

ARCHAEOLOGICAL MONITORING AND RECORDING OF BOREHOLES ALONG THE PROPOSED ROUTE OF THE LINCOLN EASTERN BYPASS, WITHAM VALLEY, WASHINGBOROUGH, LINCOLNSHIRE (WIVW 13)

> Work Undertaken For Mouchel

> > April 2014

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ARCHAEOLOGICAL MONITORING AND RECORDING LAND ON ROUTE OF LINCOLN EASTERN BYPASS, WITHAM VALLEY, WASHINGBOROUGH, LINCOLNSHIRE (WIVW13)

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1. SUMMARY

Archaeological and palaeoenvironmental examination was undertaken on columns taken from boreholes drilled during geotechnical investigation along the proposed Lincoln Eastern Bypass in the Witham Valley at Washingborough.

The work was undertaken due to the site's location in an area of known archaeological remains ranging in date from the Mesolithic to the present day. Numerous prehistoric remains, including cemeteries of Bronze Age barrows, have been identified in the area. High status Roman occupation has been recorded close to the sewage works and a medieval grange and adjacent wharf were located on the south side of the river. Other remains of Iron Age, Roman, Saxon and post-medieval date have been identified in the vicinity.

However, only one archaeological feature was identified during the investigation. This was recorded south of the river in the area of the medieval grange. Here, in Test Pit 729, was a deposit of closely-packed large fragments of limestone, possibly representing the remains of a robbed out wall. A fragment of $14^{th} - 16^{th}$ century roof tile recovered from this deposit probably implies that this structure is part of the grange complex. Limestone fragments recovered from a sandy deposit in borehole (BH) 734 probably entered the deposit through ploughing and may be associated with nearby previously identified Romano-British buildings, or perhaps the same medieval structure as that recorded in Test Pit 729. A small fragment of Roman or Post Roman ceramic building material (CBM) was also recovered from this deposit.

The sequences of deposits identified in the boreholes, for the most part, consisted of natural, fluvial and alluvial deposits overlying mudstone bedrock and sealed by modern topsoil. To the north of the river, late glacial sands overlay the natural mudstone and a single alluvial deposit was observed in the southernmost borehole of this group overlying the glacial sands.

To the south of the river natural mudstone was overlain by fluvial and alluvial deposits. The borehole closest to the river contained a thick deposit of peaty organic river mud, representing a former channel of the River Witham, laid down in a slow moving meandering river environment that could date anywhere from the prehistoric to medieval period. Deposits of made up ground, associated with a late 18th century bank that forms part of the River Witham flood defences, were recorded in boreholes 725 and 726.

Finds retrieved during the investigation include a fragment of medieval roof tile and a small piece of Roman or Post Roman CBM.

2. INTRODUCTION

2.1 Planning Background

Archaeological Project Services was commissioned by Mouchel to undertake a programme of archaeological monitoring and recording during geotechnical borehole works along part of the proposed route of the Lincoln Eastern Bypass, Lincolnshire (Figs 1-4). Approval for the development was sought through the submission of planning application PL/0007/13. The investigations were carried out between the 4th and 26th September 2013 in accordance with a

specification prepared by Archaeological Project Services and approved by the Historic Environment Officer, Lincolnshire County Council (Appendix 1).

2.2 Topography and Geology

The site is on the alignment of the proposed Lincoln Eastern Bypass and passes through the administrative districts of North Kesteven and West Lindsey, Lincolnshire (Fig. 1). It extends from Sleaford Road at Bracebridge Heath, National Grid Reference (NGR) SK 9883 6651, through Canwick parish passing close to Washingborough Sewage Works, crossing the River Witham into Greetwell, terminating at Bunkers Hill at NGR TF 0060 7321. At its south end, the route commences on the Lincoln Heath on fairly flat land at about 65m OD. Near Washingborough Sewage Works it declines down a moderate slope into the river valley, to a height of c. 3m OD. After crossing the flood plain north of the river the route climbs a moderate slope on to a fairly flat land at about 35m OD.

The bores examined as part of this project were located in the valley floor of the River Witham (Figs. 3 & 4). Soils across the valley floor are of the Adventurers 2 Association, typically earthy eutro-amorphous peat soils (Hodge *et al.* 1984, 85-6). These soils are developed on a drift geology of river alluvium which in turn seals river terrace sands and gravels that overlie Jurassic Upper Lias clays and shales (GSGB 1973). On the southern river valley side, soils are typical sandy gley soils of the Blackwood Association developed on glaciofluvial drift to the west, and Aswarby Association, brown redzinas on interbedded Jurassic limestone and clays, to the east (Hodge *et al.* 1984, 127; 99). The main area of site monitoring is in the river valley and its southern slope, on Aswarby and Adventurer's 2 soils.

2.3 Archaeological Setting

The borehole transect is located in an area of known archaeological remains dating from the Neolithic to the present day. The findspot of a Neolithic stone axe is recorded to the north of the Witham. A little to the east of the proposed bypass route is an oval enclosure recorded from aerial photographs and thought to be associated with Neolithic funerary rites (Jones 1998, 113).

Occupying the valley floor are two Bronze Age barrow cemeteries located either side of the Witham. That to the north in Greetwell is quite dispersed whereas the Canwick cemetery is compact, although its full extent is not known as many barrows may lie beneath later peat deposits.

Evidence of high status settlement, possibly a villa, has been identified just south of the river (Rylatt forthcoming). Ironstone quarries of possible Roman origin have also been identified to the north. Iron Age and Roman occupation has also been identified near the northwestern end of the bypass route, at Bunkers Hill. Indications of Saxon occupation have also been revealed.

By 1184, Kirkstead Abbey had established Sheepwash Grange in Canwick which controlled about 250 acres (Mills and Mills 1998, 47) of land. A riverside wharf, known as Calcecroft, was also established near Sheepwash Grange by which fleeces could be brought in from the other estates of Kirkstead Abbey and sent to Boston for export. The grange was surrounded by a circuit of walls and ditches and part of this enclosure can still be traced at the site.

Engineering works to the River Witham, aimed at improving its drainage and maintaining a navigable channel, were conducted from the time of the Witham Drainage Act of 1761. This stage of works probably entailed the canalisation and embankment of the river to its current course, although the river had previously been embanked. The North and South Delphs, which run either side of the River Witham, also appear to have been constructed at this time as a catchwater drain and a relief channel respectively. South Delph appears to have been joined with Sincil Bank when it was diverted in 1818 (Wheeler 1896, 152).

Previous Work

A previous borehole transect across the Witham valley has been undertaken and revealed a single post-glacial channel which had scoured out earlier Holocene sediments. The former channel had been infilled with sands and was topped by up to 3.5m of peat and organic silts (French and Rackham 2003, 37).

A programme of trial trenching was also undertaken along the route of the bypass. Within the immediate area of the borehole transect, across the valley floor was dessicated peat that overlay sands of the prehistoric land surface from which flint tools of later Mesolithic and early Neolithic date were retrieved. To the south of the river, in the area of the Bronze Age barrow cemetery, part of a possible ring ditch was exposed. Further south, a Roman building, possibly of ritual significance, was exposed which appeared to have been extensively robbed by the medieval builders of Sheepwash Grange (Rylatt forthcoming).

3. AIMS

The aim of the investigation was to examine bore columns to determine the archaeological and palaeoenvironmental nature and potential of deposits and to recover datable material from them. The objectives of the investigation were to identify and record former land surfaces and areas of archaeological activity and assess the likelihood of the discovery of cultural remains along the proposed route of the eastern bypass.

4. METHODS

Boreholes were sunk using a shell and auger rig capable of extracting undisturbed deposits. Archaeological deposits were allocated a unique reference number (context number) with an individual written description. A list of all contexts and their descriptions appears in the results section of this report. A photographic record was also compiled. Recording was undertaken according to standard Archaeological Project Services practice.

The extracted cores were examined in the laboratory, by the project palaeoenvironmentalist (James Rackham), where details were similarly described and also cross-checked with the drillers' logs.

Following examination, the records were checked and a stratigraphic matrix produced. Phasing was assigned based on the nature of the deposits and recognisable relationships between them. Occasional finds were also used to assign a phase where possible.

5. **RESULTS**

Deposits examined during the study are described and interpreted in the following tables. Identification codes for the boreholes and depths below ground surface are as provided by Lincs Labs.

BH 715

Thickness	Description	Interpretation
0-0.30m	Mid greyish brown very fine silty sand with no	Topsoil
	inclusions	
0.30-2.52m	Loose light yellow fine sand with no	Natural glacial sands
	inclusions. Gets darker due to dampness at a	
	depth of 0.60m and becomes waterlogged at	
	1.50m deep.	
2.52-2.65m	Firm mid brown clay	Natural clay band
2.65-4.40m	Friable pinkish brown sand	Natural sand
4.40-9.70m	Friable light yellow sand and gravel	Natural sands and gravel
9.70m-	Mudstone	Bedrock

The deposit sequence in BH 715 consisted of modern topsoil overlying late glacial sands and natural deposits down to mudstone bedrock which occurred 9.70m below the current ground surface.

BH 716

Thickness	Description	Interpretation
0-0.30m	Mid greyish brown very fine silty sand with no	Topsoil
	inclusions	
0.30m-	Loose light yellowish fine clean sands	Natural glacial sands

The sequence in BH 716 was observed to a depth of c. 0.30m as the metal casing for the shaft was left in place throughout the process and obscured observation. However the sequence recorded at the top of the bore hole matched that of BH 715 and comprised a topsoil layer overlying late glacial sands.

BH 717

Thickness	Description	Interpretation
0-0.40m	Friable dark brownish grey sandy silt	Topsoil/Ploughsoil
0.40-1m	Laminated yellow and grey sand deposits with some silt staining.	Fluvial sands
1-7m	Clean coarse brown sand, without inclusions	Natural sands
7m-	Coarse river terrace gravels	Natural gravels

The sequence in BH 717 was similar to that of BH 715, though here the uppermost sands were fluvial deposits.

BH 725

Thickness	Description	Interpretation
0-0.30m	Mid greyish brown sandy silt with frequent angular, sub-angular and rounded stone inclusions	Topsoil deposit
0.30-0.50m	Mid orange sand and gravel with occasional cinder	Dumped deposit/made up ground
0.50-2.20m	Dark grey silty sand and cinder/ash	Dumped deposit/made up ground
2.20-2.40m	Friable dark greyish brown organic rich sandy silt	Buried topsoil
2.40-4.30m	Dark brown silty peat with shell inclusions. Bottom 0.10m gets sandy	Buried peat
4.30-6.70m	Mid greyish yellow coarse sand, graduating to coarse grey silty sand at 5m where gravel inclusions start	Fluvial sand
6.70m-	Clean river terrace gravels, poorly sorted and composed of various sizes	Fluvial gravels

The deposit sequence within BH725 consisted of fluvial deposits overlain by a peat layer, sealed by buried former topsoil. Deposits of dumped made up ground overlay the peat. A modern topsoil deposit sealed the made up ground.

BH 726

Thickness	Description	Interpretation
0-0.20m	Mid greyish brown fine sandy silt with	Topsoil
	coarser inclusions of sand and occasional	
	inclusions of small stones	
0.20-0.60m	Stiff friable grey silty clay with chalk	Dumped deposit to make up
	gravels. Blends into next deposit	bank
0.60-1.20m	Light brown fine sandy silt	Bank deposit
1.20-2.30m	Dark brown coarse mixed sands	Bank deposit
2.30-5.20m	Peaty clay with sand	Bank deposit
5.20-6.30m	Mixed sands with a high silt content	Bank deposit
6.30-9.50m	Very coarse dark blue sand	Bank deposit
9.50-11.60m	Coarse sand and gravel	Natural sands and gravel
11.60-	Mudstone	Bedrock

BH 726 was drilled through part of the River Witham flood defences. Bedrock and natural sand were recorded from 9.50m below ground level. Above this was a sequence of redeposited silts and sands forming part of the flood defence bank for the river. The deposits which made up the bank were overlain by modern topsoil.

BH 727

Thickness	Description	Interpretation
0-0.40m	Friable dark greyish brown sandy silt, with	Topsoil
	occasional small stone inclusions	

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0.40-1.80m	Mid yellow coarse sand with occasional	Alluvial deposit
	gravel inclusions	
1.80-3.40m	Mid to light yellow gravel	Fluvial gravel deposit
3.40-3.60m	Mixed bands of blue clay and yellow and	Alluvial sands and clay
	brown sands	
3.60-4.80m	Stiff blue grey clay	Alluvial clay
4.80-6.20m`	Mid brown sand	Alluvial sand
6.20-6.60m	Band of red sand, then brown sand, then red	Alluvial deposits
	sand, then gravel	
6.60-	Blue clay	Alluvial deposit

In BH 727 a sequence of alluvial deposits overlain by modern topsoil was recorded.

BH 734

Thickness	Description	Interpretation
0-0.50m	Dark greyish brown fine silty sand with	Topsoil
	occasional small stone inclusions	
0.50-1.20m	Friable mid greyish brown fine silty sand, with	Subsoil
	occasional small stone inclusions	
1.20-2.45	River sand/golden sand	Alluvial sand
2.45	Coarse mid reddish brown sand	Natural sand

The sequence of deposits in BH 734 consisted of natural sand overlain by alluvium and a subsoil deposit, which in turn was sealed by modern topsoil. A fragment of Roman or Post Roman ceramic building material (CBM) was recovered from the possible subsoil deposit. The level at which this fragment was recovered is too deep to be the result of ploughing which implies that it comes either from a feature fill or slope wash. Environmental specialist James Rackham has suggested the latter on the basis of previous work in the area.

BH 735

Thickness	Description	Interpretation
0-0.30m	Friable mid greyish brown sandy silt, without any inclusions	Topsoil
0.30-1.30m	Coarse light yellowish brown sand and gravel, with fragmented and weathered ironstone inclusions	Natural sands and gravel
1.30-2.25m	Mid brown fine silty sandy	Natural sand
2.25m-	Grey clay with yellow laminations suggesting sandy bands within the deposit	Alluvial deposit

Borehole 735 was characterised by natural deposits overlain by modern topsoil.

BH 736

Thickness	Description	Interpretation
0-0.50m	Dark greyish brown sandy silt	Topsoil
0.50-3.90m	Fine mid brown sand, with occasional small ironstone fragments	Natural sand

3.90-	Blue clay with sandy bands	Alluvial deposit

BH 736 was similar to 735, natural clays and sands overlain by modern topsoil.

TP 729

In addition to the boreholes, two test pits (TP 729 & TP 730) were recorded. They lay within the bounds of Sheepwash Grange (Figs 3-4).

The earliest deposit encountered was a firm sand (729-04) that was heavily waterlogged and subject to liquefaction when subjected to vibration. This measured over 1.1m thick and was sealed by a 100mm thick layer of grey medium coarse sand (729-03).

Sealing this was a 0.5m thick layer of closely packed limestone fragments (729-02), perhaps indicating a collapsed wall, though no apparent faces were visible (Plates 3-4). A fragment of $14^{\text{th}} - 16^{\text{th}}$ century roof tile was recovered from this layer.

Above the possible wall was the current topsoil, comprising a 100mm thick layer of friable greyish brown sandy silt (729-01). Frequent small limestone and brick/tile fragments were recorded, though none retained for identification.

TP 730

In test pit 730 the earliest deposit consisted of waterlogged natural calcareous running sands (730-04). These running sands were overlain by a moderately dense light brownish yellow alluvial sand deposit (730-03) with a thickness of 0.60m. A final layer of naturally deposited light grey and light brown sand (730-02) sealed (730-03) and was 0.20m thick.

The natural sands were overlain by a topsoil deposit consisting of friable dark greyish brown sandy silt (730-01) with occasional gravel and organic content. This deposit had a thickness of 0.50m.

TT 701

A single trial trench was excavated to the south of Washingborough (Figs 3-4) to a depth of 2.9m below the current ground surface. The trench was 20m long by 0.50m wide.

The earliest deposit encountered at the base of the trench consisted of naturally deposited clay and mudstone (701-05) with pockets of ironstone. This was overlain by a 1.10m thick layer of alluvial laminated clay (701-04).

The clay alluvium was sealed by a 0.85m thick deposit of mixed mid brown and blue grey clay (701-03). This was overlain by a 0.15m thick layer of light yellowish brown coarse sand and ironstone (701-02).

A layer of topsoil (701-01), 0.30m thick, sealed deposit (701-02) and consisted of mid brown sandy silt containing occasional pebbles and ironstone.

6. **DISCUSSION**

Archaeological and palaeoenvironmental examination of bore columns along the route of the proposed Lincoln eastern bypass across the Witham Valley has revealed sequences that indicate depositional phases formed under differing environmental conditions.

For the most part, the sequences revealed a pattern of fluvial and alluvial deposits associated with the River Witham, overlying mudstone bedrock and sealed by modern topsoil. However, to the north of the river, glacial sands were identified above the mudstone in three boreholes. A single fluvial deposit was recorded overlying the glacial sands in the southernmost of the boreholes to the north of the River Witham.

Borehole 725 was located on the southern side of the River Witham, sunk through a bank which comprises part of the flood defences associated with the river. This borehole was also the closest to the river and as a result was somewhat different in character to the majority of boreholes. A 2.90m thick peaty organic deposit was uncovered overlying fluvial sands at 2.30m below ground level and represents a former course of the River Witham. This deposit of organic mud was laid down in a slow moving meandering river environment (Rackham pers comm) and could date anywhere from the prehistoric to medieval period.

Borehole 726 was located south and slightly east of BH 725 and also cut through a bank associated with the flood defences for the River Witham. Mudstone bedrock was encountered at 11.60m below the ground surface and was overlain by naturally deposited sand and gravel. The sand and gravel was sealed by dumped sandy deposits, 9.30m in height, forming the bank associated with the rivers flood defences. This relates to the canalisation and embankment of the river in the late 18th century.

Boreholes 727, 734, 735 and 736 were located further south of the river and were characterised by natural and alluvial deposits overlain by modern topsoil. A small fragment of Roman or Post Roman ceramic building material (CBM) was recovered from deposit 734-02 which also contained a relatively high concentration of limestone fragments. Environmental specialist James Rackham suggests the limestone is probably intrusive as he would expect this deposit to be clean. The chipped limestone fragments may be associated with Romano-British buildings that have previously been identified in this area (Rylatt forthcoming) and entered the deposit through ploughing. The inclusion of the Roman or Post Roman fragment of CBM may be the result of hill wash.

Test Pits 729 and 730 were also located south of the river. In Test Pit 729 natural sands were overlain by a deposit containing large fragments of closely packed limestone which possibly represents the remains of a collapsed wall. A fragment of $14^{th} - 16^{th}$ century roof tile was recovered from this layer and provides a tentative date. This structure is probably part of, or related to, medieval Sheepwash Grange, which was located in this immediate area. Test Pit 730 was characterised by natural and alluvial deposits overlain by modern topsoil.

A trial trench (701) was excavated at the southernmost end of the survey and revealed a sequence of mudstone bedrock overlain by fluvial and natural clays and sands sealed by modern topsoil.

7. CONCLUSION

Archaeological and palaeoenvironmental investigations were undertaken on the proposed route of the Lincoln Eastern Bypass, in an area of known remains of Mesolithic to medieval date.

However, the only distinct archaeological horizon was identified in Test Pit 729, where possible remains of a robbed-out wall were encountered. An associated roof tile suggests this to be of $14^{th} - 16^{th}$ century date and the remains are probably part of medieval Sheepwash Grange. Limestone fragments from nearby BH 734 are perhaps associated with Romano-British buildings that have previously been identified in that area.

The sequences of deposits identified in the boreholes for the most part consisted of natural, fluvial and alluvial deposits overlying mudstone natural and sealed by modern topsoil. To the north of the river, late glacial sands overlay the natural mudstone and a single alluvial deposit was observed in the southernmost borehole of this group overlying the glacial sands.

To the south of the river natural mudstone was overlain by fluvial and alluvial deposits. The borehole closest to the river contained a thick peaty organic river mud deposit which represents a former channel of the River Witham of uncertain prehistoric to medieval date.

Deposits of made up ground associated with a bank that forms part of the River Witham flood defences, established in the late 18th century, were recorded in boreholes 725 and 726.

8. ACKNOWLEDGEMENTS

Archaeological Project Services wishes to acknowledge the assistance of Mr M Meki and Mr N Appleton of Mouchel for commissioning the fieldwork and post-excavation analysis. Staff at Lincs Labs also allowed access to the columns stores at their facility. The work was coordinated by Gary Taylor who edited this report along with Tom Lane. Elizabeth Bates kindly allowed access to the parish files and library maintained by Heritage Lincolnshire.

9. PERSONNEL

Project Coordinator: Gary Taylor Site Supervisors: Andrew Failes, Neil Parker Palaeoenvironmental specialist: James Rackham Finds processing: Denise Buckley Photographic reproduction: Sue Unsworth Illustration: Paul Cope-Faulkner, Jonathon Smith, Andrew Failes Post-excavation analysis: Paul Cope-Faulkner, Andrew Failes

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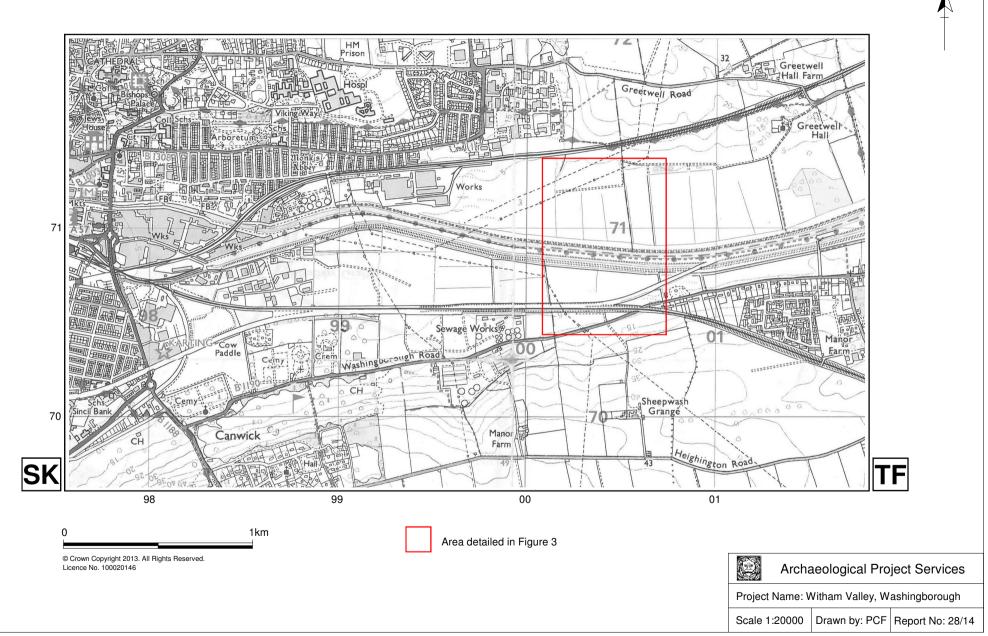
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11. ABBREVIATIONS

- APS Archaeological Project Services
- CBM Ceramic building material
- GSGB Geological Survey of Great Britain



Figure 1 - General location plan



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Figure 2 - Site location plan

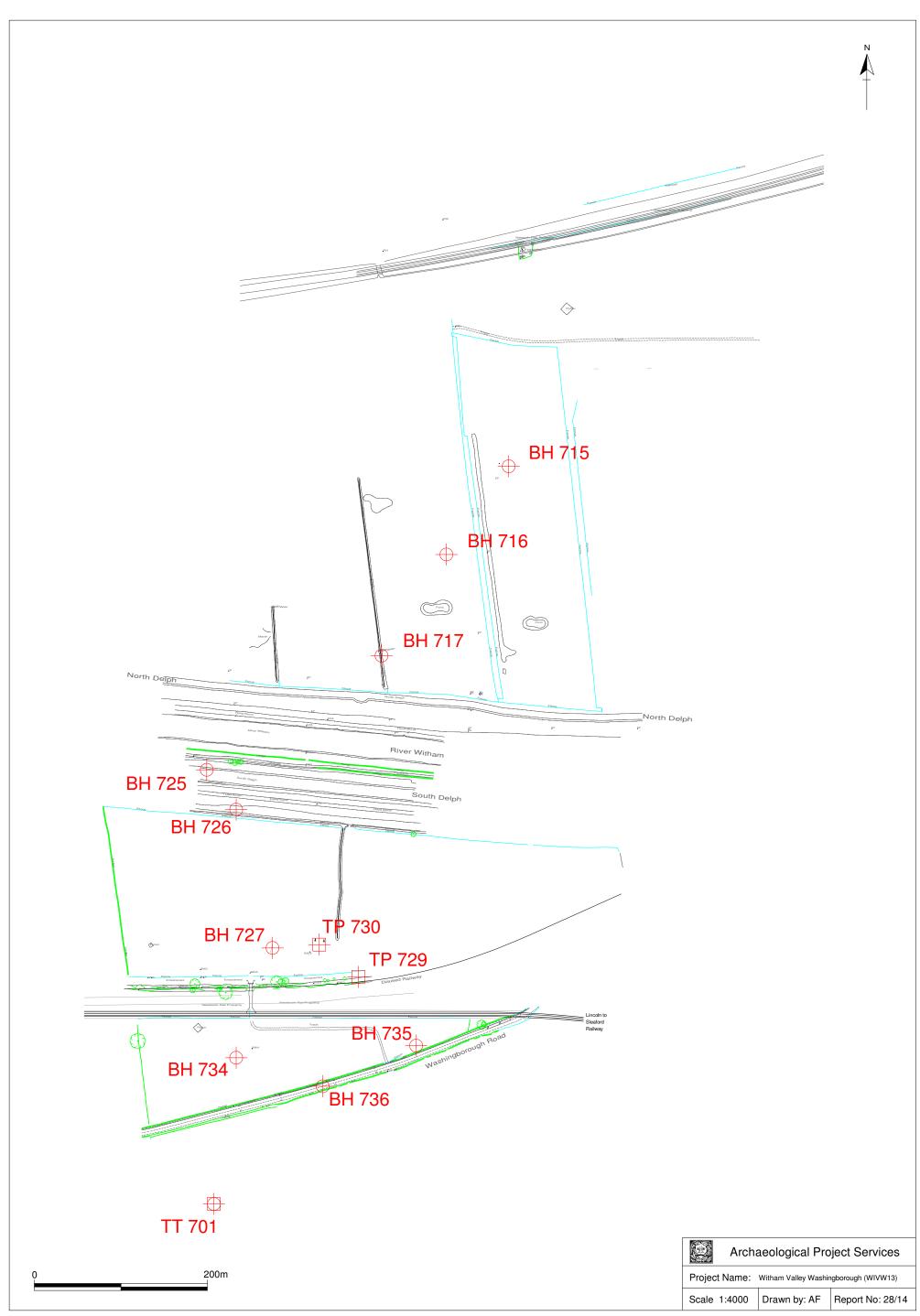


Figure 3 - Borehole, Test Pit and Trial Trench locations in the Witham Valley

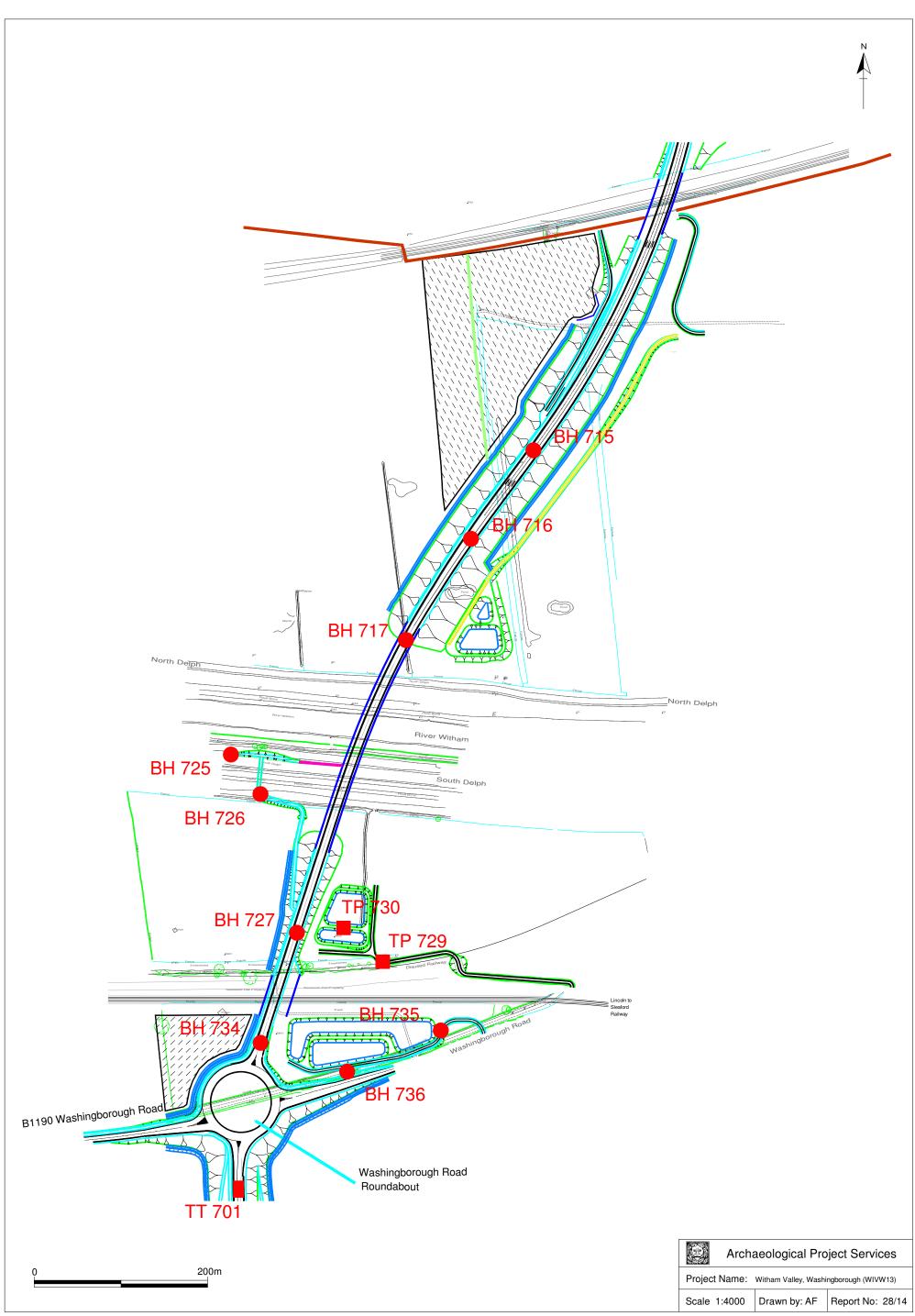


Figure 4 - Borehole, Test Pit and Trial Trench locations along the route of the proposed road

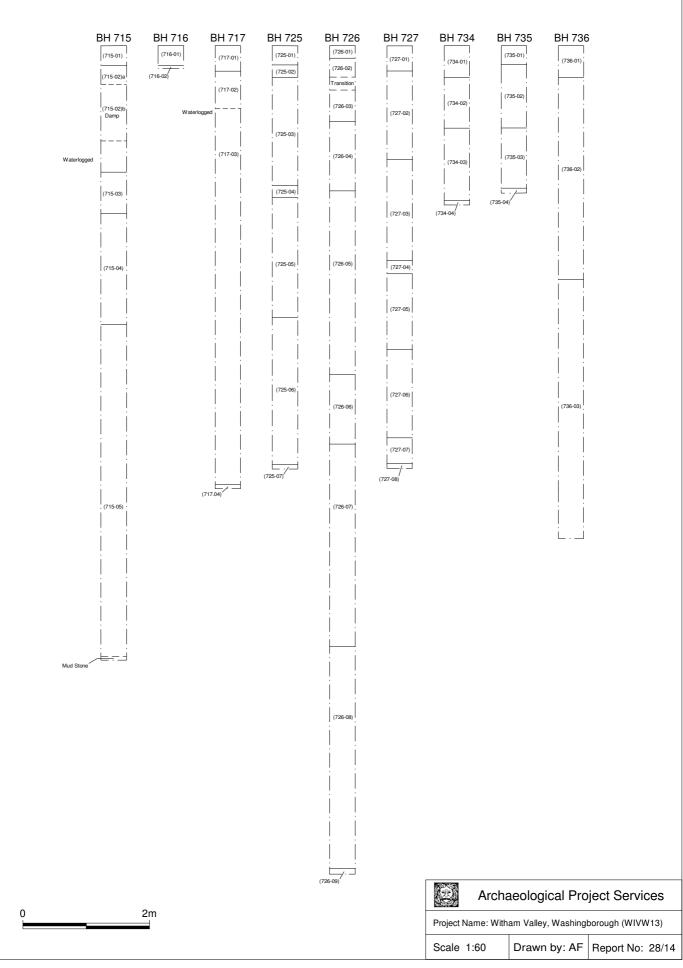


Figure 5 - Borehole survey sections

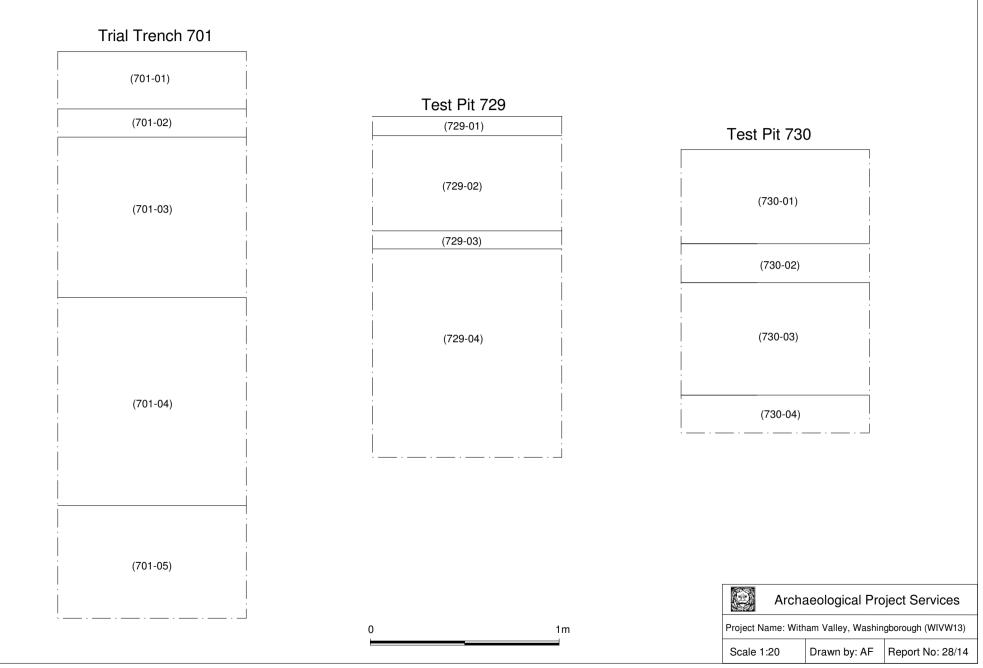


Figure 6 - Representative sections of Trial Trench 701 & Test Pits 729-730



Plate 1 - General view of site and borehole equipment (BH 716)



Plate 2 – Section in Trial Trench 701



Plate 3 – Test Pit 729: showing limestone fragments



Plate 4 - Test Pit 729: Section showing possible wall remains



Plate 5 - General view of BH 726



Plate 6 – General view of BH 725



A P S ARCHAEOLOGICAL P R O J E C T S E R V I C E S

Project Designs Desk-top Assessments Evaluations Excavations Watching Briefs Project Management Building Surveys Presentation Interpretation

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Appendix 1

SPECIFICATION FOR ARCHAEOLOGICAL MONITORING & RECORDING OF BOREHOLES ON THE LINCOLN EASTERN BYPASS

PREPARED FOR MOUCHEL

BY ARCHAEOLOGICAL PROJECT SERVICES Institute for Archaeologists' Registered Organisation No. 21

AUGUST 2013

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1 SUMMARY

- 1.1 Archaeological monitoring and recording is required during the excavation of boreholes in the area of the River Witham close to Washingborough Sewage Works, Lincolnshire.
- 1.2 The area is archaeologically sensitive. Numerous prehistoric remains, including cemeteries of Bronze Age barrows, have been identified in the area. High status Roman occupation has been recorded close to the sewage works and a medieval grange and adjacent wharf were located on the south side of the river. Other remains of Iron Age, Roman, Saxon and post-medieval date have been identified in the vicinity.
- 1.3 The investigation will involve monitoring and recording of boreholes excavated in a specified area on either side of the River Witham near Washingborough Sewage Works. Cores from other boreholes dug on the route will be examined and recorded in the laboratory, following excavation. Both examinations will involve investigation and recording of archaeological remains and deposits. Features and deposits exposed will be recorded in writing, graphically and photographically.
- 1.4 On completion of the examinations a report will be prepared detailing the results of the investigation. The report will consist of a narrative supported by illustrations and photographs.

2 **INTRODUCTION**

- 2.1 This document comprises a specification for archaeological monitoring and recording during the excavation of boreholes on the route of the Lincoln Eastern Bypass in the Witham Valley near Washingborough, Lincolnshire. Bore columns taken elsewhere on the bypass route will also be examined after excavation.
- 2.2 This document contains the following parts:
 - 2.2.1 Overview.
 - 2.2.2 Stages of work and methodologies.
 - 2.2.3 List of specialists.
 - 2.2.4 Programme of works and staffing structure of the project

3 SITE LOCATION

3.1 The site is on the alignment of the proposed Lincoln Eastern Bypass and passes through North Kesteven, Lincoln City and West Lindsey. It extends

from Sleaford Road at Bracebridge Heath, national grid reference SK 9883 6651, through Canwick parish passing close to Washingborough Sewage Works, crossing the River Witham into Greetwell, terminating at Bunkers Hill at national grid reference TF 0060 7321.

4 PLANNING BACKGROUND

4.1 Full Planning Permission (Application No: PL/0007/13) was granted by Lincolnshire County Council for the creation of the Lincoln Eastern Bypass, subject to conditions including archaeological requirements. Geotechnical investigations, involving boreholes, will be undertaken along the route. A brief for the archaeological monitoring and recording of the borehole investigations has been prepared by Lincolnshire Historic Environment Service (LHES). That brief does not cover the rest of the scheme which requires a full archaeological mitigation strategy to be submitted, approved and undertaken. The present Written Scheme of Investigation is in response to the brief prepared by LHES and similarly does not extend to any further future works that may be required.

5 SOILS AND TOPOGRAPHY

5.1 The investigation site crosses the valley of the River Witham. At its south end, the route commences on the Lincoln Heath on fairly flat land at about 65m OD. Near Washingborough Sewage Works it declines down a moderate slope into the river valley, to a height of *c*. 3m OD. After crossing the flood plain north of the river the route climbs a moderate slope on to fairly flat land at about 35m OD. On the flat land in the northern and southern parts of the route the local soils are Elmton 1 Association brown rendzinas developed on Jurassic Lincolnshire Limestone. In the lower land of the river valley are Adventurer's 2 peat soils, formed in fen and carr peat that overlies glaciofluvial sands. on the southern river valley side soils are of the Aswarby Association, brown rendzinas on interbedded Jurassic limestone and clays (Hodge *et al.* 1984, 179; 86; 99). The main area of site monitoring is in the river valley and its southern slope, on Aswarby and Adventurer's 2 soils.

6 **ARCHAEOLOGICAL OVERVIEW**

- 6.1 The area of site monitoring contains much evidence of prehistoric activity. Flints, Bronze Age palstaves and a Middle Bronze Age cinerary urn have been found south of the river and a Neolithic stone axe was recovered north of the watercourse. Bronze Age barrow cemeteries are known to both north and south of the river, buried beneath later peat deposits. Some of these barrows have been exposed by peat degradation and soil erosion and cropmarks of some barrows have been observed on aerial photographs. However, it is possible that further unknown barrows survive beneath the peat.
- 6.2 Roman pottery and evidence of high status settlement, possibly a villa, has

been recovered just south of the river and there are ironstone quarries of possible Roman origin to the north. Iron Age and Roman occupation has been identified near the northern end of the route, at Bunkers Hill. Indications of Saxon occupation has also been revealed. On the south side of the river is the site of medieval Sheepwash Grange, a monastic farming establishment, with an adjacent wharf. Post-medieval artefacts and undated remains have been identified at various locations on the route. The river was canalised in the 1820s and previously had a meandering and fluctuating course.

7 AIMS AND OBJECTIVES

7.1 The aim of the work will be to record and interpret the deposits and any archaeological features exposed during the borehole excavations.

- 7.2 The objectives of the investigation will be to:
 - Determine the form and function of the archaeological features encountered;
 - Determine the spatial arrangement of the archaeological features encountered;
 - As far as practicable, recover dating evidence from the archaeological features, and
 - Establish the sequence of the archaeological remains present on the site.

8 SITE AND LABORATORY OPERATIONS

- 8.1 <u>General considerations</u>
 - 8.1.1 All work will be undertaken following statutory Health and Safety requirements in operation at the time of the investigation.
 - 8.1.2 The work will be undertaken according to the relevant codes of practise issued by the Institute for Archaeologists (IfA), under the management of a Member of the institute (MIfA). Archaeological Project Services is IfA registered organisation no. 21.
 - 8.1.3 Any and all artefacts found during the investigation and thought to be 'treasure', as defined by the Treasure Act 1996, will be removed from site to a secure store and promptly reported to the appropriate coroner's office.

8.2 <u>Field Methodology</u>

- 8.2.1 The archaeological monitoring and recording will be undertaken during the excavation of boreholes in the specified area near the river (see attached plan boreholes located within the orange rectangle). Any other associated groundworks, such as site levelling or stripping, will also be subject to archaeological monitoring and recording.
- 8.2.2 Bore columns will be observed to identify and record deposits, archaeological features and changes in the geological conditions. The section drawings of the boreholes will be recorded at a scale of 1:10, or other scales where appropriate. Should any plans be recorded these will be at 1:20. Written descriptions detailing the nature of the deposits, features and fills encountered will be compiled on Archaeological Project Services pro-forma record sheets.
- 8.2.3 Finds recovered will be bagged and labelled for later analysis.
- 8.2.4 Throughout the investigation a photographic record will be compiled. The photographic record will consist of:
 - the site during the investigation to show specific stages of work, and the layout of the archaeology within the area.
 - individual features and, where appropriate, their sections.
 - groups of features where their relationship is important.
- 8.2.5 Should human remains be located they will be left *in situ* and only excavated if absolutely necessary. Should removal be required the appropriate Ministry of Justice licence will be obtained before the exhumation of the remains. In addition, the Local Environmental Health Department, coroner and the police will be informed, where appropriate.

8.3 <u>Laboratory Methodology</u>

8.3.1 Borehole cores will be examined by an archaeologist and a palaeoenvironmental specialist. The cores will be opened, cleaned, and the deposits recorded. Bore columns will be examined to identify and record deposits, archaeological features and changes in the geological conditions. The section drawings of the boreholes will be recorded at a scale of 1:10, or other scales where appropriate. Written descriptions detailing the nature of the deposits, features and fills encountered will be compiled on Archaeological Project Services pro-forma record sheets.

8.3.2 The archaeological and palaeoenvironment records will be correlated and cross-checked with the drillers' logs. Any archaeological material or artefacts will be extracted from the core and recorded according to the specific column and deposit it was recovered from, for subsequent specialist examination and assessment.

9 ANALYSIS AND REPORTING

- 9.1 <u>Stage 1</u>
 - 9.1.1 On completion of site and laboratory operations, the records and schedules produced during the investigation will be checked and ordered to ensure that they form a uniform sequence forming a level II archive. A stratigraphic matrix of the archaeological deposits and features present on the site will be prepared. All photographic material will be catalogued and labelled, the labelling referring to schedules identifying the subject/s photographed.
 - 9.1.2 All finds recovered during the fieldwork will be washed, marked and packaged according to the deposit from which they were recovered. Any finds requiring specialist treatment and conservation will be sent to the Conservation Laboratory at the Collection, Lincoln.
- 9.2 <u>Stage 2</u>
 - 9.2.1 Detailed examination of the stratigraphic matrix to enable the determination of the various phases of activity on the site.
 - 9.2.2 Finds will be sent to specialists for identification and dating.
- 9.3 <u>Stage 3</u>
 - 9.3.1 On completion of stage 2, a report detailing the findings of the investigation will be prepared.
 - 9.3.2 This will consist of:
 - 9.3.2.1 A non-technical summary of the results of the investigation.
 - 9.3.2.2 A description of the archaeological setting of the investigation.
 - 9.3.2.3 Description of the topography of the site.
 - 9.3.2.4 Description of the methodologies used during the investigation.
 - 9.3.2.5 A text describing the findings of the investigation.

- 9.3.2.6 A consideration of the local, regional and national context of the investigation findings.
- 9.3.2.7 Plans showing the locations of boreholes and any archaeological or geological features encountered.
- 9.3.2.8 Sections of the bore columns.
- 9.3.2.9 Interpretation of the archaeological features exposed, and their chronology and setting within the surrounding landscape.
- 9.3.2.10 Specialist reports on the finds from the site.
- 9.3.2.11 Appropriate photographs of the site and specific archaeological features.

10 **REPORT DEPOSITION**

10.1 Copies of the report will be sent to: the client; to Lincolnshire County Council Historic Environment Record; and the North Kesteven Planning Archaeologist.

11 **ARCHIVE**

- 11.1 The documentation and records generated during the investigation will be sorted and ordered into format acceptable to The Collection, Lincoln. This will be undertaken following the requirements of the document titled Conditions for the Acceptance of Project Archives for long-term storage and curation.
- 11.2 The site code will be WIVW13. The accession number is 2013.150. Archive deposition date is intended to be June 2014.

12 **PUBLICATION**

- 12.1 Details of the investigation will be input to the Online Access to the Index of Archaeological Investigations (OASIS).
- 12.2 If appropriate, notes on the findings will be submitted to the appropriate national journals: *Britannia* for discoveries of Roman date, and *Medieval Archaeology* for findings of medieval or later date.

13 CURATORIAL RESPONSIBILITY

13.1 Curatorial responsibility for the archaeological work undertaken on the site lies with the Lincolnshire County Council Historic Environment Team. They will be given 10 days written notice of the commencement of the project.

14 VARIATIONS AND CONTINGENCIES

- 14.1 Variations to the proposed scheme of works will only be made following written confirmation of acceptance from the archaeological curator.
- 14.2 In the event of the discovery of any unexpected remains of archaeological importance, or of any changed circumstances, it is the responsibility of the archaeological contractor to inform the archaeological curator.
- 14.3 Where important archaeological remains are discovered and deemed to merit further investigation additional resources may be required to provide an appropriate level of investigation, recording and analysis.
- 14.4 Any contingency requirement for additional fieldwork or post-excavation analysis outside the scope of the proposed scheme of works will only be activated following full consultation with the archaeological curator and the client.

15 **PROGRAMME OF WORKS AND STAFFING LEVELS**

- 15.1 The site works are expected to take three days, though their duration is reliant on the speed of excavation, and also depending on the quantity and complexity of archaeological remains encountered. Subsequent laboratory examination of bore cores is expected to take one day. Post-excavation work is likewise dependent on the quantity and complexity of archaeological remains encountered, but is expected to take about 5 days.
- 15.2 An archaeological supervisor, and palaeoenvironmental specialist, with experience of investigations of this type will undertake the work.
- 15.3 Post-excavation analysis and report production will be undertaken by the archaeological supervisor, or a post-excavation analyst as appropriate, with assistance from a finds supervisor, illustrator and external specialists.

16 SPECIALISTS TO BE USED DURING THE PROJECT

16.1 The following organisations/persons will, in principle and if necessary, be used as subcontractors to provide the relevant specialist work and reports in respect of any objects or material recovered during the investigation that require their expert knowledge and input. Engagement of any particular specialist subcontractor is also dependent on their availability and ability to meet programming requirements.

<u>Task</u>	Body to be undertaking the work
Conservation	Conservation Laboratory, Lincoln
Pottery Analysis	Prehistoric – D Trimble, APS/ Trent & Peak

	Archaeological Trust Roman – A Beeby, APS Post-Roman -A Beeby, APS
Non-pottery Artefacts	J Cowgill, Independent Specialist/G Taylor, APS
Animal Bones	J Rackham, Independent Specialist
Palaeoenvironmental Analysis	J Rackham, Independent Specialist
Human Remains Analysis	Dr R Gowland, Independent Specialist

17 **INSURANCES**

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

18 COPYRIGHT

- 18.1 Archaeological Project Services shall retain full copyright of any commissioned reports under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it hereby provides an exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project as described in the Project Specification.
- 18.2 Licence will also be given to the archaeological curators to use the documentary archive for educational, public and research purposes.
- 18.3 In the case of non-satisfactory settlement of account then copyright will remain fully and exclusively with Archaeological Project Services. In these circumstances it will be an infringement under the Copyright, Designs and Patents Act 1988 for the client to pass any report, partial report, or copy of same, to any third party. The Planning Authority and/or archaeological curator will be notified by Archaeological Project Services that the use of any such information previously supplied constitutes an infringement under the Copyright, Designs and Patents Act 1988 and may result in legal action.
- 18.4 The author of any report or specialist contribution to a report shall retain intellectual copyright of their work and may make use of their work for educational or research purposes or for further publication.

19 **BIBLIOGRAPHY**

Hodge, CAH, Burton, RGO, Corbett, WM, Evans, R, and Seale, RS, 1984 Soils and their use

in Eastern England, Soil Survey of England and Wales 13

Specification: Version 1, 28-08-13

Appendix 2

THE FINDS

CERAMIC BUILDING MATERIAL

By Alex Beeby

Introduction

All the material was recorded at archive level in accordance with the guidelines laid out by the Archaeological Ceramic Building Materials Group (2002) and to conform to Lincolnshire County Council's *Archaeology Handbook*. Two pieces of ceramic building material, weighing a total of 927 grams, were recovered from the site.

Methodology

The ceramic building material was weighed and then examined visually and using x20 magnification. This information was then added to an Access database. An archive list of the ceramic building material is included in Table 1 below.

Condition

One fragment is large and fresh, whilst the second piece is a surfaceless flake.

Results

Table 1 Ceramic Building Material Archive

Cxt	Cname	Full Name	Fabric	NoF	W (g)	Description	Date
729.02	PNR	Peg Nib or Ridge tile	Oxidised; medium sandy; Fe; Mica	1	924	Fresh; Iron stone; flint	14 th -16th
734.02	CBM	Ceramic Building Material	Oxidised; medium sandy; Fe	1	3	Surfaceless; Iron Stone; clay pellets	Roman or Post Roman

Provenance

Material was recovered from borehole context (729.02), a rubble layer within borehole 729, and (734.02) within borehole 734.

Range

There is a single large fragment from a late medieval or post-medieval peg, nib or ridge flat roofing tile (PNR) and a small undiagnostic flake of ceramic building material.

Potential

There is limited potential for further work. The items should be retained as part of the site archive and should pose no problems for long-term storage.

Summary

A single large fragment from a medieval or post-medieval roofing tile and a further small flake of material were recovered during the watching brief.

SPOT DATING

The dating in Table 2 is based on the evidence provided by the finds detailed above.

Cxt	Date	Comments
729.02	14 th -16th	Large fresh piece
734.02	Roman or Post Roman	

ABBREVIATIONS

ACBMG Archaeological Ceramic Building Materials Group

CBM	Ceramic Building Material
CXT	Context
NoF	Number of Fragments
NoS	Number of sherds
W (g)	Weight (grams)

REFERENCES

~ 2002, *Minimum Standards for the Recovery, Analysis and Publication of Ceramic Building Material*, version 3.2 [internet]. Available at http://www.tegula.freeserve.co.uk/acbmg/CBMGDE3.htm

~ 2012, Lincolnshire Archaeological Handbook [internet]. Available at

http://www.lincoInshire.gov.uk/residents/environment-and-planning/conservation/archaeology/lincoInshire-archaeological-handbook

Appendix 3

GLOSSARY

Alluvium	Deposits laid down by water. Marine alluvium is deposited by the sea, and fresh water alluvium is laid down by rivers and in lakes.
Braided River	A channel type consisting of multiple small shallow channels that divide and recombine numerous times forming a pattern resembling the strands of a braid. These networks of small channels are separated by small and often temporary islands variously called aits or eyots (in British usage) or braid bars. They occur in rivers with little downward slope and/or large sediment load. They are also typical of environments that decrease channel depth and consequently channel velocity, such as river deltas or alluvial fans. They often form at the end of a glacial period in areas where retreating glaciers produce a large amount of water with high sediment load and velocity.
Bronze Age	A period characterised by the introduction of bronze into the country for tools, between 2250 and 800 BC.
Context	An archaeological context represents a distinct archaeological event or process. For example, the action of digging a pit creates a context (the cut) as does the process of its subsequent backfill (the fill). Each context encountered during an archaeological investigation is allocated a unique number by the archaeologist and a record sheet detailing the description and interpretation of the context (the context sheet) is created and placed in the site archive. Context numbers are identified within the report text by brackets, e.g. [004].
Cut	A cut refers to the physical action of digging a posthole, pit, ditch, foundation trench, etc. Once the fills of these features are removed during an archaeological investigation the original 'cut' is therefore exposed and subsequently recorded.
Fill	Once a feature has been dug it begins to silt up (either slowly or rapidly) or it can be back-filled manually. The soil(s) that become contained by the 'cut' are referred to as its fill(s).
Layer	A layer is a term used to describe an accumulation of soil or other material that is not contained within a cut.
Medieval	The Middle Ages, dating from approximately AD 1066-1500.
Mesolithic	The 'Middle Stone Age' period, part of the prehistoric era, dating from approximately 11000 - 4500 BC.
Natural	Undisturbed deposit(s) of soil or rock which have accumulated without the influence of human activity
Neolithic	The 'New Stone Age' period, part of the prehistoric era, dating from approximately 4500 - 2250 BC.
Prehistoric	The period of human history prior to the introduction of writing. In Britain the prehistoric period lasts from the first evidence of human occupation about 500,000 BC, until the Roman invasion in the middle of the 1st century AD.
Romano-British	Pertaining to the period dating from AD 43-410 when the Romans occupied Britain.

Appendix 4

THE ARCHIVE

The archive consists of:

- 15 Context records/Trench sheets
- 1 Photographic record sheet
- 1 Plan record sheet
- 16 Daily record sheets
- 1 bag of finds

All primary records are currently kept at:

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

The ultimate destination of the project archive is:

The Collection Art and Archaeology in Lincolnshire Danes Terrace Lincoln LN2 1LP

Accession Number:	LCNCC: 2013.150
Archaeological Project Services Site Code:	WIVW13
OASIS record number:	archaeol1-177722

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

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OASIS ID: archaeol1-177722

Project details

- Project name Archaeological monitoring and recording of boreholes along the route of the Lincoln Eastern Bypass, Lincolnshire
- Short description Archaeological and palaeoenvironmental examination was undertaken on of the project columns taken from boreholes drilled during geotechnical investigation along the proposed Lincoln Eastern Bypass. The work was undertaken due to the sites location in an area of known archaeological remains ranging in date from the Mesolithic to the present day. Numerous prehistoric remains, including cemeteries of Bronze Age barrows, have been identified in the area. High status Roman occupation has been recorded close to the sewage works and a medieval grange and adjacent wharf were located on the south side of the river. Other remains of Iron Age, Roman, Saxon and post-medieval date have been identified in the vicinity. However, the only one archaeological horizon was identified where a deposit overlying the natural sands contained a relatively large amount of closely packed large fragments of limestone that possibly represent the remains of a robbed out wall. The sequences of deposits identified in the boreholes for the most part consisted of natural, fluvial and alluvial deposits overlying mudstone natural and sealed by modern topsoil. To the north of the river, late glacial sands overlay the natural mudstone and a single alluvial deposit was observed in the southernmost borehole of this group overlying the glacial sands. To the south of the river natural mudstone was overlain by fluvial and alluvial deposits. The borehole closest to the river contained a thick peaty organic river mud deposit which represents a former channel of the River Witham and could date anywhere from the prehistoric to medieval period. Deposits of made up ground associated with a bank that forms part of the River Witham flood defences were also recorded. Project dates Start: 04-09-2013 End: 26-09-2013 Previous/future Yes / Not known work WIVW13 - Sitecode Any associated project reference codes Any associated LCNCC:2013.150 - Museum accession ID project reference

Type of project Recording project

codes

Site status	None
Current Land use	Grassland Heathland 2 - Undisturbed Grassland
Monument type	NONE None
Significant Finds C	CBM Medieval
Significant Finds L	IMESTONE RUBBLE Uncertain
Investigation type	Recorded Observation"
Prompt E	Direction from Local Planning Authority - PPG16

Project location

Country	England
Site location	LINCOLNSHIRE NORTH KESTEVEN WASHINGBOROUGH Witham Valley, Washingborough
Study area	0 Square metres
Site coordinates	SK 9883 6651 53.1861985046 -0.52079141538 53 11 10 N 000 31 14 W Point
Site coordinates	TF 0060 7321 53.2460776613 -0.492196145549 53 14 45 N 000 29 31 W Point

Project creators

Name of Organisation	Archaeological Project Services
Project brief originator	Local Authority Archaeologist and/or Planning Authority/advisory body
Project design originator	Gary Taylor
Project director/manager	Gary Taylor
Project supervisor	Neil Parker
Project supervisor	Andrew Failes
Type of sponsor/funding body	Developer

Project archives

Physical Archive recipient	The Collection
Physical Archive ID	LCNCC:2013.150
Physical Contents	"Ceramics"
Digital Archive recipient	The Collection
Digital Archive ID	LCNCC:2013.150
Digital Contents	"none"
Digital Media available	"Images raster / digital photography","Text"
Paper Archive recipient	The Collection

Paper Archive ID	LCNCC:2013.150
Paper Contents	"none"
Paper Media available	"Context sheet","Diary","Drawing","Map","Notebook - Excavation',' Research',' General Notes","Photograph","Plan","Report","Section","Unpublished Text"
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Archaeological monitoring and recording of boreholes along the proposed route of the Lincoln Eastern Bypass, Lincolmshire
Author(s)/Editor(s)	Failes, A.
Other	28/14
bibliographic details	
	2014
details	
details Date	
details Date Issuer or publisher Place of issue or	APS
details Date Issuer or publisher Place of issue or publication	APS The Old School, Cameron St. Heckington



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