of a reasonably well defined extent, nature and date and significant examples in the regional context.

Local Sites listed in the SMR or other sources which are of very low potential or minor importance.

Negligible Areas in which investigative techniques have produced negative or minimal evidence of antiquity, or where large scale destruction of deposits has taken place (eg by mineral extraction).

2.6 The potential of a site to contain archaeological remains is based upon a consideration of its topography and the distribution and nature of recorded archaeological finds in the locality. It is measured on the basis of High, Medium, Low and Negligible.

2.7 The setting of a monument is generally considered what can be seen or heard to and from the monument. Its impact can be assessed on the basis of Major, Medium, Minor or Insignificant.

3.0 Archaeological and Historical Assessment

3.1 Desk-based Assessment

3.1.1 The proposed development site occupies a parcel of land situated between the Willington and Boston Roads leading north out of the village of Kirton. The land is flat and level at approximately 4m above Ordnance Datum. Local soils are of the Rockcliffe association, derived from the underlying marine silts (SSEW 1983). The site visit confirmed the lack of above ground remains and established the ground cover of fallow in the southern field and crops in the two northern fields.

3.1.2 No prehistoric sites or finds are known from the vicinity of the proposed development site. It lies deep in the fens, and any early remains are likely to be deeply buried beneath the alluvial silts which cover the region. The earliest recorded occupation debris in the area is of Roman date and comprises a single flue tile, found amongst medieval and post-medieval debris from Orme Hall, 550m to the northwest (SMR13038). Allen has suggested that Willington Road was Roman in origin and that forts and stations of the Roman period exist in the area (Allen 1833 : 350). Roman pottery scatters and cropmarks have been identified in the area west and north of the village of Kirton. Very occasional finds are made to the east, where the coast line would have been located further west than its current position (Phillips (ed) 1970).

3.1.3 The first substantial evidence for settlement in Kirton comes from an evaluation excavation and watching brief that were undertaken on High Street in 1996. Late Saxon and medieval deposits filling a natural pond were identified, the artefactual and environmental remains suggesting it lay within a farmyard (SMR 13500, 13501; Cope-Faulkner 1996).

3.1.4 The Domesday Book also reports Saxon settlement in Kirton. Two manors are recorded as having been present in the reign of Edward (the Confessor). By 1086, a soke is listed in addition to the two manors. The population was large, with 50 individuals recorded

in the assessment, along with a church and two 'salt-pans' (Foster & Longley 1924). The name given in the Domesday Book is Chirchetune, derived from the Old English for church, *cirice,* and village, *tun*. The first element changes to the Old Norse equivalent, *kirkja*, in the 12th century (Cameron 1998 : 75).

3.1.5 Kirton was a market town in the medieval period, and its church, dedicated to St Peter and St Paul, is substantial, although reduced from its original size (SMR 12531). The earliest dateable structural remains in the church are of the 14th century, although local tradition has it built by Alexander, Bishop of Lincoln in the 12th century (Pevsner *et al* 1989 : 421; White 1856 : 808-9). However, the church fell into disrepair through the post-medieval period and was largely dismantled and rebuilt on a smaller scale in the first decade of the 19th century (White 1856 : 809; Allen 1833 : 348).

3.1.6 The cross which formerly stood in the centre of the market town has since been moved into the churchyard (SMR 12534). The original site of the cross is marked by a traffic island, to the south of the church.

3.1.7 Archaeological interventions on Station Road (SMR 13357), High Street (SMR 13501) and Willington Road (SMR13549) have all produced evidence of medieval activity. The evaluation at Station Road produced evidence of 13th / 14th century drainage ditches and the cutting of new ditches and pits at a later date, after the 13th / 14th century ditches had silted up. Later medieval activity identified on the High Street site comprised pits and a hearth with evidence for bone working, continuing into the post-medieval period. Orme Hall, which lay 500m north of the proposed development site, was linked to the medieval abbey of Swineshead (Allen 1833; 349-50). It was demolished in 1818 but pottery and other artefacts dating to the medieval and post-medieval periods has been found in the immediate area (SMR 12528). Further medieval pottery has been found to the south of that site, 300m west of the proposed development site (SMR 12544).

3.1.8 A group of earthworks have been identified in a field on the western side of Willington

Road (Boston SMR 14/035). Fieldwalking undertaken in the adjacent fields to the south and south-east failed to date the earthworks or to produce evidence for other archaeological activity within that area (Boston SMR 14/034). However, it is thought that they are most likely to have a medieval or post-medieval origin.

3.1.9 During Elizabeth I's reign, Kirton was the third largest town in Lincolnshire (Wheeler 1990 : Appendix I, 23). However, through the post-medieval period Kirton went into a decline as a market town. The market, which had been held each Saturday was abandoned and the judicial rights of Kirton were transferred to Boston (White 1856 : 808; Olney 1979 : 9). Kirton became a mainly agricultural village. Little evidence for specific land use is available for the proposed development site, although 19th and 20th century maps indicate it remained undeveloped at this time. The Boston Road was turnpiked in 1758 (Wright 1993 : 78). The hospital, Woodlands, which lies to the east of the proposed development site was built as a private residence in the second half of the 19th century. A drain or stream which passed through the eastern edge of the site in 1838 had been straightened by 1905, although the area was still clearly very wet (see Figures). A footpath can be seen running from the church northwards, through the site, to join Willington Road near the former location of Orme Hall. A pond lay immediately to the west of this but has since been backfilled.

3.1.10 Seven undated worked stones were recovered from the garden of 48 Willington Road, c. 300m south of the proposed development site (SMR 12555). They have been interpreted as mill stones, and as such probably belonged to a water mill on the Kirton Drain, 400m to the east.

3.1.11 Early maps indicate that by the second half of the 19th century, the disposition of the fields and settlement was similar to that of the turn of the century. Available cartographic sources do not seem to indicate a high potential for early settlement within the proposed development site.

3.2 Geophysical Survey (see Figure 6 & Appendix C)

3.2.1 The entire site was subjected to a magnetometer survey, with instruments set in scan mode. Two areas for detailed survey were identified, Area A along Willington Road and Area B in the centre of the site.

3.2.2 Area A produced a large group of anomalies apparently aligned along the road and divided in two by a strong linear aligned at right-angles to the road. These anomalies appeared to have an archaeological rather than natural origin although they form no clear pattern. Possible hearths or features containing burnt material are represented by the anomalies in the northern part of the survey area (A). Two L-shaped features have been tentatively identified as dwellings (B). The irregular anomalies at the western edge of the site (C) may represent imported material and those to the east (D) may represent natural soil variations and/or infilled ponds. Apparently forming the eastern boundary of the anomalies in the northern part of the survey area, a negative linear anomaly could be a former hollow way aligned against a former field boundary represented by a slight rise in the ground in this area.

3.2.3 Area B was typical of the remainder of the site, being magnetically very quiet. Of the few pit-type anomalies identified, only that labelled F is likely to be archaeological. The few linear anomalies are thought to represent ploughing trends.

4.0 Conclusions and Recommendations

4.1 No sites or finds are recorded within the site in the County or District Sites and Monuments Records and no scheduled ancient monuments in the vicinity. The impact of the proposed development on known archaeology is therefore nil.

4.2 The site lies within the limits of a substantial medieval settlement. Although it is located north of the main development of the current settlement centre, it is possible that earlier settlement extended further north than is currently proven. The presence of a single Roman tile from the grounds of Orme House could indicate the presence of Romano-British settlement in the area.

4.3 The geophysical survey has identified a substantial group of anomalies along Willington Road. Although they form no coherent pattern, both their location in the village and the nature of the responses suggest they are the remains of medieval settlement earthworks that have been ploughed level. As such, they could be considered to be of local importance. It is unlikely that they will be sufficiently well preserved to warrant a higher importance rating than this. No details of the proposed development plan are available to the author at this time and the potential impact on the remains is therefore unknown.

4.4 The current ground conditions and potential archaeology can be used to determine the best method for field evaluation of a site. The ground conditions on this site make fieldwalking impossible and, given the nature of the potential archaeology, it is felt that trial trench excavation would be the most appropriate course of action.

5.0 Figures and Photographs

Figure 1 : Site location

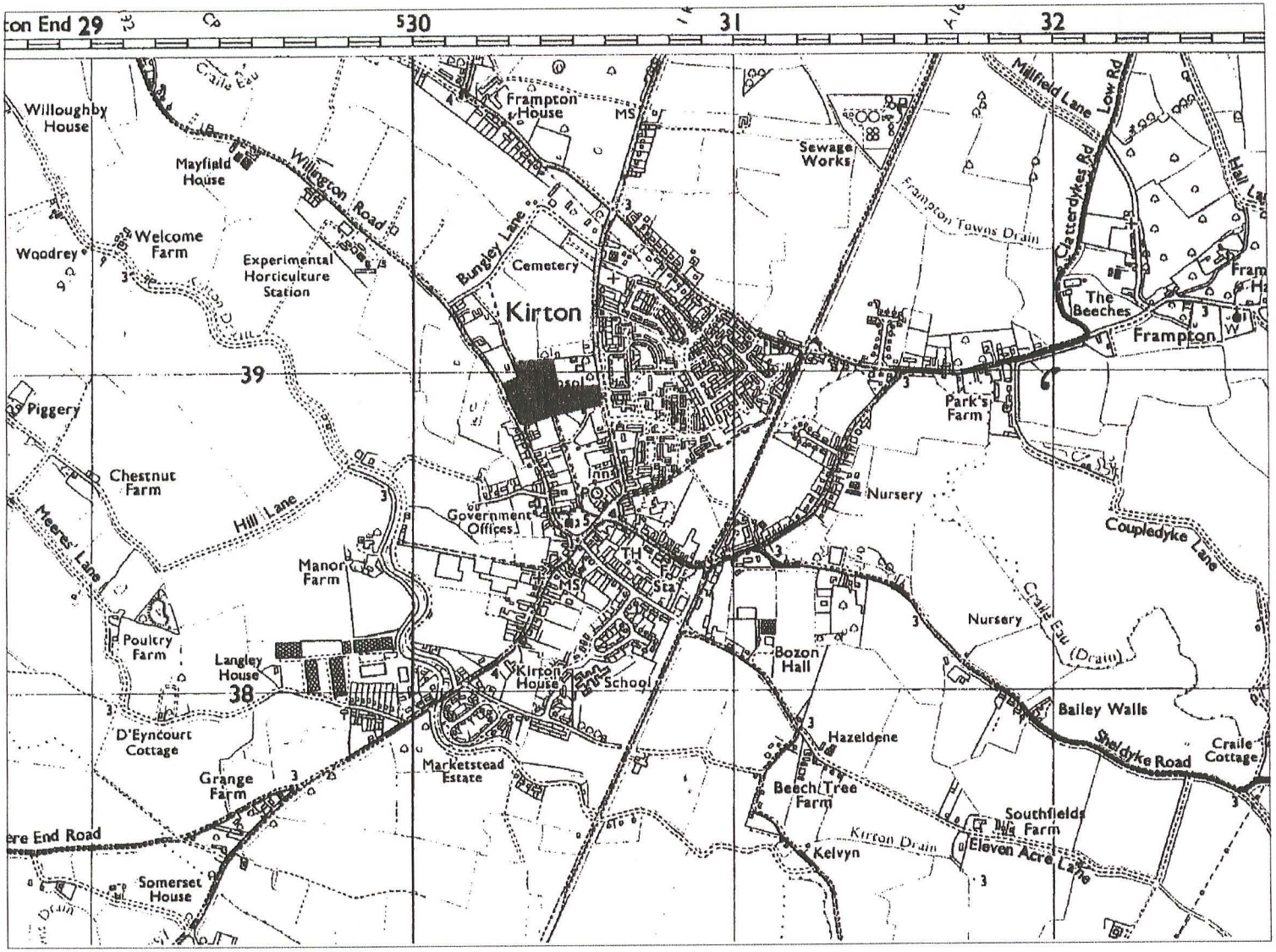
Figure 2 : Distribution of known archaeology in the vicinity

Figure 3 : A Plan of the Old Inclosure and Salt Marsh of the Parish of Kirton in the County of Lincoln 1838

Figure 4 : Ordnance Survey 1905. Sheet 117.8

Figure 5 : Ordnance Survey 1906. Sheet 117.NE

Figure 6 : Geophysical survey interpretation



Note: Map based on Ordnance Survey with the sanction of the Controller of H M Stationery Office.
Crown Copyright Reserved
Licence No. AL 52216A0001

N

0 1 kilometre

Figure 1 : Site location

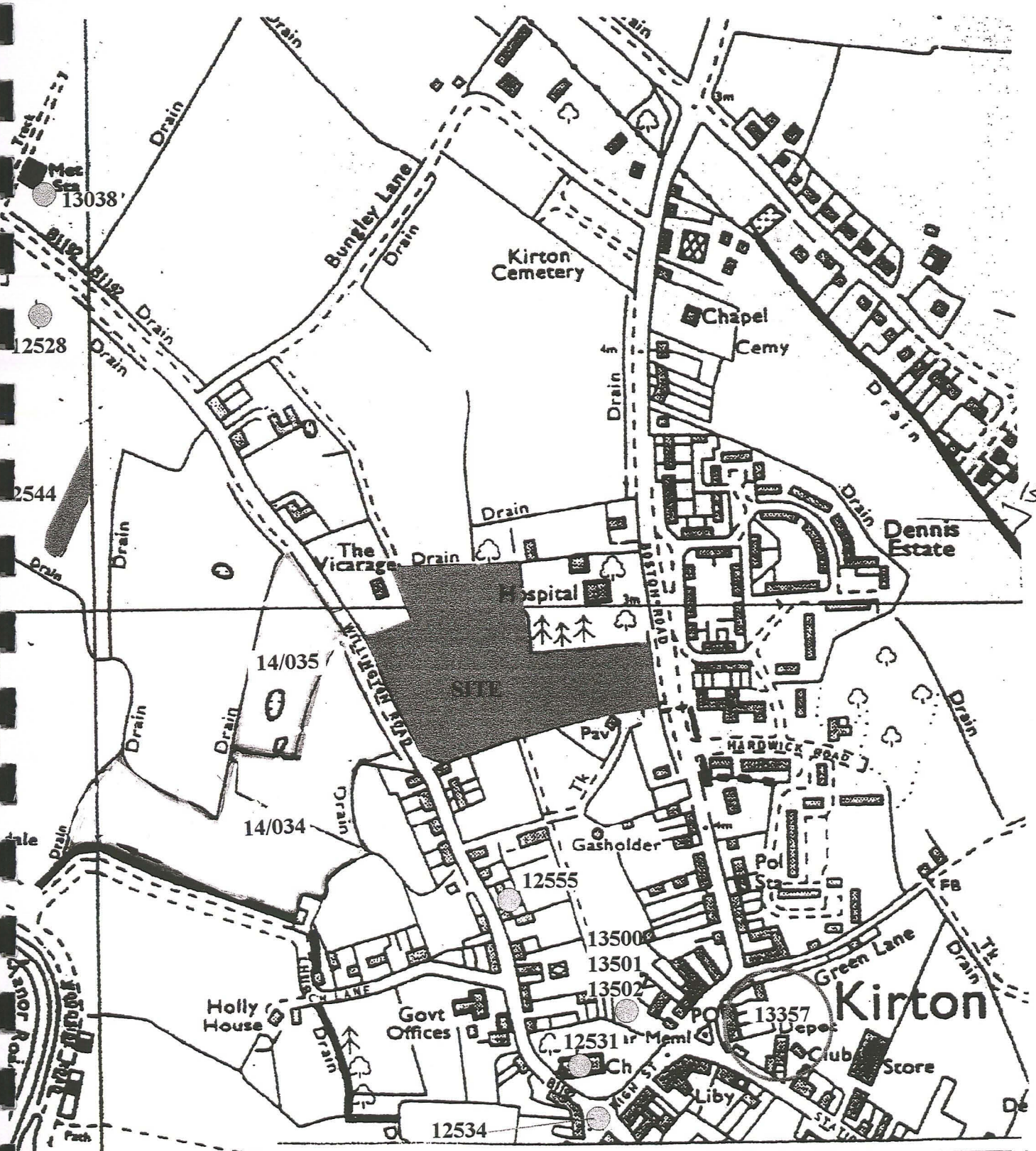


Figure 2 : Distribution of known archaeological remains in the vicinity

A Plan of the Old Inclosure and Salt Marsh
of the Parish of Kirton
in the County of Lincoln
1838

6 chains : 1 inch

Jebb & Son, Boston

(LRO ref : HD 67/11)

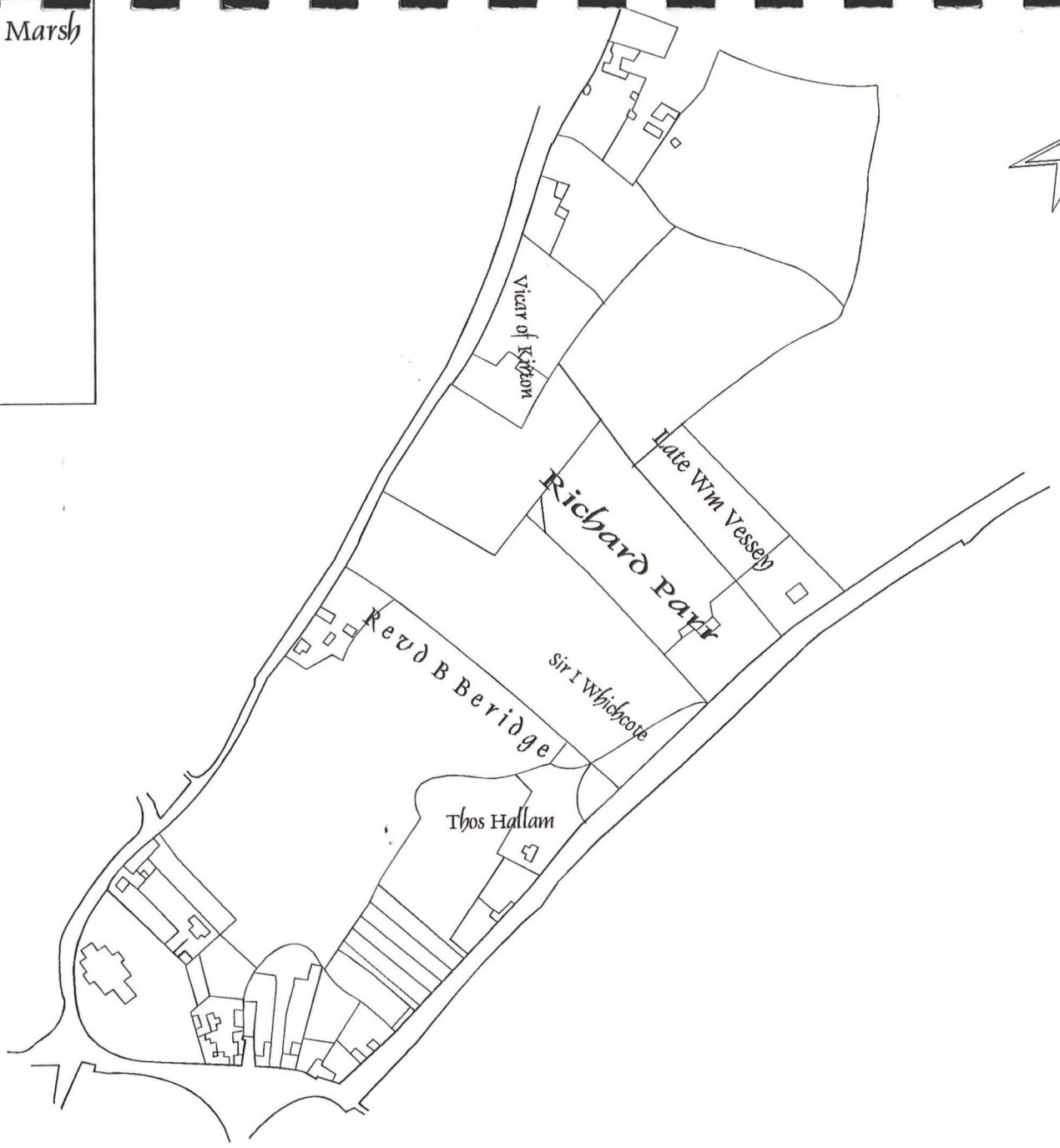


Figure 3 : A Plan of the Old Inclosure and Salt Marsh of the Parish of Kirton in the County of Lincoln 1838

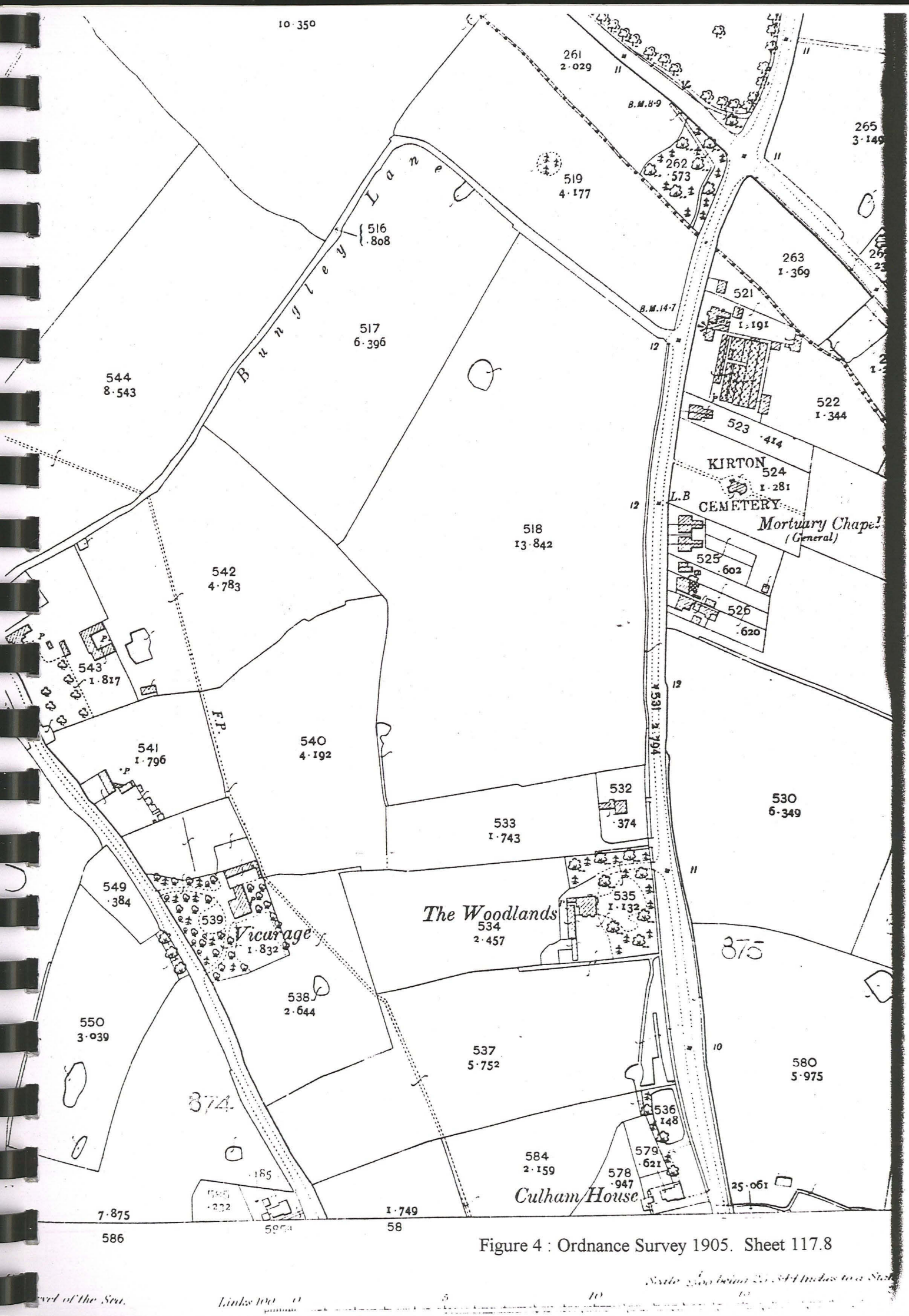


Figure 4 : Ordnance Survey 1905. Sheet 117.8

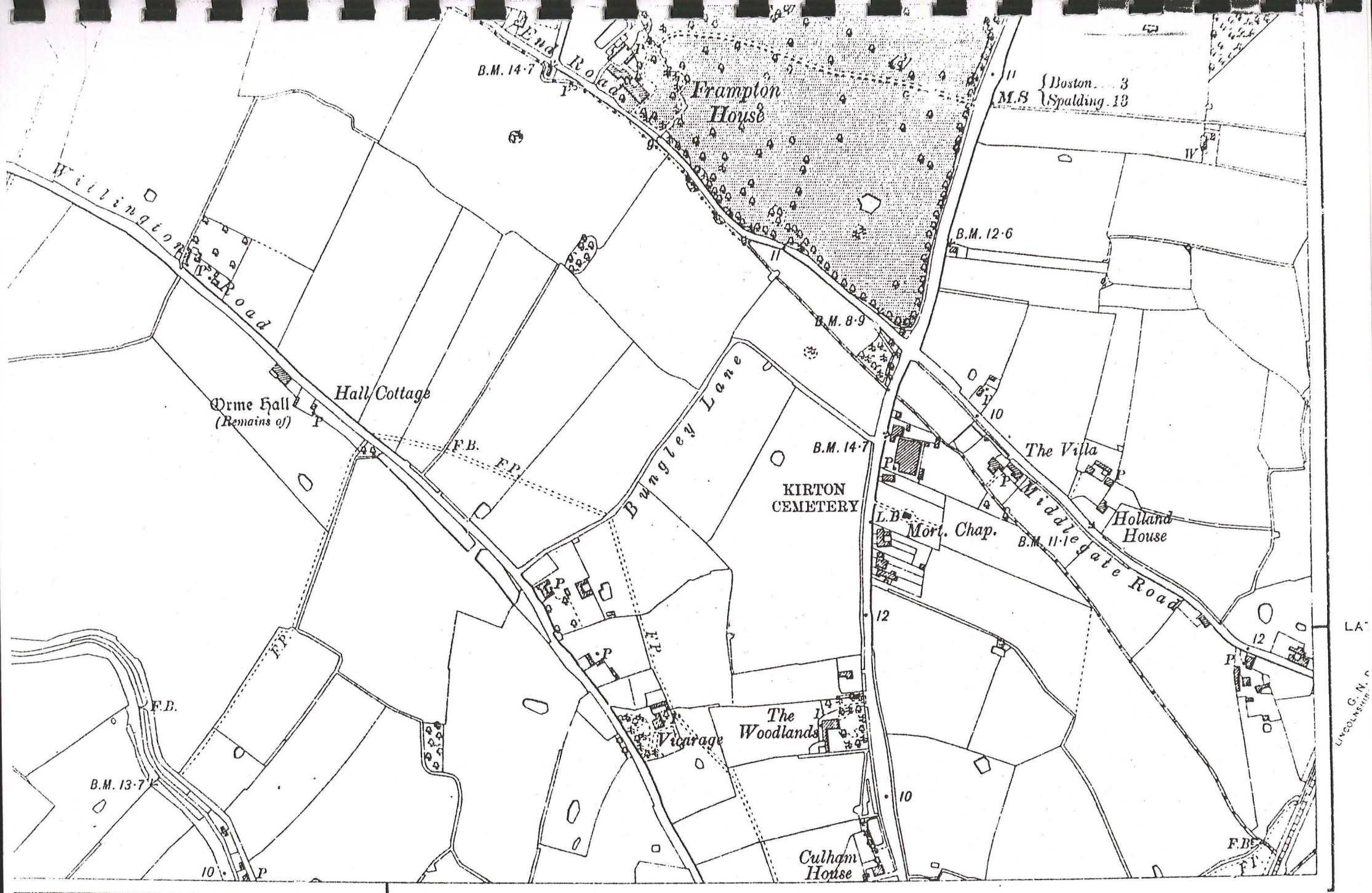
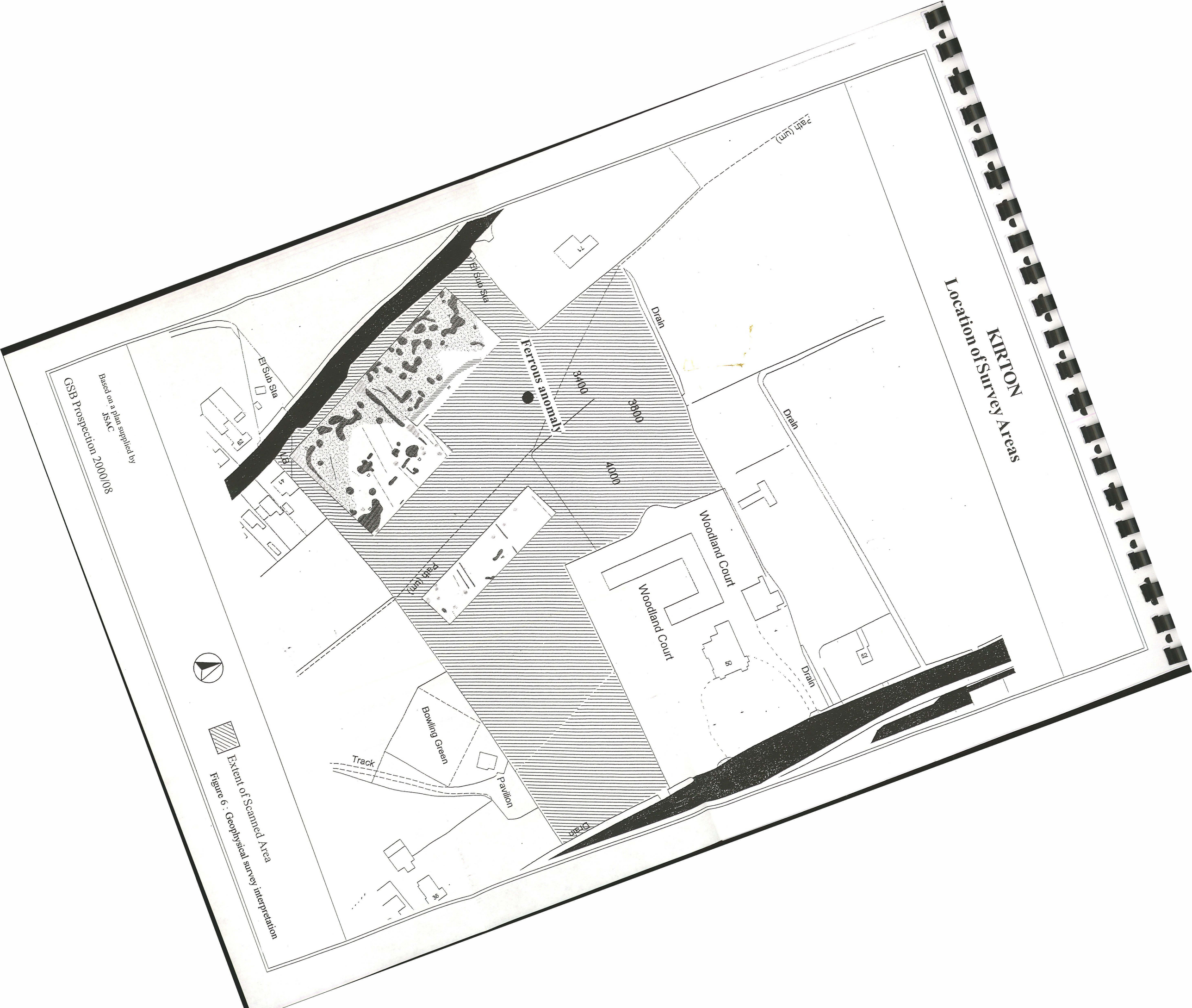


Figure 5 : Ordnance Survey 1906. Sheet 117.NE

KIRTON
Location of Survey Areas



Based on a plan supplied by JSAC

GSB Prospection 2000/08

Extent of Scanned Area

Figure 6 : Geophysical survey interpretation

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Maps & Plans

1792 Plan of Kirton (LRO ref : 3 Anc 5/48) - unavailable

18th century plan of Kirton (LRO ref : Lindsey Dep 40/36)

Jebb & Son, Boston 1838. *A Plan of the Old Inclosure and Salt Marsh of the Parish of Kirton in the County of Lincoln.* 6 chains : 1 inch (LRO ref HD 67/11)

Kirton Enclosure (Holland Fen) 1769 (LRO ref : Wigtoft Par 17/1)

Ordnance Survey 1867. *Sheet 37 Boston.* 1" : 1 mile

Ordnance Survey 1905. *Sheet 117.8.* 25" : 1 mile

Ordnance Survey 1906. *Sheet 117.NE.* 6" : 1 mile

Ordnance Survey 1910. *Sheet 56.* 1" : 1 mile

Ordnance Survey 1922. *Sheet 56.* 1" : 1 mile

Other sources

Lincolnshire Sites and Monuments Record (incl. Parish File)

Heritage Lincolnshire Archive - Parish File

Appendix A :

Relevant SMR Entries

SMR	Description	Importance
12528	Post-medieval artefact scatter on site of Orme Hall	Local
12531	Church of St Peter & St Paul	Regional
12534	site of medieval cross	Negligible
12544	Medieval pottery scatter	Local
12555	Possible mill stones found at 48 Willington Rd	Negligible
13038	Roman tile found at Orme Hall	Negligible
13357	medieval remains identified during evaluation at Station Rd	Local
13447	Crossing Keeper's Cottage. 19th century yellow brick building	Local
13500	Late Saxon remains identified during evaluation & watching brief at 17 High Street	Local
13501	Medieval remains identified during evaluation & watching brief at 17 High Street	Local
13502	Post-medieval remains identified during evaluation & watching brief at 17 High Street	Local

Appendix B :

A Specification for undertaking a geophysical survey of

Land at Boston Road / Willington Road, Kirton, Lincolnshire

John Samuels Archaeological Consultants

The Manor, South Street, Normanton on Trent, Newark, Nottinghamshire NG23 6RQ

Telephone 01636 821727 Fax 01636 822080 e-mail jsac@btconnect.com

A Specification for undertaking a geophysical survey of

Land at Boston Road / Willington Road, Kirton, Lincolnshire

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Planning ref : B/99/0494/FULL

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for

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JSAC 617/00/04

January 2000

Accession No.: 2000.29

A Specification for undertaking a geophysical survey of Land at Boston Road / Willington Road, Kirton, Lincolnshire

Contents

1.0 Introduction

1.1 The study area is situated between Willington Road and Boston Road in the village of Kirton, Boston, centred on NGR TF 3040 3894. The area proposed for development covers approximately 3.25 ha of land currently a mixture of fallow and vegetable crops.

1.2 Ashwood Homes commissioned *John Samuels Archaeological Consultants* to undertake a desk-based assessment to identify any archaeological remains in advance of the development of the site. In the light of the initial assessment of the archaeological potential, *JSAC* recommended a geophysical survey, the results of which could then be incorporated into the desk-based assessment, allowing an informed planning decision to be made. This was discussed with the Boston District Archaeologist, who has requested this specification.

1.3 This specification is based on the requirements of *Planning Policy Guidance Note 16 : Archaeology and Planning* (DoE, 1990). It is in accordance with current best archaeological practice and the appropriate national standards and guidelines, including: *Standard and Guidance for Archaeological Field Evaluation* (Institute of Field Archaeologists, 1994); *Management of Archaeological Projects* (English Heritage 1991); and *Archaeological Handbook* (Lincolnshire County Council 1998).

2.0 Archaeological Background

2.1 The site lies within the limits of a substantial medieval settlement. Although it is located north of the main development of the current settlement centre, it is possible that earlier settlement extended further north than is currently recognised.

2.2 The presence of a single Roman tile from the grounds of Orme House could indicate the presence of Romano-British settlement in the area.

2.3 No systematic survey has been undertaken in the area. However, upstanding earthworks have been identified in a field to the west of the site and associated features may continue into the proposed development site itself. The potential for as yet unidentified remains to exist within the proposed development site is considered to be medium.

3.0 Aims and Objectives

3.1 An evaluation is required to assess the nature of any archaeology on this site, in particular to see whether the earthworks continue into the application area.

4.0 Methodology

4.1 Earthworks have been identified in the adjacent field. Subsurface remnants of these features may continue into the application area.

4.2 Give the nature of archaeological remains that might be expected magnetometry is the preferred technique. It is proposed that the whole of the proposed area for road and house construction is scanned (3.25 ha) with up to 0.65ha of detailed survey where scanning indicates areas of potential interest.

4.3 **Scanning** - The area will be traversed at an interval of 10-15m, with the spacing decreasing when potential anomalies are located. The anomalies will be identified by visual assessment of the LCD screen of the gradiometer. This display constantly monitors the change in the earth's magnetic field - due to near surface variation, commonly ferrous, fired and more subtly enhanced features. The nature of the anomalies will be initially assessed during the scan. This will indicate if the responses are likely to be modern, for example a pipe. If the anomalies are still believed to be of archaeological potential then the position will be marked by a cane. Once the scan is complete then these anomalies will be further assessed using detailed/recorded survey.

4.4 **Detailed/Recorded Magnetometer Survey** - A Geoscan Research FM36 fluxgate gradiometer is a hand held device which measures small scale changes in the earth's magnetic field. The operators walk over the ground between temporary markers 20m apart. The survey area is divided into 20m x 20m grids within which data collection is undertaken. Survey measurements are collected with the FM36 instrument, sampling at 2 readings per metre with inter transect distances being 1m. Therefore, 800 readings are collected within each 20 x 20m grid. The data are captured in the internal memory of the FM36, and then downloaded onto portable computers. The individual grids are then matched together to produce an overall plan of the surveyed area. The results are analysed using a variety of in-house and commercial software.

4.5 The geophysical results which will include presentation of X-Y traces, dot-density plots and grey-scale images will be analysed and assessed against the results of a desk-based assessment based on an area of 500m around the proposed development site. It will comprise analysis of relevant information contained in and provided by the County Sites and Monuments Record (SMR); documentary and cartographic searches of relevant material in published and unpublished sources. Information about Scheduled Ancient Monuments, Registered Battlefields and Registered Parks & Gardens will be obtained from English Heritage.

4.6 A site visit and walkover survey has already been undertaken to examine the topography and current land use of the site, and to identify any previously unrecorded above ground archaeology.

4.7 Conclusions will be drawn and an indication provided of the archaeological potential of the proposed land for development and the importance of any sites directly affected or where their setting may be a consideration. Where appropriate, recommendations will be made.

4.8 At the time of writing there is no nationally agreed method of measuring the relative importance of archaeological monuments. PPG16 (paragraph 8) draws a distinction between nationally important remains and those of lesser distinction. On this basis it is possible to distinguish between monuments of national, regional local or negligible importance.

National Monuments that are scheduled and protected under the Ancient Monuments and Archaeological Areas Act (1979), those suitable for scheduling, or considered to be of national importance but not covered by the Secretary of State's criteria for scheduling.

Regional Sites listed in the Sites and Monuments Record (SMR) or other sources which are of a reasonably well defined extent, nature and date and significant examples in the regional context.

Local Sites listed in the SMR or other sources which are of very low potential or minor importance.

Negligible Areas in which investigative techniques have produced negative or minimal evidence of antiquity, or where large scale destruction of deposits has taken place (eg by mineral extraction).

4.9 The potential of a site to contain archaeological remains is based upon a consideration of its topography and the distribution and nature of recorded archaeological finds in the locality. It is measured on the basis of High, Medium, Low and Negligible.

4.10 The setting of a monument is generally considered what can be seen or heard to and from the monument. Its impact can be assessed on the basis of Major, Medium, Minor or Insignificant.

5.0 Report

5.1 The results of the geophysical survey will be presented as X-Y traces, dot-density plots and grey-scale images in an appendix to the assessment report which will comprise : Summary, Introduction, Methodology, Archaeological and Historical Background, Impact Assessment, a critical review of the techniques used, Conclusions and Recommendations for further work.

5.2 Copies of the report will be submitted to the District Archaeologist, Lincolnshire SMR, Boston District Council, and the client.

5.3 In accordance with the provision of the Copyright Design and Patents Act 1988, all intellectual property rights on all reports and recording resulting from the project will be assigned to the client.

5.4 The archive will be deposited with the City and County Museum and an accession code has been requested.

5.5 A note on the results will be prepared and offered for publication in the county archaeological journal.

6.0 Timetable

6.1 The geophysical survey will be undertaken by two people and is expected to be completed on one day in the week commencing 31 January 2000.

6.2 The report will be submitted within three weeks of completing the fieldwork.

7.0 Personnel

7.1 The geophysical survey will be undertaken by Dan Shiel andone other member of GSB Prospection, who will also produce the geophysical survey report.

7.2 The assessment report will be produced by Nansi Rosenberg BA, PIFA.

8.0 Monitoring

8.1 The Community Archaeologist will be welcome to monitor the survey as she wishes. It will be monitored internally by *JSAC*, ISO 9002 system.

9.0 Health and Safety

9.1 It is the policy of John Samuels Archaeological Consultants ('the Employer') to conform fully with the requirements of the Health & Safety at Work Etc. Act (1974).

9.2 It is accepted that it is the duty of the Employer to ensure, so far as is reasonably practical, the health and safety of all his employees at work.

9.3 The employer also has a duty to ensure that his employees are aware of their responsibility for their own health and safety, and for the health and safety of others, including the general public, who might be affected by their work.

9.4 Where employees are temporarily engaged at other workplaces, they are to respect relevant local regulations, both statutory and as imposed by other employers within the Health and Safety at Work etc. Act (1974).

9.5 In furtherance of the duty of care imposed by the Health & Safety at Work etc. Act (1974), the Employer shall make available to his employees whatever reasonable facilities

are required by particular circumstances, e.g. appropriate protective clothing, safety equipment, rest breaks for specialised tasks, etc.

9.6 Attention is paid to the requirements of more recent legislation including the provision and use of *Work Equipment Regulations* 1992, the *Management of Health and Safety at Work Regulations* 1992 and the *Construction (Design and Management) Regulations* 1994. A risk assessment is undertaken, a safety officer appointed and all aspects of health and safety nominated during work.

10.0 Figures

Figure 1 : Site Location (1:5,000)

Figure 2 : Site Location (1:1250)

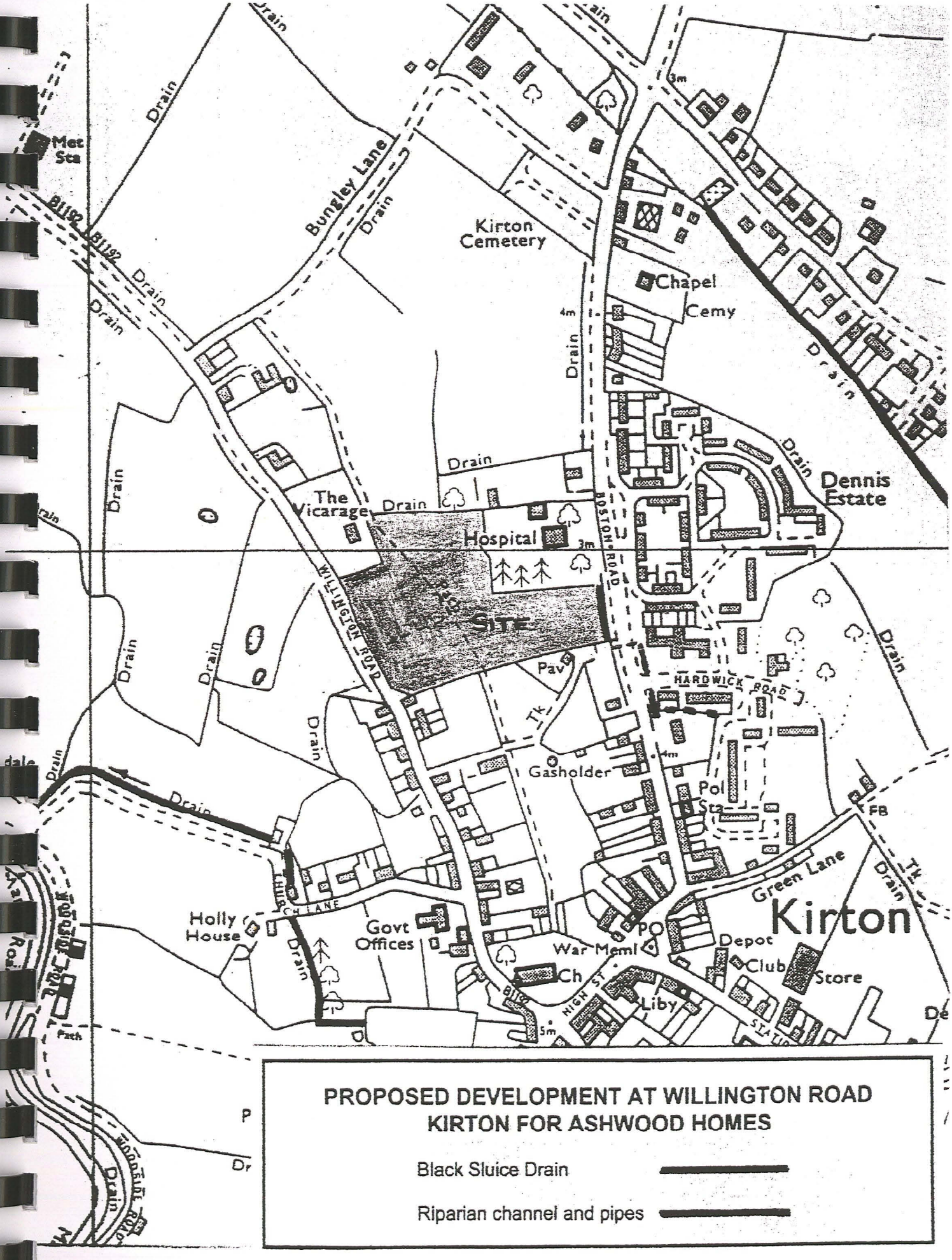

Figure 1 : Site Location (1 : 5000)

Figure 2 : Site Location (1 : 1250)

Appendix C :

Geophysical Survey Report 2000/08

Kirton, Lincolnshire

by GSB Prospection

GSB
PROSPECTION

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GEOPHYSICAL SURVEY REPORT 2000/08

KIRTON
Lincolnshire

Client:

John Samuels
Archaeological Consultants

SITE SUMMARY SHEET

2000 / 08 Kirton, Lincolnshire

NGR: TF 3040 3894

Location, topography and geology

The site lies 0.5km to the north of the village of Kirton, Lincolnshire. It consists of three level fields, two arable and one pasture, lying between Boston Road in the east and Willington Road in the west. The soils comprise deep stoneless silts and sands formed over marine alluvium that are characteristic of the Rockcliff association (811d). The soils are variably affected by groundwater depending on the presence of artificial drainage (SSEW, 1983).

Archaeology

The site lies within the limits of a substantial medieval settlement but there is no information regarding the presence of archaeological remains within application area. A single Roman tile has been recovered nearby and earthworks are present in the field to the west of the site (JSAC, 2000).

Aims of Survey

The aim of the survey was to locate and identify the nature and extent of any archaeological remains that may be present within a proposed residential development. The work forms part of an archaeological assessment being undertaken by **John Samuels Archaeological Consultants (JSAC).**

Summary of Results *

A scan of the application area identified a region of increased magnetic response immediately to the east of Willington Road. Elsewhere, the level of observed background response was low.

Detailed gradiometer survey, mainly on the western part of the site, has detected a concentration of archaeological type anomalies. Despite the lack of a clearly recognisable archaeological pattern, the results are consistent with the remains of a roadside medieval settlement. They suggest that disturbance to archaeological deposits may have occurred, possibly the ploughing out of earthworks.

Weak linear trends and several pit anomalies are present in a second survey area in the centre of the site. The results from this area serve to illustrate the low level of background response observed over the majority of the application area during scanning.

*** It is essential that this summary is read in conjunction with the detailed results of the survey.**

SURVEY RESULTS

2000 / 08 Kirton, Lincolnshire

1. Survey Area

1.1 An investigation of the evaluation area, using gradiometers in scanning mode, covered 3.25ha. A total of 0.72ha of recorded survey, Areas A and B, followed the scan. Figure 1 shows the location of the survey areas and the extent of the scan at a scale of 1:1250.

1.2 **GSB Prospection** set out the survey grid and tied it in to the existing boundaries.

2. Display

2.1 X-Y traces, dot density plots and grey scale images are used to display the results of the survey. A discussion of these formats is present in the *Technical Information* section, at the end of the text.

2.2 Figures 2 to 8 show data plots and interpretation diagrams of the results from both survey areas at a scale of 1:500.

2.3 Letters in parentheses in the text of the report refer to anomalies highlighted in the relevant interpretation diagram.

3. General Considerations - Complicating Factors

3.1 Conditions for survey were generally good; the three fields were free of obstacles and had a short vegetation cover.

3.2 The soils are of a type that commonly give a low to moderate level of magnetic response. However, where strong magnetic enhancement is likely to have taken place, that is within core occupation areas, a good level of magnetic response is likely.

4. Results of Scanning

4.1 With a gradiometer in scanning mode, an investigation of the evaluation area took place at intervals of approximately 10m. During this operation, fluctuations in magnetic signal were observed on the instruments display panel. Any significant variations were investigated more closely to determine their likely origin and those anomalies considered to have archaeological potential were marked with canes for detailed recorded survey.

4.2 Except for occasional small scale ferrous anomalies, the proposed development area exhibited a low level of magnetic response.

4.3 Scanning identified a region of high archaeological potential along the western edge of the evaluation area, adjacent to Willington Road. Dense groups of pit type anomalies appeared to be present within a general increase in magnetic background response. A second area of potential was noted during scanning immediately to the east of a footpath that runs approximately north-south across the survey area. However, in contrast to western part of the field, the anomalies appeared to be magnetically weaker.

4.4 Ferrous disturbance, probably due to the presence of a pipe or pipes, is present in the easternmost part of the site, adjacent to Boston Road.

4.5 A second region of ferrous interference occurred a short distance to the southeast of The Vicarage. Included in Figure 1 is the approximate location of this large anomaly. It is believed to be due to ferrous debris contained within the fill of a former pond (local resident, *pers. comm.*).

4.6 Given the significant change in magnetic response noted along the edge of Willington Road, most of the detailed survey lies along the western edge of the application area (Area A), with a smaller sample block in the central area (Area B).

5. Results of Detailed Survey

Area A

5.1 The results show groups of anomalies that appear to be most dense along the western edge of the survey area. A linear response, running approximately east-west, divides the survey area into two parts. A field boundary, showing as a change in cultivation, has produced this anomaly.

5.2 When compared to the level of magnetic response observed across the remainder of the site, this anomalous region provides a striking contrast. The responses appear to relate to settlement features, though a natural origin cannot dismissed; strong magnetic anomalies are common in soils associated with marine alluvium. However, the nature of the responses suggest that they relate to occupation remains. Although they appear to be unenclosed, they comprise dense groupings of strong anomalies contained within a noisy magnetic background; this is consistent with remains associated with medieval settlement. The lack of a clear archaeological pattern may be due to plough damage to an earthwork site. Earthworks are present in the field immediately to the west of the application area.

5.3 Although the anomalies indicated on the interpretation diagram probably relate to cut features, some of the responses may be of more significance. Anomalies (A), in the northern part of the survey are magnetically very strong and may represent the remains of burnt structures, such as hearths, or features containing burnt material.

5.4 A cluster of anomalies (B), in the centre of the survey area, includes two 'L' shaped responses, one being very narrow. These responses may indicate the site of a dwelling, though the interpretation is tentative.

5.5 Two groups of anomalies (C), at the western edge of the survey area, are magnetically strong but may be due to modern ferrous debris. In particular, the responses in the southwestern corner coincide with a noticeable rise in ground level that may be due to imported material.

5.6 Three anomalies (D), in the magnetically quieter eastern portion of the site, are less likely to be archaeological in origin. They are large anomalies, lying outside the main occupation area and are magnetically weaker than those recorded in the west; they could represent natural soil variations. Alternatively, the southernmost anomaly could indicate the position of a former

pond. A backfilled pond apparently lies a short distance to the north (see Section 4.5, above) and several ponds are present in the field immediately to the west of the site.

5.7 A negative linear anomaly (E), in the northeastern part of the site, coincides with a visible rise in ground level to the west. It may indicate the course of a boundary and, therefore, could be of archaeological significance. It is possible that anomaly (E) indicates the course of a hollow way. This feature appears to mark the limit of intensive occupation activity; scanning to the east showed a low level of background response.

5.8 Several linear trends are present in the data. Mostly aligned approximately east-west, they are likely to relate to recent ploughing.

Area B

5.9 The results from Area B illustrate the low level of background response observed over the majority of the site during the scan.

5.10 Several pit type anomalies are present on the interpretation diagram, but anomaly (F) appears to be the most convincing archaeological response and may represent a feature located at the edge of the occupation area.

5.11 Several linear responses and trends are present in the data and may be of archaeological interest. However, they all share an approximate east-west alignment that suggests an agricultural origin, such as ploughing.

6. Conclusions

6.1 The scan of the proposed development area recorded a generally low level of magnetic response. However, a distinct increase in magnetic response is apparent in the western part of the site, adjacent to Willington Road.

6.2 Detailed gradiometer survey detected a concentration of archaeological type anomalies. They were consistent in nature with remains of medieval settlement, with a frontage along Willington Road. There is independent evidence to support the interpretation; earthworks, presumed to be of medieval date, are present in the field to the west of the road. In addition, the site lies within a wider area of medieval occupation centred on the village of Kirton, a short distance to the south. The lack of a recognisable archaeological pattern may be due to disturbance to archaeological deposits by ploughing or the nature of the buried features. The results appear to define the eastern limit of the core settlement area.

6.3 Weak linear trends and several pit anomalies are apparent in the centre of the site. However, the nature of the anomalies and their comparatively isolated appearance suggest that they lie on the margins of the occupation area.

Project Co-ordinator: D Shiel
Project Assistants: Dr C F Gaffney & A Shields

Date of Survey: 1st and 2nd February 2000
Date of Report: 5th February 2000

References:

JSAC, 2000. *A specification for undertaking a geophysical survey of land at Boston Road / Willington Road, Kirton, Lincolnshire.* John Samuels Archaeological Consultants. unpublished report.

SSEW, 1983. *Soils of England and Wales. Sheet 4, Eastern England.* Soil Survey of England and Wales.

TECHNICAL INFORMATION

The following is a description of the equipment and display formats used in **GSB Prospection (GSB)** reports. It should be emphasised that whilst all of the display options are regularly used, the diagrams produced in the final reports are the most suitable to illustrate the data from each site. The choice of diagrams results from the experience and knowledge of the staff of **GSB.**

All survey reports are prepared and submitted on the basis that whilst they are based on a thorough survey of the site, no responsibility is accepted for any errors or omissions.

Instrumentation

(a) Fluxgate Gradiometer - Geoscan FM36

This instrument comprises of two fluxgates mounted vertically apart, at a distance of 500mm. The gradiometer is carried by hand, with the bottom sensor approximately 100-300mm from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is conventionally measured in nanoTesla (nT), or gamma. The fluxgate gradiometer suppresses any diurnal or regional effects. Generally features up to one metre deep may be detected by this method. Readings are normally logged at 0.5m intervals along traverses 1.0m apart.

(b) Resistance Meter - Geoscan RM15

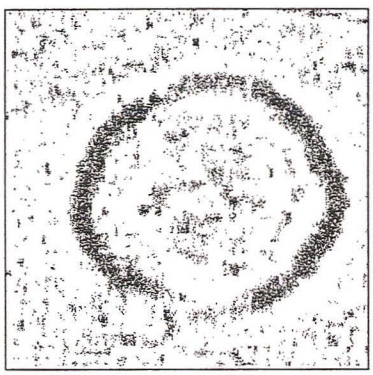
This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. The "Twin Probe" arrangement involves the paring of electrodes (one current and one potential) with one pair remaining in a fixed position, whilst the other measures the resistance variations across a fixed grid. The resistance is measured in Ohms and the calculated resistivity is in Ohm-metres. The resistance method as used for area survey has a depth resolution of approximately 0.75m, although the nature of the overburden and underlying geology will cause variations in this generality. The technique can be adapted to sample greater depths of earth and can therefore be used to produce vertical "pseudo sections". In area survey readings are typically logged at 1.0m x 1.0m intervals.

(c) Magnetic Susceptibility

Variations in the magnetic susceptibility of subsoils and topsoils occur naturally, but greater enhanced susceptibility can also be a product of increased human/anthropogenic activity. This phenomenon of susceptibility enhancement can therefore be used to provide information about the "level of archaeological activity" associated with a site. It can also be used in a predictive manner to ascertain the suitability of a site for a magnetic survey. The instrument employed for measuring this phenomenon is either a field coil or a laboratory based susceptibility bridge. For the latter 50g soil samples are collected in the field. Sampling intervals vary widely but are often at the 10m or 20m level.

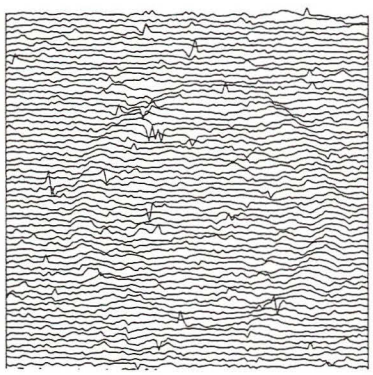
Display Options

The following is a description of the display options used. Unless specifically mentioned in the text, it may be assumed that no filtering or smoothing has been used to enhance the data. For any particular report a limited number of display modes may be used.



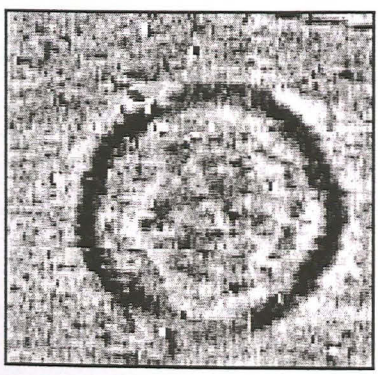
(a) Dot Density

In this display minimum and maximum cut-off levels are chosen. Any value that is below the minimum will appear white, whilst any value above the maximum will be black. Values that lie between these two cut-off levels are depicted with a specified number of dots depending on their relative position between the two levels. Assessing a lower than normal reading involves the use of an inverse plot that reverses the minimum and maximum values, resulting in the lower values being presented by more dots. In either representation, each reading is allocated a unique area dependent on its position on the survey grid, within which numbers of dots are randomly placed. The main limitation of this display method is that multiple plots have to be produced in order to view the whole range of the data. It is also difficult to gauge the true strength of any anomaly without looking at the raw data values. However, this display is favoured for producing plans of sites, where positioning of the anomalies and features is important.



(b) XY Plot

This involves a line representation of the data. Each successive row of data is equally incremented in the Y axis, to produce a stacked profile effect. This display may incorporate a hidden-line removal algorithm, which blocks out lines behind the major peaks and can aid interpretation. The advantages of this type of display are that it allows the full range of the data to be viewed and shows the shape of the individual anomalies. The display may also be changed by altering the horizontal viewing angle and the angle above the plane. The output may be either colour or black and white.



(c) Greyscale

This format divides a given range of readings into a set number of classes. These classes have a predefined arrangement of dots or shade of grey, the intensity increasing with value. This gives an appearance of a toned or grey-scale. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. While colour plots can look impressive and can be used to highlight certain anomalies, greyscales tend to be more informative.

Terms commonly used in the graphical interpretation of gradiometer data

Ditch / Pit

This category is used only when other evidence is available that supports a clear archaeological interpretation e.g. cropmarks or excavation.

Archaeology

This term is used when the form, nature and pattern of the response is clearly archaeological but where no supporting evidence exists. These anomalies, whilst considered anthropogenic, could be of any age. If a more precise archaeological interpretation is possible then it will be indicated in the accompanying text.

? Archaeology

The interpretation of such anomalies is often tentative, with the anomalies exhibiting either weak signal strength or forming incomplete archaeological patterns. They may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.

Areas of Increased Magnetic Response

These responses show no visual indications on the ground surface and are considered to have some archaeological potential.

Natural

These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions e.g. palaeochannels or magnetic gravels.

? Natural

These are anomalies that are likely to be natural in origin i.e geological or pedological.

Ridge and Furrow

These are regular and broad linear anomalies that are presumed to be the result of ancient cultivation. In some cases the response may be the result of modern activity.

Ploughing Trend

These are isolated or grouped linear responses. They are normally narrow and are presumed modern when aligned to current field boundaries or following present ploughing.

Linear Trend

This is usually an ill-defined, weak or isolated linear anomaly of unknown cause or date.

Areas of Magnetic Disturbance

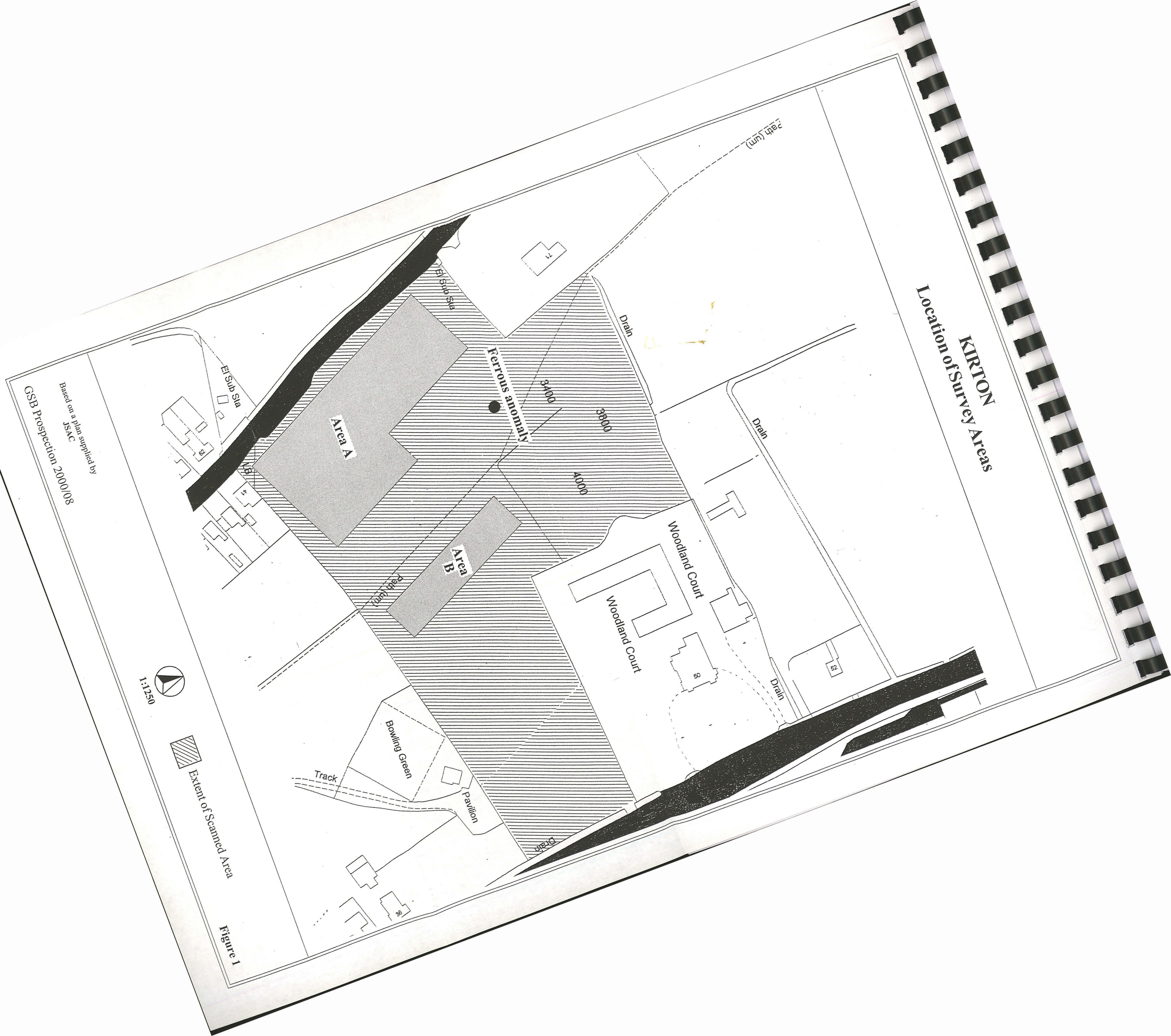
These responses are commonly found in places where modern ferrous or fired materials are present e.g. fencelines, pylons or brick rubble. They are presumed to be modern.

Ferrous Response

This type of response is associated with ferrous material and may result from small items in the topsoil or larger buried objects such as pipes. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.

List of Figures

KIRTON
Location of Survey Areas

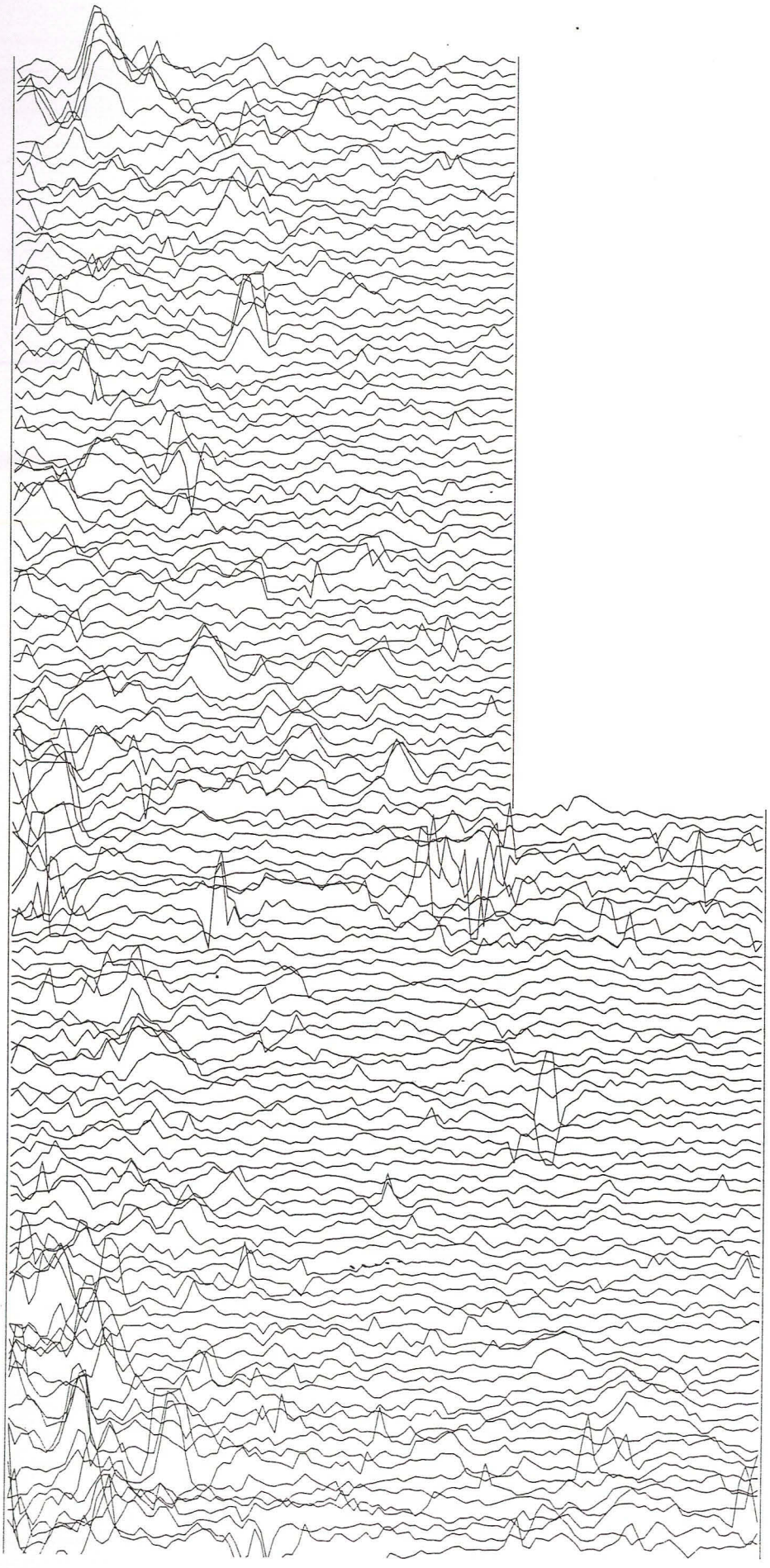


Based on a plan supplied by JSAC

GSB Prospection 2000/08

Figure 1

KIRTON
Area A



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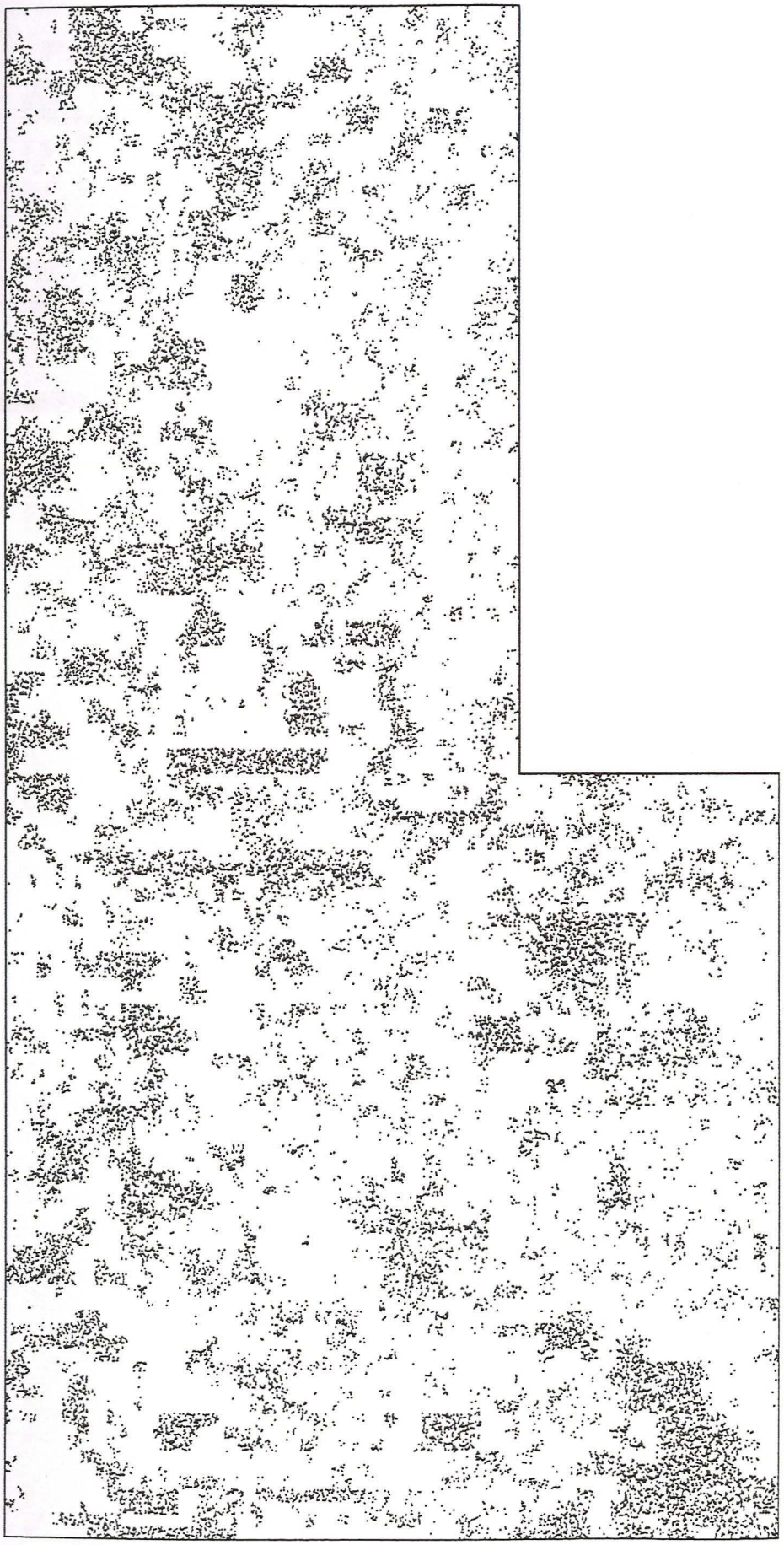
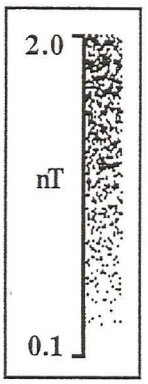
GSB Prospection 2000/08

Figure 2

KIRTON
Area A





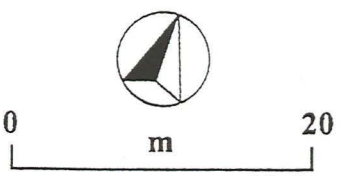
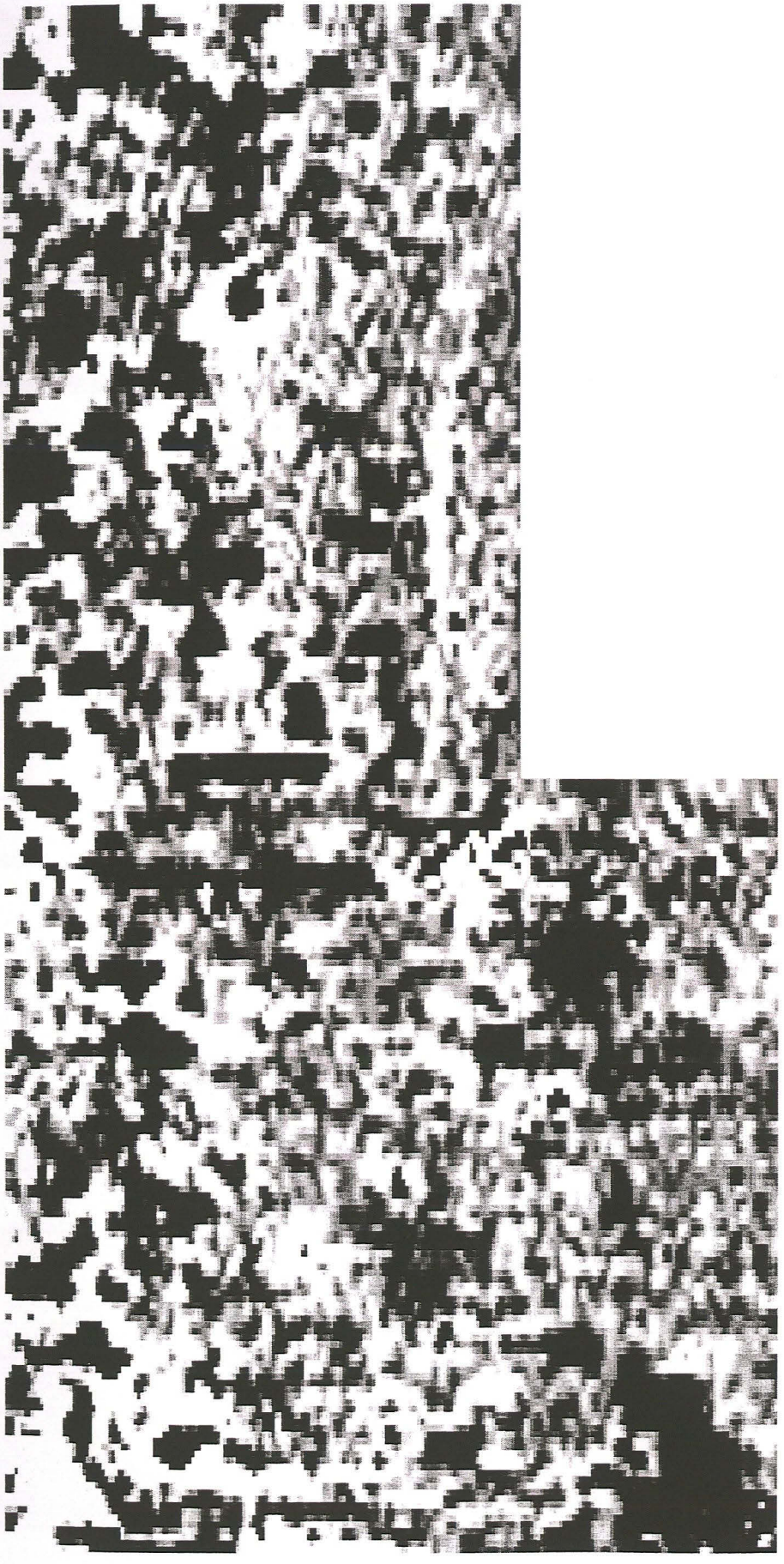
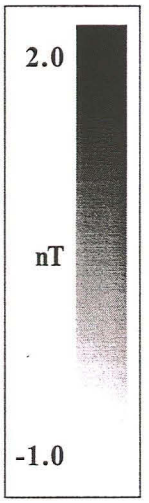


Figure 3

KIRTON
Area A





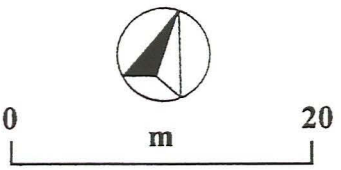


Figure 4

KIRTON
Area A

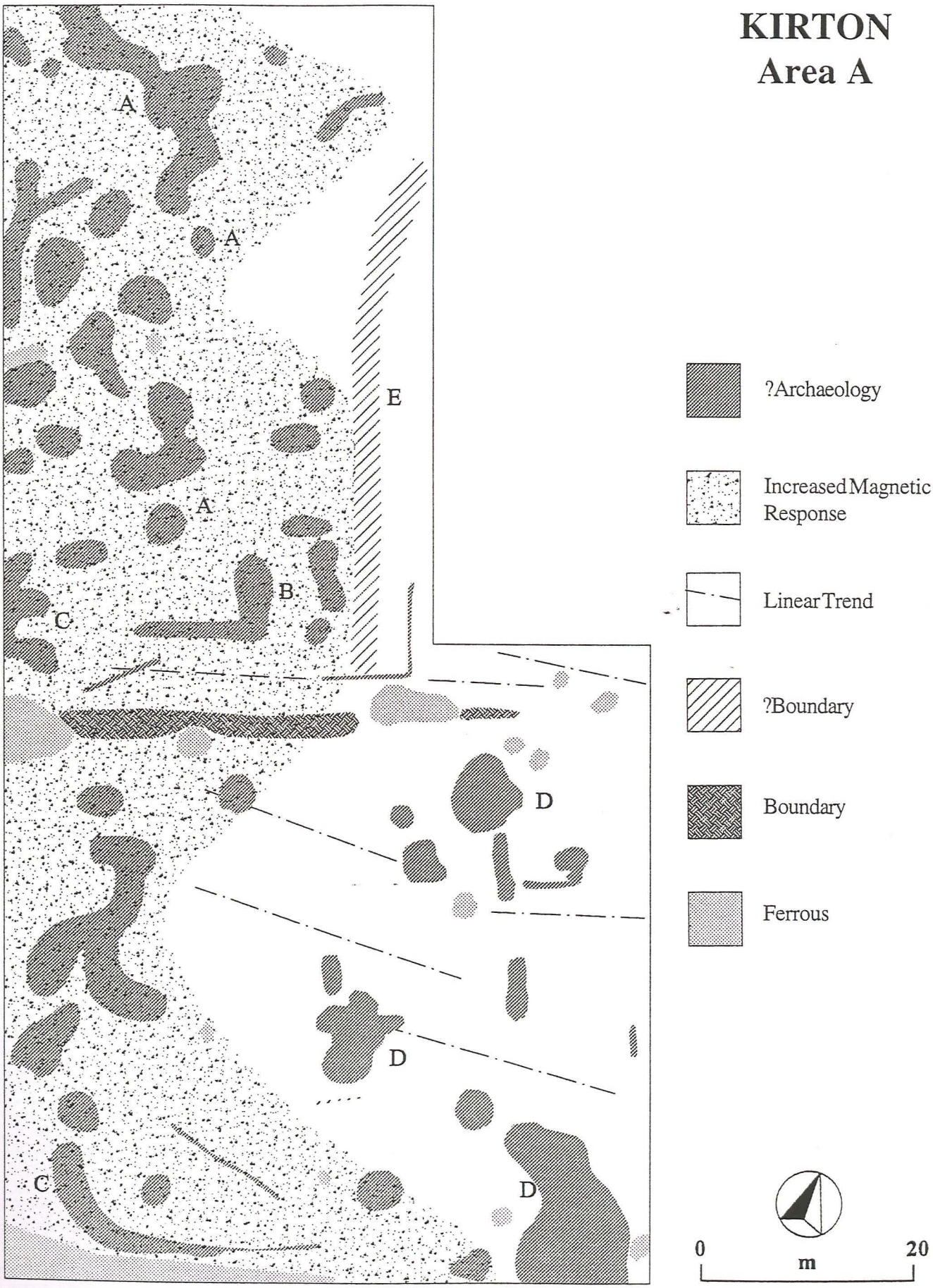
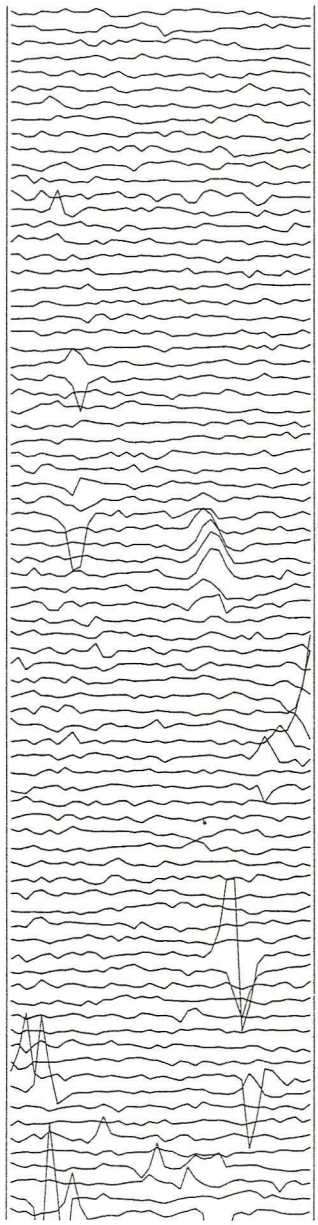
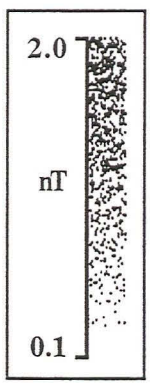


Figure 5

KIRTON
Area B



15 nT



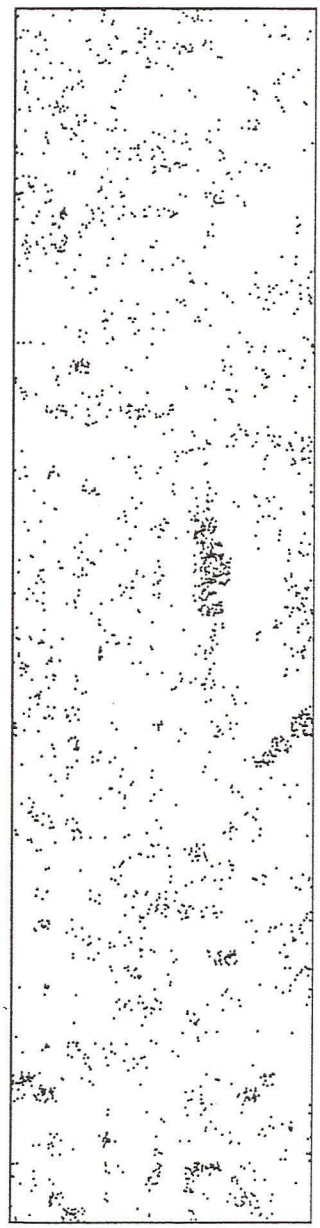


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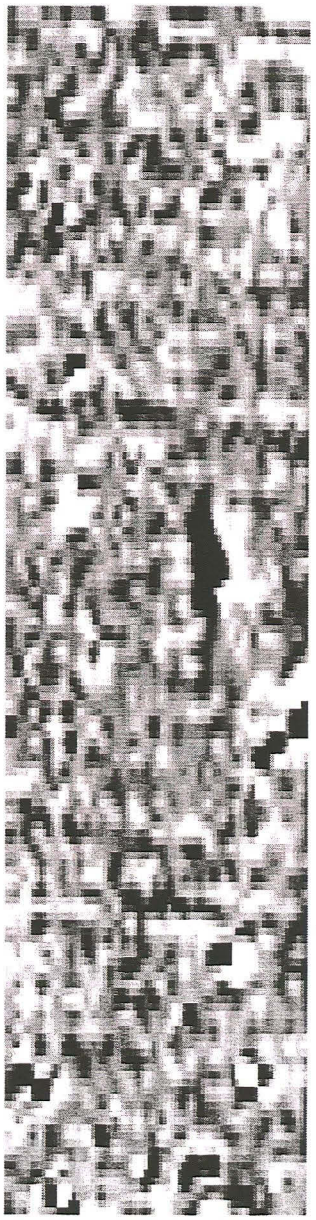
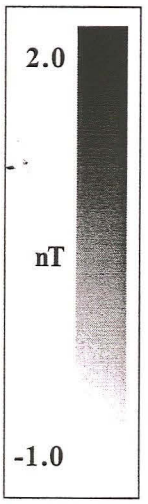
Figure 6

KIRTON
Area B





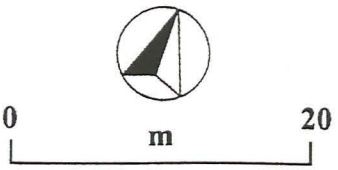
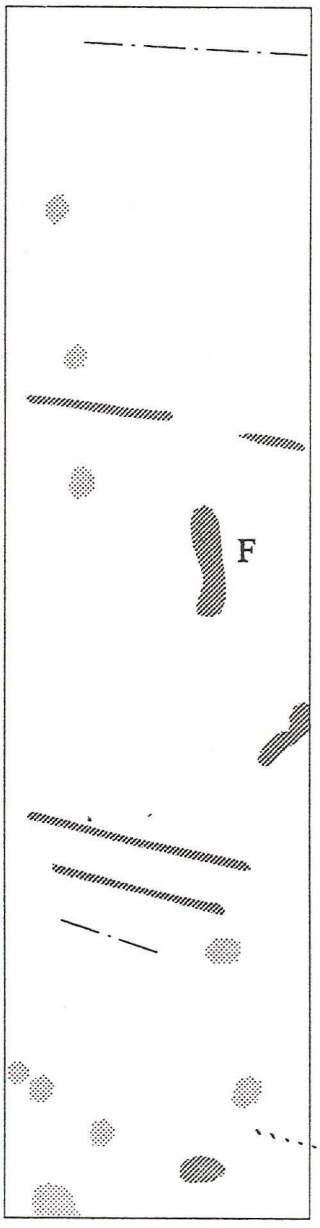


Figure 7

KIRTON
Area B



?Archaeology

Linear Trend

Ferrous

0 m 20

GSB Prospection 2000/08

Figure 8