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LINDSEY ARCHAEOLOGICAL SERVICES
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Archaeological Desk-Top Study of Land at Priory Road, Stamford (NGR: TF 0370 0740)

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Introduction

Lindsey Archaeological Services (LAS) was commissioned by David Wilson Homes Ltd in February 1994 to investigate the archaeological and historical background of a plot of land east of Stamford town centre, to fulfill part of a planning condition imposed by South Kesteven District Council. The Project Design Brief for the desk-top study was prepared by the SKDC Community Archaeologist in April 1993.

The c.1.8ha. plot is bounded by three roads: Priory Road, Uffington Road and Pinfold Lane (Fig.1). It lies on a limestone slope north of the River Welland; the 30m contour crosses the southern part of the site, which falls about 4m between Uffington Road and Priory Road. The site has been allotments and is now rough, unused open ground (Pls.1-3). The planning application was for renewal of outline permission for residential development.

Geology

The plot of ground lies within the extensive local exposures of the Lincolnshire Oolitic Limestone Series (LAO: HIG 18/8/7 1890). The River Welland flows 0.3km to the south of the site, with a flood plain extending northwards towards Priory Farm.

The local road network has adapted to the steep river valley, with most of the east-west roads using the broad river terraces (Rogers 1983, 22). Uffington Road was called Deeping Road, and Upper Road on some maps in contrast to Priory Road, labelled 'Lower Road' in 1904 (OS 1904). This road pattern may reflect medieval alternative routes when the river was in flood.

Archaeological Background

The medieval town of Stamford extended on both banks of the River Welland, but the nucleus of the settlement developed, and remained, on the north bank. Stamford was never the site of Roman urban or military occupation, although stray finds have been made from time to time, particularly on the west side of the present town, close to the Roman road which runs between Great Casterton and Durobrivae, near Peterborough. A substantial settlement appears to have developed on the site of modern Stamford by the late ninth century with evidence of a major pottery industry, iron working and quarrying. Before the Norman Conquest in 1066 Stamford was one of the Five Boroughs of the Danelaw. The Danish Borough lay east of the Market Place but only extended as far as St. Georges Street, well to the west of the proposed development.

In the early Middle Ages Stamford occupied an ideal position for a market town, a centre for industry and for trade to the continent, with evidence for imported French and Spanish pottery from excavations. There were fourteen parish churches, a quasi-university and numerous religious houses (Mahany 1978). The medieval town expanded beyond the Danish Borough in all directions, the eastern limits of the town defences being Brazenose Lane (Fig. 2).

The proposed development lay outside the Danish and medieval town centres although the extent of an extra-mural settlement remains unknown. It was in the 12th and 13th centuries that this area was settled by several religious houses.

Research into the past land-use of this area of Stamford is severely hampered by widespread confusion and ambiguity surrounding the sites of the Carmelite and Franciscan friaries. The confusion appears to have been present since the medieval period; different authorities described the two sites as formerly occupied by the other order (Page 1906, 227-30). The present interpretation accepted by Lincolnshire Sites and Monuments Record (SMR) has been used in this report: the Carmelite/White Friars on the east side of Brazenose Lane, and the Franciscan/Grey Friars north of Uffington Road (Hartley and Rogers 1974; RCHM 1977, 33). In 1714 and 1735 Greyfriars was described as 'Farr Friars', while land to the SW was known as 'Little Friars' (RCHM 1977, 33). This is a juxtaposition of most other sources consulted for this study and raises doubt about some grid references for find spots. Where possible the provenance of affected find-spots has been confirmed for Appendix 1.

Stamford's religious houses seem to have withstood the fourteenth century succession of plagues without a distinct decline in their status, perhaps as a result of gifts from desperate citizens (Rogers 1983, 42). This may have been reflected in the economic fortunes of lay settlements in the vicinity of the Friaries and Priory.

St. Leonard's Priory (Benedictine)

The Priory was established near the River Welland, where it owned a ford-crossing and received rent for water diverted to Hudd's Mill. When the priory was founded it lay 0.5km outside the medieval town walls, presumably in a largely unoccupied area; in 1146 7 houses were associated with it, although their actual location is not known (Hartley and Rogers 1974, 54).

After dissolution in 1538 some priory buildings became used as a tannery and a barn (Mahany 1969, 18).

The Carmelite Friary (White Friars)
The currently accepted location of this friary is east of Brazenose Lane, extending between St. Paul's Street and Priory Road. It was already established in 1268 when a church was built (RCHM 1977, 32-3). There is documentary evidence of several medieval properties being acquired and demolished before the site was extended, suggesting an unexpected level of occupation and insufficient open undeveloped ground outside the town walls. In 1285, 3 houses and 2 small plots belonging to neighbouring crofts were purchased; by 1317 at least a further 4 houses and 14 plots had been bought, and a toft and 3 gardens were added in 1350 (Hartley and Rogers 1974, 66). It is possible that a cluster of lay dwellings had formed close to St. Leonard's Priory, perhaps serving local quarries.

The Friary was closed in 1538, when seven brothers were resident, and passed into the ownership of the Cecil family, as did the Franciscan site. All the buildings had been cleared by 1600 (RCHM 1977, 33). The site may then have been left virtually empty until the 20th century when 4 houses were built on the north side of the plot. Some fragmentary but uninterpretable earthworks were surveyed by the Royal Commission on Historical Monuments (RCHM(E)), particularly in the south-western part of the site (RCHM 1977, 33).

Limited archaeological excavations on this site in 1971 located small areas of stone foundations and a drain.

The Franciscan Friary (Grey Friars)
This friary is now believed to have occupied part of the site of the present Stamford and Rutland Hospital, north of Uffington Road and south of the road to Ryhall. A grant during King John's reign of 5 acres (2.02 ha.) outside the East Gate, for a burial ground and a site for a hospital and house for friars and paupers, has been identified as referring to the Grey Friars order (Burton 1896, 66).

Before 1342, 7 acres (2.83ha.) of Stamford's common land, contiguous with Greyfriars, was given to the Greyfriars by Thomas, Lord Despenser. A field of 8 acres (3.24ha.) to the east of the Greyfriar's site was frequently associated with the order and this may have been the same parcel. The acreages for the fields of the 1842 Tithe Map fit this arrangement closely: Stamford Infirmary occupied Field 127, slightly over 3 acres, with a 2 acre plot (Field 126) immediately beside it. The next field to the east, 124, was slightly over 8 acres (LAO: B260 1842).

After dissolution in 1541, the land was owned by the Cecil family (RCHM 1977,33)) and ownership continued with the family and the Burghley Estate (LAO: B260 1842). The Stamford and Rutland Hospital was built on this site in 1828 and considerably extended in the 19th century (Burton 1896, 68).

Pinfold Lane

Pinfold Lane was not originally marked on Speed's 1600 Map of Stamford (Fig.3) but was added as an annotation to a 1785 reproduction of the survey (Fig.4; Harrod 1785). The irregular shape of the lane reflects the eastern side of the (Carmelite) friary grounds as depicted by Stukeley in 1736 (Fig.5) but his sketch shows no lane along the eastern side. Stukeley enclosed the entire site with a wall, although Speed restricted the wall to a short length in the southern part.

The street name appears to refer to a pound for stray animals. No pound was shown on Speed's map, but Knipe's 1833 town plan (Fig.6) and the 1842 Tithe Award plan marked a building with a small roadside enclosure immediately east of it, on the western side of Pinfold Lane (LAO:B260), which may have been the site of the pound, but no reference to it was noted in the accompanying award.

The post-medieval existence of an animal pound demonstrates that livestock was being grazed in the vicinity during the 18th and 19th centuries, quite possibly on the triangular area of ground, part of which forms the proposed development site.

In 1973, pottery sherds including Undeveloped and Developed Stamford Ware, a 15th century Bourne Ware sherd and fragments of green-glazed tile were found in foundation trenches for a bungalow being constructed in Pinfold Lane (SMR 30737).

Stone Quarrying

The field to the east of the plot under investigation has been partially quarried for limestone. The earliest located evidence of this is on Knipe's 1833 map of Stamford (Fig.6). In 1842, Field 121 was described as 'Stone Pits' and was farmed by John Palmer together with his adjacent arable field on the study area (LAO: B260) but no quarry was marked on the 1875 Enclosure plan (LAO: Kesteven Award 69). The quarry face, against the Uffington Road boundary, has been marked on subsequent Ordnance Survey maps.

Much larger scale quarrying has taken place to the north of Uffington Road, on a site that became Stamford Limeworks (OS 1904). Priory Quarry, apparently the same quarry, was

established by William Eldred during the 19th century (Birch 1972, 9). The quarry has been abandoned. Remains of an Anglo-Saxon cemetery were retrieved from that site in the 19th century (SMR 30676).

Lesser quarry sites have been identified south of Priory Road, some of which may be the stone pits mentioned in 1814 (Hartley and Rogers 1974, 55). Large and small individual hand-excavated pits were found in the 2 fields west of Priory Farm in 1974 when Stamford Archaeological Research Committee monitored a sewer trench (SMR 30658; 30724). Some traces of quarrying and redeposited human remains were found in the field close to the farm, associated with a small quantity of 17th century pottery. A larger area of workings was encountered in the field to the west, reaching a depth of 2m close to the field boundary. Medieval glazed roof tiles and Collyweston slates were recovered from the lowest layer of backfill, suggesting that this part was abandoned when medieval buildings of some status were being demolished; perhaps shortly after the dissolution of the religious houses including St. Leonard's Priory. The latest material in this backfilled pit was 19th century brick rubble and other farm refuse.

The Site

The provenance of a number (perhaps a hoard) of Roman coins, recorded as found in a garden in Uffington Road in 1977, is unsatisfactory; although the SMR lists a findspot beside the plot the artefacts were probably retrieved some distance further east along that road (SMR 30692).

Speed's map of Stamford in 1600 shows open land on the proposed development site (Fig.3). A medieval culvert and 3 side channels were reportedly uncovered close to allotments in Priory Road in 1979 (SMR 30729).

This land has been part of the Burghley Estate since at least 1841, and probably for much longer (LAO:B260). Cultivation strips marked on Knipe's 1833 plan of Stamford (Fig.4) and the arable land-use in 1842 (LAO:B260) are the only documented uses of this plot. The tenant farmer at the date of the Tithe Award also occupied the stone quarries immediately to the east, and there may have been some investigation of the stone resources on this field.

The site became allotments at an unknown date, as did other areas of nearby land. Information about these allotments was not located during this research.

Geophysical Survey

A resistivity survey of the site was undertaken in December 1993 by Geophysical Surveys of Bradford for another client. The full report is appended but the results are summarized here for convenience. Two blocks ofland were surveyed within

the development area covering a total area of c. 1 hectare. A few anomalies of potential archaeological interest were encountered but there were problems with interpreting the data because of the former use of the land as allotments.

Discussion

The documentary, cartographic and published sources located during this desktop study have all appeared to indicate that the proposed development plot has been open, undeveloped land. This image is slightly puzzling because three medieval monastic institutions occupied land on all sides of the triangle between Uffington Road, Priory Road and Pinfold Lane. Pinfold Lane seems to have been of 18th century origin, perhaps immediately east of the Carmelite Friary walls. That arrangement suggests that the land might have been owned or used by the White Friars until the 1538 dissolution, but as all the monastic land went to the Cecil Estate, tracing the ownership history of the plot would probably be impossible. The Cecil family appear to have deliberately manipulated local politics by preventing land development around the town during the 19th century (Elliott 1968; Hoskins 1955, 223); this might provide an explanation for this small plot remaining unused despite its proximity to the roads into the town.

The adjacent Roman coin findspot has no precise provenance and provides no sound reason for anticipating Romano-British remains on this site. The absence of any records of archaeological discoveries from the allotments formerly on this site tends to discount the existence of a Roman site.

There is some documentary evidence that domestic properties had extended as far as the Carmelite site during the early medieval period, and some were demolished before the Friary was built. There may have been an extra-mural settlement in the vicinity of the roads leading out to the east of the town; the extent of this is unknown but might conceivably have included this plot. Anglo-Saxon remains might be recovered from this site.

Medieval activity on this site was most likely associated with one of the nearby religious houses; structural remains of outbuildings are unlikely but cannot be ruled out. An enclosing boundary feature, perhaps a stone wall, remains a possibility. Arable or pastoral land-use might result in cultivation features (such as ridge and furrow) but these might have been removed by later cultivation.

Post-medieval land-use is more certain. The plot was apparently open land at the start of the 17th century (Fig.3) and under arable cultivation by 1833; the pattern of north-south or east-west strips recorded on Knipe's plan

might be recoverable (Fig.6). During the mid 19th century, the tenant of this plot maintained a stone quarry in the adjoining field (LAO:B260). Quarrying may have occurred at any period on this plot.

The 20th century allotments which used to occupy this land will have left ground features reflecting access paths, plot boundaries and root disturbances of shrubs and trees.

It is unfortunate that the geophysical survey already carried out was so inconclusive. This is in part due to the disturbance of the ground during its period of use as allotments.

In summary, archaeological excavation of the proposed development area might reveal archaeological features representing an assortment of possible past activities, but nothing in this search indicated the certainty of any significant remains. Consultation with the South Keteven Community Archaeologist will be required to ascertain whether any further archaeological investigations will be required prior to development.

Acknowledgements
Lincolnshire Sites and Monuments Record staff provided help and advice for this research, reducing the confusion about the friaries. Further help was provided by Ruth Waller (South Kesteven Community Archaeologist), John Smith (Keeper at Stamford Museum), the staff at Lincolnshire Local Studies Library, Lincoln and at Stamford Library.

N. Field and G. Tann
Lindsey Archaeological Services
22nd March 1994

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Appendix 1
Lincolnshire Sites and Monuments Record Summary

Key NGR National Grid Reference
SMR Lincolnshire County Sites and Monuments Record Site number, some sites also have old alphabetical codes
HTL Heritage Trust for Lincolnshire (Parish number 69)
SAM Scheduled Ancient Monument

NGR(TF) OS Sheet TF 00 NW	SMR	HTL(69.)	Description
032 076	30685 dg,am	.107	Roman colour-coated pottery; Roman coin; possible building foundations 1958.
0326 0735	" ck	.223	Medieval pottery kiln and 4th century Roman coin 1874.
033 073	30732 ab,n,da	.225	Stamford ware and other Early Medieval pottery, found 1956.
033 075	"	.226	Medieval pottery kiln, 1962; early Stamford ware pottery wasters 1976 but no trace of clay extraction pits.
033 075	"	.108	Roman Castor ware sherds 1977.
0339 0734		.265	1992 archaeological evaluation by HTL on Brazenose College site; no Anglo-Saxon features but demolished wall and artefacts.
034 074	30738 cp	.219	Four pits, with Saxo-Norman Stamford ware pottery; service trench, East Street.
"	"		Saxo-Norman pottery and iron slag; junction of St. Paul's St. and Brazenose Lane, 1963.
034 071	30620 av		Trial excavation 1974, off Brownlow St.; medieval pottery and 17th century pit.
0340 0733	30625 bm,s		Late 13th/early 14th century gateway and part of wall; ?Site of Brazenose College, 1333-1688. SAM 109.

NGR(TF) SMR OS Sheet TF 00 NW	HTL(69.)	Description
0340 0737 30632		Documentary record of medieval gateway, demolished 1780; St. Paul's Gate.
0342 0741 30610		Building remains (NE corner) and burials, 1979.
0343 0744 30610 bo		Site of Holy Trinity and St. Stephen's church, destroyed 1461.
0349 0717 30686 bn	.253	Site of Dominican Friary (Black Friar's), c.1241-1538 part of church survived to 1600.
" "		Two medieval rings, 1816 and 1821.
0349 0728 30621		Medieval gate jamb surviving, with much restored adjacent walling.
035 071 30659		Post-medieval house on Blackfriar's site, demolished 1782.
" 30660		Documentary record of fishponds 1615.
" 30661		Documentary record of dovecote and fishponds on site of Friary, 1695.
0350 0733 30621 p	.249	Carmelite (White Friar's) friary site 1268-1538. SAM 257.
" " "		Medieval spouted jug and Stamford ware pottery.
035 073? 30737 cv		Saxo-Norman pottery, Undeveloped and Developed Stamford ware; green glazed ridge tiles. Found Pinfold Lane 1973.
035 073? 30730 aa		Medieval pottery and wasters ?kiln site, found in back garden 1968; this may be a dump of kiln waste.

NGR(TF) SMR OS Sheet TF 00 NW	HTL(69.)	Description
035 074 ___	.250	Excavation behind St. Paul's St., White Friars claustral building remains, well, drain and conduit.
035 075 30621 co		Foundations of friary and coins (Edward III) found 1963.
358 0743 30614 t		Outer wall of late 14th century gateway (White Friars Gate) on Greyfriars site.
0360 0756 30684 ar	.105	Roman figurine (?Concordia)from household shrine, Melbourne Road, 1973..
0368 0752 30613 bw	.251	Grey Friars (Franciscan, Friar's Minor) friary site, pre-1230. Extensive grounds. Excavation 1973: possible doorway, pottery (medieval/post-medieval); vast quantity of whelk, cockle and oyster shells. SAM 107.
0375 0735 30729	.242	Medieval? culvert and three side channels found in Priory Road beside allotments, 1979.
037 072 30658		Extensive quarry, 2m deep, backfilled, green glazed medieval pottery, cockscomb roof tiles and collyweston slates; also a pit, backfilled with 19th century rubble and bricks.
038 072 "		Small-scale quarrying traces, possibly for roadstone, 17th century pottery; disturbed burials.
038 078 30612		Traditional but dubious site of St. Wilfrid's monastery (658-9th century).
0388 0736 30611 w		St. Leonard's Priory site. Part of Norman nave survives, also earthworks of fishponds. SAM 36.

NGR(TF) OS Sheet TF 00 NW	SMR	HTL(69.)	Description
0388 0736	30611,30724		9 E-W burials, 1 stone coffin found along frontage of St. Leonards Priory; also medieval pottery from Bourne kilns.
	"		E-W burials 2m inside boundary wall of Priory Farm; 18th-19th century lime kiln (Eldred family kiln?); evidence of late 19th century quarrying and backfilling; re-used tombstone.
038 075	30692 d,e	.114	Roman coins from garden on Uffington Road, 1977.
039 073	30658		Documentary record of a medieval dovecote on the Priory site.
040 073	30726 cu		Medieval pottery, 1975.
0409 0760	30676 j	.206	Saxon cemetery: urn with human remains found in railway cutting 1854; human remains found in adjacent limestone quarry.
042 077		.259	1991 archaeological evaluation; no trace of Anglo-Saxon cemetery.

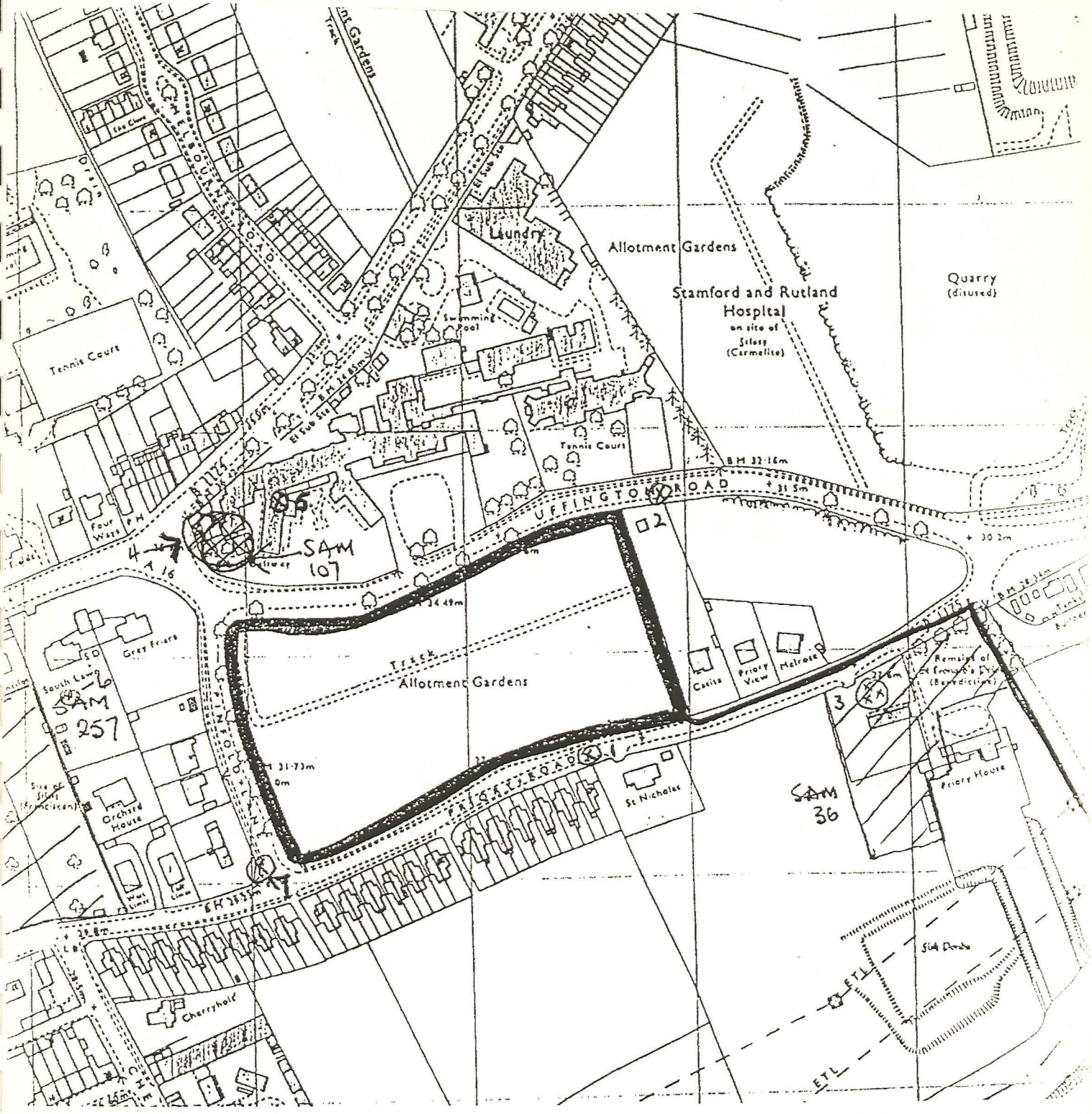

Fig. 1 Priory Rd Stamford. Site location. Reproduced from the 1:2500 OS map with the sanction of the Controller of HMSO, Crown copyright reserved. Licence no. AL50424A

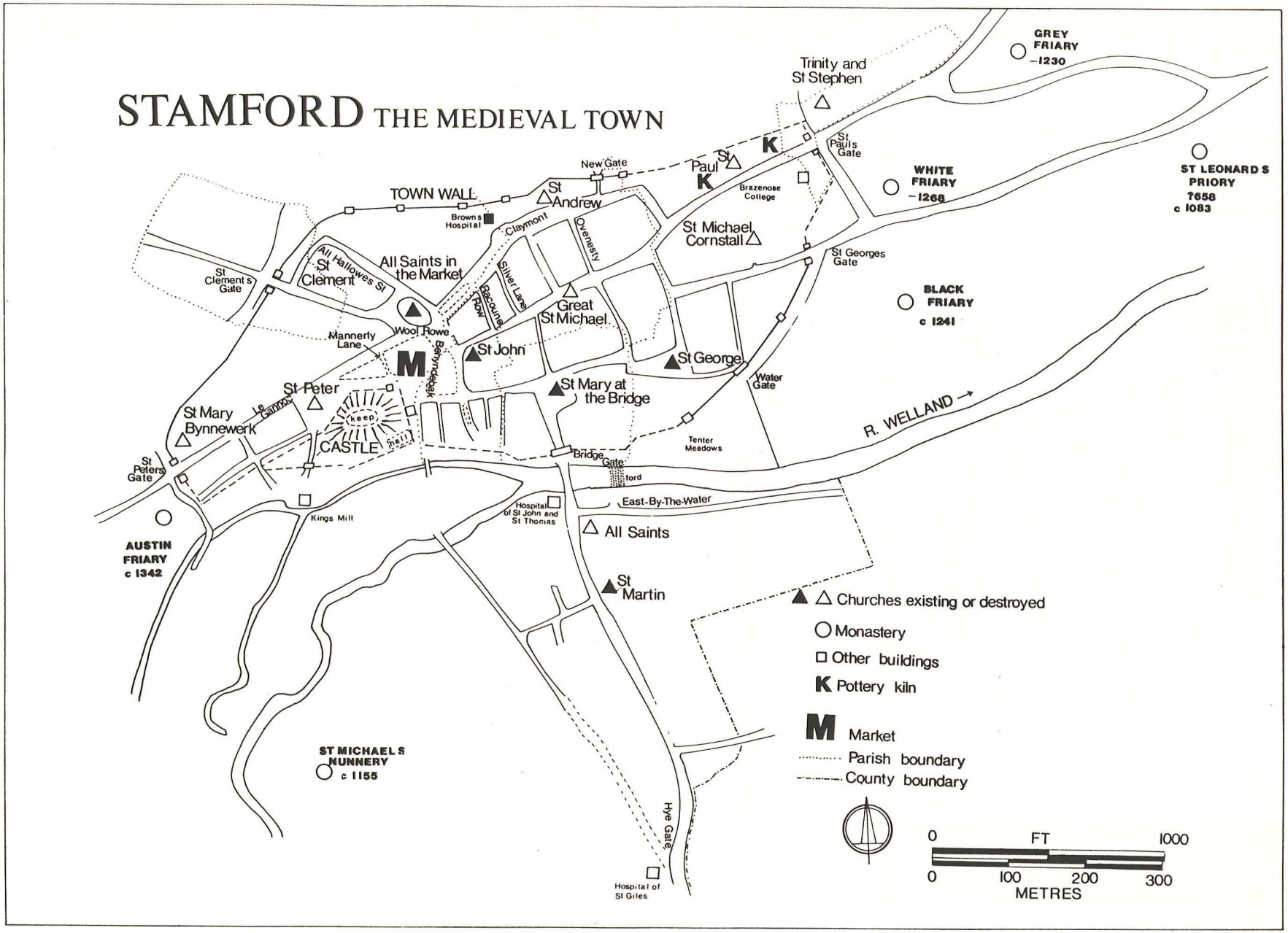

Fig. 2 Stamford, location of proposed development in relation to the medieval town. (Reproduced from Mahany 1978)

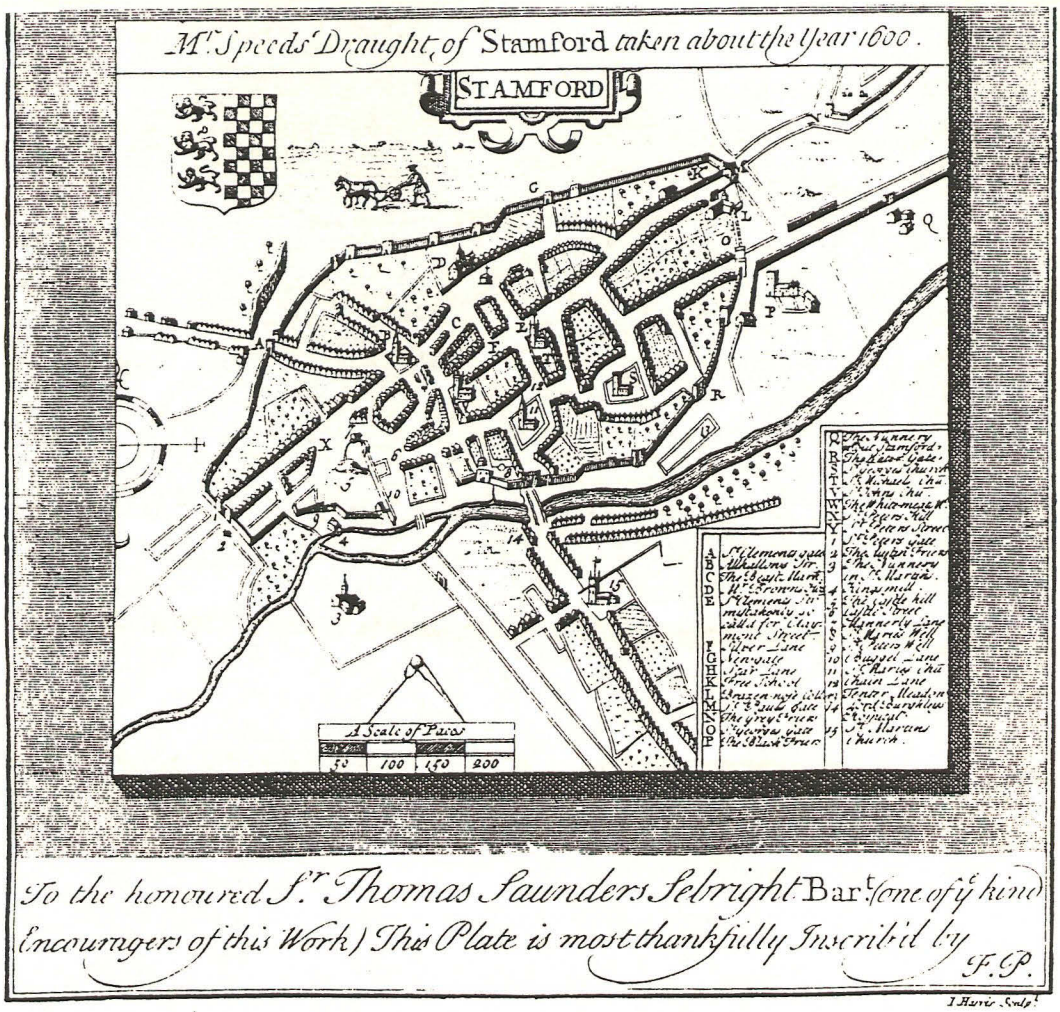

Fig. 3 Reproduction of John Speed's Map of Stamford, surveyed c.1600

Fig. 4 John Speed's Map of Stamford, enlarged and with the modern names of streets and buildings, by William Harrod of Stamford, published 1785.

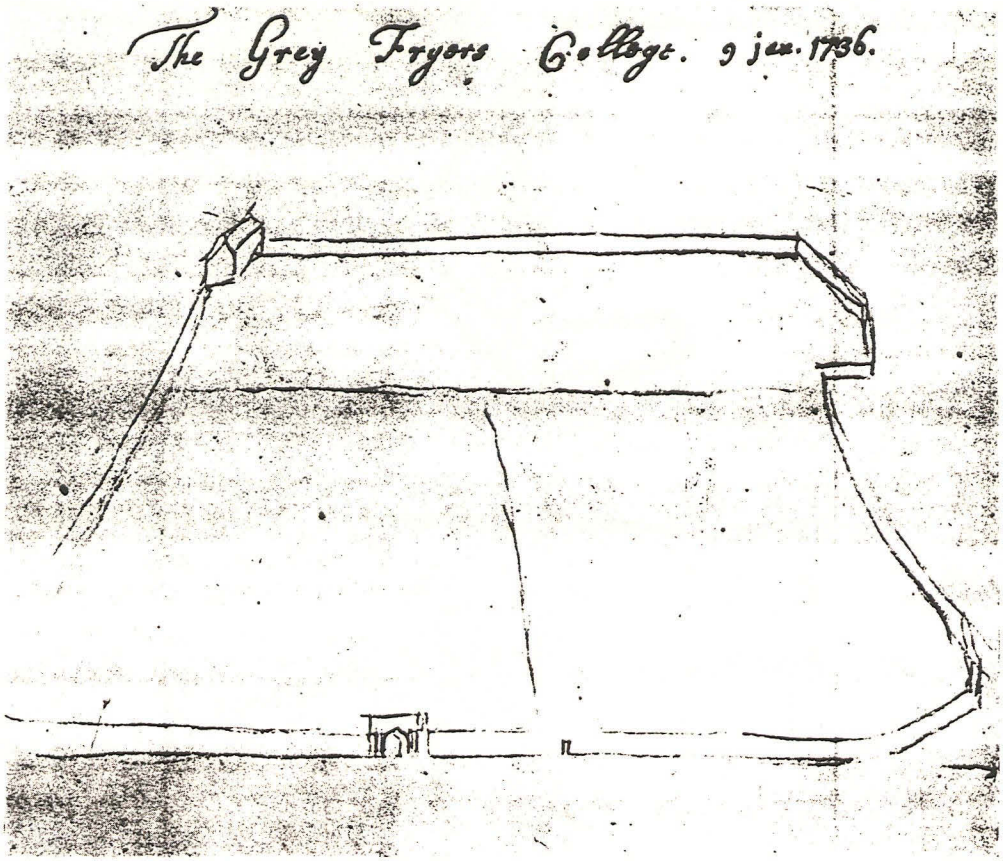

Fig. 5 Sketch plan of the 'Greyfriars' (probably the Whitefriars) by William Stukeley, 1736

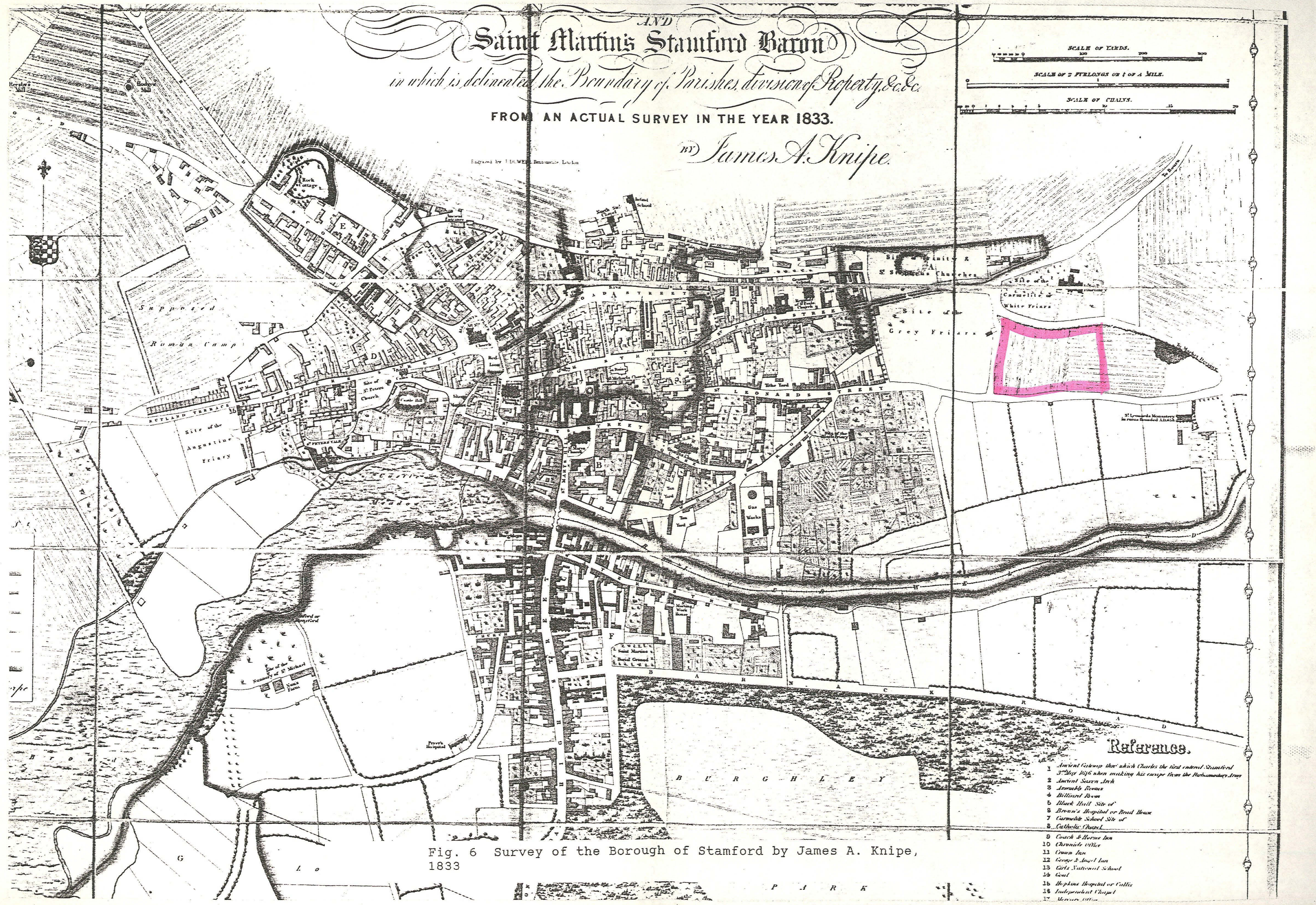

Fig. 6 Survey of the Borough of Stamford by James A. Knipe, 1833

Pl. 1 View of the site, looking NE across the former allotments

Pl. 2 View of the western side of the site, Pinfold Lane behind hedge

Pl. 3 View looking east along Priory Road, showing terraced effect of the site

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REPORT ON GEOPHYSICAL SURVEY

PRIORY ROAD, STAMFORD

Report number 93/138

Work commissioned by :

SWALLOW HOMES

SITE SUMMARY SHEET

93 / 138 Priory Road, Stamford

Location and topography

The site at Priory Road lies on the north-western outskirts of Stamford, Lincolnshire, immediately south of the Stamford and Rutland hospital. The field under investigation is bounded on three sides by Priory Road, Pinfold Lane and Uffington Road (A16) and by residential housing to the east. The ground is generally level and under rough pasture with a few dispersed trees and bushes.

Archaeology

The site lies in an area of archaeological importance being close to several scheduled ancient monuments including the remains of a Benedictine Priory. The Ordnance Survey map refers to former allotment gardens occupying the site.

Aims of Survey

Given the close proximity of the monastic remains and the possibility that stone buildings may be present on the site, it was decided to carry out a resistivity survey in order to assess the nature and extent of any archaeological features.

Summary of Results *

The resistivity survey has identified several anomalies of potential archaeological interest but no major structural elements which are suggestive of obvious buildings. Interpretation of the readings is severely hampered by the former use of the field as allotment gardens as these will have left an imprint on the results. As a consequence trial excavation trenches targeting some of the anomalous responses may be the best method of establishing their exact archaeological significance, if any.

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

SURVEY RESULTS

93 / 138 Priory Road, Stamford

1. Survey Area (Figure 1)

1.1 Two blocks, A and B, 0.64ha and 0.36ha in size respectively, were investigated within the area of a proposed residential development. A sketch plan showing the location of the survey grids is produced at 1:2500 (Figure 1).

1.2 The survey grids were set out by ***Geophysical Surveys of Bradford*** *(GSB)* and tied-in to the field corners. Details have been lodged with ***John Samuels Associates.***

2. Display

2.1 A summary interpretation diagram (Figure 2) is produced at a scale of 1:2500, while archive data plots are at 1:500 (Figures A.1 - A.3 and B.1). The results are displayed as grey-scale images and this display option is discussed in the *Technical Information* section at the end of the text.

3. General Considerations - Complicating factors

3.1 Apart from a few isolated trees and bushes there were no major difficulties in carrying out the survey. The ground was generally level with rough pasture.

4. Resistance results

Area A (Figures A.1 to A.3), a 80m by 80m block in the western half of the field. Area B (Figure B.1), a 60m by 60m block in the north east corner.

4.1 A narrow band of low resistance which crosses both survey blocks, coincides with the line of a path and former track marked on the OS map.

4.2 The broad changes in resistance reflect a combination of natural and made-made differences in the make-up of the ground. Given that there were formerly allotment gardens in the field it is very difficult to confidently place an archaeological interpretation on any of the results.

4.3 Although there are some suggestions of rectilinearity in the data these could equally be associated with divisions within the allotments, or former buildings. However, there are no really convincing wall lines and the high resistance blocks which have been highlighted on the interpretation should not be viewed as necessarily being structurally significant.

4.4 In Area B there is one peculiar area of low resistance readings which form a small L-shaped anomaly. This might be associated with a ditch / robber trench.

5. Conclusions

The resistance survey has not added significantly to the archaeological record for the site at Priory Road. Several high and low resistance anomalies of possible archaeological interest have been recorded and there appear to be hints of linearity in the results. It should be noted, however, that the field was formerly used as allotment gardens and this modern land use may account for some of the anomalous responses. In consequence, it has not been possible to offer a firm archaeological interpretation of the results. Investigation of some of the anomalies by trial trenching is suggested, in order to establish their true nature.

Project Co-ordinators: J Gater and C Stephens
Project Assistants: Dr. C Adam, N Nemcek, D Shiel and A Shields

13th December 1993

TECHNICAL INFORMATION

The following is a description of the equipment and display formats used in **GEOPHYSICAL SURVEYS OF BRADFORD** 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 **GEOPHYSICAL SURVEYS OF BRADFORD**.

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.

Magnetic readings are logged at 0.5m intervals along one axis in 1m traverses giving 800 readings per 20m x 20m grid, unless otherwise stated. Resistance readings are logged at 1m intervals giving 400 readings per 20m x 20m grid. The data are then transferred to portable computers and stored on 3.5" floppy discs. Field plots are produced on a portable Hewlett Packard Thinkjet. Further processing is carried out back at base on computers linked to appropriate printers and plotters.

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.

(b) Resistance Meter - Geoscan RM4 or RM15

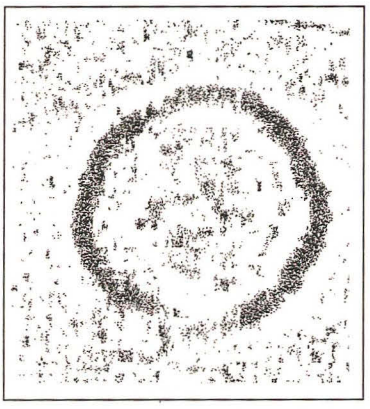
This measures the electrical resistance of the earth, using a system of four electrodes (two current and two potential.) Depending on the arrangement of these electrodes an exact measurement of a specific volume of earth may be acquired. This resistance value may then be used to calculate the earth resistivity. 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".

(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.

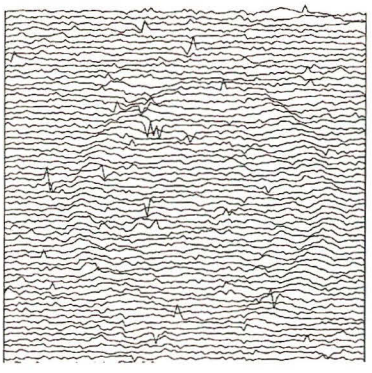
Display Options

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

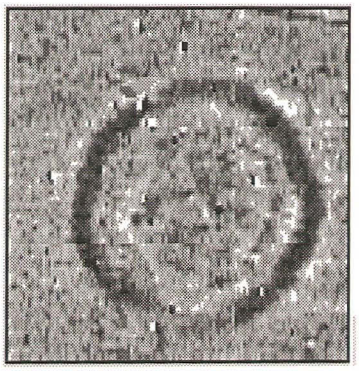
In this display, minimum and maximum cut-off levels are chosen. Any value that is below the minimum cut-off value will appear white, whilst any value above the maximum cut-off value will appear black. Any value that lies between these two cut-off levels will have a specified number of dots depending on the relative position between the two levels. The focus of the display may be changed using different levels and a contrast factor (C.F.). Usually the C.F. = 1, producing a linear scale between the cut-off levels. Assessing a lower than normal reading involves the use of an inverse plot, This plot simply 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. This display is much favoured for producing plans of sites, where positioning of the anomalies and features is important.



(b) X-Y 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. 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 indiviual anomalies. Results are produced on a flatbed plotter.

Display Options cont'd



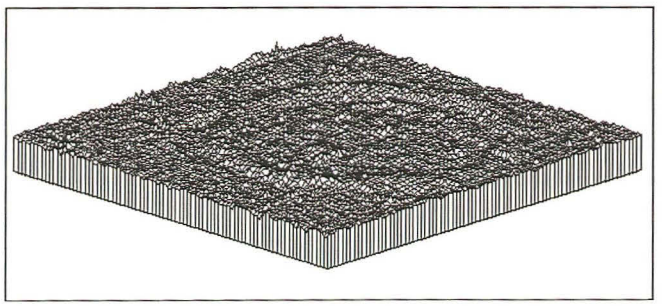
(c) Grey-Scale

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, grey-scales tend to be more informative.

(d) Contour

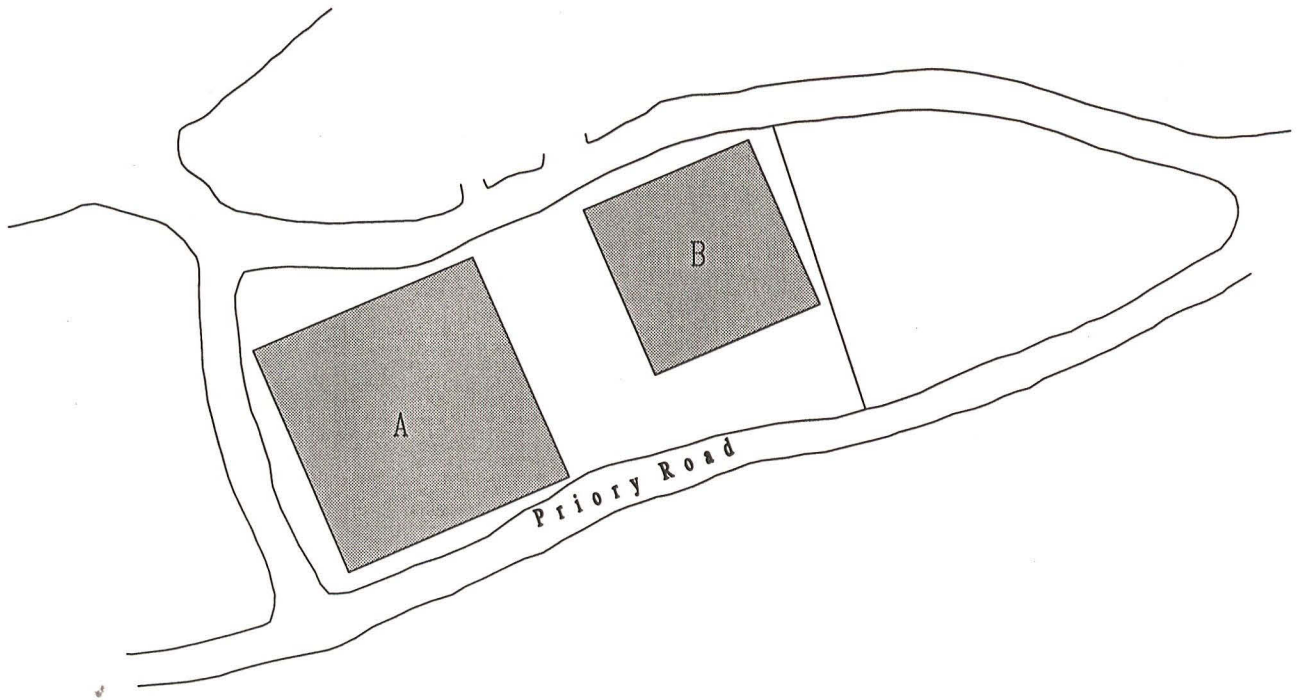
This display format is commonly used in cartographic displays. Data points of equal value are joined by a contour line. Closely packed contours indicate a sharp gradient. The contours therefore highlight an anomalous region. The range of contours and contour interval are selected manually and the display is then generated on the computer screen or plotted directly on a flat bed plotter / inkjet printer.



(e) 3-D Mesh

This display joins the data values in both the X and Y axis. The display may be changed by altering the horizontal viewing angle and the angle above the plane. The output may be either colour or black and white. A hidden line option is occasionally used (see (b) above).

GEOPHYSICAL SURVEYS OF BRADFORD	PROJECT: PRIORY ROAD, STAMFORD	TITLE: Location of Survey Grids	Sketch map based on a plan supplied by John Samuels

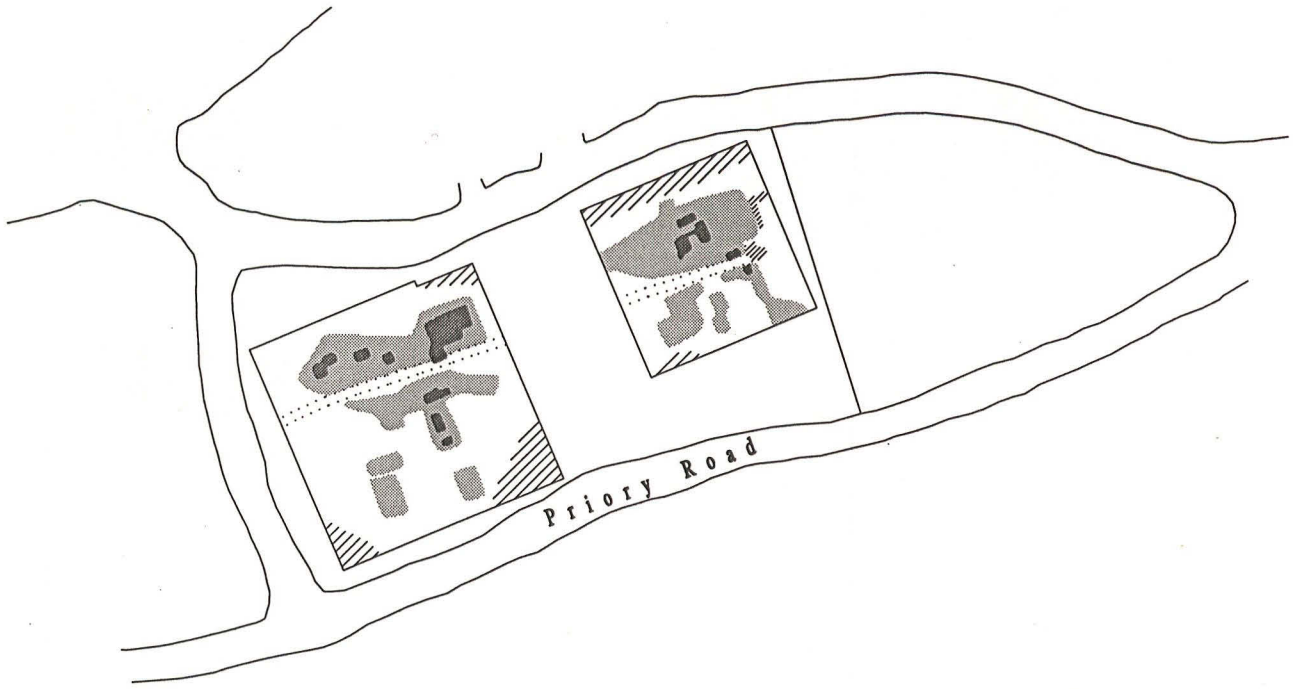


Resistance Survey

1:2500

Figure 1

GEOPHYSICAL SURVEYS OF BRADFORD	PROJECT: PRIORY ROAD, STAMFORD	TITLE: Summary Interpretation	Sketch map based on a plan supplied by John Samuels



High Resistance Anomaly

Area of Higher Resistance

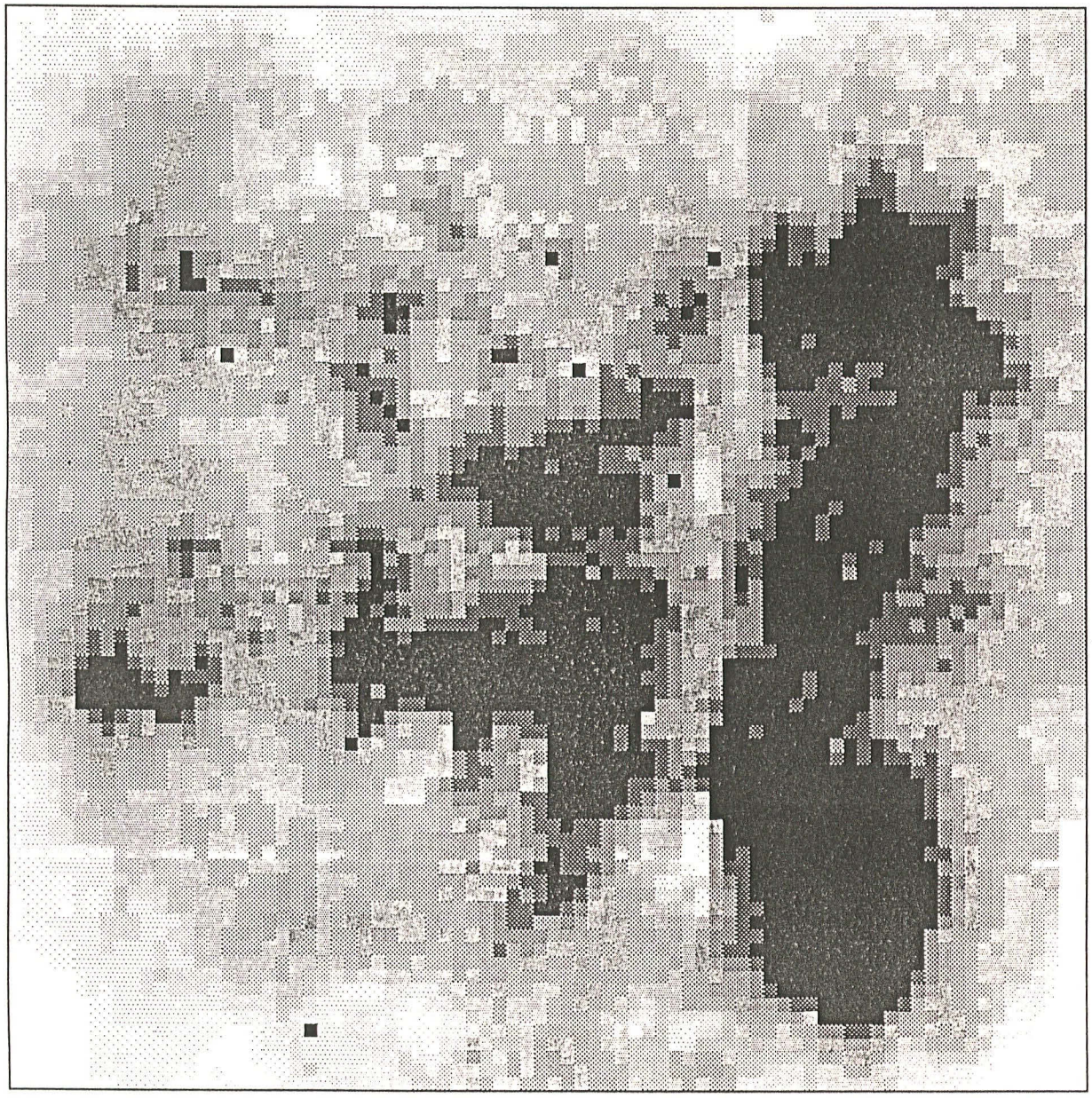
Low Resistance Anomaly

Area of Lower Resistance

Track

1:2500

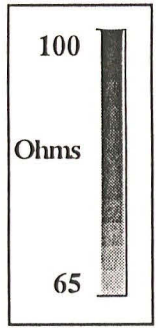
Figure 2



PRIORY ROAD, STAMFORD

Area A

Resistance Data



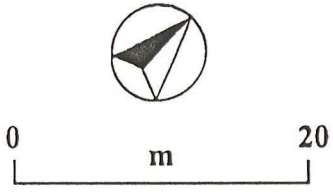
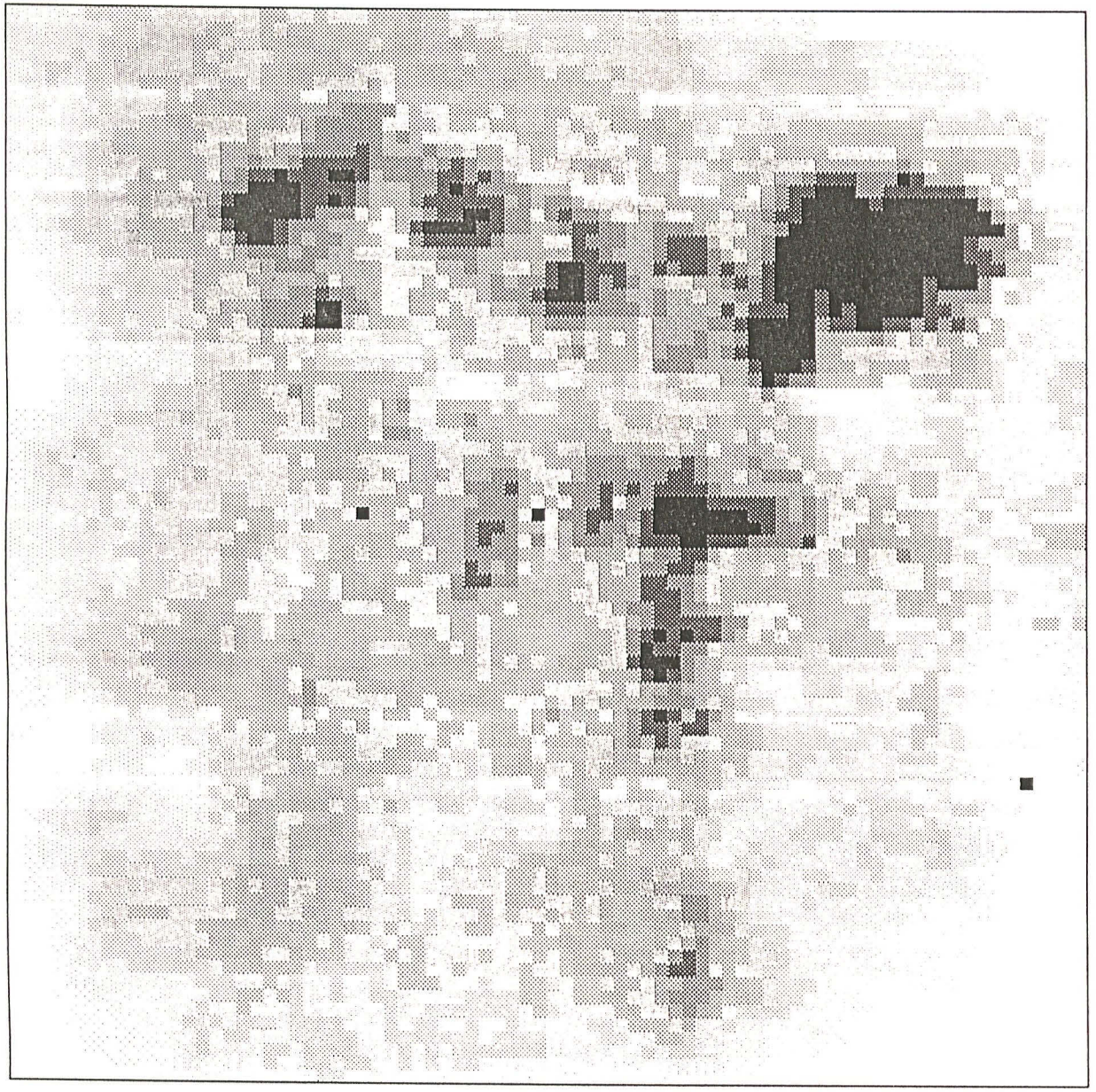


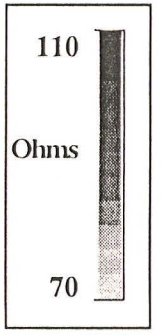
Figure A.1



PRIORY ROAD, STAMFORD

Area A

Resistance Data



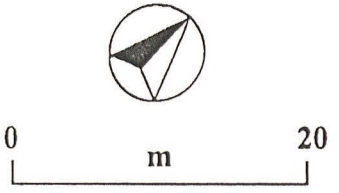
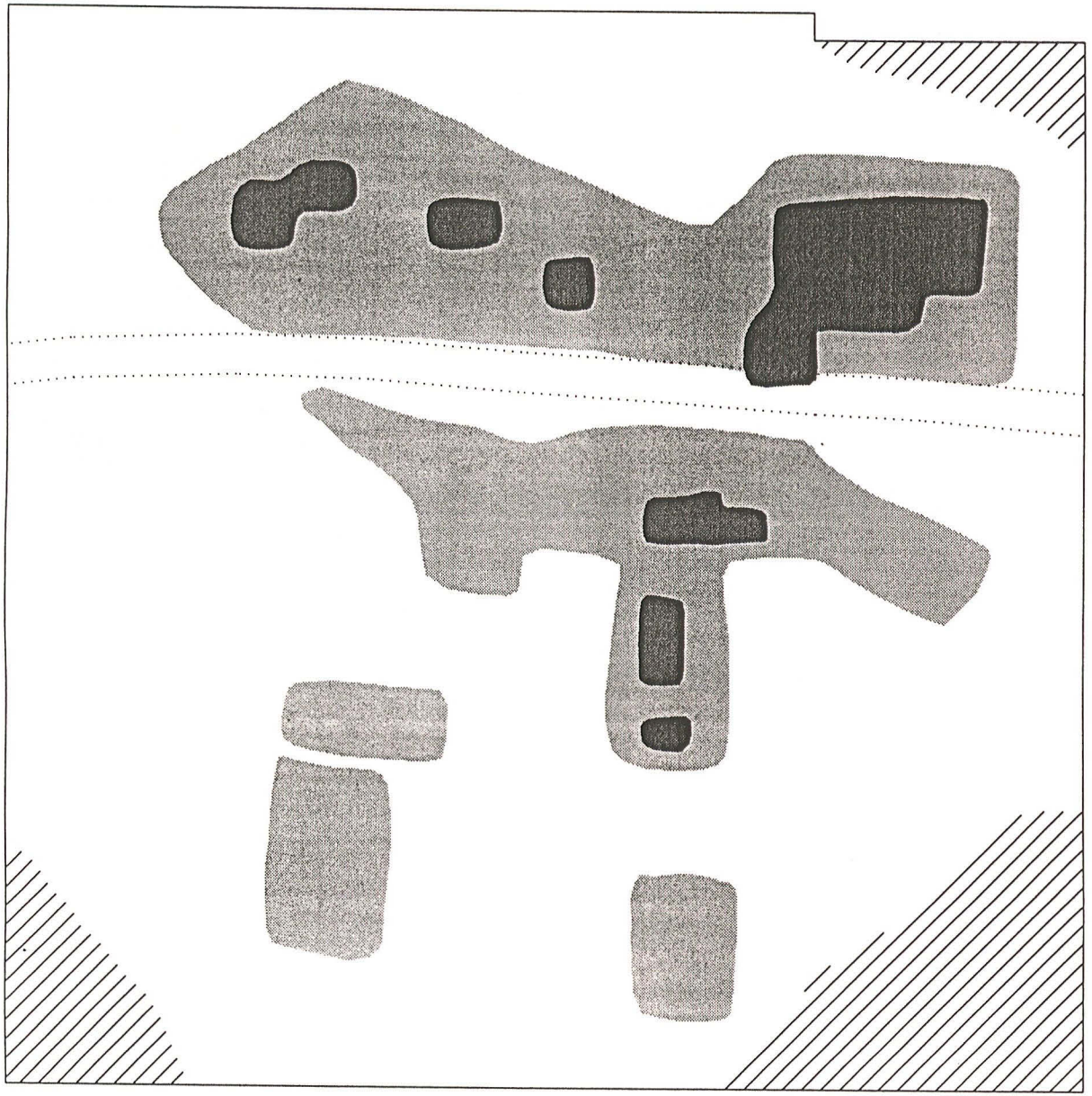


Figure A.2



PRIORY ROAD, STAMFORD

Area A

Resistance Data

High Resistance Anomalies

Area of Higher Resistance

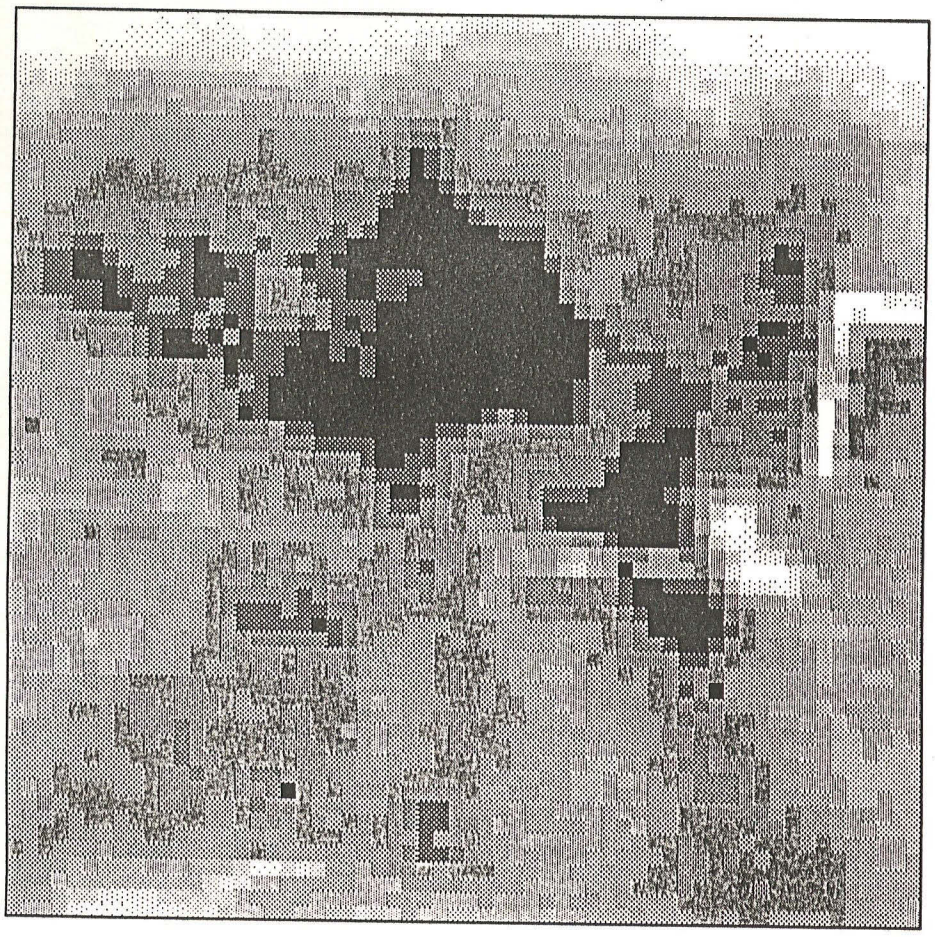
Area of Lower Resistance

Footpath / Track

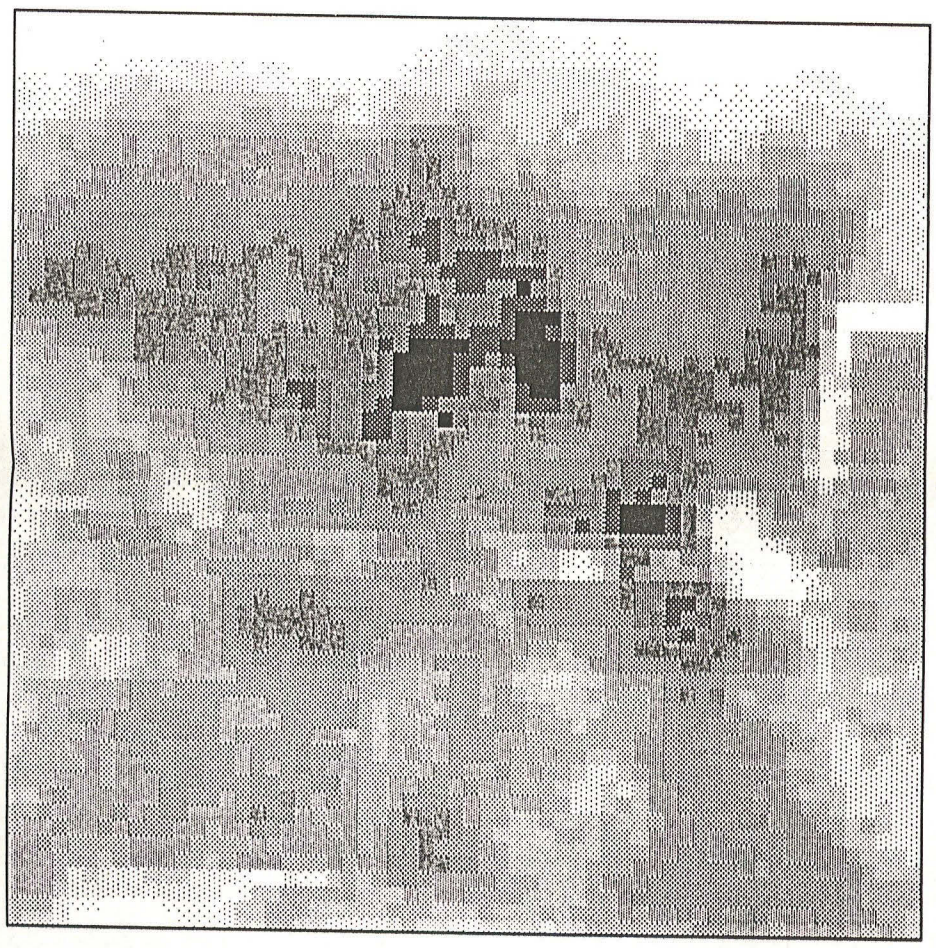
0 m 20

Figure A.3

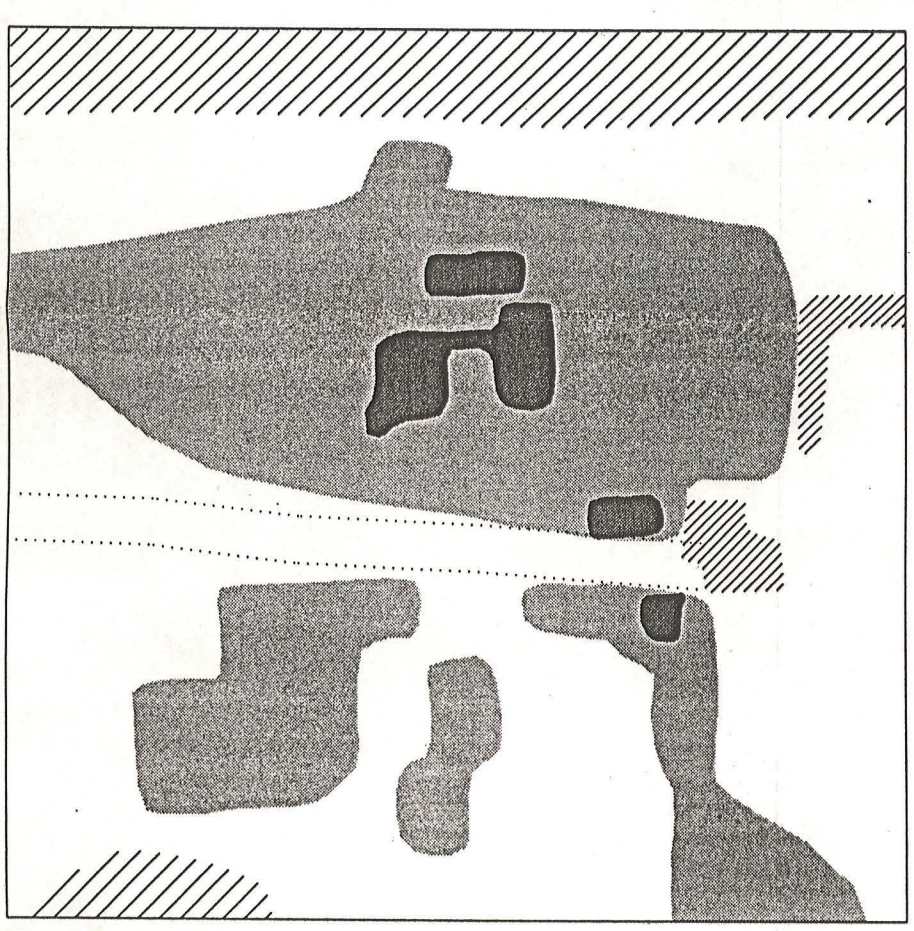
PRIORY ROAD, STAMFORD
Area B
Resistance Data



100
Ohms
65



110
Ohms
70



High Resistance Anomalies

Area of Higher Resistance

Low Resistance Anomalies

Area of Lower Resistance

Footpath / Track

0 m 20

Figure B.1