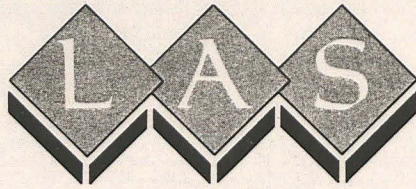


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SLI 0889

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LINDSEY ARCHAEOLOGICAL SERVICES

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**CAISTOR WESTERN BY-PASS
ARCHAEOLOGICAL DESK TOP STUDY and GEOPHYSICAL SURVEY**

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1. INTRODUCTION

An archaeological evaluation was commissioned by Engineering Consultancy Services as part of a staged assessment and evaluation programme, preceding the construction of the Caistor Western Bypass. This report has been prepared in accordance with the requirements of the Brief prepared by the County Archaeological Officer, dated February 1993.

Site Location

Caistor is situated on the north-west edge of the Lincolnshire Wolds, a chalk and sandstone scarp which rises frequently to heights over 150 metres. The older geological formation is sporadically overlain with frequent minor subsoil variations, caused largely by glacial, coastal or other climatic/environmental events, such as wind-blown sand.

The bypass route originates approximately 100m north of Nettleton village, where it extends westwards from the A46, skirting the west side of Caistor and linking North Kelsey Road with Caistor Road (Fig.1).

Method

Records from the parishes of Caistor and Nettleton lodged at the Lincoln Sites and Monuments Record (SMR) were examined and sites plotted onto a 1:10,000 map (Fig. 2) and are listed in Appendix I. A few additional records, held at the offices of LAS, were also incorporated into the list.

Visits were made to the Lincolnshire Archives Office and the Local Collections Library at Lincoln Castle.

The records of the Cambridge University Collection of Aerial Photographs (CUCAP) and National Air Photographic Library (Swindon) were searched. There was no coverage of the route held at Cambridge but the photographs held at Swindon are shown on Fig. 2 and listed in Appendix 1.

A visit was made to the site to examine ground conditions.

2. RESULTS

The archaeological evidence comprises two main categories. Casual finds record human activity in the area dating from the Mesolithic period to the recent past. Aerial photographs have recorded physical remains, such as enclosures and ditches which cannot be dated with confidence.

The parishes of both Caistor and Nettleton have produced widespread and significant evidence of human settlement from the prehistoric periods to the present day. Much of this evidence has accumulated as a result of circumstantial or chance discovery largely during the previous century.

Controlled excavation and recording has been limited to the centre of Caistor itself, and at Nettleton Top.

Prehistoric

There have been many finds between Caistor and Nettleton, spanning the Bronze Age, Neolithic and earlier periods. Many have been chance finds although the work of D.N.Colebrook in the 1950s identified several settlement areas. The only modern excavation has been at Nettleton Top in 1987 when a suspected ploughed-out Bronze Age barrow was discovered, occupying part of the same site as a later Anglo-Saxon settlement.

A number of isolated Bronze Age and earlier finds have been recorded in the vicinity of the bypass route. North of the proposed junction with North Kelsey Road, five cremation urns were discovered during the bulldozing of a Bronze Age burial mound (4), (5). An Upper Palaeolithic hand axe, dating to before 10,000BC, was recorded at the same site, though this may have been transported by advancing or retreating ice during one of the later glacial phases. Its presence raises awareness concerning the diversity of prehistoric settlement evidence around Caistor.

Caistor lies immediately west of the Caistor High Street, an important prehistoric trackway. This provided effective communication between settlements along the western edge of the Wolds between South Ferriby on the Humber and Horncastle. Its significance, at least from the Bronze Age (2,000 BC and later) is indicated by the number of round barrows which cluster along its route.

To date, no Iron Age finds have been made in the locality. Unlike Horncastle, where Romano-British occupation appears to have developed from an Iron Age settlement, there is currently no indication of Iron Age origins within the town of Caistor.

Romano-British

By the late 3rd or early 4th century AD Caistor was a fortified town of considerable importance. Its walls, measuring some 4m in thickness, enclosed an area of about three and a half hectares. The walled area is now a Scheduled Ancient Monument. The true status of this monument has yet to be understood, though it seems possible that both Caistor and Horncastle, on the south-west edge of the Wolds, were fortified to counter the threat of seafaring migrants of Germanic origin. The walled circuits of these towns are unique in Britain. Both sites have been compared with late Roman shore forts, but their inland locations suggest that their function was to monitor and control transport and communications between the Humber and Wash via the Caistor High Street. There is a possibility that the Banovallum referred to in the Antonine Itinerary (probably meaning 'peak strength') was Caistor, rather than Horncastle.

Surprisingly little is known regarding the development and internal layout of the settlement. Previous excavations have concentrated largely on dating and understanding the defences (Rahtz 1960; Richards in the 1960s). In 1992, Lindsey Archaeological Services excavated a small evaluation trench immediately outside the wall where an associated defensive ditch was identified for the first time.

The proposed by-pass route lies well west of the Roman defences. The intervening low ground, however, has produced significant Romano-British finds over the years, particularly east of the sports ground. It is unclear whether this represents extra-mural development or if any of the activity pre-dates occupation of the later walled area uphill. At least two 3rd or 4th century pottery kilns and a suspected inhumation cemetery are known in this area (11), (12), (15), (16), (26). Further west, close to the present sewage works, fragments of a mosaic floor were disturbed during ploughing some fifty years ago (22), possibly indicating the site of a villa which no doubt held economic, social and political ties with the town to the east.

West of the bypass route at its north end, there are groups of extensive cropmarks. Although these are difficult to date on morphological grounds alone, similar examples in the county are known to be Romano-British (10), (20), (21).

A Roman cremation cemetery is already known c. 230m west of the route, just inside of the Nettleton parish boundary, close to a large sub-rectangular cropmark (13).

Anglo-Saxon

There is little doubt that Caistor remained a centre of significant regional importance after the withdrawal of Roman administration from Britain in the early 5th century AD. It was probably the capital of the North Riding of the Kingdom of Lindsey; it had a mint in the 10th century and was a royal estate at the time of the Norman Conquest.

Little is known of any early Saxon presence within the town itself, although gravel extraction at nearby Fonaby in the 1950's revealed a substantial 6th century cremation cemetery. In 1972, a single inhumation burial of the same century, with associated brooch and beads, was found at 'Tree Tops' on the Nettleton Road, (28), which may have been part of a cemetery already identified in the 19th century (38). The Rev. Hippisley Maclean reported the discovery of a further burial in 1857, approximately half way between Nettleton and Caistor which had a bronze bowl at its feet and fragments of a shield boss, now known to date to the 5-6th century. According to Maclean, further burials were found prior to 1857 in the same area. In 1987, excavations by Lindsey Archaeological Services at the top of Nettleton Hill identified part of an extensive Anglo-Saxon settlement, dated again to the 6th century

The early ecclesiastical importance of Caistor first came to light in 1770 when an 8th or 9th century titulus, or dedication, stone was discovered (29). Originally, this would have been set on a holy site to record the dedication of a building or altar, forming an epitaph to a ruler or saint. Its presence suggests that there existed in Caistor an early Saxon church of some importance. The fabric of the present church preserves pre-Conquest architectural features.

Medieval

Caistor declined as a centre of regional importance during the medieval and post-medieval periods, though it continued to function as a local market town. There are earthworks and fish ponds north-east of the sewage works off Navigation Lane ((27), (39)) and there are extensive earthworks in Nettleton parish close to Manor Farm (37). North of (37) there is a suspected moated site near the Nettleton/Caistor parish boundary, (35), and this lies a short distance east of a large sub-rectangular enclosure (36).

3. THE BY PASS ROUTE

The route of the proposed bypass was inspected on 23/7/93 and a record was made of current agricultural land use (Fig. 1). The parish boundary dividing Nettleton and Caistor is a deeply-cut stream or beck and the sides of this were inspected at several locations, revealing deposits of wind-blown sand to depths exceeding 2m. Land towards the south-east end of the route is heavy clay.

The route was examined again in January 1994 when fieldwalking was proposed. However, only two fields were in a suitable condition for walking. Nothing was found in the field adjacent to the A46 at the south-east end of the route (Pl. 2). At the north end, although the field was ploughed it was covered in sewage from the adjacent works and was not walked over.

Four areas of potential archaeological interest were identified from the desk top survey.

1. Cropmarks at the north end of the route have been identified in the same field as the bypass. It is not known if associated settlement extends as far east as the bypass route.

2. The parish boundary between Caistor and Nettleton. Roman cremations have been found on this boundary to the west of the bypass route suggesting that the boundary may be of considerable antiquity. Excavation at this stage is not considered practical as it forms a field boundary but it is suggested that monitoring and recording should be carried out when groundworks for the road construction are in progress.

3. At least two moated sites lie west of the route in Nettleton parish. There may be associated features along the line of the route.

4. There is documented evidence that there may be an Anglo-Saxon cemetery near the junction of the bypass and the A46. the closest located find was the knife, or possible scramasax, (31) on Fig. 2, which was found in the 1950s. See geophysical report below.

4. GEOPHYSICAL SURVEY

Figs. 3-8. (Figs. 6-8 in plastic sleeve)

A geophysical survey of the whole bypass corridor was carried out by the Landscape Research Centre (Pl. 1), whose report is appended. In summary, a total of 30 grids, numbered from south-east to north and each 30m square, were surveyed along the route (Figs. 3, 6,7). Magnetic anomalies which may relate to archaeological remains were found in Grids 1-4,7,9,11, 13,21,22,23 and 26-30 (Fig. 8).

The main areas of interest were at the north and south ends of the route. Grids 1-4 at the south end are in the area where there is the possibility of Anglo-Saxon remains. Geophysical survey is rarely able to identify features as small as graves but some of the anomalies recorded appear to be gullies or ditches (Fig. 4). This has been identified as an area for further investigation.

At the north end of the route most of the anomalies occur to the north of Navigation Lane where cropmarks have already been recorded from aerial photographs (Fig. 5). These may be related to the cropmark site and should be further investigated.

5. PROPOSALS FOR FURTHER WORK

The results of the Desk Top Study have shown that the whole area around Caistor has a high density of archaeological remains dating from the early prehistoric period onwards. The results of the Desk Top and geophysical surveys have highlighted areas at the north and south ends of the route which deserve further investigation prior to commencement of the groundworks. Smaller anomalies along the central part of the route will also be covered.

It is proposed that 17 machine-excavated trenches, each 15m long and 1.5m wide, should be dug in the following locations

1. Grids 1-4 6 trenches to examine the anomalies identified by the geophysical survey
2. A single trench in each of Grids 7, 10, 13, 16, 19 and 23
3. 2 trenches to examine anomalies in Grids 21 and 22
4. A single trench in each of the Grids 26, 28 and 30 to examine anomalies identified by the geophysical survey.

Examination of the machine dug trenches will be carried out as described in the proposals dated March 19th 1993 and within the original budget of the same date.

Any further stages of work which may arise as a result of the evaluation trenches will need to be determined in consultation with the County Archaeological Officer.

Colin Palmer-Brown and Naomi Field
March 25th 1994

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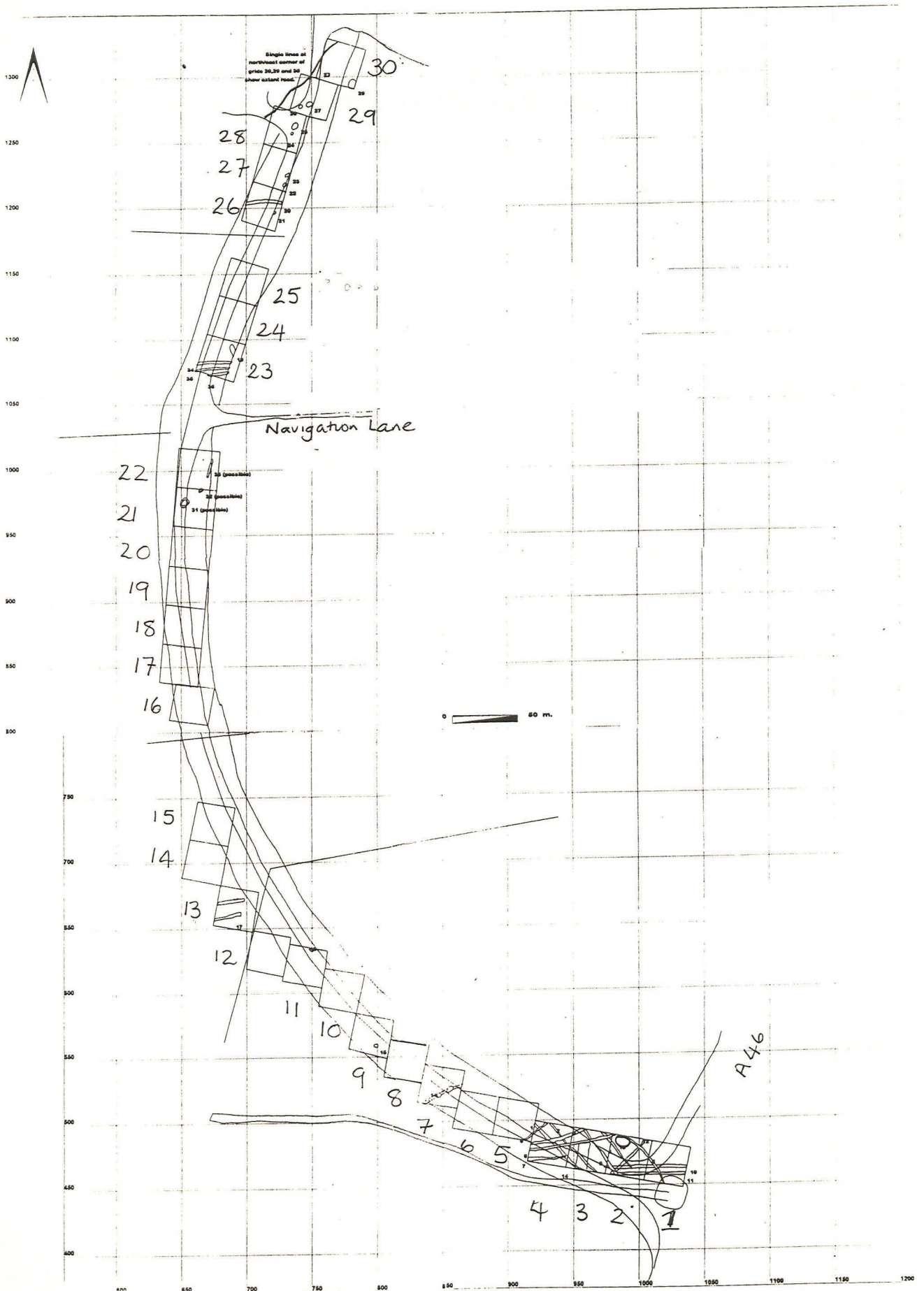


Fig. 3 Location of geophysical survey grids along the bypass route, showing position of proposed trial excavation trenches

APPENDIX 1

Archaeological Remains in the vicinity of the By-Pass Route

LM=Lincoln Museum. Alphabetical reference relate to each 1:10,000 scale map. A few records have been computerised and have a unique Sites and Monuments Record five-figure number reference.

RCHM= Royal Commission on the Historical Monuments of England, National Air Photographic Library reference. (Film number+ negative no.) Some of these photos are also held by LAS

Prehistoric

No.(Fig.2)	NGR	LM Ref.	Description
(1)	TA10050129	F	Flints, scrapers+ 2 leaf arrowheads
(2)	TA099 988	AA	Neolithic stone axe
(3)	c.TA 1101	O	Bronze Age socketed axe
(4)	TA 1073 0195	H	Worked flints, scrapers, Bronze Age pottery, burnt bone
(5)	TA 1068 0195	AT	Destroyed round barrow, 5 cremations in urns, worked flints including microliths + Palaeolithic hand axe
(6)	TA 1005 0013	C	Bronze Age flints
(7)	TA 1040 0007	E	Worked flints
(8)	TA 1040 0050	E	Worked flints
Unlocated	---	O	looped & socketed bronze axe
Unlocated	---	AX	Flint plano-convex knife
Romano-British			
(9)	TA 102 010	-	Cropmarks (RCHM ref. 2920/25; 2921/28,34)
(10)	TA 105 012	-	Cropmarks, rectangular enclosure + other faint marks (RCHM ref. 2920/26,27,34; 2921,32,35)
(11)	TA113 011	W (50585)	Human burials, no grave goods.

No. (Fig. 2)	NGR	LM Ref.	Description
(11)	TA113 011	W	undated inhumations (as above). 2 N-S burials. 2 crouched burials, 60 yds. W. of above.
(12)	TA1137 0108	W	Adult human skeleton found in Navigation Lane in sewage works, no assoc. finds.
(13)	TA 1045 0076	D (50217)	4th century R-B cinerary urns found 1937
(14)	TA 1134 0180	AC	R-B grey ware pottery
(15)	TA 1130 0100	Q, AI	R-B pottery kiln, 3rd/4th century, S of Navigation Lane, 3 ft below ground
(16)	TA 113 012	AF	Site of R-B pottery kiln, 4th century. Resistivity survey suggested more kilns to S.
(17)	TA 1176 0144	I	??R-B inscription
(18)	TA 117 013	AD	Jet/shale spacer bead of Romano-British date + silver coin of Gallienus
(19)	TA 1135 0120	AF	Romano-British pottery, 3rd/4th century grey ware, waster sherds, kiln furniture
(20)	TA 1010 0150	--	Cropmark site, ditched enclosure + annexe (RCHM ref. NMR12271/06,08,09; NMR12257/37,38,39,40,41,42)
(21)	TA 1055 0125	--	Cropmarks (RCHM ref. 2920/26,27,34; 2921/29,32,33,35)
(22)	TA 109 012	?	Tesserae, possible villa site
(23)	TA 1188 0135	J	Romano-British pot sherds
(24)	TA 1163 0125	K	Roman lead tank
(25)	TA 1175 0123	?	Roman coins

No.(Fig.2)	NGR	LM Ref.	Description
(26)	TA 1140 0110	?	Burial, Navigation Lane ?Roman.
Saxon/medieval			
(27)	TA 108 012		Earthworks (RCHM ref. 2921/31; 5157/16,17; NMR1851/287-290)
(28)	TA 1127 0087	P(50587)	6th century Anglo-Saxon burial, in garden of 'Tree Tops'. Bead necklace, 2 annular brooches, iron knife + ring on hip.
(29)	TA 1141 0127	AV	Pre-Danish inscribed <u>titulus</u> ; found Castle Hill, 1770.
(30)	TA 1155 0131	AG	Danish/medieval pottery + coins (Caistor Grammar School boarding house)
(31)	TA 1091 0037	A	Knife with silver wire decoration; possibly an Anglo-Saxon scramasax.
(32)	TA 118 003	--	?Strip lynchets (AP)
(33)	TA 106 003	--	Amorphous earthworks, perhaps continuous with western half of Nettleton
(34)	TA 1045 0045	--	?Moated site (RCHM ref. 2920/23)
(35)	TA 103 007	--	Small ?moated site, c. 0.3ha (RCHM ref. 2921/25)
(36)	TA 10380063	--	Large banked enclosure /cropmark (RCHM ref. 2921/25)
(37)	TA 101 003	--	Slight but extensive earthworks around Manor Farm.
(38)	TA111 006	B(50220)	Anglo-Saxon inhumation cemetery
(39)	TA 1090 0120	50498	?medieval fish ponds (RCHM ref. 2921/34)
(40)	TA 119 013	Z	15-16th century weight box

No. (Fig.2)	NGR	LM Ref.	Description
(41)	TA 115 013	AK	Rouletted rim sherd, St Neot's Ware pot
(42)	TA 111 030	AQ	Substantial scatter of R-B pottery
(43)	TA 1167 0126	AU	SS Peter and Paul church
---	unlocated	AW	Anglo-Saxon/Scandinavian bone comb

Miscellaneous

(44)	TA 116 077	BA	Silver bowl, unknown date
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Vertical photographs held at Swindon

Library no	Sortie no and frames	date
4966	106G/UK/515/1088-1090	(15.7.45)
4966	106G/UK/515/2088-2091	(15.7.45)
469	CPE/UK/1746/2058-2060	(21.9.46)
469	CPE/UK/1746/5057-5059	(21.9.46)
540	CPE/UK/1880/6192-6193	(6.12.46)
832	CPE/UK/2563	(28.3.48)
9279	OS/67031/19-21	(16.4.67)
9279	OS/67031/44-46	(16.4.67)
7514	MAL/78003/50-51	(6.3.78)



Pl. 1. Geophysical survey at south-east end of bypass route, Lincoln - Caistor road behind hedge.

Pl. 2. View looking north-west along route (marked by pegs) showing state of ground.



Landscape Research Centre Ltd

Magnetometer & Resistivity Survey

Caistor, Lincolnshire

17th January, 1994

Summary :

A magnetometer survey was carried out by the Landscape Research Centre Ltd. for Lindsey Archaeological Services, as part of an archaeological assessment of a proposed bypass at Caistor, Lincolnshire. The proposed development area had a number of magnetic anomalies which are discussed in detail below.

Enclosed :

The report consists of this document, several plans and images, and one table, numbered below. All plans have north pointing to the top of the page.

1) An A4 sheet at a scale of 1:4000 showing the position and numbers of the grid used in the magnetometer survey. The plan also shows the boundaries of the proposed bypass and the position of Navigation Lane. Four straight lines give the approximate centre points of current field boundaries. The grid is at 30 metre intervals. The plan was digitised using 1:500 sheets provided by Lindsey Archaeological Services. Because the magnetometer image is presumed to be a flat surface, whereas the actual topography of the land has contour variation, it was necessary to stretch some parts of the grid in order to provide a plan which has relevance to the actual ground topography.

2 and 3) These are plans of the magnetometer data displayed as a greyscale image. The plans are at a scale of 1:1000. The grid is at 20 metre intervals. Plan 2 is the image of grids one to fifteen and Plan 3 is the image of grids sixteen to thirty. It was necessary to divide the image into two separate plans because of the length of the survey. (almost one kilometre long). The bottom of grid 16 can be seen in the extreme north of Plan 2.

4) This is a plan of the digitised interpretation of the magnetic anomalies with the numbers used in the text below at a scale of 1:2000. Note that these are the digitised outlines of magnetic signals and need not necessarily equate with the true size of the feature, which might be either larger or smaller than the extent of the magnetic signal.

5) Table one giving the raw data and statistics of each individual grid. Included are the minimum and maximum values, the range, the average value and standard deviation for each of the thirty grids.

Report :

The subject of this report is the discussion of the results of a magnetometer survey carried out on behalf of Lindsey Archaeological Services. The site in question is a proposed bypass between Nettleton and Caistor, Lincolnshire. The magnetometer survey was conducted using a *Geoscan Research* fluxgate gradiometer (model FM36), hereafter referred to as a magnetometer. A 30 metre grid was felt to provide the best coverage of the area in question. The zigzag traverse method of survey was used. The survey was conducted by taking readings every 25cm along the north/south axis and every metre along the east/west axis (thus 3600 readings for every 30m grid). The data has been processed and presented using the programs GeoImage (a program dealing with the processing of geophysical data) and Geosys (a program which can display, process and present digitised plans and images).

The survey was carried out between the 15th December, 1993 and the 17th January 1994. The time taken to complete the survey was hindered by extreme weather conditions. The personnel involved were James Lyall and Heather Clemence. The survey area was based on a number of wooden pegs already in place, delimiting the extent of the bypass and its immediate environs. Due to local ground conditions (for instance the presence of large field drains and tree coverage), it was not always possible to follow the exact route of the proposed bypass. However, we kept as close as possible to the proposed route while providing a continuous cover, and thus we feel that a representative sample was achieved. In three places it proved more prudent to leave a gap in the survey, either because of obstacles or metal fences. The total area covered was 27000 square metres or 2.7 hectares, along a proposed route of approximately one kilometre.

The magnetometer data:

The magnetometer data is displayed both as an image (Plans two and three) and as a digitised interpretation (Plan four). Plans two and three are presented as a greyscale image. The anomalies are the areas of lighter and darker grey, which indicate areas of high and low magnetic susceptibility. In all, 33 magnetic anomalies were detected, with 3 further possible anomalies, and these will be discussed below. The magnetic response of the site varied according to the underlying geology, with some areas providing a good response and other areas a poor response. In areas of poor magnetic response, the lack of magnetometer evidence does not necessarily equate to a lack of archaeology. Due to the survey being carried out along the route of the proposed bypass, a 30 metre wide corridor was surveyed. Interpreting the anomalies found without being able to see the full context of the anomalies is thus made more difficult, so the report will concentrate on each grid (or set of grids), starting in the east (with grid number one, see Plan one, the grid numbers) and moving round to finish in the north, with grid number thirty.

Grid numbers one to four.

Five linear anomalies (numbered 1 to 5), orientation NW/SE, were visible in the first four grids. These anomalies were particularly strong in grids 2 and 3, perhaps hinting at a different underlying geology. It is possible that these anomalies could be field drains. A number of slightly weaker linear anomalies (numbered 6 to 11), orientation WNW/ESE, were particularly visible in grids 1,2 and 4. These have the correct proportions to be medieval ridge and furrow lines. A linear anomaly (number 12) with a different orientation (NE/SW) is visible in grid 2. Grid 3 appears to show a rectilinear negative anomaly (number 30), but no interpretation can be offered as to the nature of this anomaly. There is also a faint signal showing a possible semi-circular anomaly (number 13) in the centre north of grid 2, but this is possibly caused by the confluence of the diagonally opposed linear anomalies 4,5 and 8.

Grid number five.

This grid shows the continuance of the WNW/ESE linear anomalies (possible ridge and furrow) discussed above. A number of high spots (black or white in the image) are also visible in this grid. These are caused by iron or metallic objects in the ground, but there is no way to tell whether these objects were lost or deposited in antiquity or are only pieces of recent scrap metal, for instance horse shoes or pieces of broken plough shares. Thus these anomalies could either be scrap iron or possibly features with iron in them.

Grid number six.

This grid shows faint lines which are probably the result of recent ploughing. These lines were visible on the ground (in short turf), as lines of slightly greener, more lush, turf growth.

Grid number seven.

This grid shows a strong (NE/SE) linear anomaly (number 14). There are three high points visible in this anomaly, indicating the presence of metal, but whether this is of a recent or ancient date cannot be ascertained from magnetometer data.

Grid numbers eight to ten.

These grids showed only the faint traces of recent ploughing (as in grid 6), with grid 9 showing a number of high spots. Grid 9 also has a possible small anomaly (number 15), but the signal is faint and this is not certain.

Grid eleven.

This grid has a strong signal just at the northern edge (number 16), but there is not enough data to say whether this is due to the presence of a feature or to a piece of metal just outside the survey grid.

Grid twelve.

Grid twelve shows only high spots. The different shades of grey to the west are due to the proximity of the extant ditch and drain. The high spots do appear to lie in a semi-circular alignment, but whether this is due to chance or deliberate action cannot be ascertained from survey alone.

Grid thirteen.

Grids 12,13 and 14 had to be moved slightly off the centre line of the proposed route of the bypass due to tree coverage and the presence of the large ditch and drain. Grid 13 had two linear features (numbers 17 and 18) which are similar in size and signal strength to anomalies 6 to 11 in grids one to four (orientation NE/SW). They may thus be the remains of ridge and furrow ploughing, but the small size of the sample does not allow for a high confidence level of this interpretation. Also visible is a very strong signal in the east. This is probably due to the proximity of the metal fence to the east. The grey stripes to the east of the grid are the results of "dummy logging". This was done because of the proximity of a metal fence to the east.

Grids fourteen to twenty-two.

Grids 14 to 22 showed no significant magnetic anomalies. Slight NW/SE lines are probably the remains of relatively recent ploughing. There are three possible anomalies in grids 21 and 22. Anomalies 31 and 32 are possible semi-circular anomalies, with 31 being the larger. Thirty-three may be a north/south linear anomaly. The magnetic signals are so faint that no great reliance can be placed on this interpretation. The area incorporating these grids was of a lower magnetic response than the areas to the east and the north.

Grid twenty three.

Grid 23 is situated to the north/east of the sewage treatment plant. The south/east corner of the grid is 34 metres from the north side of the ditch running east/west along the dirt track. A strong magnetic anomaly is present in the centre/north of this grid, as well as three weak linear anomalies (numbered 33 to 35). The white rectangular areas in the east of grids 23,24 and 25 are due to "dummy logging". This was done because of the proximity of the ditch to the east.

Grids twenty-four and twenty-five.

These grids have a number of high spots which mask the weak NW/SE linear anomalies (probable recent ploughing).

Grids twenty-six to thirty.

These grids have a number of powerful magnetic anomalies (numbered 21 to 29). It is possible that they could be explained by the presence of the road and industrial area to the north east, being rubble and the remains of construction, but this cannot be proven from magnetometer survey alone. The road itself is visible in the north east corners of grids 28,29 and 30 as a powerful diagonal signal. It is the presence of the road which causes the extremely high standard deviation in grids 29 and 30 (see Table one). Grid 26 contains a linear anomaly (number 20) with a WNW/ESE orientation. It is not clear whether the high magnetic spots are a part of this anomaly or merely happen to lie on the line of the anomaly. The north/west corner of grid number 30 is nine metres from the existing road to the north.

Conclusion :

In conclusion, the site, due to its length across different underlying geology, was of a variable magnetic susceptibility, being of a medium to high magnetic susceptibility at the eastern and northern ends, while of a low magnetic susceptibility in the centre of the survey area. In addition to this, the survey area of a 30 metre wide corridor, while covering the threatened area, does not allow for the interpretation of the magnetic anomalies in their wider surrounding context. The plans should allow any archaeological investigation (if such is deemed to be necessary) of the area to concentrate in the specific areas believed to be significant. The United Kingdom latitudes are such that there can be a distortion of up to half a metre in position between the magnetic anomalies shown and the position of the actual features themselves.

Report by James Lyall

Landscape Research Centre Ltd.

GRID NO	MIN	MAX	RANGE	AVERAGE	STD. DEV.
1	-227	1062	1289	70	39
2	-657	1340	1997	19	48
3	-849	3003	3852	59	85
4	-229	811	1040	63	35
5	-2063	3236	5299	44	91
6	-146	385	531	37	20
7	-2178	3959	6137	54	145
8	-27	190	217	41	14
9	-822	660	1482	19	42
10	-218	227	445	14	15
11	-1842	639	2481	-1	51
12	-1056	1848	2904	16	63
13	-3397	3140	6537	36	248
14	-267	323	590	32	20
15	-331	500	831	33	27
16	-230	349	579	-37	18
17	-139	216	355	-28	15
18	-207	214	421	-43	16
19	-276	444	720	-57	22
20	-337	1119	1456	-42	32
21	-179	657	836	-41	23
22	-504	228	732	-58	25
23	-2419	3568	5987	-8	164
24	-809	1667	2536	-21	80
25	-525	406	931	-15	38
26	-1020	575	1595	-33	59
27	-2439	3100	5539	-18	147
28	-3699	3977	7676	-18	175
29	-3878	3406	7284	-16	3430
30	-3283	3683	6966	-27	214

Table one

A table giving the statistics of the values in the thirty grids of the magnetometer survey.

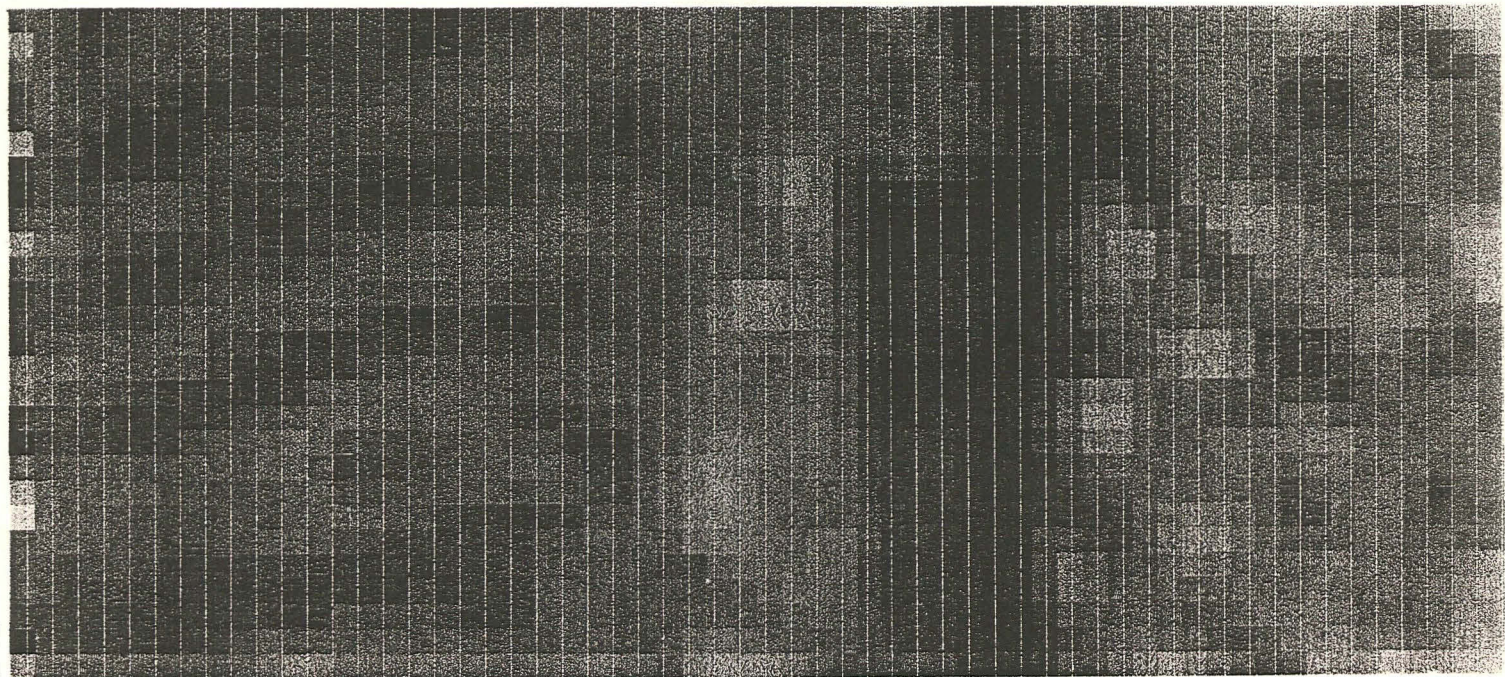
MIN - the minimum value in nanoTesla.

MAX - the maximum value in nanoTesla.

RANGE - the range of values in nanoTesla.

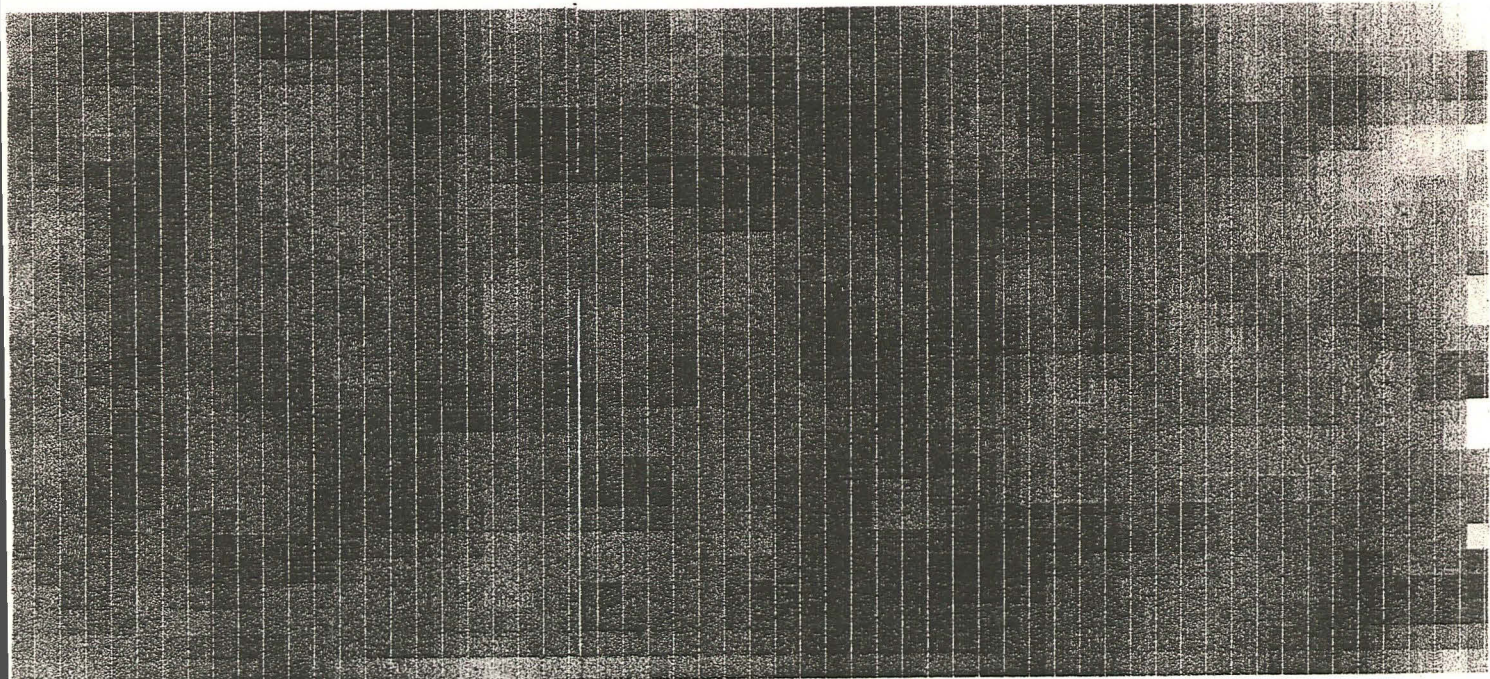
AVERAGE - the average value of the grid in nanoTesla.

STD DEV - the standard deviation of the grid.



4

3



2

1

Fig. 4 Grids 1-4. Contrast-enhanced and smoothed image. Scale 1:300

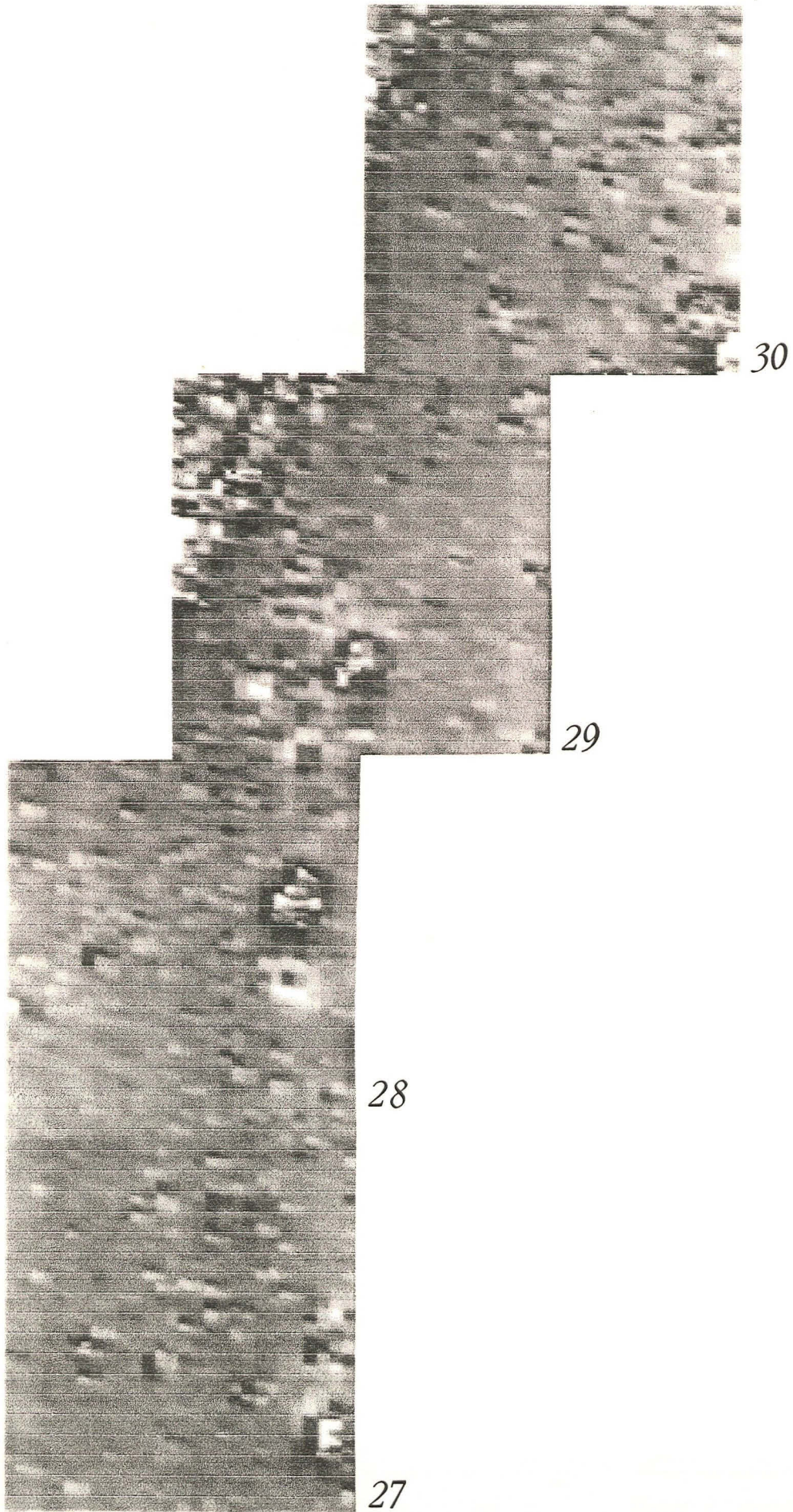
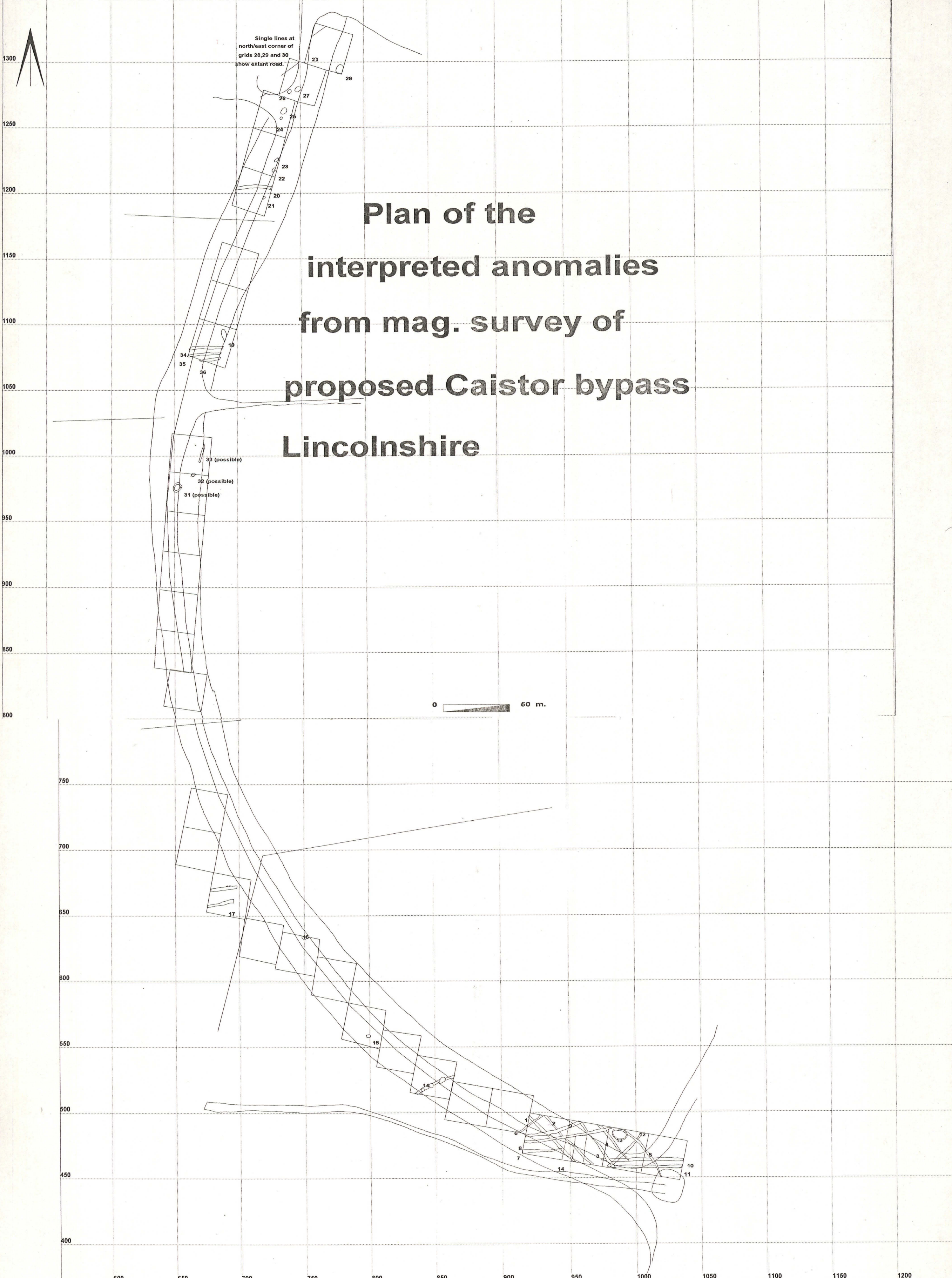


Fig. 5 Grids 27-30. Inverted, contrast-enhanced and smoothed image. Scale 1:500



**Plan of the
interpreted anomalies
from mag. survey of
proposed Caistor bypass
Lincolnshire**

Fig. 8 Grids 1-30 (30 at top) showing plan of interpreted anomalies from the magnetometer survey. Scale 1:2000

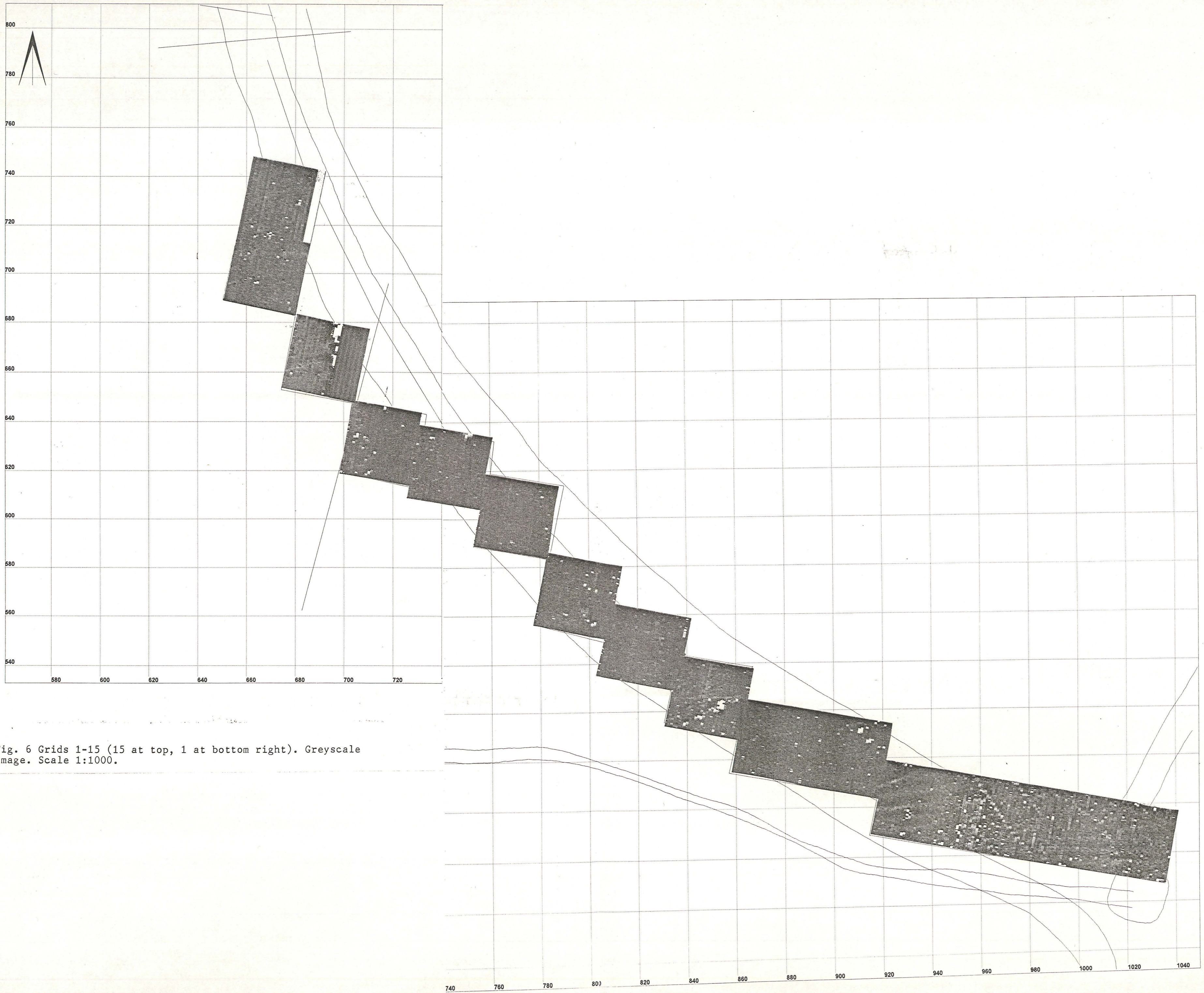


Fig. 6 Grids 1-15 (15 at top, 1 at bottom right). Greyscale image. Scale 1:1000.

Proposed Bypass at Caistor, Lincolnshire

Navigation
Lane

Plan showing the
magnetometer data
displayed as a
greyscale image



1260
1240
1220
1200
1180
1160
1140
1120
1100
1080
1060
1040
1020
1000

980
960
940
920
900
880
860
840
820
800

640 660 680 700 720 740 760 780 800 820 840 860 880 900 920 940 960

Fig. 7 Grids 16-30 (30 at top, 16 at bottom). Greyscale image.
Scale 1:1000