ARCHAEOLOGICAL EVALUATION REPORT:
TRIAL TRENCHING ON LAND OFF BRAYFORD WHARF EAST, LINCOLN, LINCOLNSHIRE

Planning Reference: Pre-planning
NGR: SK 9734 3709
Oasis Reference: allenarc1-136984
AAL Site Code: LIBE 12
Museum Accession Number: LCNCC 2012.120

Report prepared for
Keir Construction Limited
on behalf of the University of Lincoln

By
Allen Archaeology Limited
Report Number 2012101

November 2012

Allenarchaeology

Contents

List of Appendices

List of Figures

List of Plates

Document Control

Element	Name	Date
Draft report prepared by:	Gavin Glover	07/11/12
Illustrations prepared by:	Rob Evershed and Gavin Glover	07/11/12
Draft report edited by:	Mark Allen	07/11/12
Draft Report reviewed by:	Globe Consultants Ltd	20/11/12
Report produced by:	AAL 2012101	20/11/12

Allen Archaeology Limited reports are printed double-sided and on 100% recycled paper to reduce our carbon footprint.

Cover image: Trench 2 under excavation, looking southeast

Executive Summary

- Allen Archaeology Limited was commissioned by Keir Construction on behalf of the University of Lincoln to undertake an archaeological evaluation by trial trenching of land off Brayford Wharf East, Lincoln, in support of an intended planning application.

- The site is situated adjacent to the course of the River Witham, to the south of the historic core of the city of Lincoln. Excavations immediately to the south of the site revealed Roman and Saxon/Saxo-Norman deposits related to management of the river edge, along with medieval and later deposits dump deposits. Historic map evidence indicates the presence of buildings on the proposed development site since the 19th century, the buildings most likely being related to industrial activity close to the river and the nearby Brayford Pool.

- The trial trenching and an associated auger survey revealed an extensive sequence of deposits with archaeological potential within both trenches, the most extensive sequence being revealed in Trench 1, closest to the river. Substantial deposits of buried soils were encountered in both trenches, with Roman deposits recorded towards the base of Trench 2. A possible structure or structures of late 10th or 11 century date, which included potential wooden flooring, was revealed in Trench 2, along with the stone foundation of a possible later post-medieval building. A second, stone-built structure, possibly the corner of a further building was revealed in Trench 1 and is most likely of late medieval date.

- The remains of 19th and 20th century buildings and associated demolition deposits were encountered in both of the trenches and, along with the stone wall foundation in Trench 2, formed the uppermost 1m of the trenches.

- The evaluation has shown that any groundworks to a depth of 1.3m below the existing ground surface will only impact upon deposits of limited archaeological interest so a watching brief should suffice during these works. Any groundworks below this limit may require further investigation.

1.0 Introduction

1.1 Allen Archaeology Limited (hereafter AAL) was commissioned by Kier Construction (the Client) on behalf of the University of Lincoln to undertake an archaeological trial trench evaluation in advance of submission of a planning application for the construction of an accommodation block on land off Brayford Wharf East, Lincoln.

1.2 The excavating, recording and reporting conforms to current national guidelines, as set out in the Institute for Archaeologists '*Standard and guidance for archaeological field evaluations*' (IfA 1999, revised 2001 and 2008), the English Heritage document '*Management of Research Projects in the Historic Environment'* (English Heritage 2006) and the local guidelines in the *Lincolnshire Archaeological Handbook* (LCC 2012). A specification was also prepared by this company (AAL 2012a). All appropriate English Heritage guidance on archaeological practice was also followed (www.helm.org/server/show/nav.7740).

1.3 The documentary archive will be submitted to 'The Collection' museum in Lincoln in December 2013 where it will be stored under the Museum Accession Code LCNCC: 2012.120.

2.0 Site Location and Description

2.1 The proposed development area is located to the south of the historic core of the city of Lincoln, on the east side of Brayford Wharf East (Figure 1). The site comprises a broadly L-shaped block of land and is currently occupied by early 20th century brick buildings and an area of hardstanding. The site is centred on NGR SK 9734 3709 and lies at approximately 6m above Ordnance Datum (OD).

2.2 The bedrock geology of the site comprises Lias mudstone, siltstone, limestone and sandstone, with a superficial geology of alluvial clay, silt and sand (BGS Geology of Britain Viewer http://mapapps2.bgs.ac.uk/geoindex/ home.html).

3.0 Planning Background

3.1 The proposed redevelopment of the site entails the construction of a seven storey block of student accommodation, although at the time of writing no planning application has yet been submitted. In line with the current planning guidance, as set out in National Planning Policy Framework (NPPF, Department for Communities and Local Government 2012), the client has commissioned a programme of archaeological investigation to be undertaken in advance of the submission of a planning application, to provide further information upon the nature and extent of the archaeological resource that may be affected by the proposed development.

3.2 The approach adopted is consistent with the recommendations of Chapter 12: Conserving and Enhancing the Historic Environment of the National Planning Policy Framework (NPPF) (Department for Communities and Local Government 2012), which superseded Planning Policy Statement 5 (PPS5) (Department for Communities and Local Government 2010) in March 2012.

3.3 The first stage of archaeological investigation comprised the monitoring of a series of geotechnical investigations across the site, the monitoring being undertaken by AAL in September 2012 (AAL 2012b). Following the completion of these works, a strategy for the archaeological evaluation of the site, which is reported on here, was agreed with the Heritage Team at the City of Lincoln Council.

4.0 Archaeological and Historical Background

4.1 The proposed development area lies c.30m east of the River Witham, the river turning eastwards c.215m to the north of the site, where it defined the southern extent of the defended area of Lincoln's Roman *colonia*, which was established in the later 1st century AD following the withdrawal of the military. A substantial extra-mural suburb extended southwards along Ermine Street, broadly following the line of the modern High Street to the east of the site. In the 19th century a possible timber causeway that carried the road across the river was identified, as well as a north to south stone wall near to St Benedict's Church, c.200m to the northeast of the site, which was interpreted as the east side of a dock (Jones 2003). Excavations on the south side of St Benedict's Square in 1985 exposed a series of 3rd century AD timber posts, intended to either stabilise the waterfront or for mooring vessels. Later dumping of rubbish to raise the ground surface, a possible area of hard standing, and a late Roman east to west aligned drain were also encountered (Steane 2001).

4.2 In 1982 excavations were undertaken immediately to the south of the current site, ahead of the construction of the Lincolnshire Echo offices (now Lincoln University's Business and Law departments) (Steane 2001). The earliest deposits exposed consisted of interleaving deposits of silts, sands, clays and peat, representing flood deposits and organics accumulating on the margins of a much wider and shallower river course. Pottery of early 3rd century AD date was recovered from these deposits, along with three leather shoes and four fragments of cobblers waste. These deposits were sealed by dumps of material representing river edge consolidation, retained in places by wooden stakes, planks and wattle, gradually pushing the river edge westwards. These dumps again incorporated several leather shoes and offcuts, as well as high status pottery and metalwork.

4.3 Lincoln as a whole appears to have suffered a gradual decline in population and prosperity towards the end of the Roman period, leading to widespread abandonment and decay of much of the Roman city by the 5th century AD. Only small quantities of early and middle Saxon pottery have been recovered from the area of the former Roman lower city and there is no evidence for activity in the southern suburb until the 9th or 10th century (Vince 2003a). Recent investigations adjacent to the Bus Station, c. 250m east of the current site, exposed a probable sunken-feature building, associated with an important group of 7th to 8th century pottery (AAL 2009). The site is located on Thorn Island, a former sand and gravel bank in the River Witham. It appears to have been abandoned by the 9th or 10th century (*ibid*.), at which time there is an increase in the amount of material being recovered from the former Roman city, suggesting its gradual reoccupation.

4.4 The town continued to develop and prosper over the following years so that it was once again an important regional centre by the time of the Norman Conquest, and the area along the High Street developed as an important commercial and residential suburb known as Wigford (Vince 2003b). The city however suffered widespread population decline and a downturn in commercial activity from the 13th century onwards, due to the effects of the loss of the cloth trade, followed by the Black Death in the mid 14th century.

4.5 The excavations undertaken in 1985 at St Benedict's Square exposed a Late Saxon drainage channel running east to west, and a later network of Late Saxon wattle fences that appeared to form a waterfront revetment, containing dumps of soils with abundant residual late Roman material. These wattles appear to have collapsed by the end of the 10th century, although further overlying dumps of material were recorded, as well as a drystone wall and further wooden posts representing the remnants of another wattle fence line (Steane 2001).

4.6 The 1982 excavations to the south of the site (*ibid*.) indicated the presence of further revetments and dumped deposits dating to the late Anglo-Saxon to Saxo-Norman periods, and again amongst the refuse was cobbler's waste, as well as a single human skull. Pits and ditches further to the east may indicate occupation on the reclaimed land. Ground raising and reclamation continued across the site during the 13th – 14th century and by the late 15th – 16th century reclamation had shifted the river further to the west beyond the limits of the site, although ground raising and dumping continued into the post-medieval period.

4.7 Significant revival of the fortunes of Lincoln did not begin until the later 18th century, when the city developed an extensive heavy manufacturing industry, the development of which was accompanied by the widespread construction of terraced housing to accommodate the workers in the following years (Stocker 2003). Historic map evidence indicates that the current site was occupied by buildings since at least the early 19th century (Mills and Wheeler 2004), and the Ordnance Survey Map of 1907 shows buildings which may represent the derelict brick structures along the northern boundary of the site.

4.8 Prior to the current stage of works, a series of geotechnical test pits and boreholes were monitored across the site, totalling six boreholes and five test pits (AAL 2012b). The monitoring identified approximately 4m of archaeological deposits overlying the glacial sands, with the natural ground surface falling away gently towards the river to the west of the site. The glacial sands were sealed by a prehistoric peat horizon, then by a ground surface which produced small quantities of Roman pottery. This, in turn, was sealed by a later peat horizon, overlain by a sequence of dumps and ground raising deposits of medieval to post-medieval date, but also containing small quantities of residual late Saxon material. A well preserved leather shoe of 12th to 14th century date was recovered from these deposits. Across the site there was evidence of truncation from recent construction, ranging in depth from 0.3m to 2.5m.

5.0 Aims and Objectives

5.1 The purpose of the evaluation was to gather sufficient information for the planning authority to be able to formulate a policy for the management of the archaeological resources present on the site.

5.2 Evidence was gathered to establish the presence/absence, nature, date, depth, quality of survival and importance of any archaeological deposits to enable an assessment of the potential and significance of the archaeological remains, and to assess the impact of the proposed development on the archaeology.

6.0 Methodology

6.1 A strategy for the evaluation of the site was agreed with the Heritage Team at the City of Lincoln Council, which involved the excavation of two evaluation trenches, each measuring approximately 5m by 5m (Figure 2). In each trench, recent surfaces were broken out by mechanical excavator fitted with a hydraulic breaker, with subsequent machine excavation undertaken by an excavator fitted with a 1.6m wide toothless bucket. Non-archaeological overburden was removed in spits not exceeding 0.1m in thickness, to a maximum safe depth of c1m within each 5m x 5m area. Following machine excavation all further excavation was undertaken by hand. A 3m x 3m sondage was dug centrally within each 5m x 5m area, the sondages measuring 1m deep (2m below ground level). A further sondage, measuring 1m x 1m was positioned centrally within each 3m x 3m sondage. In Trench 1 this smaller sondage could only be excavated to a depth of approximately 0.6m (2.6m below ground level) due to

the ingress of groundwater, whilst in Trench 2 the smaller sondage was excavated to a depth of 1m (3m below ground level).

6.2 Where archaeological features were encountered, a sufficient sample of each feature was excavated to attempt to determine the date, extent, level of preservation, form and where possible, function of the features. Bulk soil samples were recovered from selected, well-dated contexts and assessed for their palaeoenvironmental potential.

6.3 A full written record of the archaeological deposits and features was made on standard AAL context recording sheets. Archaeological deposits were drawn or surveyed in plan and section at an appropriate scale, with Ordnance Datum heights obtained by the use of a survey-grade GPS system. Full colour photography formed an integral part of the recording strategy and photographs incorporated scales, an identification board and directional arrow where appropriate.

6.4 Each deposit or feature was allocated a unique identifier (context number), and accorded a written description, a summary of these are included in Appendix 7. Three digit numbers within square brackets throughout this report reflect cut features (e.g. ditch [219]).

6.5 A programme of hand augering was undertaken in each trench to ascertain the depth and nature of deposits where extended below the excavated levels. Selected samples were retained for possible future scientific analysis.

7.0 Results (Figures 3 – 6)

7.1 Trench 1 (Figures 3 – 4, Plates 2 – 4)

7.1.1 In Trench 1, the earliest deposit encountered during the excavation of the trench (as opposed to during the auger programme) comprised a layer of light grey sand, 112, which contained occasional pieces of roundwood and large quantities of mussel shell. The top of the deposit was recorded at 3.19m OD but its full thickness was not visible as the ingress of water at this level was too severe to allow hand excavation to continue safely. It was however apparent that the deposit measured at least 0.05m thick. The deposit most likely represents the accumulation of sandy material washed down to the river banks from slightly higher ground to the east and has incorporated a number of wood fragments present as river debris.

7.1.2 Layer 112 was sealed by a deposit of mid brown peat, 111, which measured 0.1m thick and was encountered at a height of 3.29m OD. The peat appeared to be an *in situ* deposit and probably represents the development of vegetation along the margins of the River Witham.

7.1.3 A layer of soft greyish brown sandy clay, 110, which included occasional mollusc shells and charcoal flecks, sealed the peat deposit and measured 0.33m thick. The deposit appears to have been reworked through biological action and was presumably therefore not permanently waterlogged at the time that it accumulated.

7.1.4 A deposit of dark greyish brown silty clay, 104, was visible in the sections of the western and southern limits of the 3m x 3m sondage but did not extend into the trench as far as the central 1m x 1m sondage. Pottery recovered from the deposit included examples from the medieval, post-medieval and early modern periods but it is possible that some of the later elements of the assemblage were intrusive. Layer 104 was partially sealed by a 0.6m thick layer of dark brown silt, 103, which extended across the 3m x 3m sondage, sealing deposit 110. A medieval roof tile was recovered from the deposit but further finds were difficult to identify as a result of the very wet ground conditions. Both layers 103 and 104 were similar to layer 110 and are

most likely further deposits which accumulated gradually and were reworked by biological action, again suggesting that at the time that they were deposited the area was not permanently waterlogged.

7.1.5 A distinctive layer of firm mid yellowish brown sand, 102, which included frequent fragments of tile of both medieval and Roman date, extended over layer 103 in the northern half of the 3m x 3m sondage. It measured an average of 0.15m thick but was up to 0.32m thick in the eastern trench section, where the deposit appeared to slope slightly downwards and filled an undulation in the underlying deposit. Pottery dates suggest that the deposit was mainly derived from 15th to 16th century material. Layer 102 appears most likely to be a dump of sand and building material, possibly to act as a levelling deposit and provide a firmer, drier surface than would have been provided by the soft underlying deposit 103. The large quantity of tile suggests that it originated, at last in part, from the demolition of a building, but it is not clear whether this would have been in the immediate vicinity or whether the deposit represents the importation of material to the site from further afield.

7.1.6 The remains of a possible wall, 106, which had been constructed within a construction cut, [107], were encountered in the northwest corner of the 3m x 3m sondage, the construction cut having been cut through the sandy deposit 102. The wall was constructed from roughly hewn limestone blocks which measured an average of 200mm x 200mm x 100mm. The blocks were laid in roughly level courses but no bonding material was evident and the structure appears to have been built as a dry-stone wall. The full width of the structure was not visible within the trench but it measured at least 0.8m wide and 0.45m high. The stonework did not appear to extend into the trench and it is possible that it represents either the corner of a building, the end of a wall, or, if the structure was not a wall, a substantial stone-built base or plinth.

7.1.7 The stonework structure had been sealed by a layer of dark grey silt, 101, which was up to 1m thick in places. The layer was similar to layers 103, 104 and 110 and probably represents a further period where soil deposits gradually accumulated at the site and were reworked through biological action. Pottery recovered from layer 101 suggests that this period dated to the mid 15th to 16th century.

7.1.8 A series of late post-medieval deposits and structures were encountered in the uppermost 1m of the trench, either overlying or cut into layer 101. At the eastern end of the northern section of the trench, a wall, 105, constructed from yellow stock bricks was clearly visible, although had been much damaged by modern demolition works. Map evidence suggests that the wall most likely formed part of a building which once extended southwards at the western end of the existing buildings on the site, to form a larger building with an L-shaped ground plan. Such a layout is clearly visible on the 1887 – 88 Town Plan and later mapping indicates that this southern extension to the existing buildings was extant until the 1970s.

7.1.9 A second wall, 109, constructed from red brick, was encountered at the southern end of the western section of the trench. The line of the wall follows that of a building visible on mapping dating from 1907 through to at least the 1960s. Its absence from the 1887 – 88 Town Plans indicates a late 19th or early 20th century origin.

7.2 Trench 2 (Figures 5-6, Plates 5-8)

7.2.1 The earliest excavated deposit encountered in Trench 2 was a layer of compact, reddish brown sandy silt, 228, which was revealed at 3.58m OD, towards the base of the 1m x 1m sondage. The deposit was not fully exposed as a maximum safe working depth had been reached, but it

measured at least 0.04m thick. The deposit appears to be derived from sand possibly washed in towards to the course of the river to the west.

7.2.2 Layer 228 was sealed by a 0.8m thick deposit of mid grey sandy silt, 227. The homogenous nature of this thick deposit suggests that it represents a gradual accumulation of material which had been reworked through biological action. Pottery recovered from the deposit has been dated to the 4th century AD and although this could be residual material there is little to indicate that the pottery is not indicative of the date of deposition of the layer.

7.2.3 A layer of compressed peat, 224, which measured 0.05m thick, extended over layer 227. It sloped downwards very slightly to the north and was encountered at a maximum elevation of 4.42m OD (Approximately 2m below the modern ground surface). The elevation of the peat layer was higher than that expected for peat levels at the site (Rackham *pers. comm*.) and it is likely that the layer did not form as a result of vegetation growth along the river margins. A more probable explanation is that the peat represents the remains of a substantial piece, or pieces, of degraded wood. The relatively level surface and consistent thickness of the peat suggest that it may originally have been planking of some form, perhaps the remains of a wooden floor surface. A small assemblage of pottery was recovered from the layer and has been dated to the 4th century AD. Given the interpretation of the peat as compressed planking it seems more likely that the pottery originates from the layer beneath, which produced pottery of the same date, rather than from the deposit itself.

7.2.4 The possible floor surface was sealed by a layer of mid grey sandy silt, 226, which measured up to 0.11m thick. It was notable that unlike several of the other deposits at the site, layer 226 did not appear to have been subject to much reworking through biological action and contained little humic material. It seems more likely that the deposit was either dumped or sealed quickly by further material soon after it had accumulated.

7.2.5 A 0.2m thick layer of firm, mid orange and light yellowish brown sandy clay, 221, had been deposited on top of layer 226 in the central part of the trench and was encountered at a height of 4.4m OD. It extended over an area measuring 1.5m x 0.7m but had been truncated to the south and west by ditch [219] (see Section 7.2.7 below). Two sherds of Saxo-Norman pottery were recovered from the deposit which appears to have been deliberately deposited and may have formed part of a clay floor surface or floor make up, replacing the earlier possible wooden floor surface; its clay-rich composition perhaps providing a degree of protection from the damp underlying soils. Analysis of soil samples taken from the deposit indicate the presence of mixed hearth or oven waste and could be taken as an indicator that the possible floor make up was part of a domestic building.

7.2.6 The possible clay floor, or floor make up, had been partly overlain on its eastern side by a deposit of dark greenish brown sandy silt, 218, which contained occasional fragments of mussel shell and produced a small assemblage of pottery dated to the late 10th to mid to late 11th centuries. A very similar deposit, 222, was encountered to the west and may have been a continuation of the same deposit. Both deposits were similar to the extensive deposits of dark sandy silts elsewhere at the site, which appear to have accumulated gradually and been reworked through biological activity.

7.2.7 A shallow ditch, [219], truncated layers 218, 221 and 222. It formed a T-shape in plan, with steep sides and a flat base, and had been completely truncated to the south by the construction cut, [233], for a recent post-medieval wall, 215. The ditch measured 0.5m wide and 0.1m deep and contained a single fill, 220, which comprised dark greyish brown sandy silt with wood or peat fragments. A small assemblage of pottery was recovered from the ditch fill and has been dated to the late 10th to mid to late 11th centuries and a analysis of a soil sample taken from the fill indicated the presence of hearth or oven waste, possibly derived from the

underlying floor make up 221. The function of the ditch is unclear, it could have formed part of a bedding trench for the sill beams from a wooden structure, the beams themselves having subsequently been removed or it may have been a shallow drainage feature.

7.2.8 A 0.2 – 0.4m thick layer of dark grey sandy silt, 229, extended across the trench, sealing ditch [219], possible floor or make up 221 and deposits 218 and 222. It had been sealed by a similar deposit, 203 (also recorded as 207), which measured up to 0.80m thick and produced a small assemblage of early 16th to 17th century pottery. The boundary between deposits 229 and 203 was relatively diffuse with both appearing to have accumulated gradually and been subject to reworking through biological activity.

7.2.9 The remains of a possible wall foundation, 208, were clearly visible in the eastern section of the 5m x 5m area of the trench. It had been constructed from roughly hewn limestone blocks which measured an average of 300mm x 200mm and two courses had survived. Later brickwork (see Section 7.2.11 below) had been constructed directly on top of the limestone blocks and the possible foundation could represent the use of limestone as a foundation layer for contemporary brickwork. Alternatively, the limestone blocks may have been the remains of the foundation of an earlier building at the site, possibly extending to the east, which had been used *in situ* as the foundation for the later brick building. The date for this putative building is uncertain as no finds were recovered from amongst the stonework, but the latest pottery recovered from the underlying layer, 203, was of early 16th to 17th century date and if stonework 208 is the remains of an earlier building it must therefore date to a period between the early 16th to 17th centuries and the construction of the brick-built structure, probably in the 19th century.

7.2.10 A vertical sided pit, [230], which measured 0.35m wide and 0.65m deep, had been cut into layer 203. It contained a yellowish brown sandy fill, 231, and had a large piece of unworked limestone at its base. The pit may have been a substantial posthole and the absence of any brick fragments from its fill could suggest that it was related to the putative earlier building, 208.

7.2.11 The uppermost 1m of the trench was dominated by the remains of brick-built buildings, associated floor surfaces, drains and deposits related to the construction and subsequent demolition of the buildings. The remains are of low archaeological significance and are only summarised here. The earliest of the structures appears to be a wall, 204, which had been constructed on top of the possible stone wall foundation 208. A brick-lined drain, 202, within a construction cut [235], which extended along the northern section of the trench, appears to have been an associated contemporary structure and also appears to have been associated with a further contemporary wall, 216, visible in the western section of the trench. An east to west orientated wall, 215, which extended across the trench and had been constructed on top of a substantial concrete beam, appears to have been associated with an extension to the building originally formed by wall 204, as the foundations for wall 215 stopped abruptly at the line of the earlier wall. A north to south orientated wall, 213, and an associated concrete floor surface, 214, recorded in the southern and partly in the western section of the trench were also associated with the extension to the earlier brick building. Alterations or repairs to wall 204 were apparent with construction of a later patch of brickwork, 209, and a drain, 205, also appears to have been a later construction. Demolition material and modern deposits formed the ground level at the top of the trench, which fell from 6.88m OD at the eastern side of the trench to 6.53m OD on its western side.

8.0 Discussion and Conclusions

8.1 On the whole, the uppermost 1m of both trenches comprised only 19th century and later remains and although these remains are evidence of Lincoln's importance as a centre for industry during the 19th and early 20th centuries they are of low archaeological significance. An exception may be the stone foundations of a possible building revealed beneath a brick wall in the eastern section of Trench 2. This was encountered approximately 0.8m below the present ground surface and may be the remains of a building dating to the period between the 16th and 19th centuries. It is possible that further remains of this putative building survive to the east of Trench 1 although with little of the building extending into the evaluated area its form and function remain unclear.

8.2 Substantial deposits of buried soils were encountered in both of the trenches, the deposits being indicative of gradual accumulation and development of soils over an extended period of time from the Roman period through to the early post-medieval period. Evidence for deliberate reclamation of the riverside wetlands through the dumping of imported material was very limited at the site however and no evidence for riverside features such as revetments was encountered. It is important to note that such remains may survive at depths below those reached by the evaluation trenches however, particularly in Trench 1 where the sediment samples recovered during augering as part of the present project suggest approximately 3.1m of deposits with archaeological potential lie beneath the maximum excavated depth of the trench.

8.3 Of some significance was the survival of possible late Saxon or Saxo-Norman structures at the site, with a possible wooden floor surface surviving as an area of compressed peat in Trench 2. A clay-rich deposit encountered at a similar depth in the trench may also be related to flooring. Both of these possible floor deposits represent important evidence of activity in this part of Lincoln during the late 10th and 11th centuries. Late Saxon riverside revetments and bank consolidation, along with limited evidence for industry or craft activities, were revealed during archaeological works prior to the construction of buildings adjacent to the south of the site (Steane *et al* 2001, 65-80) and the possible structures encountered in Trench 2 suggest that activity during this period extended at least into the present site and possibly further along the riverside in this area of Lincoln.

8.4 In Trench 1 a possible wall, most likely of late 15th to 16th century date may have been the corner of a building which extended to the north and west of the trench. Very little of this possible wall was revealed within the evaluated area and although it undoubtedly represents a substantial construction it is unclear what its form or function was. The structure was sealed by buried soils which are likely to have given it a degree of protection from more recent activity at the site and it seems likely that further remains will survive beyond the limits of the 3m x 3m sondage in which it was encountered. The excavations to the south of the proposed development indicated that by this period the river margin had moved to the west of the site, possibly as a result of reclamation along the river edge (*ibid*, 77) and the possible wall seems most likely to have been a building relatively close to the river edge.

8.5 The evaluation has shown that any groundworks to a depth of 1.3m below the existing ground surface will only impact upon deposits of limited archaeological interest so a watching brief should suffice during these works. Any groundworks below this limit may require further investigation.

9.0 Effectiveness of Methodology

9.1 The archaeological evaluation methodology employed at the site was appropriate to the nature and extent of the proposed development, which is likely to involve piled foundations, with any localised ground reduction unlikely to extend much further than 1m below the current ground surface. The trial trenches have demonstrated that archaeological deposits survive to a depth of at least 3.14m OD in Trench 1 at the western end of the site and to a depth of at least 3.57m OD in Trench 2 at the eastern end of the site. It is unfortunate that the full sequence of archaeological deposits could not be excavated within the confines of the trenches due to safety constraints but samples recovered during hand augering in the base of the trenches shows that deposits with archaeological potential extend to a depth of 0.05m OD in Trench 1 and 3.12m OD in Trench 2. The hand augering has shown that a long and well preserved sediment sequence survives at the site which has the potential to increase our understanding of environmental conditions in this part of Lincoln from at least the Neolithic period through to the recent past. Recommendations for further work to examine this important sediment sequence are set out in Appendix 5.

10.0 Acknowledgements

10.1 Allen Archaeology Limited would like to thank Keir Construction Ltd for this commission and Globe Consultants Ltd and the University of Lincoln for their help throughout the project.

11.0 References

AAL, 2009, *Archaeological Evaluation Report: Trial Trenching in Advance of the Lindongate Redevelopment Project, Lincoln, Lincolnshire*. Unpublished Allen Archaeology Ltd Report 2009065

AAL, 2012a, *Specification for an archaeological evaluation: Land off Brayford Wharf East, Lincoln*. Unpublished Allen Archaeology Ltd project document

AAL, 2012b, *Archaeological Watching Brief Report: Land off Brayford Wharf East, Lincoln*. Unpublished Allen Archaeology Ltd Report 2012086

Department for Communities and Local Government, 2010, *Planning Policy Statement 5: Planning for the Historic Environment*, London, Department for Communities and Local Government

Department for Communities and Local Government, 2012, *National Planning Policy Framework*. London, Department for Communities and Local Government

Jones, M.J., 2003, 'The Colonia Era. The archaeological account', in *The City by the Pool*, pp. 56 – 138, Oxbow Books, Oxford

LCC, 2011, *Lincolnshire Archaeological Handbook: a manual of archaeological practice*. Lincoln, Lincolnshire County Council, Built Environment Dept

Steane, K. *et al.* 2001 *The Archaeology of Wigford and the Brayford Pool* Oxbow Books, Oxford

Stocker D (ed.)., 2003, *The City by the Pool*, Oxbow Books, Oxford

Stocker D., 2003, 'Lincoln's Industrial Era (c.1750 – c.1945). Archaeological account', in *The City by the Pool*, pp. 338 - 362, Oxbow Books, Oxford

Vince A., 2003, 'The New Town: Lincoln in the High Medieval Era (c.900 to c.1350). The archaeological account', in *The City by the Pool*, pp. 159 - 296, Oxbow Books, Oxford

Appendix 1: Colour Plates

Plate 1: General view of site, looking northwest

Plate 2: Trench 1 under excavation, looking southwest

Plate 3: Trench 1, looking northeast. 2m and 1m scales

Plate 4: Southwest facing section of the 3m x 3m sondage n Trench 1. Wall 106 is visible at the left side of the section. 2m and 0.5m scales

Plate 5: Trench 2 under excavation, looking southwest

Plate 6: The 1m x 1m sondage in Trench 1, looking southwest. Possible timber floor 224 is visible as a dark band. 2 x 1m scales

Plate 7: Possible floor make up 221 (centre) and ditch [219] prior to excavation of the ditch and before excavation of the 1m x 1m sondage in Trench 1. Looking northeast, 1m scale

Plate 8: Southwest facing sections of the 3m x 3m and 1m x 1m sondages in Trench 1. Looking north-east, 1m and 0.5m scales

Appendix 2: Roman Pottery Assessment

By Ian Rowlandson

Introduction

The ceramics presented for assessment totalled 86 manually retrieved Roman sherds, weighing 1.915kg total RE 1.48, from a scheme of archaeological evaluation.

Methodology

The pottery has been archived using count and weight as measures according to the guidelines laid down for the minimum archive by *The Study Group for Roman Pottery* (Darling 2004) using the codes developed by the City of Lincoln Archaeological Unit- CLAU (see Darling and Precious *forthcoming*). Rim equivalents (RE) have been recorded and an attempt at a 'maximum' vessel estimate has been made following Orton (1975, 31). The pottery has been bagged by fabric and vessels selected as suitable for illustration have been bagged separately for ease of future reference. The archive record (see below) is an integral part of this report and will be curated in an Access database, available from the author in a digital format. The report was produced on the basis of a phased context list.

Condition

The pottery from this site is relatively fresh but few sherds can be fitted together. The sherds are probably from a maximum of 84 vessels. The groups are mixed and may represent pottery from the redeposition of middens for ground reclamation rather than primary waste deposits.

Dating

The pottery presented for study dates from the mid to late 2nd century through to the very late 4th to early 5th century AD. The groups of pottery are mixed and it is likely that they derive from dumping of rubbish to reclaim land in the Roman period or later. The only groups that did not also contain post-Roman ceramics are dated to the 4th century AD both from layers (224 and 227). It is not certain that these groups were deposited in the Roman period or during later phases of land reclamation. Similar deposits have already been recognised during previous excavations at Brayford Wharf East (Jones 2003, 99 Site code BWE82).

Presented here is a context summary. The contexts marked with * also contain post-Roman ceramics; the Roman pottery within these contexts is probably residual (see Irving, this volume).

Roman pottery dating summary

Context	Spot date	Comments	Sherd	Weight (g)	Total RE %
203	L2+*	A small group including fragments of samian and greyware including a beaker with an everted rim and a large jar. Also present is a heavily burnt fragment from a greyware base.	10	225	19
218	L4+*	A medium sized group including a fragment of Oxfordshire Red Colour coat, a colour coated beaker with a grooved rim, a fragment of a form 37 samian bowl mortaria from the Nene Valley and Mancetter/Hartshill industries along with fragments from large greyware jars.	36	789	59
220	L3+*	A small group including fragments of greyware, colour coated pottery and a BB1 jar with a cavetto rim.	9	74	9
221	ML2-E3	A single rim sherd from a flange rimmed bowl in a local Black Burnished ware fabric.	1	19	2
224	4C	A small including a fragment from a greyware dish with a grooved rim and a fragment from a 'Romano-Saxon' bowl with pressed dimple decoration. Heavily burnt fragments of Dressel 20 amphorae were also present. It is likely that this group dates to the later 4th century AD.	8	416	0
227	4C	A mixed group including fragments from greyware jars, amphorae, a rough-cast beaker, a Mancetter/Hartshill mortarium and a basal fragment from a Swanpool colour coated mortarium.	22	392	59

Overview of Fabrics & Forms

Fabric summary							
Fabric code	**Fabric group**	**Fabric details**	**Sherd**	**Sherd %**	**Weight (g)**	**Weight %**	**Total RE %**
SAMCG	Samian	Central Gaulish	5	5.81%	25	1.31%	2
DR20	Amphorae	Dr 20 amphorae	5	5.81%	474	24.75%	0
GAU4	Amphorae	Gauloise 4	2	2.33%	53	2.77%	0
MOMH	Mortaria	Mancetter-Hartshill mortaria	2	2.33%	52	2.72%	0
MONV	Mortaria	Nene Valley mortaria	1	1.16%	19	0.99%	6
MOSPC	Mortaria	Swanpool colour-coated mortaria	1	1.16%	64	3.34%	0
CC	Fine	Other colour-coated wares	2	2.33%	3	0.16%	0
NVCC1	Fine	Nene Valley Colour-coat- light firing fabric	3	3.49%	29	1.51%	0
NVCC2	Fine	Nene Valley Colour-coat- late red fabric	1	1.16%	2	0.10%	10
OXRC	Fine	Oxfordshire red colour-coated	1	1.16%	4	0.21%	0
RC	Fine	Miscellaneous rough-cast colour-coated beakers	1	1.16%	4	0.21%	0
SCCC	Fine	South Carlton colour-coated	2	2.33%	27	1.41%	15
CR	Oxidised	Roman cream wares (various)	2	2.33%	12	0.63%	0
OX	Oxidised	Misc. oxidized wares	1	1.16%	7	0.37%	0
BB1	Reduced	Black burnished 1, unspecified	1	1.16%	11	0.57%	6
BBT	Reduced	Black Burnished type copies	2	2.33%	30	1.57%	4
GREY	Reduced	Miscellaneous grey wares	50	58.14%	1074	56.08%	105
IAGR	Reduced	Native tradition/transitional grit-tempered wares	1	1.16%	11	0.57%	0
PART	Reduced	Parisian type wares	1	1.16%	5	0.26%	0
DWSHT	Calcareous	Dalesware type	1	1.16%	7	0.37%	0
SHEL	Calcareous	Miscellaneous undifferentiated shell-tempered	1	1.16%	2	0.10%	0

Form summary							
Form	**Form Type**	**Form Description**	**Sherd**	**Sherd %**	**Weight (g)**	**Weight %**	**Total RE %**
A	Amphorae	Unclassified form	7	8.14%	527	27.52%	0
BK	Beaker	Unclassified form	4	4.65%	28	1.46%	0
BKCOR	Beaker	Cornice rim	1	1.16%	8	0.42%	15
BKEV	Beaker	Everted rim	1	1.16%	11	0.57%	12
BKFO	Beaker	Folded; indeterminate type	1	1.16%	19	0.99%	0
BKGR	Beaker	Grooved rim	1	1.16%	2	0.10%	10
BKRC	Beaker	Roughcast	1	1.16%	4	0.21%	0
37	Bowl	Samian form- see Webster 1996	1	1.16%	14	0.73%	0
B	Bowl	Unclassified form	1	1.16%	2	0.10%	2
BEV	Bowl	Everted rim	1	1.16%	31	1.62%	13
BFL	Bowl	Flange rimmed	1	1.16%	19	0.99%	2
BGR	Bowl	With grooved rim	1	1.16%	36	1.88%	10
BD	Bowl/dish	-	2	2.33%	64	3.34%	0
CLSD	Closed	Form	31	36.05%	326	17.02%	0
18/31R	Dish	Samian form- see Webster 1996	1	1.16%	7	0.37%	0
DGR	Dish	Grooved rim	1	1.16%	13	0.68%	4
DPR	Dish	Plain rim	3	3.49%	41	2.14%	11
J	Jar	Unclassified form	1	1.16%	10	0.52%	0
JCUR	Jar	Curved	1	1.16%	11	0.57%	6
JEV	Jar	Everted rim	2	2.33%	29	1.51%	19
JL	Jar	Large	7	8.14%	290	15.14%	11
JNK	Jar	Necked	1	1.16%	14	0.73%	5
JNN	Jar	Narrow-necked	1	1.16%	34	1.78%	22

Form summary							
Form	**Form Type**	**Form Description**	**Sherd**	**Sherd %**	**Weight (g)**	**Weight %**	**Total RE %**
JS	Jar	Storage	1	1.16%	194	10.13%	0
M	Mortaria	Unclassified Form	3	3.49%	116	6.06%	0
MRR	Mortaria	Reeded rim	1	1.16%	19	0.99%	6
OPEN	Open	Form	4	4.65%	17	0.89%	0
-	Unknown	Form uncertain	4	4.65%	20	1.04%	0

The range of pottery present is similar to mid to late Roman group from the City of Lincoln. Small fragments of amphorae from Gaul (context 227) and Southern Spain (203, 218 and 224) are also present. Central Gaulish samian is present along with finewares from colour coated industries from the Nene Valley and Lincoln area. Mortaria from the Nene Valley (218), Mancetter/Hartshill industries (contexts 218 and 227) and an unusual fragment from a local colour coated Swanpool mortarium (227) are present. The majority of the pottery is from the local greyware industries located to the south of the Witham. Within this group are a typical range of jars, bowls and dishes. Of interest amongst these sherds is a fragment from a dimple decorated 'Romano-Saxon' bowl that is typically found in 4th century groups from the city and most commonly from groups attributed to the end of the 4th century. Very few sherds in the shell gritted SHEL and DWSHT fabrics are present in this group.

Potential

It is recommended that all of the pottery from this site is retained and no problems are anticipated for their storage. This pottery should be reconsidered and integrated with any Roman pottery retrieved as part of any further investigation on the site. If further work is done it is recommended that the samian should be sent for to a specialist to check the identification of the fabrics and identify the decorative scheme on the form 37 bowl from context 218.

References

Darling, M.J., 2004, Guidelines for the archiving of Roman Pottery. *Journal of Roman Pottery Studies* 11, 67-74.

Darling, M.J. and Precious, B.J., *forthcoming*, *Corpus of Roman Pottery from Lincoln*, Lincoln Archaeological Studies No. 6, Oxbow Books, Oxford

Jones, M.J., 2003b, The Colonia Era: Archaeological Account, in *Stocker (ed) 2003,* 56-138

Orton, C. R., 1975, Quantitative pottery studies, some progress, problems and prospects. *Science and Archaeology* 17, 30-5.

Stocker, D. (ed), 2003, The City by the Pool: Assessing the Archaeology of the City of Lincoln, Lincoln Archaeological Studies No 10, Oxbow, Oxford

Webster, P., 1996, Roman Samian Pottery in Britain, Practical Handbook in Archaeology 13', Council for British Archaeology, York

LIBE12- Roman pottery archive												
Context	Fabric	Form	Decoration	Vessels	Alt	Drawing	Comments	Join	Sherd	Weight	Rim diam	Rim eve
203	DR20	A		1	BURNT		BS; HEAVILY BURNT		1	81	0	0
203	GREY	CLSD		1	CONCRETION		BS; MORTAR CONCRETION		1	34	0	0
203	GREY	CLSD		1	BURNT		BASE LOWER WALL BURNT/RE-OXIDISED SURFACES		1	30	0	0
203	GREY	BKEV		1			RIM SHLDR		1	11	9	12
203	GREY	JL		1	ABR		RIM		1	32	26	7
203	GREY	CLSD		3			BS		3	29	0	0
203	SAMCG	18/31R		1			BS		1	7	0	0
203	SAMCG	OPEN		1			BS; TINY FRAG		1	1	0	0
218	BBT	DPR	BIA	1			RIM; BURNISHED INTERSECTING ARCHS EXTERNAL		1	11	26	2
218	CR	CLSD		1	ABR		BS; UNUSUAL A-TYPICAL FABRIC FOR LOCAL PRODUCTION		1	8	0	0
218	DR20	A		1	ABR		BS		1	15	0	0
218	GREY	JS		1			BS		1	194	0	0
218	GREY	J		1			BS; SHLDR		1	10	0	0
218	GREY	BD		1			BASE		1	43	0	0
218	GREY	BGR		1			RIM		1	36	22	10
218	GREY	OPEN		1	ABR		BS		1	11	0	0
218	GREY	CLSD		9			BS		9	91	0	0
218	GREY	JL		2	ABR		BS		2	64	0	0
218	GREY	JEV		1			RIM		1	22	14	14
218	GREY	JL		1	ABR		BS		1	45	0	0
218	GREY	JL		1			BS		1	99	0	0
218	GREY	CLSD		1	?MORTAR		BS		1	23	0	0
218	IAGR	CLSD		1	ABR		BS		1	11	0	0
218	MOMH	M		1	ABR		BS; MUD ROCK TRITS		1	23	0	0
218	MONV	MRR		1	BURNT; ABR		RIM FRAG		1	19	27	6
218	NVCC1	-		1	VAB		BS		1	4	0	0
218	NVCC1	BK		1	ABR		BS; PROB SAME VESSEL		2	25	0	0
218	NVCC2	BKGR		1	ABR		RIM		1	2	8	10
218	OXRC	OPEN		1	ABR		BS		1	4	0	0
218	RC	BKRC	RC	1			BS; ROUGH CAST SCRAP NENE VALLEY SOURCE?		1	4	0	0
218	SAMCG	37	MOULD	1			BS; OVOLO; BEADED BOARDER; FIGURE		1	14	0	0
218	SAMCG	OPEN		1			BS; SCRAP		1	1	0	0
218	SAMCG	B		1			RIM		1	2	20	2
218	SCCC	BKCOR		1	ABR		RIM		1	8	10	15
220	BB1	JCUR		1	VAB		RIM		1	11	16	6
220	CC	BK		1	ABR		BS; ?SOURCE ORANGE SANDY FAB; BROWN COULOUR COAT		1	1	0	0
220	GREY	JL		1	BURNT		BS; VITRIFIED		1	24	0	0
220	GREY	CLSD		5	ABR		BS		5	32	0	0
220	GREY	DPR		1	VAB		RIM		1	6	18	3
221	BBT	BFL		1	ABR		RIM; ?DIAM		1	19	26	2
224	CC	BK		1	ABR		BS; FLAKE; ORANGE CC; PALE FABRIC		1	2	0	0

LIBE12- Roman pottery archive												
Context	**Fabric**	**Form**	**Decoration**	**Vessels**	**Alt**	**Drawing**	**Comments**	**Join**	**Sherd**	**Weight**	**Rim diam**	**Rim eve**
224	DR20	A		1	V. BURNT		BS; HEAVILY BURNT		1	204	0	0
224	DR20	A		2	BURNT		BS; BURNT		2	174	0	0
224	GREY	CLSD		2			BS		2	22	0	0
224	GREY	BSAX	DIMP	1			BS; PUSHED IN DIMPLE FROM EXTERNAL; LATER 4TH CENTURY		1	9	0	0
224	PART	CLSD		1			BS; NO DECORATION		1	5	0	0
227	CR	CLSD		1	BURNT		BS		1	4	0	0
227	DWSHT	-		1	VAB		BS		1	7	0	0
227	GAU4	A		1	ABR		BS		2	53	0	0
227	GREY	BEV		1			RIM		1	31	20	13
227	GREY	CLSD		5	ABR		BS		5	37	0	0
227	GREY	JEV		1	ABR		RIM		1	7	14	5
227	GREY	BD		1	ABR		BASE		1	21	0	0
227	GREY	DPR		1			RIM		1	24	26	6
227	GREY	JL		1			RIM		1	26	18	4
227	GREY	DGR	BIA	1			RIM; BURNISHED INTERSECTING ARCHS DECORATION		1	13	20	4
227	GREY	JNN		1			RIM		1	34	12	22
227	GREY	JNK		1			RIM		1	14	24	5
227	MOMH	M		1	ABR; WORN INT		BS		1	29	0	0
227	MOSPC	M		1	WORN INT		BASE		1	64	0	0
227	OX	-		1	BURNT; ABR		BS; FLAKE; ?VESSEL OR TILE FRAG?		1	7	0	0
227	SCCC	BKFO	RC	1			BS; ROUGH CAST		1	19	0	0
227	SHEL	-		1	ABR		BS		1	2	0	0

Appendix 3: Post-Roman Pottery and Ceramic Building Material Assessment

By Dr Anne Irving

Post-Roman Pottery

Introduction

All the material was recorded at archive level in accordance with the guidelines laid out in Slowikowski *et al.* (2001). The pottery codenames (Cname) are in accordance with the established type series for Lincoln (Young *et al.* 2005). A total of 114 sherds from 79 vessels, weighing 4,195 grams was recovered from the site.

Methodology

The material was laid out and viewed in context order. Sherds were counted and weighed by individual vessel within each context. The pottery was examined visually and using x20 magnification. This information was then added to an Access database. An archive list of the pottery is included in Archive Catalogue 1, with a summary included in Table 1. The pottery ranges in date from the Late Saxon to the Early Modern period.

Condition

Most of the pottery is very fresh and comprises large sherds. Soot and carbonized food deposits indicate vessels were used for domestic tasks such as cooking. A single Lincolnshire Fine-shelled ware (LFS) vessel has a red internal deposit which may be from an industrial process. Many of the sherds have concretions adhering to them which are the result of submersion in damp/wet conditions.

Results

Period	cname	Full name	Earliest date	Latest date	NoS	NoV	W (g)
Late Saxon to Saxo-Norman	LKT	Lincoln kiln-type shelly ware	850	1000	44	25	1186
	LSH	Lincoln shelly ware	850	1000	5	4	69
	LSLS	Late Saxon Lincoln Sandy ware	850	920	2	2	16
	SNLS	Saxo-Norman Lincoln Sandy Ware	970	1080	2	2	9
	TORK	Torksey ware	850	1080	4	3	65
	LFS	Lincolnshire Fine-shelled ware	970	1200	3	3	37
Early Medieval	LEMS	Lincolnshire Early Medieval Shelly	1130	1230	2	2	74
	LSW1	12th century Lincoln Glazed ware	1100	1200	4	2	72
	EMHM	Early Medieval Handmade ware	1100	1250	1	1	4
	LSWA	Lincoln Glazed ware Fabric A	1100	1500	3	2	170
	NSP	Nottingham Splashed ware	1100	1250	1	1	56
Medieval	BOUA	Bourne-type Fabrics A, B, C, E, F and G	1150	1400	2	2	35
	LLSW	Late Lincoln Glazed ware	1350	1500	2	2	42
	LSW2	13th to 14th century Lincoln Glazed Ware	1200	1320	8	8	203
	LSW3	14th to 15th century Lincoln Glazed Ware	1280	1450	3	2	166
	NOTG	Nottingham glazed ware	1250	1500	3	1	216
	SCAR	Scarborough ware	1150	1350	1	1	7
	TOY	Toynton Medieval Ware	1280	1500	7	4	983
Late to Post Medieval	CIST	Cistercian-type ware	1480	1650	6	3	188
	BOU	Bourne D ware	1350	1650	4	3	287
	HUM	Humberware	1250	1550	2	2	116
	MP	Midlands Purple ware	1380	1600	1	1	23
	BERTH	Brown glazed earthenware	1550	1800	2	1	63
	MY	Midlands Yellow ware	1550	1650	1	1	10
Early Modern	ENGS	Unspecified English Stoneware	1690	1900	1	1	98
				TOTAL	**114**	**79**	**4195**

Range

Late Saxon to Saxo-Norman

Contexts (218) and (220) produced groups of Late-Saxon and Saxo-Norman wares. The composition of these two contexts, which comprise shell-tempered vessels (LFS, LKT and LSH) and sandy wares (LSLS, SNLS, TORK) suggests a date of the late 10th to mid/late 11th century for these two deposits. In contrast to the other material recovered from the site, these contexts contain multi-sherd vessels and appear to represent primary deposition.

Medieval

A wide range of medieval vessels are present, spanning the 12th to 15th centuries. These include wares produced in Lincoln, Toynton-All-Saints, Nottingham and Scarborough. The condition of these sherds, which are mainly large and fresh, suggests they came from deposits of dumped rubbish which remained largely undisturbed although the mixed date of many contexts shows this material was re-deposited at some point.

Post-medieval and Early Modern

Twelve vessels date from the 16th to 20th centuries.

Potential

Three Lincoln Kiln-type (LKT) vessels from context (218) with complete or near complete profiles are recommended for illustration during the next phase of work.

No other work is required on the assemblage although it may require reassessment in light of further excavation at the site. All the pottery is stable and should be retained; it poses no problems for long-term storage.

Ceramic Building Material

Introduction

All the material was recorded at archive level in accordance with the guidelines laid out by the ACBMG (2001) and to conform to Lincolnshire County Council's *Archaeology Handbook*. A total of 103 fragments of ceramic building material, weighing 23290 grams was recovered from the site.

Methodology

The material was laid out and viewed in context order. Fragments were counted and weighed within each context. The ceramic building material was 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 Archive Catalogue 2, with a summary in Table 2.

Condition

Many of the fragments are fresh, although some show signs of soot and spalling.

Results

Table 2, Summary of the Ceramic Building Material

Cname	Full name	NoF	W (g)
BOX	Roman box tile	1	52
BRK	Brick	1	550
CBM	Ceramic building material	2	14
GFLOOR	Glazed floor tile	1	97
GPNR	Glazed peg, nib or ridge tile	1	230
IMB	Imbrex	2	150

NIB	Nibbed tile	13	3086
PNR	Peg, nib or ridge tile	67	10739
RBRK	Roman brick	5	7046
RID	Unidentified ridge tile	1	59
RTIL	Roman tile	2	233
TEG	Tegula	7	1034
	TOTAL	**103**	**23290**

Range

Roman

Nineteen fragments of box-flue, tegula, imbrex and brick date to the Roman period. One complete brick is exceptionally fresh and may have been reused in a later period.

Medieval

Eighty-four fragments date from the late 12th to 16th century. Most are pieces of flat roofing tile, and context (102) contains tiles which appear to come from the same production batch. These show signs of sooting and some are spalled.

Potential

All the material is stable and should be retained. No further work is required on the assemblage.

Provenance

Trench 1

Pottery dating from the medieval, post-medieval and early modern periods was retrieved from buried soil layers 101, 102 and 104. These also contained large amounts of medieval tile and examples of Roman ceramic building material. A further buried soil, 103, contained a single example of medieval roof tile.

Trench 2

Pottery and ceramic building material of mixed date came from buried soil 203. Buried soil 218 and 220 the fill of ditch [219] produced pottery dating from the late 10th to mid/late 11th century. A number of these vessels are sooted and over-fired; they appear to have been used for domestic, and possibly industrial, purposes. These contexts, along with layers 224 and 227, also contained Roman tile.

Context Dates

The dating in Table 3 is based on the evidence provided by the finds detailed above.

Table 3, Spot dates

Cxt	Date	Earliest Horizon	Latest Horizon	Comment
101	Mid 15th to 16th	MH10	PMH2	
102	15th to 16th	MH9	PMH2	
103	Late 12th to 15th	MH3	PMH2	Date on CBM
104	19th to 20th	EMH	EMH	
203	Early 16th to 17th	PMH1	PMH6	
218	Late 10th to mid/late 11th	ASH11	ASH14	
220	Late 10th to mid/late 11th	ASH11	ASH13	
224	Roman	R	R	Date on CBM
227	Roman	R	R	Date on CBM

Abbreviations

ACBMGArchaeological Ceramic Building Materials Group

BS	Body sherd
CBM	Ceramic Building Material
CXT	Context
LHJ	Lower Handle Join
NoF	Number of Fragments
NoS	Number of sherds
NoV	Number of vessels
TR	Trench
UHJ	Upper Handle Join
W (g)	Weight (grams)

References

~ 2001, *Draft Minimum Standards for the Recovery, Analysis and Publication of Ceramic Building Material*, third version [internet]. Available from http://www.geocities.com/acbmg1/CBMGDE3.htm

Slowikowski, A. M., Nenk, B., and Pearce, J., 2001, *Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics*, Medieval Pottery Research Group Occasional Paper 2

Young, J., Vince, A.G. and Nailor, V., 2005, A Corpus of Saxon and Medieval Pottery from Lincoln (Oxford, Oxbow)

Archive Catalogue

Archive catalogue 1, The Pottery

Cxt	Cname	Fabric	Form	NoS	NoV	W (g)	Part	Decoration	Description	Date
101	BERTH		Jug/ jar	2	1	63	BS			Late 15th to 16th
101	BOU	Slightly sandy + ca	Drinking jug	1	1	23	Base			
101	BOU	Slightly sandy + ca	Jug	2	1	86	BS		?ID	
101	BOUA	A/B	Jar/ bowl	1	1	13	Rim			
101	BOUA	B	Jar/ bowl	1	1	22	BS		?ID	
101	CIST		Drinking vessel	3	1	85	Near profile	Applied white pad stamped with a wheel	Double handled?	
101	CIST		Drinking vessel	1	1	56	BS with LHJ	Applied oval pad stamped with leaf design	Ticknall?	
101	CIST		Jug	2	1	47	BS			
101	HUM		Jug/ jar	1	1	73	BS			Mid 13th to 14th
101	HUM		Jug/ jar	1	1	43	BS			15th to 16th
101	LEMS		Jar/ bowl	1	1	36	Base		Soot	
101	LSW1		Jar/ pipkin	3	1	56	Rim + BS			
101	LSW2		Jug	3	3	37	BS			
101	LSW2		Jug	2	2	69	Base		One finger pressed	
101	LSW2		Jug	1	1	5	Rim		Inturned rim	
101	LSW3		Jug	1	1	131	Handle		Grooved rod; cu glaze	
101	LSW3		jug/ jar/ bowl	2	1	35	BS			
101	NOTG		Jug?	3	1	216	BS		Internal brown residue	
101	TOY		Cistern	1	1	117	Rim	Applied cordon around rim; pressed with grid stamp	Abraded	
101	TOY		Jug	1	1	486	Base		Multiple stacking scars on base	
101	TOY		Jug	4	1	301	BS	Applied pressed strip		
101	TOY		Jug/ jar	1	1	79	BS		?ID	
102	LSW1		Jug	1	1	16	Base		Concretions	
102	MP		Jug/ jar	1	1	23	BS			
104	BOU	Smooth	Jug	1	1	178	BS			
104	ENGS		Bottle	1	1	98	Rim		Stopper	
104	LKT		Jar/ bowl	1	1	86	Base		Soot starts 10-20mm above basal angle	
104	LSW2		Jug	1	1	76	Handle		Strap with central hollow and pressed edges	
203	EMH M		Jar/ bowl	1	1	4	BS		Soot	
203	LEMS		Jar/ bowl	1	1	38	Rim		Lipped?; Spalled; internally leached; ?ID	
203	LFS		Jar/ bowl	1	1	27	Base		Soot; ?ID	
203	LKT		Jar/ bowl	5	1	107	BS + base		Soot	
203	LKT		Jar/	7	1	167	BS		Soot; all same vessel?	

			bowl							
203	LKT		Jar/ bowl	1	1	34	Base		?ID; soot	
203	LLSW		Jug/ jar	1	1	24	BS			
203	LLSW		Jug/ jar	1	1	18	BS		?ID	
203	LSH		Jar/ bowl	1	1	10	Rim			
203	LSH	E	Jar/ bowl	2	1	45	Rim + BS	Rectangular roller stamping on body	Soot; same vessel?; abraded	
203	LSW2		Jug/jar	1	1	16	BS	Combed wavy lines	CU glaze	
203	LSWA		Jug	1	1	21	Base	Finger pressed		
203	LSWA		Pipkin	2	1	149	Rim, handle + base		Abraded; soot; rod handle; concretions; cf Young et al 2005, p.139, fig.123, 906-9	13th-14th
203	MY		Hollow	1	1	10	BS			
203	NSP		Jug	1	1	56	Handle		Pressed strap handle; internally abraded	
203	SCAR		Jug/ jar	1	1	7	BS		CU glaze; spalled; ?ID	
218	LFS		Jar/ bowl	1	1	4	BS		Soot	
218	LFS		Jar/ bowl	1	1	6	BS		Soot; internal deposit - red; possibly industrial?	
218	LKT		?	1	1	27	BS		Overfired; cylindrical; spalled; concretion	
218	LKT		Bowl	2	1	93	Rim		Ridged body; soot; concretions; DR	
218	LKT		Jar	1	1	17	Rim		Soot; concretions	
218	LKT		Jar	1	1	27	Rim		Soot; concretions	
218	LKT		Jar	6	1	183	Rim, Base + BS		Overfired; concretions; all same vessel?; DR	
218	LKT		Jar	4	1	152	Rim + base		Soot on outer body and over rim; concretions; DR	
218	LKT		Jar/ bowl	8	8	195	BS		Soot; spalled; concretion	
218	LKT		Jar/ bowl	1	1	13	BS	Diamond roller stamping		
218	LKT		Jar/ bowl	2	2	39	BS		Brown internal deposit; one soot	
218	LSH		Jar/ bowl	1	1	11	Base		Sanded base?	
218	LSLS		Jar/ bowl	2	2	16	BS		Soot; concretions; ?ID	
218	TORK		Jar	1	1	12	BS			
218	TORK		Jar/ bowl	1	1	38	BS		Abraded; concretions	
218	TORK		Jar/ bowl	2	1	15	Base			
220	LKT		Jar	1	1	29	Rim		Soot	
220	LKT		Jar/ bowl	3	3	17	BS		Soot	
220	SNLS		Jar/ bowl	1	1	3	BS		?ID	
221	LSH		Jar/ bowl	1	1	3	Base		Soot; fingerprint	
221	SNLS		Jar	1	1	6	BS		?ID	

Archive catalogue 2, The Ceramic Building Material

Cxt	Cname	Fabric	NoF	W (g)	Description	Date
101	BRK		1	550	Overfired; spalled; nib/flange?	Roman?
101	CBM		2	14	Flakes	
101	GFLOOR		1	97	Pocked reduced glaze; soot; abraded/spalled	
101	NIB	Lincoln fabric 1	1	446	Left hand corner; moulded small round cut-back nib; mortar	
101	NIB	Lincoln fabric 7	1	113	Applied rectangular nib	
101	NIB	Lincoln fabric 1	1	297	Left hand corner; Moulded and folded nib	
101	NIB	Lincoln fabric 7	1	234	Applied triangular nib	
101	PNR	Lincoln fabric 1	6	735	Flat roofers; some spalled; some mortar	
101	PNR	Fe	1	118	Flat roofer	
101	PNR	Lincoln fabric 7	9	993	Flat roofer; some patchy soot; some mortar	
101	PNR	Lincoln fabric 7	2	368	Flat roofer; corner	
101	PNR	Lincoln fabric 7	1	168	Cut post-firing to triangular corner; mortar; flat roofer?	
101	PNR	Lincoln shale + fe	1	27	Flat roofer	
101	PNR	Lincoln fabric 1/7	1	298	Flat roofer; corner; mortar	'
101	PNR	Lincoln fabric 1	1	90	Flat roofer; corner	
101	PNR	Lincoln fabric 1/7	4	459	Flat roofer; one with brown deposit	
101	RID		1	59		15th to 16th
102	NIB	Lincoln fabric 7	5	1175	Flat roofer; all same batch?; some spalled/soot; applied large triangular nib	15th/16th
102	NIB	Lincoln fabric 1	1	131		
102	PNR	Lincoln fabric 7	4	750	Flat roofer; all same batch?; some spalled/soot	15th/16th
102	PNR	Lincoln fabric 7	17	2733	Flat roofer; all same batch?; some spalled/soot	15th/16th
102	PNR	Lincoln fabric 7	2	843	Flat roofer; corner; all same batch?	
102	PNR	Lincoln fabric 7	4	1157	Flat roofer; all same batch?	
102	RBRK		2	4542	Same brick; complete; spot of fuel ash glaze; 30 x 270 x 270mm	
102	RBRK		2	2188		
102	RBRK		1	316		
103	PNR	Lincoln fabric 7 + fe	1	210	Flat roofer; mortar	
104	PNR	Lincoln fabric 1 + fe	1	253	Flat roofer; soot	
203	GPNR	Lincoln fabric 1/7	1	230	Corner; flat roofer; reduced glaze	
203	NIB	Lincoln fabric 7	2	528	Moulded triangular nib	
203	NIB	Lincoln fabric 7 + fe	1	162	Nib very worn	
203	PNR	Lincoln fabric 7	9	912	Flat roofer	
203	PNR	Lincoln fabric 1	2	579	Flat roofer; corner	
203	PNR	Lincoln fabric 1/7	1	46	Flat roofer	
218	BOX		1	52	Combed	
218	RTIL		1	207	?ID or later	
218	RTIL		1	26	Spalled frag of TEG?	Roman
218	TEG		7	1034	Three with trances of flanges	
220	CBM		1	2	Flake	?
220	RBRK		1	223	Sooted on one face	
224	IMB		1	90		
227	IMB		2	150		

Appendix 4: Animal Bone Assessment

By Dr Martyn G. Allen

A small quantity of animal bones was recovered from the excavations at Brayford Wharf, Lincoln, with spot dating indicating that relevant contexts formed in the Roman (c.2nd-4thC AD), medieval (c.10th-16thC AD) and post-medieval/modern periods (17th-19th/20thC AD).

Methods

The faunal remains were studied using the personal reference material of the author, and each fragment was examined in full. The assemblage has been counted by the number of individual specimens (NISP) and identified to species or were assigned a size category (e.g. cattle-size, sheep-size). Where modern breaks where observable and fragments could be refitted, these were counted together as one specimen. Sheep and goat specimens were separated where possible by distinguishing morphologies in their horncores (Schmidt 1972) and analysis of anatomical elements employed the zoning system of Serjeantson (1996).

Biometric data were collected from relevant specimens, primarily following the criteria of Von den Driesch (1976), with cattle horncores measured following Sykes and Symmons' (2007) criteria. Dental wear on mandibular teeth was recorded on cattle, sheep/goat, and pig specimens using the methodology of Grant (1982), whilst evidence of epiphyseal fusion was recorded where possible. Non-metric sexual traits were recorded on the pelves of cattle (Grigson 1982) and on the morphology of pig canines (Schmidt 1972). Evidence of pathology, burning, and butchery, were all recorded where prevalent at a detailed level.

The Assemblage

The general condition of the bone is very good and levels of fragmentation appear to be low. Cattle bones dominate the assemblage (Table 1), as is usually common from urban sites, and their remains were particularly prominent in contexts 218 (l.10th-11thC AD) and 101 (m.15th-16thC AD). In both contexts, cattle remains were represented by a range of specimens from the foot bones to meat-bearing elements such as humerus, femur and pelvis. Sheep/goat and pig remains were present in low quantities spread across a number of contexts, whilst sheep bones were positively identified from two horncores; goat remains were absent.

Horse was represented in two l.10th-11thC AD contexts by tooth specimens, although a largely complete humerus also came from context 103. A dog mandible and metapodial were identified from the m.15th-16thC AD context 101 along with four cat bones. The cat bones included two tibiae, humerus and a femur, and are likely to derive from the same skeleton, perhaps a disturbed deposit. Red deer was represented by a heavily worked antler tine, whilst domestic fowl bones included a femur and a tibiotarsus from a late Roman and medieval context respectively. A further bird bone, an ulna, was possibly from a goose. One bone from the modern 19th/20thC AD context 104 had a surface texture reminiscent of a fish species, most likely from a skull fragment. This specimen would require some further analysis to substantiate the identification.

Context *spot date*	**221** *m.2nd-e.3rd*	**227** *4thC*	**218** *l.10th/11th*	**220** *l.10th/11th*	**101** *m.15th/16thC*	**102** *15th/16thC*	**203** *e.16th/17th*	**104** *19th/20thC*	**103** -	**Total**
cattle		4	21	3	11		1	8	3	51
sheep/goat		7	1	4	2		3	1		18
sheep					1			1		2
pig		1	2	1			2	2		8
horse			1	1					1	3
dog					2					2

cat			1		4					5
red deer			1							1
dom. fowl		1	1							2
bird					1					1
cf. fish								1		1
cow-sized	2	10	7	1	8		8	3	2	41
sheep-size	1	4	6	1	2	1		5		20
Total	3	27	41	11	31	1	14	21	6	155

Table 1, NISP by taxa and context from Brayford Wharf, Lincoln.

Data potential and Recommendations

46 bones provided age information from epiphyseal fusion, whilst five mandibles were recorded for dental wear. 29 specimens provided biometric data, 23 had been butchered, and four have been sexed.

This small assemblage is severely limited in the information it can provide, particularly due to the extensive chronological range represented. As it currently stands, no further work is required on the material. However, if further excavation produces larger quantities of animal bone (e.g. 1000+ specimens) from well-stratified contexts of Roman and/or medieval date these will require full analysis. Previous excavations from Lincoln have produced substantial collections of animal bone and these have added a considerable level to our understanding of Roman and medieval animal management, carcass processing, and the consumption patterns of the urban population (e.g. Dobney *et al.* 1996). The data potential indicated by this small assemblage from Brayford Wharf suggests that larger assemblages will provide a high frequency of ageing, butchery, and biometric information.

References

Dobney K.M., Jaques S.D. and Irving B.G. 1996, *Of Butchers and Breeds: Report on the Vertebrate Remains from Various Sites in the City of Lincoln.* Lincoln Archaeological Studies No.5 (Lincoln, City of Lincon Archaeology Unit).

Grant A. 1982, 'The use of tooth wear as a guide to the age of domestic ungulates' in Wilson B., Grigson C. and Payne S. (eds.), *Ageing and Sexing Animal Bones from Archaeological Sites*, BAR British Series **109** (Oxford, British Archaeological Reports) pp. 91-108.

Schmidt E. 1972, *Atlas of Animal Bones for Prehistorians, Archaeologists and Quaternary Geologists* (Amsterdam, Elsevier Publishing).

Serjeantson D. 1996, 'The animal bones' in Needham S. and Spence A. *Refuse and Disposal at Area 16 East Runnymead; Runnymede Bridge Research Excavations*, vol. II (London, British Museum Press) pp. 194-222.

Sykes N.J. and Symmons R. 2007, 'Sexing cattle horn-cores: problems and progress', *International Journal of Osteoarchaeology*, **17**, 514-523.

Von den Driesch A. 1976, *A Guide to the Measurement of Animal Bones from Archaeological Sites.* Peabody Museum Bulletin **1** (Harvard University, Peabody Museum of Archaeology and Ethnology).

Appendix 5: Palaeoenvironmental Assessment

By James Rackham and Rob Scaife

Evaluation excavations conducted by Allen Archaeology on land off Brayford Wharf East were limited to a maximum depth of approximately 2.5 to 2.8m deep, the trenching stepped in twice from the modern ground surface. In order to investigate those underlying sediments that could not be evaluated by trenching the Environmental Archaeology Consultancy was asked to undertake hand augering in both Trenches 1 and 2 of the evaluation.

An auger hole was sunk in the base of each trench using a hand operated 1m long 25mm diameter gouge auger, with extension rods that permitted coring to a depth of over six metres. The core was undertaken until 'clean' grey or yellow sands indicated that the undisturbed late glacial sands underlying the site were recorded. Each core was logged in the field and depth below ground surface recorded. The top of each borehole was surveyed on site and the logs below have been corrected for Ordnance Datum. In addition to logging the cores two samples were collected from the basal silts in the borehole from Trench 1 for pollen analysis, and samples were taken from the top and bottom of the 'natural' sedimentary sequence for possible radiocarbon dating to define the chronological period represented by the sediments.

The following logs were recorded:

Borehole 1 (BH1) - Trench 2

Top of borehole at 4.42m OD, coordinates – E497359.161, N370948.268

4.42-4.32	dark greyish brown (10YR 4/2) silty sand with larger grits
4.32-4.28	very dark greyish brown (10YR 3/2) fine sandy silt
4.28-4.25	dark greyish brown (10YR 4/2) silty sand with larger grits
4.25-4.21	very dark brown (10YR 2/2) fine smooth degraded organics – probably degraded wood – wooden floor?
4.21-4.08	dark grey (10YR 4/1) fine sandy silt with occasional mussel shell fragments
4.08-3.97	dark grey (5Y 4/1) very (fine to medium) sandy silt with olive staining
3.97-3.84	dark grey (5Y 4/1) very sandy silt with charcoal fragments
3.84-3.75	yellowish brown (10YR 5/4) silty fine sands, with larger grits
3.75-3.47	light yellowish brown (10YR 6/4) medium sands (water running in!)
3.47-3.37	dark greyish brown (10YR 4/2) silty sands with small pebbles to 15mm diameter and limestone fragments
3.37-3.3	dark greyish brown (10YR 4/2) silty sand
3.3-3.2	dark greyish brown (10YR 4/2) silty sand with small stones
3.2-3.12	dark greyish brown (10YR 4/2) silty sand with occasional charcoal
3.12-3.02	brownish yellow (10YR 6/6) fine to medium sands

The borehole stopped on brownish yellow sands, interpreted as of late glacial origin.
Less than half a metre of 'archaeological deposits' remained unexcavated beneath the evaluation trench and no organic or waterlain sediments were recorded in the borehole. The undisturbed glacial sands are recorded at 3.12m OD. The only deposit of note, which was visible in the sides of the basal step of the evaluation trench was a very dark brown humified organic horizon of approximately 4cm thickness (context 224). This deposit was horizontal, was visible in all four sides of the basal step of the trench and is interpreted as a very degraded timber layer (rather than a peat horizon), quite possibly a 'floor'. The lower deposits in the borehole, silty sands with occasional small stones and charcoal, appear to reflect colluvial deposition of sands from upslope and silts possibly deriving from flood events, worked by soil processes.

Borehole 2 (BH 2) - Trench 1

Top of borehole at 3.75m OD, coordinates – E497319.384, N370964.740

3.75-3.0	already hand excavated
3.0-2.92	brown peats with wood, mussel shell at 2.92
2.92-2.84	grey sands with grits and occasional small stones
2.84-2.77	sandy peats with wood fragments
2.77-2.68	dark brown peat with wood
2.68-2.65	grey sand
2.65-2.56	brown peat with occasional sand lenses
2.56-2.45	grey sand
2.45-2.38	brown peat
2.38-2.33	black fibrous peat
2.33-2.29	brown organic silt
2.29-2.19	brown humified peaty silt
2.19-1.92	grey sand
1.92-1.65	black/very dark grey shelly organic silt
1.65-1.35	dark grey organic silt with shell fragments
1.35-1.05	grey brown shell rich organic silts
1.05-0.91	shelly organic silts with wood fragments
0.91-0.05	brown humified fine organic silts (wood on top, 0.90m OD, sampled for C14 and sediment at 0.15). Pollen samples at 0.45 (330cm) and 0.17 (358cm).
0.05 to -0.38	brown humified organic silt
-0.38 to -0.58	grey sands

Coring stopped on grey sands interpreted as of late glacial date. (Munsell colours were not logged for this core)

The lower sediments in BH2, brown humified organic silts, were deposited in water under low energy conditions and probably reflect a time when this area of the site lay within the Brayford Pool. Organic silts, often with numerous freshwater shells, continued to be deposited up to 1.92m OD indicating that the area still lay within the Pool. A horizon of grey sand at 1.92-2.19m OD indicates a much higher energy environment and might be interpreted as indicating that the channel of the River Witham had now migrated to this part of the site, before moving away again and returning the area to a low energy depositional environment. At 2.33m OD the waterlain silts give way to fibrous peats indicating a vegetated area on the margins of the main water body, but still saturated and probably seasonally underwater. A sequence of peats interleaved with sands probably reflects organic build up on the margins of the Brayford with intermittent inwash of sands from the higher ground to the east. An increase in wood in the peats at 2.77m OD perhaps suggests growth of woodland carr on the eastern margin of the pool. At 2.92m OD marine mussel shell occurs with peats and wood and suggests a Roman or post-Roman date for the deposits at this level.

Pollen Analysis of Two Spot Samples
Rob Scaife

Introduction
Two test pollen samples have been analysed to determine presence of pollen, taxonomic content and, based on the latter, the broad age of the sediments based on known vegetation chronologies. Sub-fossil pollen has been extracted in countable numbers and the results indicate that the on-site habitat was alder dominated and the sequence is probably of Neolithic to Early Bronze Age date.

The Pollen Data

The two organic/peat samples were processed using standard pollen extraction procedures (Moore *et al*. 1991). Samples of 2ml produced moderate, but easily countable numbers of pollen. Preservation is moderate to good. Total pollen counts of 300 grains per sample plus fern spores were identified and counted. The resulting data are given in table 1 below.

Depth	330cm	358cm
Trees & Shrubs		
Betula	4	4
Pinus		1
Quercus	41	61
Tilia	1	4
Fraxinus		1
Ilex	1	
Alnus	145	160
Corylus avellana type	31	21
Salix	1	1
Hedera		1
Erica	1	
Herbs		
Ranunculus type	1	
Chenopodiaceae	1	
Plantago major type		1
Plantago lanceolata	1	
Bidens type	1	1
Lactucoideae	1	
Poaceae	22	21
cf. Cereal type	5	1
Large Poaceae (>45u)	11	7
Cyperaceae	35	13
Typha angustifolia type		1
Ferns		
Dryopteris type	9	15
Pteridium aquilinum	5	7
Total Pollen	**302**	**300**
Total Spores	**14**	**22**

Table 1*:* Pollen count data from Brayford Wharf East.

The two pollen spectra are dominated by trees and shrubs with some herbs but of limited taxonomic diversity.

Trees and shrubs: *Alnus* is dominant in both samples 49% (total pollen) at 330cm and 53% at 358cm. *Quercus* (14% and 20%) with *Corylus avellana* type (10% and 7%) are also important. There are sporadic occurrences of *Tilia* (more important at 358cm), *Fraxinus* and *Ilex*.

Herbs: Herb pollen are dominated by Poaceae (7%) and Cyperaceae (12% and 4%). Possible Cereal pollen is present especially in the upper sample (330cm) with a single occurrence of *Plantago lanceolata*. Large Poaceae (certain wild grasses having cereal size pollen grains but thin exine; e.g. *Glyceria*) are present.

Fern spores: These comprise monolete *Dryopteris* type (3% and 5% tp + spores) and Pteridium (2% and 2% tp + spores).

Marsh *taxa:* These include the *Alnus* and Cyperaceae noted above and a single occurrence of *Salix* at 358cm).

Discussion

The pollen data can be viewed in terms of the on-site vegetation contributing to the local peat and organic sediments and the surrounding drier land of the fluves.

On site: Numbers of alder (*Alnus*) are high suggesting on-site dominance of floodplain alder carr woodland. Willow (*Salix*), which is poorly represented in pollen spectra, may also have been present. Sedges (Cyperaceae) are also present and may have formed a ground flora to the alder carr woodland (e.g. *Carex paniculata*) or form more open, wetter areas of fen. A proportion of the grass (Poaceae) pollen doubtless also comes from this habitat.

The off-site vegetation component: Oak (*Quercus*) and hazel (*Corylus*) are important and appear to have been the main constituents of local woodland. However, the density of the alder woodland may have inhibited the ingress of pollen from the surrounds. This factor would be especially important in giving poor representation of the poorer represented species such as ash (*Fraxinus*) and lime (*Tilia*) both of which are present here.

Herbs are dominated by sedges (see above) and grasses. A proportion of the latter come from the surrounding region and may imply some local grassland, ribwort plantain (*Plantago lanceolata*) probably comes from this community. Cereal pollen is possibly present and thus providing some indication of age through the possibility of arable cultivation.

Age/Dating: Although pollen is not a technique for dating sediments, some tentative conclusions can be made based on the known broad changes in developing Holocene vegetation. Clearly, the samples are of Holocene and not late Devensian (late glacial) date which would have few trees and a dominance of herbs. Furthermore, the spectra are not of early Holocene age, that is, showing importance of juniper, birch (in the pre-boreal) and pine and subsequent dominance of elm, oak and hazel (the Boreal). Alder with dominant oak and hazel with some lime may indicate a middle Holocene (Atlantic) age although elm and lime would be expected in greater numbers. The absence in quantity of elm and the possibility of cereal pollen, however, suggests a post Elm Decline age. That is, after *c.* 5,500-5,000 BP. The importance of trees with small number of lime pollen in the lower sample tentatively indicates a Neolithic or Early Bronze Age date.

Conclusions

The two auger holes extend our knowledge of the area. With the base of the sedimentary sequence at -0.38m OD in Trench 1 and the top of the late glacial sands at 3.12m OD in Trench 2 it is clear that the undisturbed late glacial sands that floor the site rise 3.5m across the 40m between BH1 and BH2 and the site must include deposits that reflect the edge of the Brayford Pool and the eastern bank of the River Witham throughout much of the prehistoric and historic periods. As such the site is likely to include a sequence of deposits reflecting the reclamation of this area from the pool and river, perhaps mirroring, although not necessarily of similar date, the sequence revealed beneath the Brayford Centre (Carlyle and Atkins 2009). The excavated deposits above the natural sediments in Trench 1 suggest a mixture of river and pool edge sediments, downslope inwash and possible dumping along the margins of the waterbody.

The Roman pot sherds at the base of the archaeological sequence in Bh4 of the watching brief conducted at the site during geotechnical investigations (AAL 2012, Fig. 3) overlay peats at approximately 3-3.5m OD and would imply Roman activity on the higher ground beneath the site, a probable Roman ploughsoil was recorded at approximately 4.0m OD beneath the AMC Block (Rackham *et al* 2003) on the University site indicating that land at this level was probably above the influence of any river floods.

Relatively undisturbed peats occur in Trench 1 at 3.0m OD, but because these lie over peats and organic silts that have been subject to humification and compaction since their formation they must have been formed at a much higher elevation. The occurrence of marine mussel shell beneath, a food item found on Roman and later sites but not generally associated with Iron Age settlements, suggests that this level is likely to be of Roman or later date, while the finds from Trench 1 and the initial test pits and boreholes (AAL 2012, Fig. 3) would suggest that this level is probably medieval in date. A radiocarbon date calibrated to AD 660-900 was recorded at Brayford North at 2.22-2.32m OD (Carlyle and Atkins 2009), again with compacted organic deposits below, which is consistent with a medieval date for the base of the disturbed deposits in Trench 1. At Brayford Wharf East, approximately 120m north of the site, in 1998 the samples from geotechnical boreholes produced possible 12th century material below 0m OD in what was probably a former channel of the Witham (Rackham 1999). At this site the sands were cut or scoured to a depth of nearly -3m OD but no organic silts of the character recorded here were noted below 0m OD suggesting that this area lay in the river channel for much of its history and/or had been heavily scoured in the last two millennia when the river crossed the site.

Time has not allowed the radiocarbon dating of material collected from the auger holes, but the results of the pollen analysis would suggest that the base of the organic sequence at a level of -0.38m OD, 0.55m below the assessed basal pollen sample is probably late Mesolithic or Neolithic in date. If correct this would indicate a waterlain and subsequent aquatic marginal and probable alder carr sediment and peat sequence dating from the Neolithic up to the medieval period. There may be episodes of erosion associated with the sand horizons so the sequence may not be continuous, but this may represent some 5-6000 years of organic sediment and peat deposition.

While these deposits remain undated by radiocarbon we cannot be entirely confident of the chronology suggested above, although nearly 3.5m of organic deposits, with good pollen and probably good macrofossil evidence, are clearly an important local resource for studying the landscape history and human impact in the Lincoln area over several millennia.

Recommendations

With a significant fall in the old ground surface or late glacial sands between Trenches 2 and 1, and a possible former course of the River Witham across the site a transect that records the falling ground surface and any 'river bank edge' would extend our limited knowledge of this area of Lincoln. When combined with a radiocarbon dating programme and the washing of samples from the cores for the recovery of datable finds so that a chronology can be constructed the programme of reclamation on the eastern bank of the River Witham will be much better understood.

The deposits beneath Trench 1 also afford an important resource for studying and understanding the environmental history of Lincoln, and specifically the Brayford area over several thousand years, perhaps from the late Mesolithic/Neolithic to the medieval period.

It is recommended that a series of five boreholes are sunk at approximately 12m intervals east-west across the site starting from approximately six metres from the western edge. The boreholes should be taken to a depth of 7m or until clean undisturbed glacial sands are recorded. Each borehole should be cased and a continuous core of between 84 and 102mm diameter taken from each borehole. The upper metre in each core may need to be hand excavated to avoid services and remove obstructions. The cores should be split, photographed and logged. The most suitable core for palaeoenvironmental analysis (probably the longest) should be sub-sampled for radiocarbon dating in order to establish the chronology of the lower sedimentary deposits. The lower 'archaeological' deposits (above the glacial sands) in the other cores should be sampled in 10cm units and washed for the recovery of datable finds. The results of this work should be written up as an assessment report with any proposals for the post-excavation study of the palaeoenvironmental sequence in the selected core.

Acknowledgements
We should like to thank Gavin Glover and the site staff for their assistance during the hand augering on site.

References

AAL, 2012 *Archaeological Watching Brief Report: Land off Brayford Wharf East, Lincoln, Lincolnshire* Unpublished Allen Archaeology Ltd report No. 2012086

Carlyle, S. and Atkins, R. 2009 *Medieval Land Reclamation at Brayford Pool, Lincoln. Archaeological excavation at the Brayford Centre 2000*. BAR British Series 498.

Clay, C. 2012 Figure 3: Deposit model of sequence exposed in boreholes and test pits. Allen Archaeology.

Moore, P.D., Webb, J.A. and Collinson, M.E. 1991 *Pollen Analysis* Second edition. Oxford: Blackwell Scientific.

Rackham, D.J. 1999 Brayford Wharf East 1998. Follow up investigation of the commercial borehole samples. Unpublished report for CLAU

Rackham, D.J., Scaife, R.G. and Gale, R. 2003 Lincoln University AMC Block. Environmental Archaeology Assessment. Unpublished report for CLAU

Appendix 6: Assessment of the Plant Macrofossils and Other Remains

By Val Fryer

Introduction and Method Statement

Excavations at Brayford East, undertaken by Allen Archaeology Ltd, recorded a limited number of features of probable tenth to eleventh century date. Samples for the retrieval of the plant macrofossil assemblages were taken from a possible floor make-up layer (context [221] sample 2) and from the fill of ditch [219] (sample 1), which appeared to cut through floor [221].

The samples were processed by manual water flotation/washover, and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16, and the plant macrofossils and other remains noted are listed in Table 1. Nomenclature within the table follows Stace (1997) for the plant macrofossils and Kerney and Cameron (1979) and Macan (1977) for the mollusc shells. Most plant remains were charred, but de-watered macrofossils, denoted within the table by a lower case 'w' suffix, were noted within the assemblage from sample 1. Modern seeds were also recorded.

The non-floating residues were collected in a 1mm mesh sieve and were sorted when dry. All artefacts/ecofacts including pottery, bone, fish bone, eggshell and marine mollusc shells were removed for further specialist analysis.

Results

Cereal grains and seeds of common weeds were present at a low to moderate density within both assemblages. Preservation was poor to moderate, with the severely puffed condition of a number of both grains and seeds suggesting that combustion had occurred at very high temperatures.

Oat (*Avena* sp.), barley (*Hordeum* sp.) and wheat (*Triticum* sp.) grains were recorded, with oats occurring most frequently. Cultivated oat (*A. sativa*) floret bases, with straight basal abscission scars, were noted within both assemblages, but other chaff elements were rare. However, sample 2, from floor [221], did include a small number of bread wheat (*T. aestivum/compactum*) type rachis nodes. The same assemblage also included what appeared to be two very poorly preserved fragments of pea/bean (large Fabaceae) type cotyledon.

Seeds of common segetal weeds were most common within the assemblage from sample 2, although rare specimens were also noted within ditch fill [220]. Taxa noted included stinking mayweed (*Anthemis cotula*), orache (*Atriplex* sp.), fat hen (*Chenopodium album*) and cornsalad (*Valerianella dentata*). A fragmentary charred sedge (*Carex* sp.) nutlet was recorded from sample 2, whilst sample 1 included a number of de-watered duck-weed (*Lemna* sp.) seeds. A possible small fragment of hazel (*Corylus avellana*) nutshell was also noted within the assemblage from sample 2. Charcoal/charred wood fragments were abundant throughout, along with small pieces of charred root or stem. Heather (Ericaceae) stem fragments and florets were moderately common, and ling (*Calluna vulgaris*) capsules and cross-leaved heath (*Erica tetralix*) leaves were also recorded.

Although specific sieving for molluscan remains was not undertaken, shells of both terrestrial and freshwater snails were noted within both assemblages. Other remains included black porous and tarry residues, siliceous globules and vitreous concretions, all of which were probable residues of the combustion of organic remains at very high temperatures, and bone, eggshell and fish bone fragments.

Conclusions and Recommendations for Further Work

In summary, both assemblages are very similar in composition, containing small quantities of mixed refuse including hearth/oven waste, food refuse and possible flood detritus. However, it is currently unclear whether material from floor level [221] was accidentally incorporated into ditch [219] when the latter cut the floor, or whether two separate deposition incidents are represented. Both assemblages contain moderate to high densities of charred stem fragments, including specimens of heather. Such material is commonly seen within deposits of oven rake-out waste, where heather was greatly favoured as a fuel, as it ignited easily and maintained an even, high temperature throughout combustion. Heather was also used as flooring, bedding and thatch, and is occasionally found charred as a result of catastrophic fires, but the fact that the current material was obviously burnt at a very high temperature almost certainly indicates that it is derived from an oven or hearth type context. Much of the heather was probably imported to the site from areas of heathland in the hinterlands of the city, although it should be noted that cross-leaved heath was possibly growing on or near the site, as it favours bog and wet heathland conditions.

The few cereal grains which are recorded also display evidence of high temperature combustion, as most are severely puffed and distorted. It is currently unclear whether charring occurred accidentally during culinary preparation, or whether the grains were constituents of cereal processing waste, which was also commonly used as fuel. However, it is possibly of note that grains, and most particularly oats (which are predominant within these assemblages), were often toasted prior to consumption (cf Alms Lane, Norwich Murphy 1985).

As neither of the assemblages contain a sufficient density of material for quantification (i.e. 100+ specimens), no further analysis is required. However, if any further interventions are planned within the immediate area, it is strongly recommended that additional plant macrofossil samples of approximately 20 – 40 litres in volume are taken from all features recorded during excavation.

References

Kerney, M.P. and Cameron, R.A.D., 1979 *A Field Guide to the Land Snails of Britain and North-west Europe*. Collins

Macan, T.T., 1977 British Fresh- and Brackish-Water Gastropods: A Key *Freshwater Biological Association Scientific Publication* No. **13**

Murphy, P., 1985 'The Plant Remains' from Alms Lane, in Atkin, M., Carter, A. and Evans, D., 'Excavations in Norwich, 1971 – 1978, Part II *East Anglian Archaeology* **26**, 228 – 234

Stace, C., 1997 *New Flora of the British Isles*. 2nd edition. Cambridge University Press

Key to Table

x = 1 – 10 specimens xx = 11 – 50 specimens xxx = 51 – 100 specimens xxxx = 100+ specimens
cf = compare w = de-watered b = burnt ss = sub-sample

Sample No.	**1**	**2**
Context No.	**220**	**221**
Feature No.	**219**	
Cereals and other food plants		
Avena sp. (grains)	xx	xx
(awn frags.)	x	x
A. sativa L. (floret bases)	x	x
Hordeum sp. (grains)	x	
Hordeum/Secale cereale type (rachis node)		x
Triticum sp. (grains)	x	x
(rachis internode)	x	
T. aestivum/compactum type (rachis nodes)		x
Cereal indet. (grains)	x	x
Large Fabaceae indet.		xcf
Herbs		
Anthemis cotula L.	x	x
Apiaceae indet.		x
Atriplex sp.		x
Bromus sp.		xcf
Chenopodium album L.		x
Small Poaceae indet.		x
Valerianella dentata (L.) Pollich		x
Wetland plants		
Carex sp.		x
Lemna sp.	xw	
Tree/shrub macrofossils		
Corylus avellana L.		xcf
Other plant macrofossils		
Charcoal <2mm	xxxx	xxxx
Charcoal >2mm	xxxx	xxxx
Charcoal >5mm	xx	x
Charcoal >10mm	x	x
Charred root/stem	xxx	xxxx
Mineral replaced root/stem	x	
Characeae indet.	x	
Calluna vulgaris (L.)Hull (capsules)	x	x
Ericaceae indet. (stem)	xx	x
(florets)	x	xx
Erica tetralix L. (leaves)		x
Indet. culm nodes	x	
Indet.fruit stone/nutshell frags.	x	x
Indet.seeds	x	x

Mollusc shells		
Terrestrial species		
Cochlicopa sp.	x	x
Discus rotundatus	x	
Vallonia sp.	x	x
Freshwater species		
Anisus leucostoma	x	x
Armiger crista	x	
Bathyomphalus contortus	x	
Bithynia sp.	x	x
(operculum)	x	
B. tentaculata	x	
Hippeutis sp.	x	
Planorbis planorbis	x	
Succinea sp.		x
Valvata piscinalis	x	
Other remains		
Black porous 'cokey' material	xx	x
Black tarry material	x	
Bone	x xb	x
Eggshell	x	
Fish bone	x	x xb
Mineralised faecal material	x	
Mineralised root channels		x
Ostracods	x	
Siliceous globules	x	x
Small mammal/amphibian bones	x	x
Vitreous material	x	x
Sample volume (litres)	**14ss**	**14ss**
Volume of flot (litres)	**0.1**	**0.2**
% flot sorted	**100%**	**50%**

Appendix 7: Context Summary List

CBM = Ceramic Building Material (e.g. brick and tile)

Trench 1

Context	Type	Description	Interpretation
100	Layer	Loose dark reddish brown rubble fill, average of 0.50m thick	Modern levelling material
101	Layer	Dark grey silt up to 1m thick	Buried soil
102	Layer	Firm, mid yellowish brown sand with frequent tile. Average thickness of 0.20m	Ground consolidation layer
103	Layer	Dark brown silt, up to 0.60m thick	Buried soil
104	Layer	Dark greyish brown silty clay, containing occasional CBM and stone fragments. Average thickness of 1.00m	Buried soil
105	Masonry	Yellow brick, average brick dimensions of 240mm x 60mm x 60mm, total dimensions of 0.50 x 0.50m in section.	Wall foundations
106	Masonry	Roughly hewn limestone blocks, average dimensions 200mm x 200mm x 100mm, built in level courses. No bonding material. 0.80 x 0.45m visible	Possible wall foundation or corner of a building
107	Cut	Construction cut, width of 0.70m	Construction cut for wall 106
108	Fill	Firm dark grey sandy silt with occasional limestone rubble	Backfill of cut [107]
109	Masonry	Late Post-medieval red brick wall, 0.22m wide x 1.15m high	Late Post-Medieval wall
110	Layer	Soft greyish brown sandy clay with occasional mollusc shells and charcoal flecks, 0.33m thick	Buried soil
111	Layer	Mid brown soft peat, a thickness of 0.10m	*In situ* peat
112	Layer	Moderately compact light grey sand with occasional round wood fragments, exceeds 0.05m thick	Possible accumulated detritus from river edge

Trench 2

Context	Type	Description	Interpretation
200	Layer	Modern rubble layer containing; brick, rubble, *etc.* 0.25m thick	Modern ground surface
201	Layer	Dark brown silt with frequent small sub-angular stone inclusions, average thickness of 0.30m	Levelling layer
202	Masonry	Red brick wall, up to 4 courses survive. Stone slab cap	Brick-lined drain and cover
203	Layer	Dark grey silt, occasional small sub angular stone inclusions. Up to 0.80m thick, not fully excavated	Buried soil
204	Masonry	Red brick wall , includes 3 beam holes that contained wood debris, maximum height of 0.80m	Foundations for late Post-Medieval building
205	Cut	Steep sides, flat base, 0.40m wide x 0.40m deep	Cut for Post-Medieval drain
206	Fill	Loosely compacted sand and gravel, containing cast iron pipe with a diameter of 8cm, 0.40m thick	Fill of cut [205]
207	Layer	Dark grey silt up to 0.20m thick	Buried soil
208	Masonry	Irregular limestone blocks, 2 courses surviving, blocks 300mm x 200mm, maximum height of wall 0.40m	Possible stone wall foundation
209	Masonry	Red brick wall, extending to a width of 0.70m	Repair or alteration to wall 204

Context	Type	Description	Interpretation
210	Layer	Modern concrete surface, average thickness 0.15m	Modern concrete surface
211	Layer	Mixture of rubble, brick, and powdered mortar, has an average thickness of 0.80m	Late Post-medieval dump deposit
212	Layer	Laminated layers of modern material, including; sand, gravel, brick, and cement, maximum thickness of 0.58m	Dump layers
213	Masonry	Red brick wall, 8 courses high, associated with floor surface 214	Post-Medieval wall
214	Layer	Concrete floor, average thickness of 0.20m	Floor associated with walls 213 and 215
215	Masonry	Red brick wall, stepped foundations with concrete base, wall is 10 courses high	Wall foundation
216	Masonry	Red brick wall, maximum height 0.70m	Wall foundation, possibly associated with wall 204
217	Layer	Mixture of brick, rubble, and, concrete, a maximum thickness of 0.90m	Backfill of cut 233
218	Layer	Dark greenish brown sandy silt, with occasional mussel shells, limestone fragments, and charcoal flecks	Buried soil
219	Cut	'T' shaped, steep sided, flat base, 0.50m wide	Shallow ditch, possible beam slot or drainage feature
220	Fill	Dark greyish brown sandy silt with wood/peat fragments	Fill of ditch [219], woody fragments may be derived from layer 224
221	Layer	Mid orange, firm sandy clay. 1.50m x 0.70m x 0.20m thick	Possible floor make up
222	Layer	Dark greenish brown sandy silt, unexcavated	Probable buried soil
224	Layer	Dark brown, compressed peat, an average thickness of 0.05m	Possible degraded and compressed timbers – possible floor
225		Unstratified	
226	Layer	Mid grey, sandy silt, up to 0.10m thick, frequent small sub-angular stones	Possible dumped deposit or trample
227	Layer	Mid grey sandy silt, occasional small round stones, up to 0.75m thick	Buried soil
228	Layer	Reddish brown, compact sandy silt, occasional charcoal or mineral flecks and small rounded stones. Not fully excavated due to depth	Inwashed sands
229	Layer	Dark grey sandy silt, with occasional limestone inclusions, up to 0.40m thick	Buried soil
230	Cut	Sub-circular cut of pit, dimensions of 0.50m deep x 0.30m wide	Cut of pit, possible posthole
231	Fill	Orange brown, coarse sand, with occasional small angular limestone inclusions, 0.50m thick	Fill of pit [230]
232	Fill	Rubble, containing small stones, sand, and cement	Backfill of construction cut [233]
233	Cut	Linear, straight, vertical sides, stepped at top, up to 1.7m wide, mainly 0.70m wide	Construction cut for wall 215
234	Fill	Loose, dark grey sandy silt, 0.15m thick	Fill of drain 202
235	Cut	Linear, straight, vertical sides, flat base, Rectangular cut, profile dimensions 0.40 wide x 0.30m deep	Cut for brick-lined drain 202

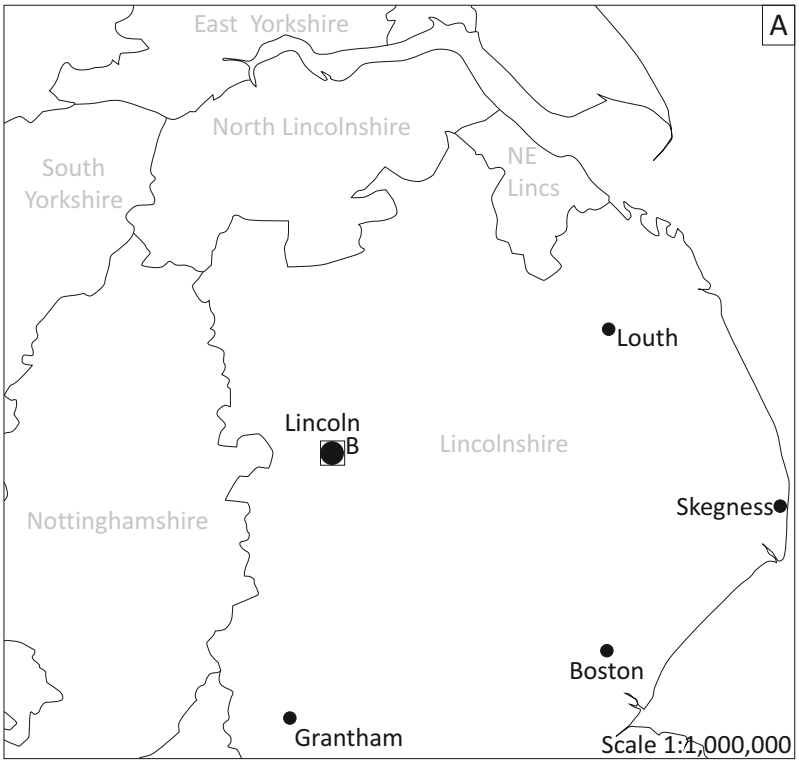


Figure 1: Site location in red

© Crown copyright 2000. All rights reserved. Licence Number 100047330

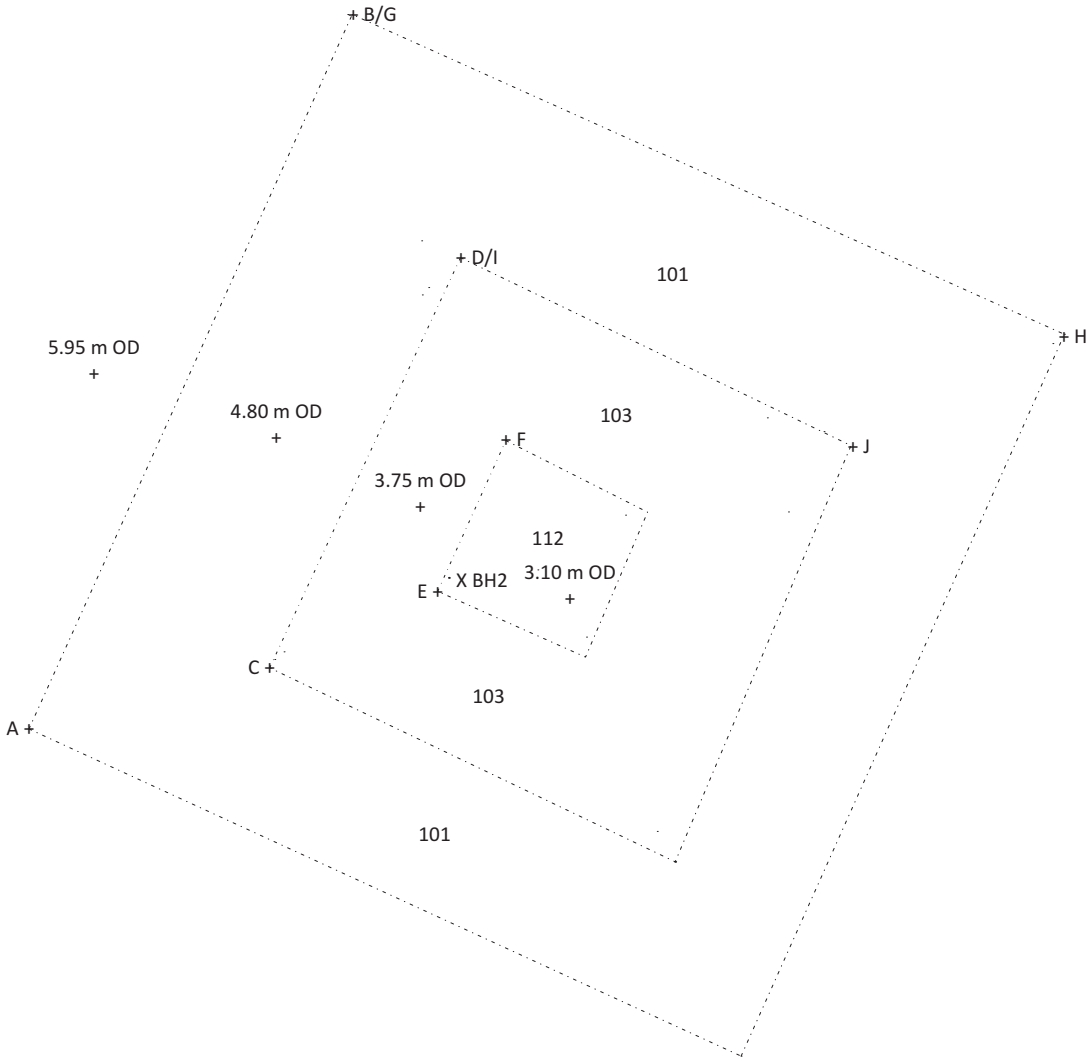
Site Code	LIBE 12
Scales	1:10,000,000 1:1,000,000 1:25,000 @ A4
Drawn by	GG
Date	06/11/12

Allenarchaeology
Lincoln
Birmingham
Cambridge
Southampton
www.allenarchaeology.co.uk

Figure 2: Trench location

Site Code	LIBE 12
Scale	1:500 @ A4
Drawn by	GG
Date	05/11/12

Allenarchaeology
Lincoln
Birmingham
Cambridge
Southampton
www.allenarchaeology.co.uk



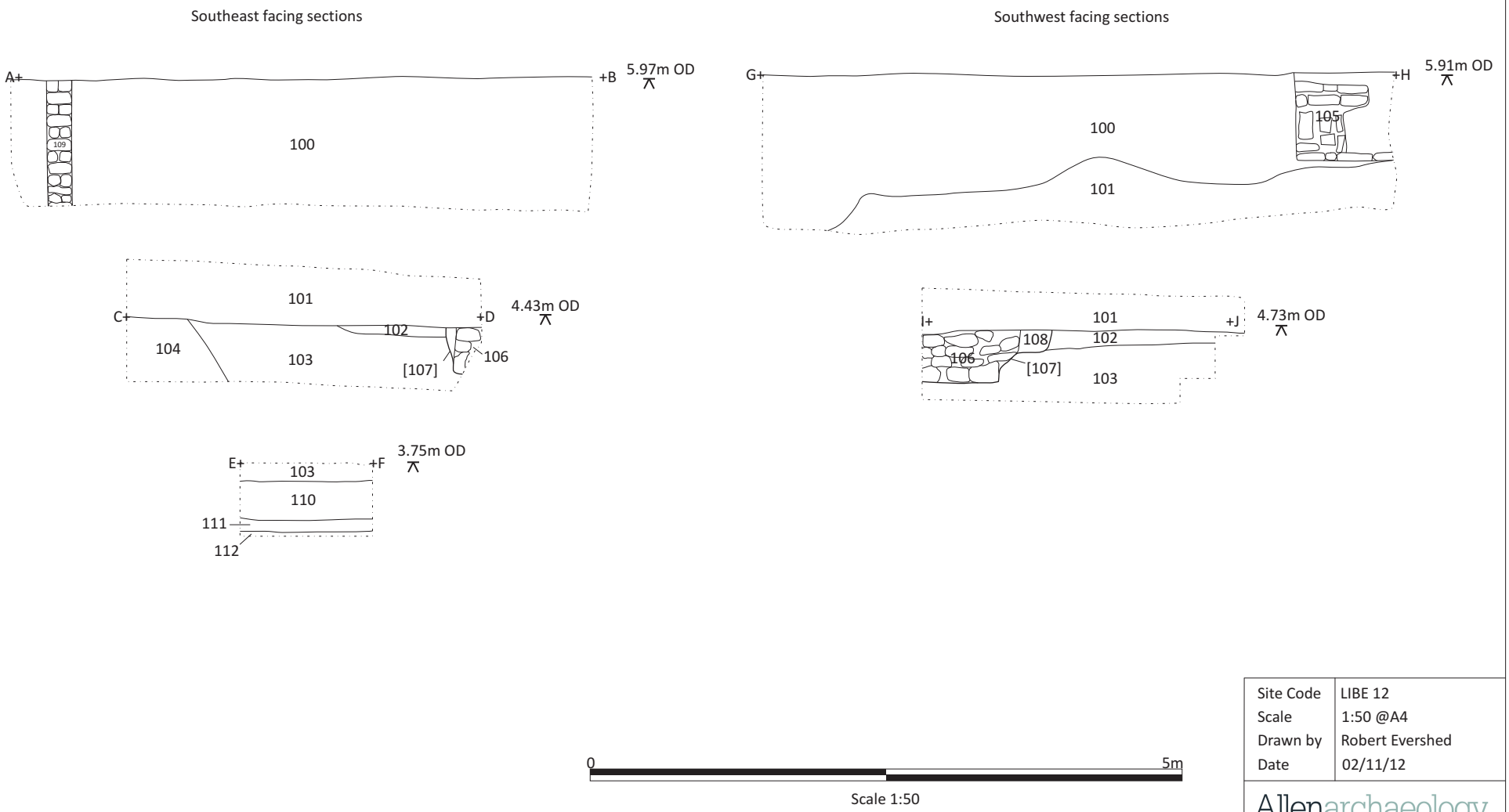
Site Code	LIBE 12
Scale Drawn by Date	1:50 @ A4 GG 05/11/12

Allenarchaeology

Lincoln
Birmingham
Cambridge
Southampton

www.allenarchaeology.co.uk

Figure 3: Plan of Trench 1



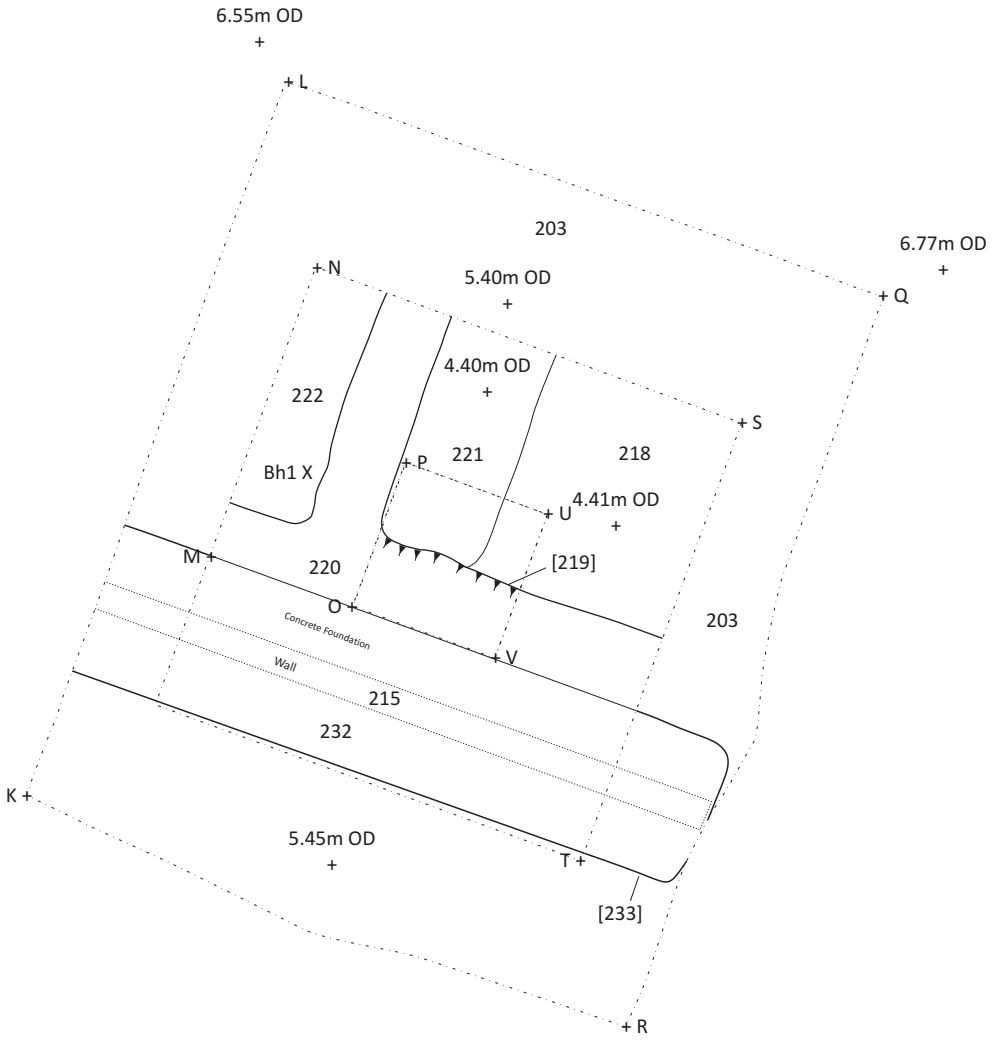
Site Code	LIBE 12
Scale	1:50 @A4
Drawn by	Robert Evershed
Date	02/11/12

Allenarchaeology

Lincoln
Birmingham
Cambridge
Southampton

www.allenarchaeology.co.uk

Figure 4: Selected sections from Trench 1



Scale 1:50

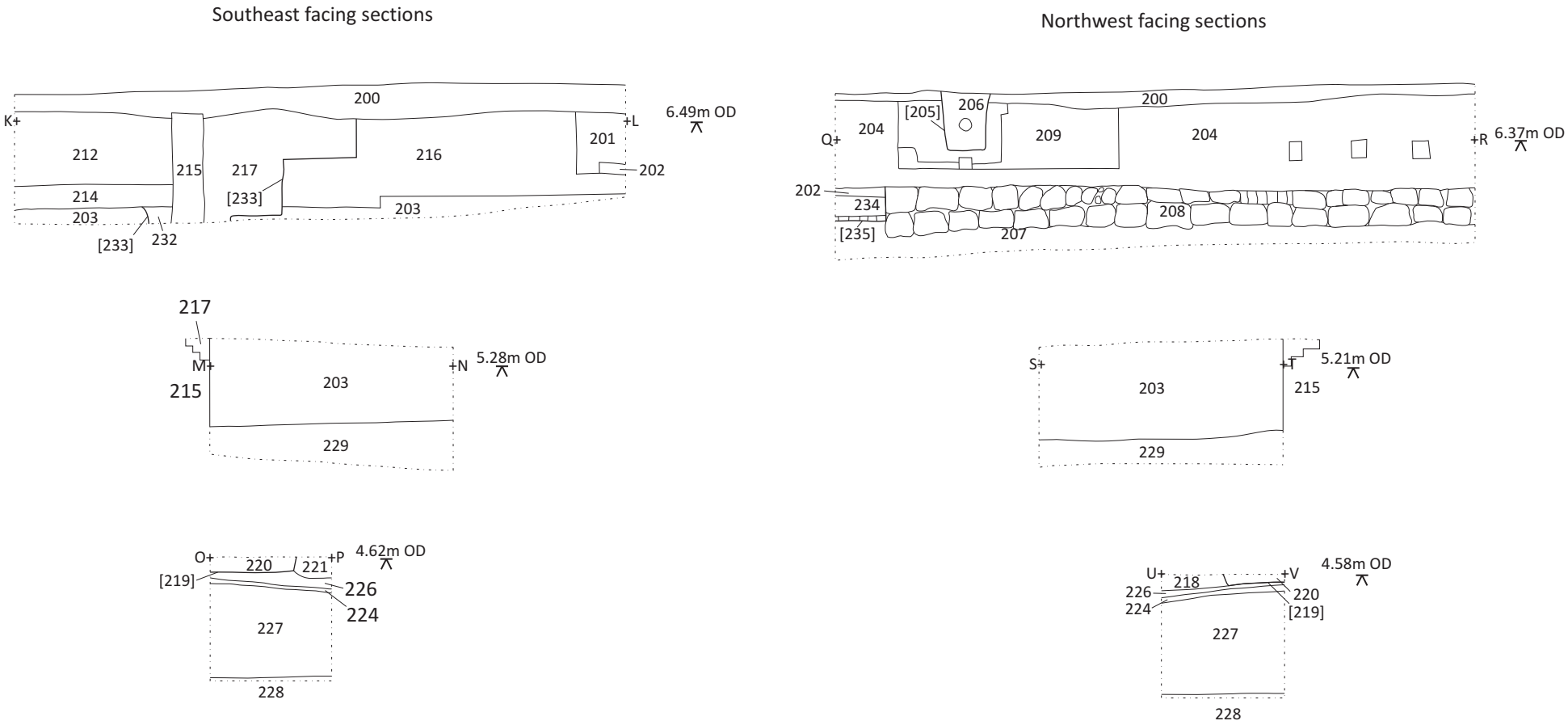
Site Code	LIBE 12
Scale	1:50 @A4
Drawn by	Robert Evershed
Date	02/11/12

Allenarchaeology

Lincoln
Birmingham
Cambridge
Southampton

www.allenarchaeology.co.uk

Figure 5: Plan of Trench 2



Site Code	LIBE 12
Scale	1:50
Drawn by	Rob Evershed
Date	02/11/12

Allenarchaeology

Lincoln
Birmingham
Cambridge
Southampton

www.allenarchaeology.co.uk

Figure 6: Selected sections from Trench 2

Allen Archaeology Limited
Website: www.allenarchaeology.co.uk

Company Registered in England and Wales No: 6935529

Lincoln
Unit 1C
Branston Business Park
Lincoln Road
Branston
Lincolnshire LN4 1NT

Tel/Fax: +44 (0) 1522 794400
Email: info@allenarchaeology.co.uk

Birmingham
Arion Business Centre
Harriet House
118 High Street
Birmingham
B23 6BG

Tel/Fax: +44 (0) 800 610 2545
Email: birmingham@allenarchaeology.co.uk

Cambridge
Wellington House
East Road
Cambridge
CB1 1BH

Tel/Fax: +44 (0) 800 610 2550
Email: cambridge@allenarchaeology.co.uk

Southampton
International House
Southampton International Business Park
George Curl Way
Southampton
SO18 2RZ

Tel: +44 (0) 800 610 2555
Email: southampton@allenarchaeology.co.uk