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**GEOPHYSICAL AND
FIELDWALKING SURVEY
ON LAND AT WALCOTT ROAD,
BILLINGHAY,
LINCOLNSHIRE
(BWR02)**



A P S
ARCHAEOLOGICAL
PROJECT
SERVICES

Conservation
Services

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**GEOPHYSICAL AND
FIELDWALKING SURVEY
ON LAND AT WALCOTT ROAD,
BILLINGHAY,
LINCOLNSHIRE
(BWR02)**

Work Undertaken For
Warrington Builders and Developers Ltd
and Clive Wicks Associates

April 2002

Report Compiled by
Tobin Rayner BSc (Hons), AIFA

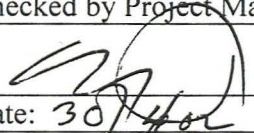
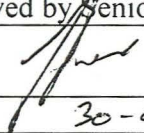
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1. SUMMARY

A geophysical and fieldwalking survey was undertaken to determine the archaeological implications of a proposed residential development on land at Walcott Road, Billinghay, Lincolnshire.

The site lay within an area of known archaeological activity dating from the Early Bronze Age (2400-1800 BC) to modern periods.

The geophysical survey recorded no anomalies of potential archaeological origins. The only responses were to modern fences and a track way.

A total of 25 artefacts was recovered during fieldwalking ranging in date from the medieval to modern periods. The artefactual remains probably derived from manuring and suggest that the area was agricultural land on the edge of any settlement. Furthermore, this situation appears to have been maintained until the early modern period.

2. INTRODUCTION

2.1 Planning Background

The area is the site of a proposed residential development. The North Kesteven Heritage Officer recommended that a non-intrusive archaeological evaluation, comprising geophysical and fieldwalking surveys, be carried out to provide information to assist the determination of any planning application.

Archaeological Project Services were commissioned by Warrington Builders and Developers Ltd to undertake the investigation. Fieldwalking was carried out on the 2nd April 2002.

The investigations were carried out in accordance with a specification prepared by APS and approved by the North Kesteven Heritage Officer (Appendix 1).

2.2 Topography and Geology

Billinghay is located 13km northeast of Sleaford and 25km southeast of Lincoln, North Kesteven District, Lincolnshire (Fig. 1).

The site is situated in the northwest of the village, on the north side of Walcott Road, to the rear of the cemetery at National Grid Reference TF 150 552. It is an irregular block of land of c. 1.5ha.

Billinghay sits on a slight ridge on the southern edge of the Witham valley, almost surrounded by low-lying and formerly wet fen. The site lies on the northern edge of this ridge at about 10m OD. Soils at the site are fine and coarse loamy over clayey soils of the Beccles 2 Association developed on chalky till and glaciofluvial drift (Hodge *et al.* 1984, 119).

2.3 Archaeological Setting

Billinghay is situated in an area of known archaeological remains dating from the Early Bronze Age (2400-1800 BC) and later. Pottery of this period, of a type known as Beaker ware, has been found west of the village centre (NK9.6). Other finds of this period are known from throughout the parish and include bronze swords from Billinghay Dales and flints from north of the village.

Romano-British remains include a coin of the Emperor Constans (AD 333-50). A Roman cemetery is also believed to lie in the vicinity of the area known as The Whyche as ten skeletons and associated pottery were found while excavating

gravel pits (Trollope 1872, 79). The Car Dyke, a Roman watercourse is also located in the vicinity, less than 100m to the north of the investigation area. This once connected the River Witham near Lincoln with the River Nene east of Peterborough and may have had a drainage function (Simmons and Cope-Faulkner 1997). There is some dispute regarding the course of the Car Dyke in Billingham, some have seen the Car Dyke as turning and following the course of the Billingham Skirth, whereas others have suggested it continued in a southeasterly direction (Cope-Faulkner 1998, 2).

Billingham is first mentioned in the Domesday Survey of 1086. Referred to as *Belingei*, the name is derived from the Old English 'island of land of the Billingas' (Cameron 1998, 14). The Billingas or Bilmigas are thought to be the name of a Saxon tribe, whose presence in the area is preserved in the place-names of Billingham and Horbling. The area in Billingham known as the Whyche is also Saxon in origin and is derived from the Latin *vicus*, meaning dwelling or village (Ekwall 1974, 515).

At the time of the Domesday Survey, Billingham belonged to the Archbishop of York and contained 16 acres of meadow and 3 fisheries (Foster and Longley 1976).

The medieval period (1066-1500 AD) is best represented by the parish church of St. Michael, dating to the 13th century (Pevsner and Harris 1989, 146). The Billingham Skirth is also medieval, although possibly utilised the course of the Car Dyke, and is known to have existed by 1200 AD (Hallam 1965, 104).

3. AIMS

The aims of the combined field walking and geophysical surveys were to gather information on the presence or absence of archaeology within the application area to enable the archaeological curator to formulate a scheme for the management of any such remains. The objectives were to establish the form, spatial arrangement, density and date range of any archaeological features present on the site.

4. METHODS

Geophysical

The entire field was subject to fluxgate gradiometry, accompanied by volume-specific magnetic susceptibility survey using a Bartington field coil.

Fieldwalking

Field walking was undertaken of the area on transects at approximate 10m intervals, using plough and drill furrows as a directional guide. Surface artefacts were collected, bagged and assigned a unique reference number. Each of these finds were accurately plotted using a Geodolite Total Station, placed within a site-specific grid. During the fieldwalking, the surface of the field was inspected for evidence of earthwork and soil-mark features (Figure 4).

5. RESULTS

Geophysical

No anomalies of potential archaeological origins were recorded. The faint slightly curving strips (Appendix 3, Fig. 2) are probably the result of local geological conditions. The boundaries of the development area are marked by modern fences, structures and an access track that

gave rise to ferromagnetic responses (Appendix 3, Fig. 4).

Fieldwalking

Fieldwalking took place on the 2nd April 2002. Field conditions were changeable with crop and drilled areas making visibility variable across the site.

A total of 25 items was recovered during the fieldwalking of which ceramic building material was by far the most abundant and ranging in date from the post-medieval to modern periods (Appendix 2).

A single fragment of pottery of probable 13th-15th century date is the earliest material recovered and there is only one other possible medieval artefact. The great majority of the assemblage is post-medieval, 16th-18th century, in date, and brick/tile forms the main component, providing 17 of the 27 items (63%) retrieved.

One of the tile fragments, Plot 14, was cut down in the past for reuse. The object was trimmed to a width of 54mm and the cut edge smoothed. It is unclear what function this tile fragment served during its reuse but its employment as a hone or whetstone is possible.

A single piece of Swithland roofing slate was retrieved. Although Swithland slate was quarried and utilised in the Roman period it was not used extensively outside the Leicester area until the 17th century and was largely replaced by the Welsh slate industry in the mid 19th century (Ball and Jones 1976, 51-2), this chronology therefore suggesting the post-medieval date for the piece.

6. DISCUSSION

Geophysical

The absence of anomalies of archaeological potential, recorded during the geophysical survey, suggest that the development area has probably not been inhabited at any time and that any utilisation of the site was related to agriculture. However, this apparent lack of features may be due to the geophysical techniques employed.

Fieldwalking

As a fairly small and predominantly post-medieval collection, the assemblage is of limited local significance. The low quantities of artefacts overall indicate that the site was never inhabited. The isolated medieval artefacts, one fragment of pottery, one of tile, probably entered the area in manuring scatter, suggesting that the site served an agricultural function at that time. The same probably applies to the post-medieval component of the assemblage. However, the greater quantity of material of this period, and the high percentage of tile/brick, probably reflects the closer proximity of buildings during this period.

The absence of any material earlier than the 13th century is informative and suggests that the area was neither occupied nor functioned as arable land prior to this date.

7. ASSESSMENT OF SIGNIFICANCE

For assessment of significance the Secretary of State's criteria for scheduling ancient monuments has been used (DoE 1990, Annex 4; See Appendix 4).

Period

Activity dateable from the probable medieval to the early modern periods has been recognised within the assessment area.

Rarity

The medieval and later artefactual remains identified at the proposed development site are characteristic of manuring scatters indicating an agricultural setting on the edge of settlement and as such is quite common.

Documentation

Records of archaeological sites and finds made in the assessment area are kept in the Lincolnshire Sites and Monuments Record and parish files of the North Kesteven Heritage Officer.

Group value

The sparse nature of the archaeological evidence from the assessment area does not present any temporal or spatial group value. The scatter of artefacts generally represent manuring of arable land on the fringe of settlement during those periods.

Survival/Condition

Any shallow buried archaeological remains, which may exist at the site, are likely to have been damaged by ploughing activity. However, there is no clear evidence for archaeological remains of any date at the site.

Fragility/Vulnerability

As already discussed, any near-surface archaeological remains, which may exist at the site, have probably been damaged by agricultural activity. These remains would be very susceptible to further erosion, both from ploughing and from groundworks associated with development. Again, however, there give no distinct indications of archaeological remains at the site,

which suggests there is no fragility / vulnerability to assess.

Diversity

Moderate period diversity is represented by evidence of medieval, Post-medieval and early-modern remains. The small artefact assemblage from each period, is generally too low to attribute function, although it is suggested that the medieval and later dated material has arrived on site through manuring.

Potential

No evidence of prehistoric, Roman or Anglo-Saxon date was identified at, or near, the proposed development site and the potential for remains of this period to be present at the site appears to be low.

The medieval to early-modern artefacts identified during the fieldwalking survey appears to have derived through manuring of the area and suggests an arable land-use throughout these periods. Furthermore, the lack of anomalies of potential archaeological origins recorded during the geophysical survey would appear to correspond with this suggestion.

8. EFFECTIVENESS OF TECHNIQUES

The techniques employed during the archaeological investigation were effective. Geophysical survey enabled a rapid evaluation of the whole area. Feldwalking also enabled a quick investigation in order to identify possible archaeological sites and to achieve an overview of the general nature of the archaeological potential of the site.

9. CONCLUSIONS

A geophysical and fieldwalking survey was undertaken as part of an evaluation process to assess the archaeological potential of land at Walcott Road, Billinghay, Lincolnshire, prior to determination of any planning application.

However, no definite archaeological remains were identified. Geophysical survey did not record any anomalies of potential archaeological origin and fieldwalking identified a moderate scatter of medieval and later artefacts typical of manuring spreads. No artefacts earlier than the medieval period were recovered.

10. ACKNOWLEDGEMENTS

Archaeological Project Services wish to acknowledge the assistance Warrington Builders and Developers Ltd who commissioned the work. Jo Hambly, the Heritage Officer for North Kesteven District Council, kindly permitted examination of the relevant parish files.

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12. ABBREVIATIONS

APS Archaeological Project Services.

BGS British Geological Survey

IFA Institute of Field Archaeologists

NK Numbers prefixed with these letters are the reference codes used by the Heritage Officer for North Kesteven District Council

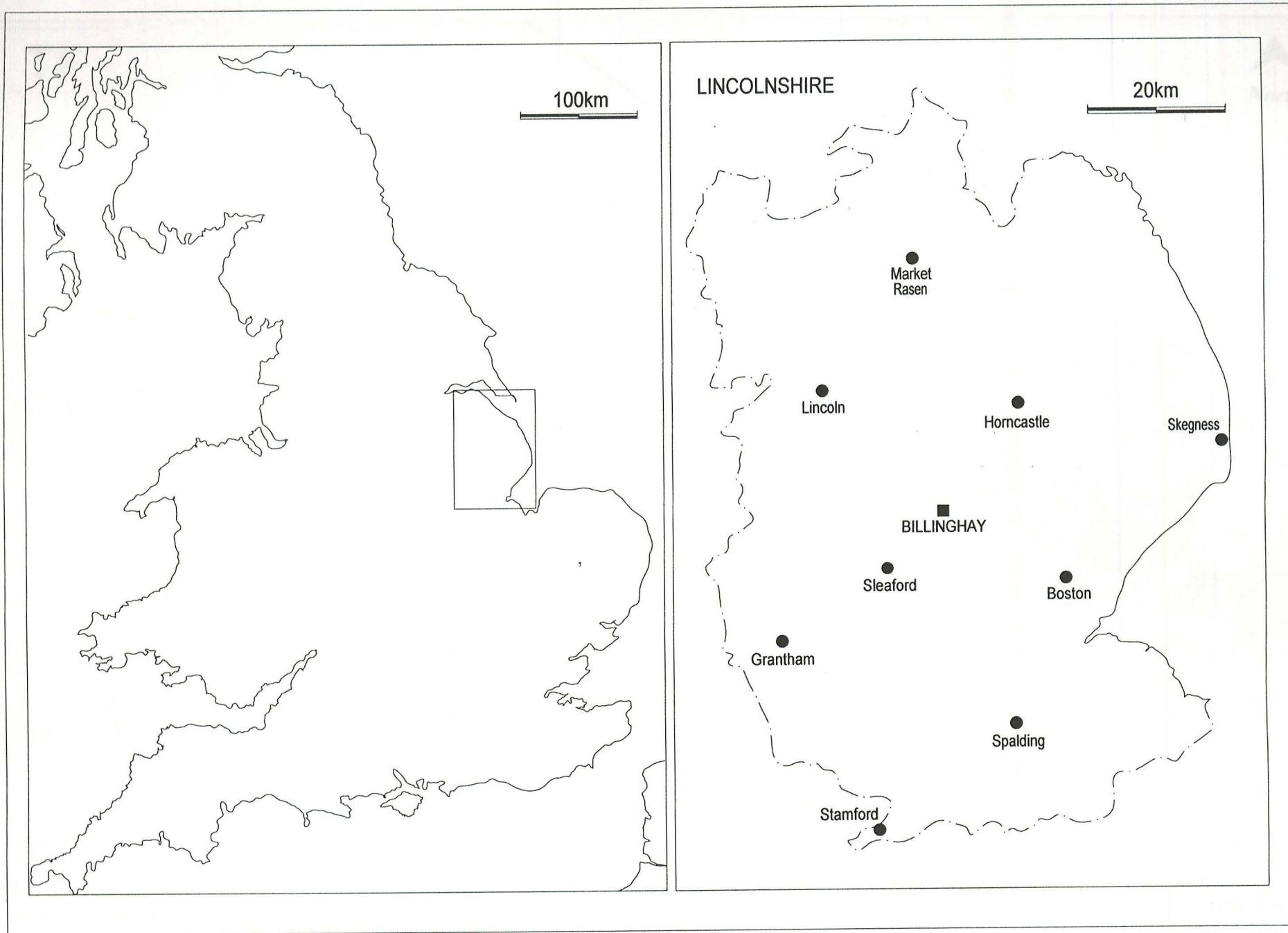


Figure 1: General location plan

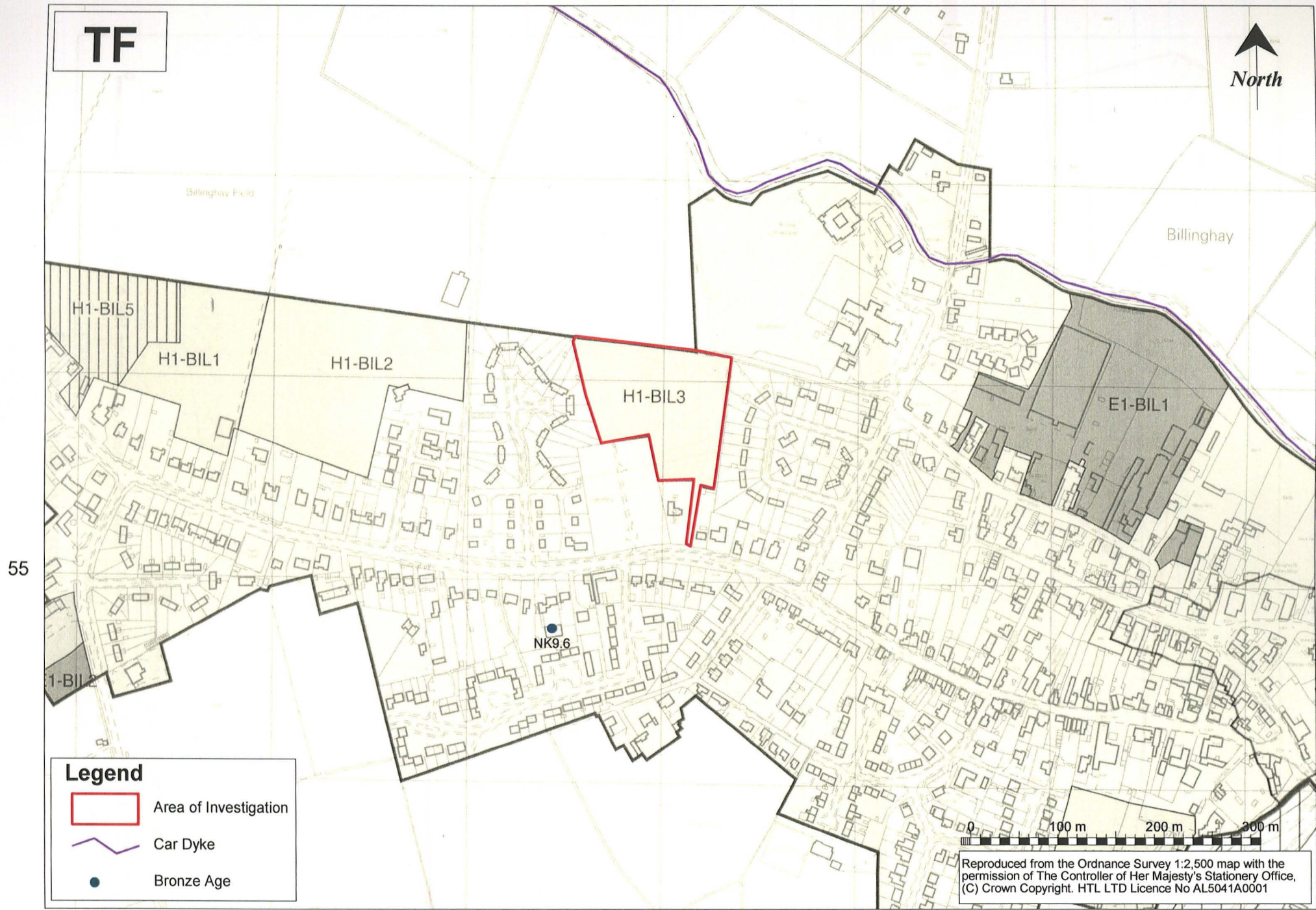


Figure 2: Location plan and archaeological setting

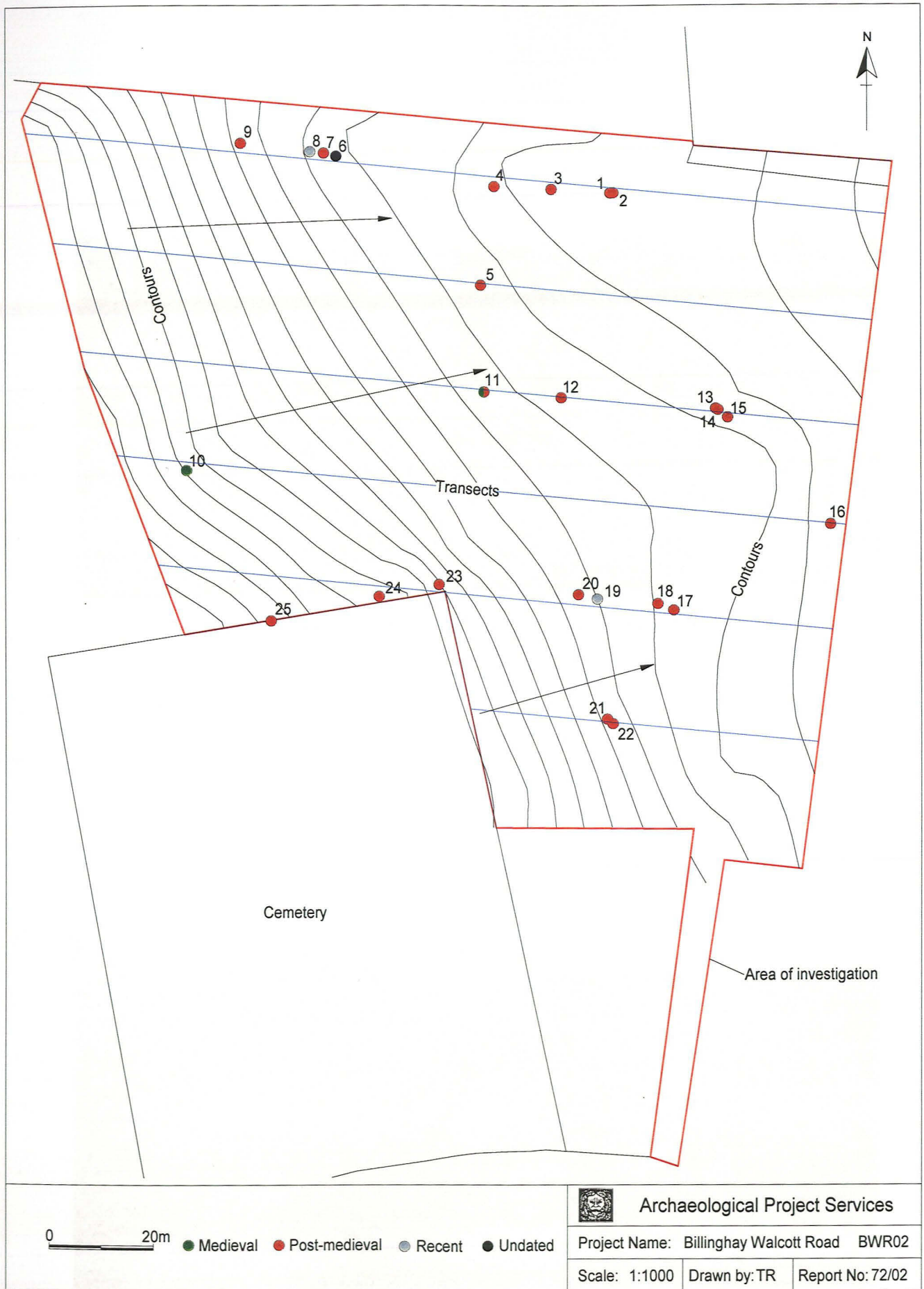


Figure 3: Fieldwalking results



Plate 1: View of area of investigation, looking southwest



Plate 2: Fieldwalking in progress, looking east

Appendix 1

Specification for Geophysical and Fieldwalking Survey on land at Walcott Road, Billingham, Lincolnshire

1 SUMMARY

- 1.1 A predetermination evaluation is required on land on the north side of Walcott Road, Billingham, Lincolnshire. As the first stage of the evaluation a fieldwalking survey and geophysical survey of the area is requested.
- 1.2 The proposed development is sited in an area rich in archaeological evidence with extensive evidence for prehistoric and Roman activity in the immediate vicinity.
- 1.3 Fieldwalking will be undertaken on transects at approximate 20m intervals. Surface artefacts will be collected and assigned a unique reference number and will be accurately plotted using a Geodolite Total Station.
- 1.4 The complete extent of the evaluation area will be subject to detailed gradiometer survey.
- 1.5 On completion of the fieldwork the geophysical results will be analysed by computer. A report giving a summary of results will be produced. This will include plans of the location of the survey and computer-generated plots of the survey results. Additionally, an interpretive diagram of the results will be included in the report.
- 1.6 Artefacts recovered during fieldwalking will be identified and plot produced showing the location of different dates and classes of artefact. Plans showing a summary of the results of both elements of the survey will also be produced.

2 INTRODUCTION

- 2.1 This document comprises a specification for fieldwalking survey and geophysical survey of land on the north side of Walcott Road, Billingham, Lincolnshire. The site is located at National Grid Reference TF 150 552 (centre).
- 2.2 Following the requirements of the archaeological brief, this document contains the following parts:
 - 2.2.1 Overview
 - 2.2.2 Aims and objectives
 - 2.2.3 Stages of work and methodologies
 - 2.2.4 List of specialists
 - 2.2.5 Programme of works and staffing structure of the project

3 SITE LOCATION

- 3.1 Billingham is located 20km northwest of Boston and 24km southeast of Lincoln in the administrative district of North Kesteven. The site is situated in the northwest of the village, on the north side of Walcott Road, to the rear of the cemetery at National Grid Reference TF 150 552. It is an irregular block of land of c. 1.5ha.

4 PLANNING BACKGROUND

- 4.1 Residential development of the site is proposed. An archaeological evaluation is required in order to provide information to assist in the determination of any planning application. As the first stage of that evaluation process fieldwalking survey and geophysical survey of the development area is requested.

5 SOILS AND TOPOGRAPHY

- 5.1 Billingham sits on a slight ridge on the edge of the Witham valley, almost surrounded by low-lying and formerly wet fen. The site lies on the northern edge of this ridge at about 10m OD. Soils at the site are fine and coarse loamy over clayey soils of the Beccles 2 Association developed on chalky till and glaciofluvial drift (Hodge *et al.* 1984, 119).

6 THE ARCHAEOLOGY

- 6.1 The settlement of Billingham is recorded in the Domesday Book of 1086, indicating an origin in at least the Late Saxon period. Archaeological discoveries in the area indicate human activity in the vicinity extending back into prehistoric times with burials, pottery and stone implements having been found, as well as some evidence for Roman activity. Finds in the immediate vicinity include fragments of a Bronze Age beaker discovered on the other side of Walcott Road.

7 AIMS AND OBJECTIVES

- 7.1 The aims of the fieldwalking and geophysical survey will be:
- 7.1.1 to gather information on the presence or absence of archaeology within the application area as the first step in an evaluation which will enable the North Kesteven Heritage Officer to formulate a scheme for the management of any such remains.
- 7.2 The objectives will be to establish:
- 7.2.1 the form of the archaeological features present within the site;
 - 7.2.2 the spatial arrangements of the archaeological features present on the site;
 - 7.2.3 the density of archaeological features present in the investigation area
 - 7.2.4 the date range of archaeological activity on the site

8 GEOPHYSICAL SURVEY

- 8.1 Reasoning for this technique
- 8.1.1 The geophysical survey of the site will use fluxgate gradiometer. This technique enables large areas to be investigated rapidly and the results facilitate the rapid identification of the likely archaeological potential of the site.
 - 8.1.2 The effectiveness of the technique is limited by background magnetic susceptibility and the ground cover which ideally should be minimal.
- 8.2 Methodology
- 8.2.1 The entire area of the site will be surveyed by an experienced operator to identify areas of enhanced magnetic activity. The survey area will be

divided into 30m squares and readings logged at 0.5m intervals along traverses 1m apart.

8.3 Report

- 8.3.1 A report will be prepared on completion of the survey detailing the methodologies used and the results of the work. The areas and nature of archaeological activity will be shown on a series of computer generated plots and the anomalies encountered will be interpreted. The report will be prepared in accordance with the English Heritage (1995) document Geophysical Survey in Archaeological Field Evaluations, Research and Professional Services Guideline 1.

9 FIELDWALKING

- 9.1 Fieldwalking will be undertaken on all fields in a suitable condition on transects at approximate 20m intervals, using plough or drill furrows as a directional guide. Areas of significant artefact density thus identified will be subject to more detailed walking on transects at c. 10m intervals.
- 9.1.1 Surface artefacts will be collected, bagged and assigned a unique reference number.
- 9.1.2 Each of these finds will be accurately plotted using a Geodolite Total Station, placed within a site-specific grid.
- 9.2 During fieldwalking the surface of the fields will also be inspected for evidence of earthwork or soil-mark features.
- 9.3 The report will include specialist description of artefacts recovered and plots showing the position of transects and the location of the different periods and classes of artefacts. Plans showing detailed and summary interpretations of the results of the fieldwalking and the geophysical survey will be produced.

10 REPORT DEPOSITION

- 10.1 Copies of the fieldwalking and geophysical survey report will be sent to: the client; the North Kesteven Heritage Officer; and the Lincolnshire County Sites and Monuments Record.

11 PUBLICATION

- 11.1 A report of the results of the geophysical and fieldwalking survey will be published in Heritage Lincolnshire's periodic report and an article of appropriate content will be submitted for inclusion in the journal of the Society for Lincolnshire History and Archaeology.

12 CURATORIAL MONITORING

- 12.1 Curatorial responsibility for the project lies with the North Kesteven Heritage Officer. Seven days notice in writing will be given to the North Kesteven Heritage Officer prior to the commencement of the project to enable them to make appropriate monitoring arrangements.

13 VARIATIONS TO THE PROPOSED SCHEME OF WORKS

- 13.1 Variations to the scheme of works will only be made following written confirmation from the North Kesteven Heritage Officer that such alterations are acceptable.

- 13.2 Should the North Kesteven Heritage Officer require any additional investigation beyond the scope of the brief for works, or this specification, then the cost and duration of those supplementary examinations will be negotiated between the client and the contractor.

14 SPECIALISTS TO BE USED DURING THE PROJECT

Task	Body to be undertaking the work
Geophysical survey	Engineering Archaeological Services
Pottery Analysis	Prehistoric: Dr D Knight, Trent and Peak Archaeological Trust Roman: B Precious, Independent Specialist Anglo-Saxon: J Young, Independent Specialist. Medieval and later: H Healey, independent archaeologist; or G Taylor, Archaeological Project Services
Other Artefacts	J Cowgill, Independent Specialist; or G Taylor, Archaeological Project Services

15 PROGRAMME OF WORKS

- 15.1 The geophysical survey is expected to take 1-2 days. The analysis of the results and report production is expected to take the geophysics specialist, and assistants, about 5 days. Fieldwalking will take a team of three people one day; processing of the finds and reporting will take 5-7 days depending on the quantity and complexity of the material gathered in the survey

16 INSURANCES

- 16.1 Archaeological Project Services, as part of the Heritage Trust of Lincolnshire, maintains Employers Liability Insurance of £10,000,000, together with Public and Products Liability insurances, each with indemnity of £5,000,000. Copies of insurance documentation can be supplied on request.

17 COPYRIGHT

- 17.1 Archaeological Project Services shall retain full copyright of any commissioned reports under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it hereby provides an exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project as described in the Project Specification.
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- 17.4 The author of any report or specialist contribution to a report shall retain intellectual copyright of their work and may make use of their work for educational or research purposes or for further publication.

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Appendix 2

The Finds

by Hilary Healey and Gary Taylor

Recording of the pottery was undertaken with reference to guidelines prepared by the Medieval Pottery Research Group (Slowikowski *et al.* 2001) and the pottery was quantified using the chronology and coding system of the Lincolnshire ceramic type series. A total of 7 fragments of pottery weighing 158g was recovered as individual spot finds. In addition to the pottery, other artefacts, predominantly brick/tile but also clay pipe, glass and slate, comprising 20 items weighing a total of 372g, was also retrieved. No faunal remains were recovered.

Provenance

It is probable that most of the pottery and ceramic building material was made in moderate proximity to Billingham, with the earliest pottery fragment perhaps made at Toynton, 25km to the northeast. The glazed red earthenware, Plot 1, may be a product of Old Bolingbroke 20km to the northeast, or Boston, 15km to the southeast of Billingham.

The piece of slate (Plot 25) is from quarries at Swithland in Leicestershire.

Range

The range of material is detailed in the table.

A single fragment of pottery of probable 13th-15th century date is the earliest material recovered and there is only one other possible medieval artefact. The great majority of the assemblage is post-medieval, 16th-18th century, in date, and brick/tile forms the main component, providing 17 of the 27 items (63%) retrieved.

One of the tile fragments, Plot 14, was cut down in the past for reuse. The object was trimmed to a width of 54mm and the cut edge smoothed. It is unclear what function this tile fragment served during its reuse but its employment as a hone or whetstone is possible.

A single piece of Swithland roofing slate was retrieved. Although Swithland slate was quarried and utilised in the Roman period it was not used extensively outside the Leicester area until the 17th century and was largely replaced by the Welsh slate industry in the mid 19th century (Ball and Jones 1976, 51-2), this chronology therefore suggesting the post-medieval date for the piece.

Condition

Although many of the pieces are abraded, all the material is in good condition and present no long-term storage problems. Archive storage of the collection is by material class.

Documentation

There have been previous archaeological investigations at Billingham which are the subjects of reports. Details of archaeological sites and discoveries in the area are maintained in the files of the North Kesteven Heritage Officer and the Lincolnshire County Council Sites and Monuments Record.

Potential

As a fairly small and predominantly post-medieval collection the assemblage is of limited local significance. The low quantities of artefacts overall indicate that the site was never inhabited. The isolated medieval artefacts, one fragment of pottery, one of tile, probably entered the area in manuring scatter, suggesting that the site served an agricultural function at that time. The same probably applies to the post-medieval component of the assemblage. However, the greater quantity of material of this period, and the high percentage of tile/brick, probably reflects the closer proximity of buildings during this period.

The absence of any material earlier than the 13th century is informative and suggests that the area was neither occupied nor functioned as arable land prior to this date.

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PLOT	FABIC CODE	DESCRIPTION	FORM	NO.	WT(G)	DATE	PERIOD
1	GRE	Glazed red earthenware	Pancheon	1	53	17-18C	PM
2	CBM	Handmade brick		1	14	Post-medieval	PM
3		Clay pipe, bore 7/64"	Stem	1	2	17C	PM
4	BL	Red earthenware, black glazed	Pancheon	1	34	18C	PM
5	BL	Red earthenware, black glazed		1	11	18C	PM
6	CBM	?Handmade brick		1	17		
7	CBM	Tile, oxidized, 14mm thick		1	21	Post-medieval	PM
8	CBM	Machine-made brick		1	8	20C	RECENT
9	CBM	Tile, oxidized, 14mm thick		1	23	Post-medieval	PM
10	?TOY	?Toynton All Saints-type		1	10	?13-15C	MED
11	CBM	Tile, reduced core, 14mm thick		1	78	late medieval-early post-medieval	MED-PM
12	CBM	Handmade brick		1	12	Post-medieval	PM
13	CBM	Brick/tile, handmade		1	6	Post-medieval	PM
14	CBM	Tile, slightly reduced core, 13mm thick, reused		1	42	Post-medieval	PM
15	CBM	Pantile		1	27	18-19C	PM
16	BL	Red earthenware, black glazed		1	17	18C	PM
17	CBM	?Handmade brick		1	4	?Post-medieval	PM?
18	CBM	?Handmade brick		1	15	?Post-medieval	PM?
19	VGF	Plant pot		1	5	20C	RECENT
20	CBM	Tile, oxidized, 14mm thick		1	49	Post-medieval	PM
21	BL	Red earthenware, black glazed		1	28	18C	PM
22	CBM	?Handmade brick		3	7	?Post-medieval	PM?
23	CBM	?Handmade brick		1	17	?Post-medieval	PM?
24		Green glass	Bottle	1	16	19C	PM
25		Swithland slate		1	14	Post-medieval	PM

Abbreviations

BL Black glazed wares
 CBM Ceramic Building Material
 GRE Glazed Red Earthenware
 TOY Toynton All Saints ware
 VGF Victoria Garden Furniture

C Century
 MED Medieval
 PM Post-medieval

Appendix 3

Geophysical Survey Report
by EAS Ltd

*Survey Commissioned
by
Archaeological Project Services
Surveyed
by
I.P. Brooks
Engineering Archaeological Services Ltd.*

*registered in England
Nº 2869678*

*Walcott Road, Billingham
Geophysical Survey*

April 2002

EAS Client Report 2002/10

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NGR

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Copyright

Walcott Road, Billingham, Geophysical Survey - Introduction:

NGR

Centred on TF 15017 55162

Location and Topography

The area surveyed lies behind and adjacent to the cemetery on Walcott Road, Billingham. It is surrounded by houses on three sides and by open fields and a school to the north. The land is basically flat and at the time of the survey was under a sparse crop of cereals with a background of stubble.

Archaeological Background

This survey forms part of the archaeological investigation of the site prior to a potential development of the plot for housing.

Aims of Survey

To locate, by detailed survey, magnetic anomalies of potential archaeological origins.

SUMMARY OF RESULTS

No anomalies of potential archaeological origins were noted. The only response were to the modern fences and a track way.

Walcott Road, Billingham, Geophysical Survey -Results:

Survey Results:

Area

An area of approximately 1.4 ha was investigated, covering the majority of the development area (Figure 1).

Display

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

Results:

Sixteen 30 x 30 m grids were investigated. These were aligned on the northern boundary of the plot.

Area

No anomalies of potential archaeological origins were recorded..

The faint slightly curving strips seen in Figure 2 are probably the result of local geological conditions.

The boundaries of the plot are marked by modern fences and structures which gave rise to the ferromagnetic responses shown in blue on Figure 4. The north eastern corner of the survey was adjacent to an access track which also gave rise to a disturbed area.

Magnetic Susceptibility

Soil samples were taken from the area of detailed survey in order to assess the magnetic susceptibility of the soils. It was not possible to obtain a subsoil sample for comparison .

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Grid 1	15	15.0
Grid 3	16	15.0
Grid 5	16	12.9
Grid 7	13	12.0
Grid 9	11	10.3
Grid 11	18	17.0
Grid 13	15	13.8
Grid 16	15	14.2

The susceptibilities as measured are consistently low with little difference between samples, suggesting that conditions are not ideal for magnetic survey and that no concentrations of archaeological activity are recorded in the magnetic susceptibility values.

Walcott Road, Billingham, Geophysical Survey -Conclusions:

Conclusions

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

No anomalies of potential archaeological origins were recorded.

Walcott Road, Billingham, Geophysical Survey - Technical Information:

Techniques of Geophysical Survey:

Magnetometry:

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

Resistivity:

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

Resistance Tomography

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

Magnetic Susceptibility:

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

Instrumentation:

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

Methodology:

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

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

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

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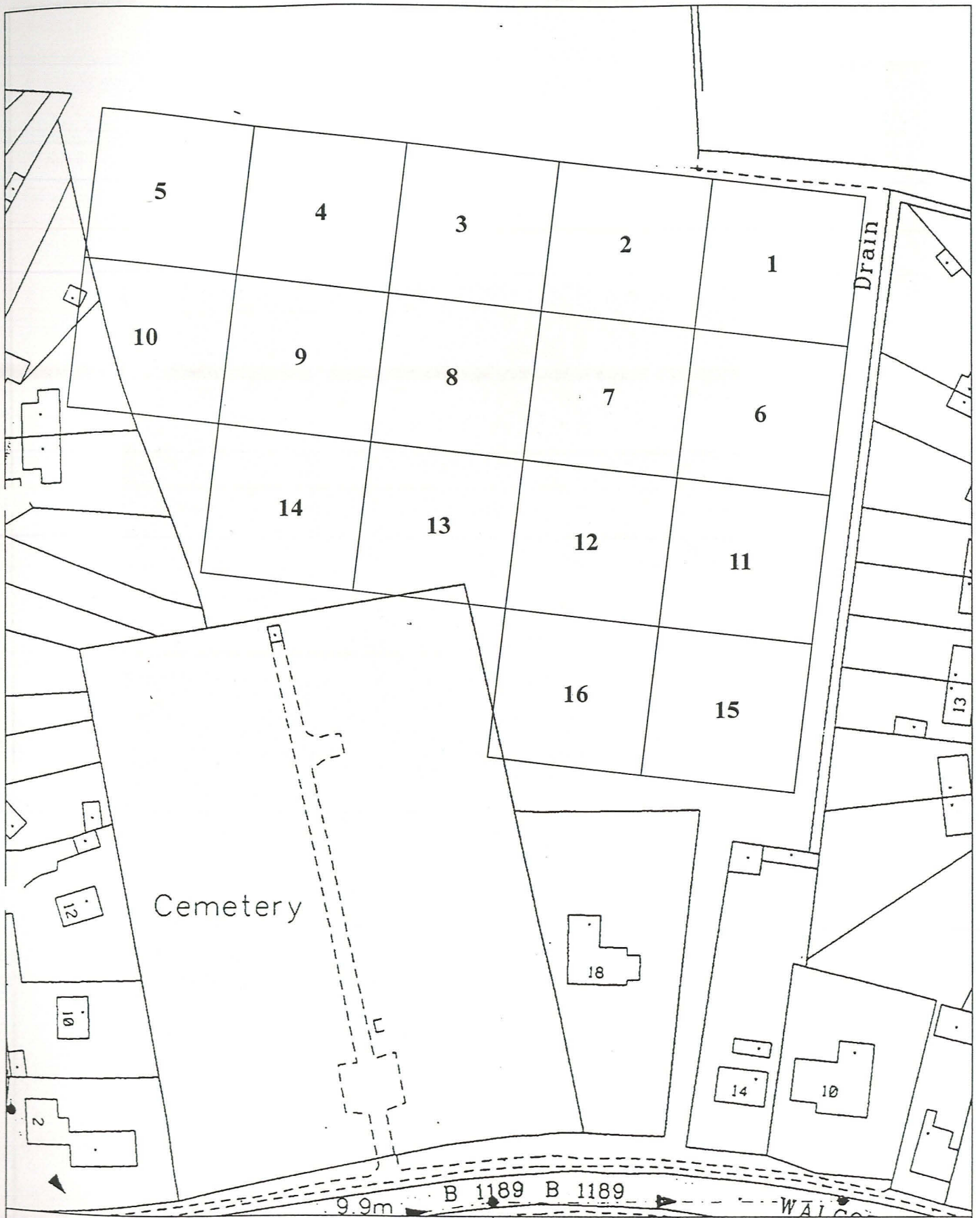


Figure 1: Walcott Road, Billingham
Location
Scale 1:1000

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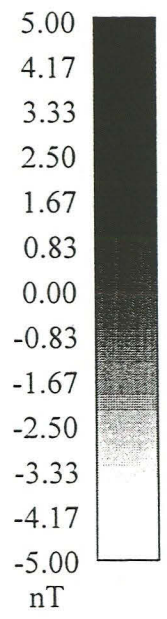
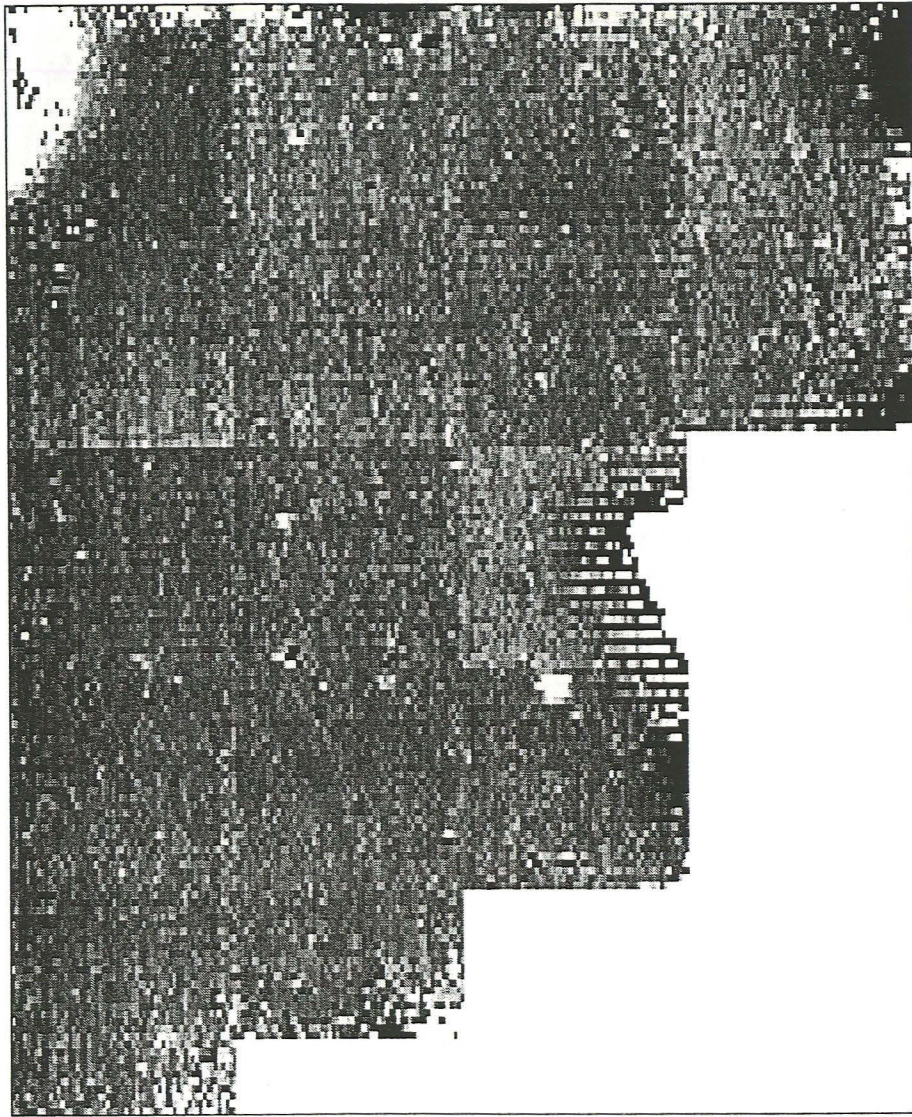
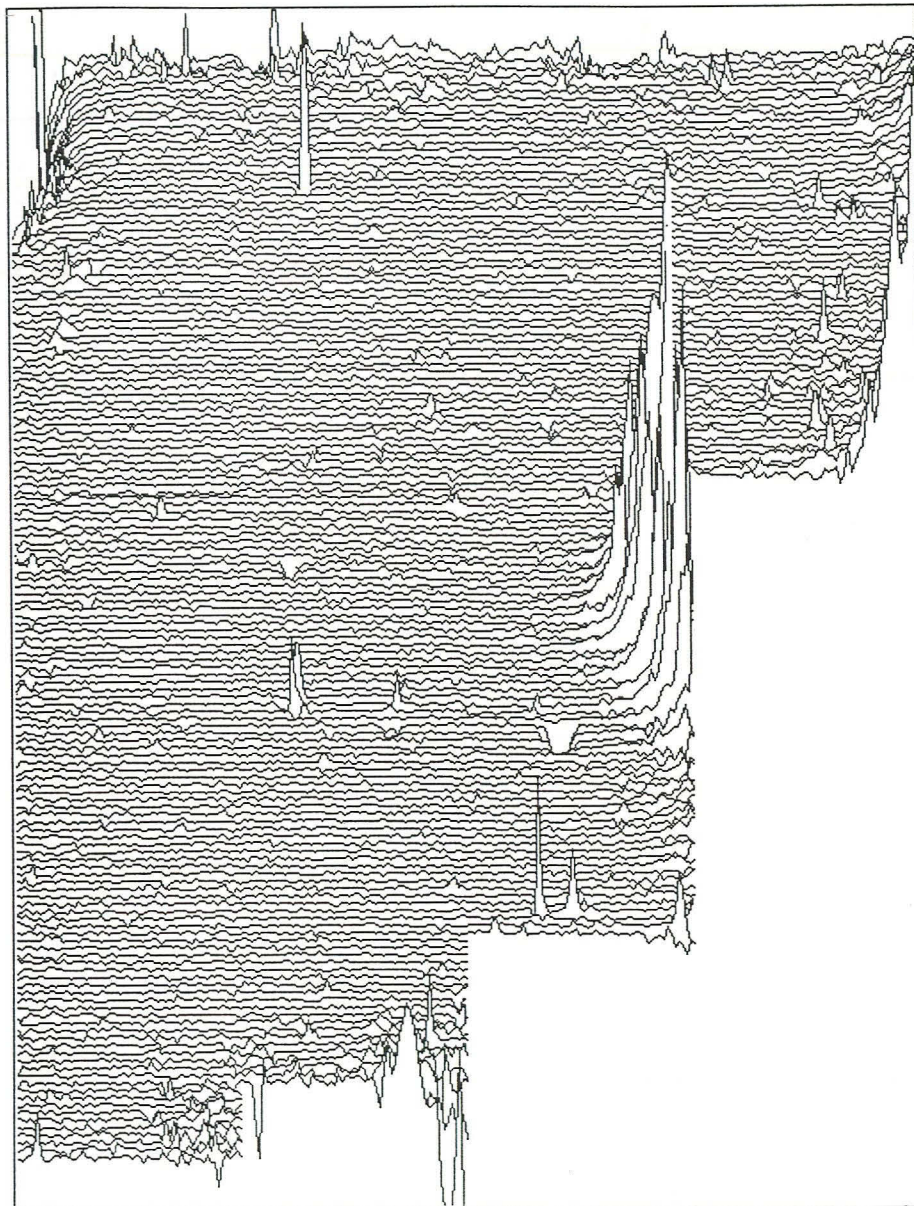


Figure 2: Walcott Road, Billinghamay
Grey Scale Plot
Scale 1:1000



34.40
nT

Figure 3: Walcott Road, Billingham
X - Y Plot
Scale 1:1000

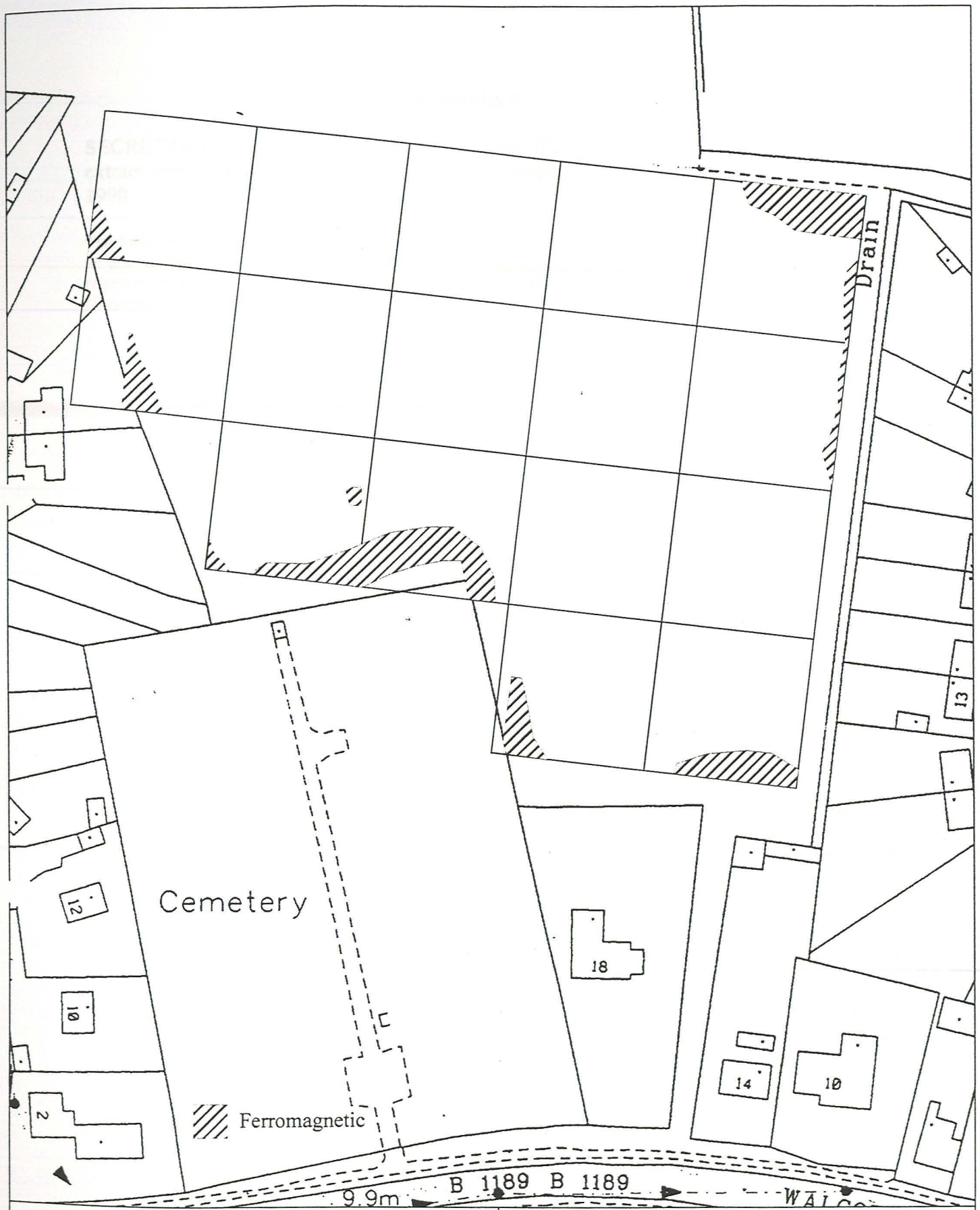


Figure 4: Walcott Road, Billingham
Interpretation
Scale 1:1000

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Appendix 4

SECRETARY OF STATE'S CRITERIA FOR SCHEDULING ANCIENT MONUMENTS - extract from *Archaeology and Planning* DOE Planning Policy Guidance note 16, November 1990

The following criteria (which are not in any order of ranking), are used for assessing the national importance of an ancient monument and considering whether scheduling is appropriate. The criteria should not however be regarded as definitive; rather they are indicators which contribute to a wider judgement based on the individual circumstances of a case.

i *Period*: all types of monuments that characterise a category or period should be considered for preservation.

ii *Rarity*: there are some monument categories which in certain periods are so scarce that all surviving examples which retain some archaeological potential should be preserved. In general, however, a selection must be made which portrays the typical and commonplace as well as the rare. This process should take account of all aspects of the distribution of a particular class of monument, both in a national and regional context.

iii *Documentation*: the significance of a monument may be enhanced by the existence of records of previous investigation or, in the case of more recent monuments, by the supporting evidence of contemporary written records.

iv *Group value*: the value of a single monument (such as a field system) may be greatly enhanced by its association with related contemporary monuments (such as a settlement or cemetery) or with monuments of different periods. In some cases, it is preferable to protect the complete group of monuments, including associated and adjacent land, rather than to protect isolated monuments within the group.

v: the survival of a monument's archaeological potential both above and below ground is a particularly important consideration and should be assessed in relation to its present condition and surviving features.

vi *Fragility/Vulnerability*: highly important archaeological evidence from some field monuments can be destroyed by a single ploughing or unsympathetic treatment; vulnerable monuments of this nature would particularly benefit from the statutory protection that scheduling confers. There are also existing standing structures of particular form or complexity whose value can again be severely reduced by neglect or careless treatment and which are similarly well suited by scheduled monument protection, even if these structures are already listed buildings.

vii *Diversity*: some monuments may be selected for scheduling because they possess a combination of high quality features, others because of a single important attribute.

viii *Potential*: on occasion, the nature of the evidence cannot be specified precisely but it may still be possible to document reasons anticipating its existence and importance and so to demonstrate the justification for scheduling. This is usually confined to sites rather than upstanding monuments.

Appendix 5

Glossary

Alluvium	Deposits laid down by water. Marine alluvium is deposited by the sea, and fresh water alluvium is laid down by rivers and in lakes.
Anglo-Saxon	Pertaining to the period when Britain was occupied by peoples from northern Germany, Denmark and adjacent areas. The period dates from approximately AD 450-1066.
Crop mark	A mark that is produced by the effect of underlying archaeological or geological features influencing the growth of a particular crop.
Domesday Survey	A survey of property ownership in England compiled on the instruction of William I for taxation purposes in 1086 AD.
Geophysical Survey	Essentially non-invasive methods of examining below the ground surface by measuring deviations in the physical properties and characteristics of the earth. Techniques include magnetometry and resistivity survey.
Iron Age	A period characterised by the introduction of Iron into the country for tools, between 800 BC and AD 50.
Layer	A layer is a term used to describe an accumulation of soil or other material that is not contained within a cut.
Medieval	The Middle Ages, dating from approximately AD 1066-1500.
Natural	Undisturbed deposit(s) of soil or rock which have accumulated without the influence of human activity
Neolithic	The 'New Stone Age' period, part of the prehistoric era, dating from approximately 4500-2250 BC.
Post-medieval	The period following the Middle Ages, dating from approximately AD 1500-1800.
Prehistoric	The period of human history prior to the introduction of writing. In Britain the prehistoric period lasts from the first evidence of human occupation about 500,000 BC, until the Roman invasion in the middle of the 1st century AD.
Romano-British	Pertaining to the period dating from AD 43-410 when the Romans occupied Britain.
Saxon	Pertaining to the period dating from AD 410-1066 when England was largely settled by tribes from northern Germany

Appendix 6

The Archive

The archive consists of:

This document
1 Box of finds

All primary records and finds are currently kept at:

Archaeological Project Services
The Old School
Cameron Street
Heckington
Sleaford
Lincolnshire
NG34 9RW

The ultimate destination of the project archive is:

Lincolnshire City and County Museum
12 Friars Lane
Lincoln
LN2 1HQ

The archive will be deposited in accordance with the document titled *Conditions for the Acceptance of Project Archives*, produced by the Lincolnshire City and County Museum.

Lincolnshire City and County Council Museum Accession Number: 2002.149

Archaeological Project Services Site Code: BWR02

The discussion and comments provided in this report are based on the archaeology revealed during the site investigations. Other archaeological finds and features may exist on the development site but away from the areas exposed during the course of this fieldwork. *Archaeological Project Services* cannot confirm that those areas unexposed are free from archaeology nor that any archaeology present there is of a similar character to that revealed during the current investigation.

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