RPS Planning, Transport and Environment

INDEX DATA	RPS INFORMATION
Scheme Title A40 Headington Bypass	Details Stage 2 Assessment: Fieldwalking & Geophysical survey.
Road Number A40	Date
Contractor Oxford Archaeological Unit	
County Oxfordshire	
OS Reference	
Single sided ✓ Double sided	
A3 1 Colour 0	

OXFORD ARCHAEOLOGICAL UNIT

A40 HEADINGTON BYPASS

STAGE 2 ASSESSMENT: FIELDWALKING AND GEOPHYSICAL SURVEY

Contents

1. INTRODUCTION

1.1 The Oxford Archaeological Unit has been commissioned by Rendel Palmer and Tritton, Development and Engineering Consultants for the Department of Transport, to undertake an archaeological evaluation of the route of the Headington Bypass section of the proposed A40 North of Oxford bypass.

1.2 The brief was to undertake the study in three stages:
Stage 1 - Desktop Study
Stage 2 - Field Survey
Stage 3 - Trial trenching
The Desktop study has already been completed.

1.3 Stage 2, which is the subject of this report, involved Geophysical survey and Surface Collection survey of the route. Geophysical survey and limited fieldwalking was carried out by the OAU between 25th May and 30th June.

2. APPROACH AND METHODOLOGY

2.1 The original strategy was to fieldwalk all areas under cultivation and survey areas under pasture or Set Aside by geophysical survey. The methodology was to follow that used for the North Oxford Bypass Archaeological Assessment, detailed in volume 2, sections 2.2.2 and 2.2.3 (OAU January 1993). Because of the time of year it was not possible to fieldwalk most of the cultivated fields, since these had oilseed rape crops standing more than 1.2 m high.

2.2 An alternative strategy was drawn up, extending the geophysical survey to the whole of the route, and supplementing this by less systematic fieldwalking where at all possible to identify sites of high visibility. The methodology for the Geophysical survey was unchanged; the methodology for the limited fieldwalking is detailed in the relevant section below (4.1-2). The areas covered by geophysical survey and by fieldwalking are shown on Figures 1 and 2.

2.3 In the event it was not possible to use geophysical survey in the oilseed rape fields, and these (field nos 4055, 6962, 7960 and 8956 W of Lower Farm) have not been assessed at all in Stage 2 (see Figure 1). The state of the fields also affected the geophysical survey results, since standing crops and Set Aside scrub meant that the magnetometer had to be carried higher than is ideal, so that in some areas readings are weaker than would have been obtained under ideal ground conditions.

3. STATUS OF THE REPORT

3.1 Because of the limited surface collection that could be undertaken, and the probability that further surface collection will be undertaken at a later stage in the assessment, the gazetteer of known or suspected sites identified in the Stage 1 Desktop study has not been updated in this report. The findings of the field survey will be integrated with the results of the trial trenching in the Stage 3 final report.

4. GEOPHYSICAL SURVEY

by A.D.H. Bartlett BSc MPhil with B.Y. Turton MA

4.1 Introduction

4.1.1 This survey was commissioned by the Oxford Archaeological Unit as part of the archaeological evaluation of the route of the proposed A40 Headington bypass. Fieldwork for the survey was done in June 1993.

4.1.2 The survey covered the greater part of the route, with the exception of small wooded or obstructed areas, and two fields where the crop of oilseed rape was too dense for access. The geophysical techniques used, magnetometer surveying and magnetic susceptibility measurements, were the same as for earlier work on the proposed A40 North Oxford bypass in 1992.

4.1.3 A 20 m wide strip was surveyed (40 m for certain sections), following as nearly as possible the centre line of the route. This was intended to provide a sufficient sample of the route for areas of archaeological activity to be identified and interpreted.

4.1.4 The survey was marked out where possible in 100 m sections on the ground, which are shown superimposed on extracts from the engineers' 1:2500 drawings of the road works, and reproduced as figure 2 in this report. Fields covered by the survey are identified on this plan and on the survey charts (figures 3-6) by the OS land parcel numbers, which have been added to the maps where necessary. Details of the measurements to be taken to re-establish sections of the survey on the ground can be supplied on request.

4.2 Survey Procedure

4.2.1 The areas as shaded on figure 2 were surveyed using a Geoscan FM18 fluxgate gradiometer with readings recorded at a rate of 3 per metre along traverses 1 m apart, to give the results as plotted at 1:625 scale on figures 3-6. Each section of the survey is displayed both as a graphical profile or trace plot, and as a half tone plot, which provides an alternative view in plan of detected features. High readings are represented by dark shading on the half tone plots.

4.2.2 All the plots as reproduced are based on a processed version of the data in which high readings (caused by buried iron) have been truncated, irregularities in line spacing caused by variations in the instrument zero setting have been corrected, and the results smoothed (or treated with a low-pass filter) to reduce background noise levels and emphasise the broader features which may be archaeologically significant.

4.2.3 The magnetometer responds best to small anomalies in the geomagnetic field caused by the thermoremanent magnetism of fired materials, notably baked clay structures such as kilns or hearths. It is also highly effective for detecting cut features such as ditches and pits silted with topsoil, which normally has a higher magnetic susceptibility than the underlying subsoil. Human occupation, particularly when associated with burning, further enhances the magnetic susceptibility of topsoil, increasing the response from ditches and pits, and also making it possible to locate sites by magnetic susceptibility measurements on the superficial topsoil. A survey of this kind can be used with quite widely spaced readings to give a broad indication of occupied areas.

4.2.4 The magnetometer survey was therefore supplemented by magnetic susceptibility measurements taken at 20m intervals along the edges of the 20m wide survey strips. The readings were taken using a Bartington MS2D field coil, except in areas where the vegetation was too dense to allow ground contact with the coil, and soil samples were taken for later measurement. The field coil readings have been converted to numerically equivalent units of mass susceptibility for display. They are plotted as graphs, and in the form of shaded squares corresponding to the 20m squares from which the readings were taken, at 1:2500 scale beneath the magnetometer plots.

4.3 Results

4.3.1 The survey findings are discussed below for the results as shown on figures 3 to 6 in turn from west to east.

4.3.2 Figure 3

4.3.2.1 This plan shows results from the survey of the line of the link road to the proposed roundabout at the Marston junction, and from the main route through field 0058. The final short section of the main route west of the Bayswater Brook is wooded and was not surveyed.

4.3.2.2 The link road was surveyed from the present western boundary of field 5400 (which is not marked on the base map used for figure 2i). There is a break in the plots as shown on figure 3 at the change of direction in the centre of the field. Findings from this section of the survey are minimal. There are a few isolated magnetic anomalies which may represent pieces of buried iron, or other magnetic debris such as scattered bricks, and a line of such disturbances (arrowed at A), which could perhaps represent a former boundary or trackway. The susceptibility readings are low throughout this section.

4.3.2.3 The survey of the link road continues with the section of the results from field 0058 labelled a-b, and finishes with a strip next to the fence of the present bypass in field 0041. A wooded triangle between these sections was not surveyed. Findings from 0058 are similar to those from field 5400. There is a scattering of small anomalies, which again probably represent non-archaeological interference, and form clusters near the two ends of the survey (labelled B and C on the plot). Magnetic stones occurring naturally in a gravel soil can sometimes cause anomalies of this kind, but they would probably in that case be more evenly distributed. There is also a strong magnetic anomaly (D) at the east end of the plot, which again appears to be caused by buried iron.

4.3.2.4 The plots from field 0041 are heavily disturbed by magnetic interference from a pipe alongside the road fence, but there are no other features which can be recognised as of potential archaeological interest.

4.3.2.5 Findings from the main route (c-d) across field 0058 are similar to those from the link road, and are limited to small localised disturbances which are unlikely to be archaeologically significant. The magnetic susceptibility readings do not show any noticeable variations in fields 0058 or 0041.

4.3 3 Figure 4

4.3.3.1 This plan includes results from sections of the route where the width of the survey was increased to 40 m, both because of increased landtake for the roadworks, and because

there may have been a medieval settlement in this area. The wider coverage extends from Lower Farm, across Wick Farm and field 4627, and into the small area surveyed in field 7220 (figure 5). The line of the proposed new access road to Wick Farm was also surveyed at 20m width. The fields between Lower Farm and the areas surveyed in field 0058 (figure 3) were under a dense crop of oilseed rape and could not be surveyed.

4.3.3.2 Features detected in the survey of field 9645 at Lower Farm are likely to be caused by modern interference. Various iron objects and a heap of rubble caused the strong anomalies at E. There are some similar disturbances in field 9835, but also a line of anomalies which could represent a former boundary at F. Nearby, there is another line of anomalies (outlined on chart) which could represent an intermittent response to a ditch-like feature (G), although the effect is weak. There is also an increase in magnetic susceptibility values close to F and G.

4.3.3.3 The 40 m wide strip surveyed across field 1339 is crossed by a pipe, but also shows a rather more disturbed or noisy general response than was the case for the fields described so far. No individual anomalies can be identified as significant, but the effect could perhaps be a result of past human activities nearby. The 20m wide north-south sections surveyed in this field (a-b and c-d) show the effects of modern disturbances, including a pipe and fence, with other anomalies caused by buried iron.

4.3.3.4 Only modern disturbances can be identified in the results from field 2436, which is overgrown waste ground. There is a concentration of magnetic anomalies near the site of a recent bonfire.

4.3.3.5 In field 4627 there is an increase in the general noise level of the survey, similar to that noted in 1339, at the two ends of the field, where there are also a number of magnetic anomalies (outlined on plot) which could represent broad silted hollows or pit-like features. These are rather ill-defined, but slightly more distinct at the east end of the field, where it may also be significant that there is a very pronounced area of susceptibility enhancement. This extends across much of the eastern half of the field, but falls off at the west. A few other anomalies have been circled in the centre on the field which could, but may not necessarily, represent small pits.

4.3.3.6 The variations in magnetometer response seen in this field may be partly of geological origin. There is a boundary in the solid geology indicated on the copies of the road engineers' geological maps supplied to us, which corresponds quite closely to the limits of the noisy areas noted at the ends of the survey. This boundary (between the Temple Cowley and West Walton Formations) does not, however, relate to the change seen in the susceptibility values, and the increase in susceptibility combined with the presence of magnetic anomalies, as seen particularly at the east of the field, perhaps means that archaeological as well as geological factors could have affected the survey.

4.3.4 Figure 5

4.3.4.1 The magnetic activity noted in field 4627 does not appear to extend into 7220, where both magnetic and susceptibility readings appear undisturbed. There is more activity in field 8428, including a cluster of strong anomalies at the east of the field. These disturbances may be modern, given that a number of the anomalies are narrow spikes, representing iron, but the susceptibility values here are also relatively high. There are weaker features elsewhere in the field, but few individual magnetic anomalies which can be identified as possible subsurface features. Two rather doubtful examples which could be small pits are indicated

on the plot.

4.3.4.2 Field 0038 shows some variation in susceptibility response, but with no clear correlation with the magnetometer plots, which are mostly quiet. There is, however, a ditch-like feature at the east of the survey, labelled H, together with a slight increase in general magnetic activity extending perhaps some 80 m into the field from the east end of the survey. Other magnetic disturbances are likely to be modern, including a wire fence to the south of the survey, and an electricity pole at J.

4.3.4.3 Part of field 4400 is quiet, except for an anomaly caused by a piece of farm machinery near K, but there is a distinct change towards the east of the field. Here, as in 4627, there are rather broad and ill-defined pit-like anomalies (some of which are outlined on the plot), combined with a pronounced increase in susceptibility values. This effect may again be wholly or partly geological. A geological boundary between the Beckley Sand and the Wheatley Limestone Formation crosses the field some 120 m from the west end of the survey, and so divides the apparently responsive area from quieter ground to the east.

4.3.4.5 Numerous pieces of limestone could be seen on the ground at the west side of this field, suggesting that the outcrop lies near the surface. It is not therefore clear whether the magnetic features as noted may be of archaeological interest, or whether they represent slight natural variations in the soil cover on the limestone, which provides much more magnetically responsive conditions that the gravels and clays encountered over much of this route.

4.3.5 Figure 6

4.3.5.1 The fields shown here are mostly on a clay soil, but there is a small area of limestone crossed by the survey at the west end of field 0005. There is a cluster of magnetic anomalies here, but they are mostly narrow, and unlikely to be archaeologically significant. There are also some raised susceptibility values, but they diminish about 100 m from the west of the survey at a point which appears to mark the boundary between the Wheatley Limestone and the Kimmeridge Clay. The susceptibility values then remain low throughout the remaining fields surveyed to the eastern end of the route.

4.3.5.2 Few features were located in these fields in the magnetometer survey. There are clusters of small anomalies at the two ends of field 0063, but these again appear unlikely to be archaeological, and a large roadside pipe was seen in 3567 and 6359. The overall noise level also increases slightly near the pipe, but susceptibilities remain low. Anomaly L at the west side of field 3567 is caused by a nearby electricity pole.

4.4 Conclusions

4.4.1 The survey has produced a number of clear findings, including the ditch near the Roman Road at the edge of field 0038 and the old boundary in field 9835, and has identified areas where slight or dispersed archaeological features or materials may be present, but in general findings of distinct subsurface features are rare. The soils along the route, as is often the case on clays and gravels, are not in general strongly magnetic, and this may have limited the strength of response to certain types of features. The fact that some apparently archaeological features were detected suggests that at least any substantial disturbances associated with past settlement sites (where magnetic enhancement should be strongest) should have been found, even if the response elsewhere is incomplete.

4.4.2 Areas showing increased magnetometer response which could relate to settlement activity were seen near to Wick Farm in fields 1339 and 4627, although there were few individual magnetic anomalies which could be interpreted as distinct features, and no clear plan of the site emerged. This is not unusual for a magnetic survey of a medieval settlement, where there may be scattered debris, but there are unlikely to be as many ditches or pits cut into the subsoil as at sites of earlier periods. The disturbances seen at the east end of field 4627 may be of particular interest because they correspond also to an area of susceptibility enhancement. There is another area of magnetic activity with susceptibility enhancement in field 4400, extending perhaps across the valley of the Bayswater Brook into field 0005, but this corresponds clearly to an outcrop of Limestone, and is likely to be a geological effect.

4.4.3 Other magnetic disturbances for which an archaeological explanation cannot be wholly excluded were seen in field 8428. Findings from the fields surveyed at the ends of the route to the west of Lower Farm and south of the Bayswater Brook were minimal.

5. FIELDWALKING RESULTS

5.1 The line of the route was walked in field parcel 0038 just E of the Bayswater Road, at present planted with potatoes (see Figure 1). The methodology was based upon that for full field survey. Transects (lettered A-T on Figure 7) were walked N-S along the rows between the plants, spaced at approximately 20 m intervals, and finds were recovered in 20 m collection units. In some places it was not possible to carry out the survey due to the height and ground cover of the crop. Tile was not retrieved, but Roman or medieval tile was noted where present.

5.2 A scatter of Roman pottery of the 3rd-4th centuries was found in the western half of the field (Figure 7). The pottery was concentrated next to the road, which is of Roman origin (see Desktop study, Fig. 1b, OAU no. 7). The high proportion of mortarium sherds is noteworthy, and may indicate a production site in the vicinity, though a domestic component was also present in the assemblage.

5.3 A scatter of Roman tile including keyed tiles and roof tiles was noted accompanying the concentration of pottery alongside the road, and another mixed with a rubble spread on the S side of the route centred 175 m from the road, which could indicate a building. This was not however associated with a concentration of Roman pottery, and may be of later date.

5.4 A sparse scatter of medieval pottery dating from the 12th century onwards was also recovered. More of this was recovered from the western half of the field, and the pottery was probably derived from manuring from the adjacent settlement at Stowford (Figure 7).

5.5 A scatter of post-medieval pottery and other debris was also recovered across the survey area. The distribution of this is not illustrated, but like the medieval pottery, more of this came from the western than from the eastern half of the field.

6. INTEGRATION OF STAGE 1 AND STAGE 2 RESULTS

6.1 The combined assessments of Stage 1 and Stage 2 have indicated three areas of high potential for further investigation (Figure 1, A-C):

6.1.1 Area A. The Stage 1 desktop study identified a deserted medieval settlement at Wick,

presumably centred around Wick Farm (Desktop study Fig. 1b, OAU no. 4). The field immediately S of Wick Farm (2436) did not give clear geophysical readings because of modern interference, but the background 'noise' was high in the adjacent fields either side, possibly indicating some former activity in this area.

6.1.2 Area B. Another deserted medieval settlement is documented on or close to the route at Stowford Farm (Desktop study Fig. 1b, OAU no.8). An area of possible subsoil features associated with high magnetic susceptibility levels was identified by geophysical survey 150 m W of Stowford Farm, which may relate to the former medieval settlement.

6.1.3 Area C. Immediately E of the Bayswater Road, which follows the line of a Roman road, cropmarks were identified from aerial photographs 150 m to the N of the route (Desktop study Fig. 1b, OAU no. 19). On the line of the route at this point a spread of Roman pottery indicates domestic settlement and possibly pottery production, associated with tile and stone spreads which may indicate buildings. No concentrations of medieval pottery that might indicate occupation associated with Stowford (see B) above) were found. A possible ditch and other weak geophysical anomalies were detected in the same area.

6.2 East of the Roman activity identified above an area of high magnetometer readings coinciding with high magnetic susceptibility values (Figure 1, Area D) was identified on the high ground overlooking the Bayswater Brook (field 4400). This may be of archaeological significance, but does correspond to a change in the underlying geology, where an outcrop of limestone comes to the surface. Since limestone is much more magnetic than the surrounding clay areas, the high readings may be geological rather than archaeological.

6.3 One further area of particular interest (Figure 1, Area E) lies W of Lower Farm (fields 4055, 6962, 7960). The Stage 1 report has indicated the site of a possible Roman villa 400 m N of the route at this point (Desktop study Fig. 1a, OAU nos 2 and 3) and has suggested that the area of Roman activity may extend to within 200 m of the route. This was the area that could not be assessed by either geophysical survey or fieldwalking.

7. PROPOSALS FOR STAGE 3 TRENCHING

7.1 The route will be divided between areas of high potential, where a 2% sample is appropriate, and those where the Stage 1 and Stage 2 assessment has not indicated anything of archaeological significance, for which a 1% sample will be sufficient. For the calculation of the required sample of trenches the complete landtake of the proposed route has been considered.

7.2 All trenches will be 30 m long and 1.5 m wide. Topsoil and overburden will be removed by machine down to archaeological levels, and these will be cleaned, recorded and a sample excavated by hand, following the methodology established for the North Oxford Bypass Archaeological Assessment (OAU January 1993).

7.3 A sample of the topsoil at the end of each trench will be excavated by hand to characterise the artefactual content of the topsoil.

7.4 The trenches will be arrayed in a manner which, within on-site constraints, allows the greatest degree of confidence possible for locating archaeological sites and also allows the investigation of features, sites and areas of potential identified in earlier stages of the assessment.

7.5 The areas of high potential correspond to letters A-C) and E) on Figure 1. Area D) will initially be examined with a 1% trenching sample, but contingency trenches will be allowed for in case features are encountered. Detailed maps (Figures 7-11) show the position of the trenches, which are numbered consecutively W to E.

7.6 Due to our inability to fieldwalk all the parts of the route under crop, and to the reduced strength of the geophysical signals obtained, increased reliance will have to be placed on test-trenching to obtain an accurate picture of the archaeology. This has necessitated more trenches in some areas, for instance area E.

7.7 Over and above the three contingency trenches allowed for area D (Figure 1), a contingency element of 10 % for further trenching is incorporated into the proposals.

8. TIMING

8.1 The Stage 3 assessment is due to be completed by 23rd August 1993. This will depend upon successful (and rapid) negotiation of access for ground intervention in Set-Aside areas, which we understand will require consent from the Ministry of Agriculture, Fisheries and Food.

8.2 It is anticipated that there may be a continuing problem with access to fields still under crop, particularly those not yet assessed in Stage 2. We understand that harvesting should take place in early August, but this will depend upon the weather.

9. COSTINGS

9.1 A total of 96 trenches is proposed. These are divided as follows (see Figures 8-12):

	1%		2%
Trenches 1-14	14	Trenches 15-30	16
Trenches 31-2	2	Trenches 33-49	17
Trenches 50-53	4	Trenches 54-67	14
Trenches 75-82	8	Trenches 68-74	7
Trenches 83-96	14		—
Totals	42		54

9.2 At a cost of £7.48 per metre for 1% sampling and £12.22 per metre for 2% sampling this will cost £9,424.80 for the 1% sampling and £19,796.40 for the 2% sampling.

9.3 A 1 sq. m area will also have to be dug by hand for all trenches but those in field 0038, a total of 87 trenches. This will cost £59.17 per trench, totalling £5,147.79.

9.4 A contingency element of 3 trenches for area D and a further 10 trenches (10% of the total) is allowed for. This will cost £2917.20.

9.5 The total cost of the ground intervention will therefore be:

	£ 9424.80
	£19796.40
	£ 5147.79
	£ 2917.20
Total	£37286.19

OAU
July 1993

APPENDIX 1

FIELDWALKING IN PARCEL 0038: THE POTTERY REPORT

1. Some 295 sherds (214 Roman, 22 medieval and 59 post-medieval) were recovered from fieldwalking in field 3. A further 3 post-medieval sherds came from fields 1 and 2.

2. Present comments are largely confined to the Roman material. The medieval sherds were generally quite small and probably represent no more than 'background noise', resulting from manuring of fields. The date range of the sherds was perhaps from the 12th century onwards. There were no concentrations of medieval material. Post-medieval pottery was more common but was likewise widely distributed, together with a general scatter of other post-medieval material - tile and brick, coal and clinker, glass and clay pipes.

3. The Roman pottery is principally datable to the 3rd and 4th centuries. The only sherd which need have been earlier was a fragment of samian ware, though some of the undiagnostic oxidised and reduced coarse wares could also have been of 2nd century rather than later date.

4. The majority of the pottery was from local sources. Sixteen sherds (7.5% of the Roman total) were from outside the region. These were the samian fragment already mentioned, a possible amphora sherd (the only other import), a Nene Valley colour-coated ware bowl rim (4th century), four sheds of pink grogged ware and nine of black-burnished ware. These two last fabrics are amongst the most common non-local products in late Roman assemblages in this region.

5. Most if not all the remaining sherds are probably local products of the Oxfordshire industry. (The nearest known kilns of this industry lie little more than 1 km to the W in Headington). The principal components were Oxfordshire colour-coated ware (18 sherds, 5 rims), mortaria (50 sherds, 16 rims), white wares (15 sherds, 2 rims), oxidised wares (65 sherds, 5 rims) and reduced wares (50 sherds, 11 rims). The relative abundance of oxidised sherds (and the paucity of rim sherds in these wares) is notable, but easily explained. These sherds are amongst the most difficult to identify with confidence. Local oxidised fabrics have a tendency to fragment to a greater degree than other fabrics. Small, abraded, oxidised fragments can of course be of tile (of almost any date) or of pottery of post-medieval date. The oxidised ware group tends therefore to be something of a catch-all category. Not all the small fragments assigned to it are confidently dated to the Roman period.

6. The most striking feature of the Roman assemblage as a whole, however, is the high proportion of mortrium sherds. All but two of these are in the Oxfordshire white ware fabric (OAU fabric M22), which accounts for 22.4% of all the Roman sherds from this collection. This figure is 4 or 5 times what would be expected from a normal domestic assemblage. Unfortunately, the overall size of the group is not sufficiently large to allow confident demonstration that this is significant - mortaria do tend to break into larger than average sherds and are easy to see on the surface of fields. Nevertheless the abnormally high occurrence of these sherds might suggest that this is not a standard domestic assemblage. The possibility that some of the sherds could derive from a production site must be considered. The absence of obvious wasters is not necessarily significant, particularly in a group of this size. Characteristically distorted mortaria are relatively rare on production sites.

7. The range of mortarium forms was typical of the later 3rd-4th century, (Young) types M17, M18, M22 and possibly M23 being represented.

8. The Roman pottery concentrates notably at the W end of field 3, with almost exactly half of the sherds coming from the two units in transect A.

Paul Booth, OAU
July 1993

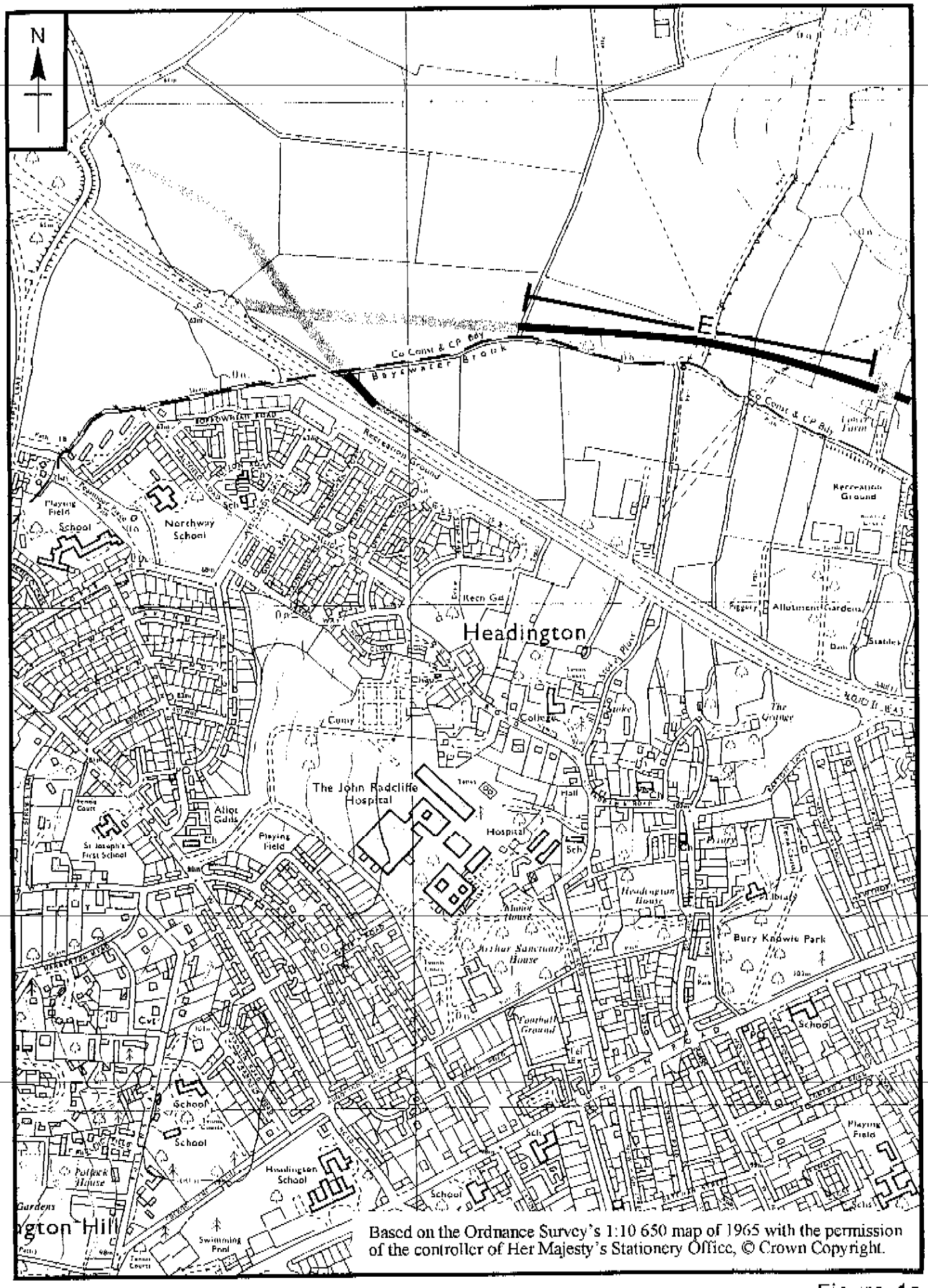
N
Headington
Northway School
The John Radcliffe Hospital
Bury Knowle Park
Headington School
Recreation Ground
Allotment Gardens
Playing Field
Swimming Pool
Based on the Ordnance Survey's 1:10 650 map of 1965 with the permission of the controller of Her Majesty's Stationery Office, © Crown Copyright.

Figure 1a

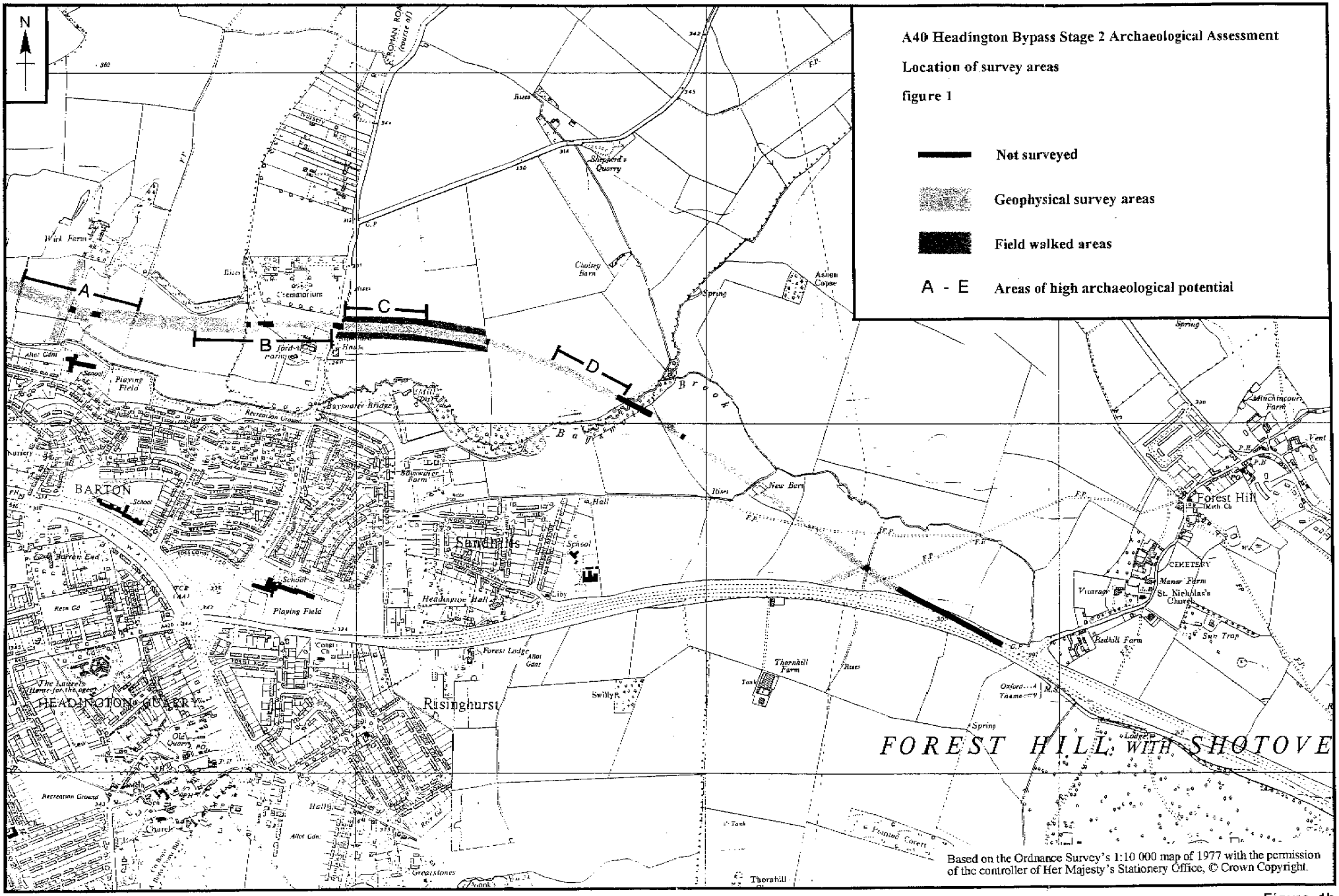
A40 Headington Bypass Stage 2 Archaeological Assessment
Location of survey areas
figure 1
Not surveyed
Geophysical survey areas
Field walked areas
A - E
Areas of high archaeological potential
N
A
B
C
D
BARTON
Sandhills
Risinghurst
FOREST HILL WITH SHOTOVE
Based on the Ordnance Survey's 1:10 000 map of 1977 with the permission of the controller of Her Majesty's Stationery Office, © Crown Copyright.

Figure 1b

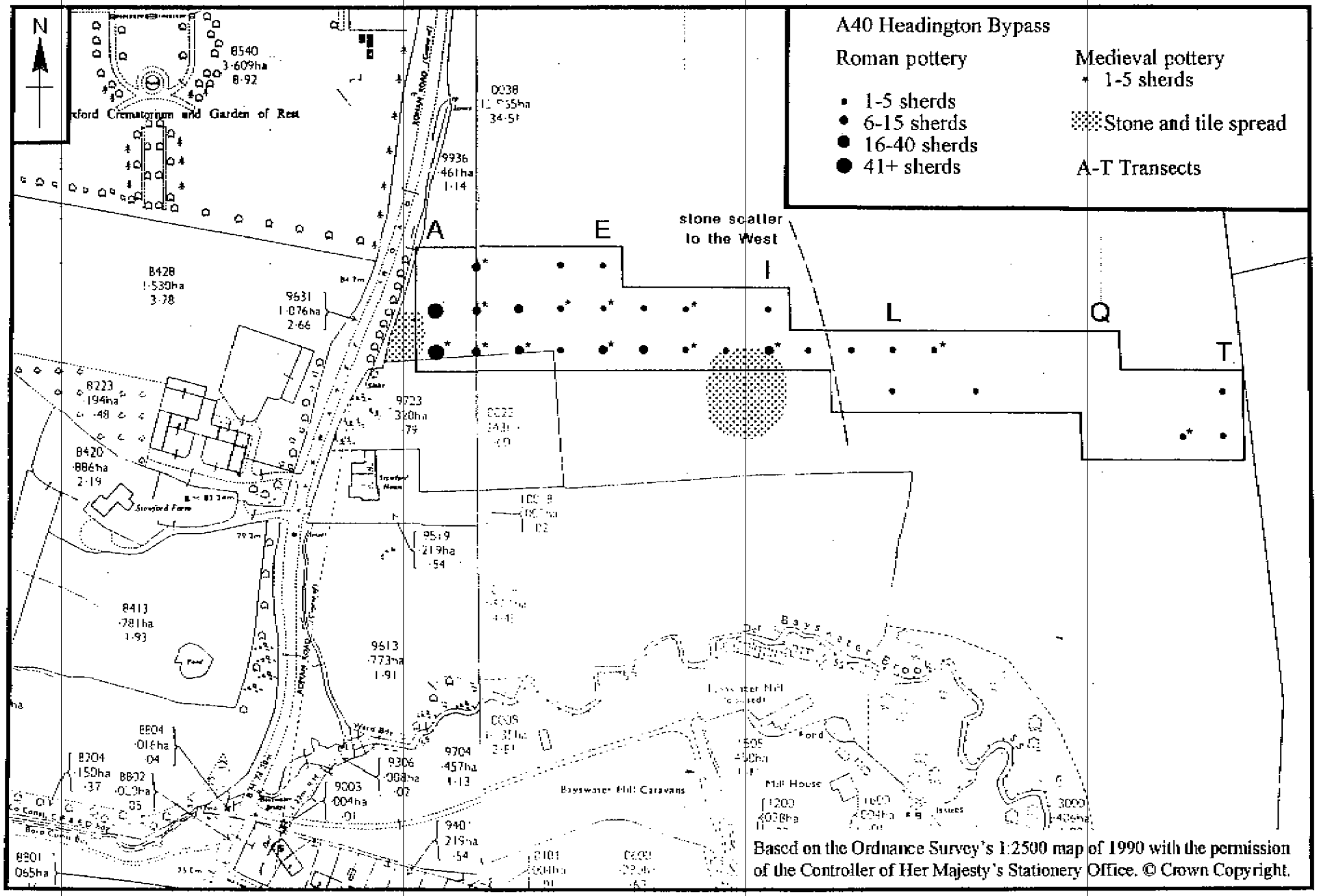

Figure 7 Field walked area C