



Chapel Street Car Park and the Common Staithe, King's Lynn, Norfolk

Report on Geoarchaeological Boreholes

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Chapel Street Car Park and the Common Staithe, King's Lynn, Norfolk

Geoarchaeological Borehole Report

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Summary

Oxford Archaeology was commissioned by Norfolk County Council on behalf of Historic England to undertake a programme of archaeological borehole surveys at the sites of the Chapel Street Car Park and the Common Staithe in King's Lynn, Norfolk.

The work was funded by Historic England. King's Lynn has been designated as a Heritage Action Zone by Historic England. The results of the borehole surveys will feed into the production of a deposit model element of an Urban Archaeological Database that has been commissioned by Historic England to inform future development proposals.

Following initial ground penetrating radar survey of the two sites, a total of 15 borehole cores were collected from the Chapel Street site, with a further 17 borehole cores collected from the Common Staithe site.

At the Chapel Street site, organic waterlogged medieval occupation deposits were identified at c.1–2m below ground level, beneath thick deposits of make-up and demolition rubble. Radiocarbon dating combined with artefactual evidence suggests occupation occurred from the 11th–13th centuries on marshy ground marginal to the main core of settlement. Preservation of plant remains was found to be very good. Waterlogged food plants occur, often in samples with other environmental indicators, suggesting that the material derives from mixed domestic waste. These include apple pips and seeds of fig. Charred plant remains occur in low quantities but include grain of wheat, barley and oats alongside arable weeds. Overall, the finds assemblages were quite small, probably due to the very limited size of the samples from the boreholes. Fragmented ceramic building material (mainly bricks and roof tiles) were most common and difficult to date accurately. Only two sherds of pottery of Grimston-type ware were recovered, along with a small number of bone fragments, shell and fish bone.

At Chapel Street, the organic occupation deposits overlie a thick sequence of tidal/estuarine deposits to at least 8m depth. Preserved pollen and foraminifera assemblages indicate that these deposits formed in environments of brackish creeks and mudflats. Thin peat deposits recorded at depth have been radiocarbon dated to the Early Bronze Age and Early Iron Age and preserve palaeoenvironmental remains indicating saltmarsh environments in the vicinity.

At the Common Staithe, the sediment sequences appear more complex, reflecting the waterfront history of the site fronting the River Great Ouse. Significantly, radiocarbon dating combined with artefactual evidence suggests that the tidal foreshore sequences – overlying Glacial Till and reaching depths of c.9.50–10m – date no earlier than the Saxo-Norman period, and probably the latter end of this range. This is consistent with the conclusions of the desk-

based assessment which, based on previous work, suggested much of the site was likely to have been located in the intertidal zone during the early period of the town's development, with dryland located on the western side of the Tuesday Market (Kewley 2018, 15).

However, evidence was found for utilisation of the foreshore and perhaps dumping of rubbish, which increased during the late 12th–14th centuries prior to major ground raising and reclamation. The intercalation of tidal sands between episodes of dumping/activity suggests the foreshore was open to the river at this time. The deposits appear quite complex with mixed dark brown to black organic deposits containing frequent artefactual material (tile, pottery, shell, bone, leather and fragments of wood). These organic occupation deposits occur within c.1.5–4.8m depth and extend westwards as far as BH07 in the central area, and to BH12 and BH13 in the north.

The recovery of leather fragments indicates good waterlogged preservation. Although fragile with few diagnostic features, the leather is likely to represent shoemaking or cobbling waste. The bulk of the finds assemblage comprised brick and tile fragments; however, a small assemblage of pottery was recovered from the organic deposits, almost exclusively Grimston-type ware (late 12th–14th centuries). Notable finds include a possible lava quern fragment from BH07 which may be from the Mayen-Niedermendig quarries in the Eifel region of Germany.

Overall, the bulk samples from the organic deposits at Common Staithe produced a diverse range of waterlogged plant remains. Seeds and nuts of possible food remains include grape, fig, sloe, cherry, damson/bullace and hazelnut. There were a number of plants represented that are likely to have been arable weeds, although these could conceivably have arrived on site mixed with straw. Similarly, there were weed species commonly associated with grassland and ruderal plants that grow on waste ground. Wetland plants were well-represented and include several species of sedge. Estuarine/saltmarsh plants are represented by seablite and possibly by black bog-rush. Charred remains included cereal grains – oats, barley, free-threshing wheat and rye. Foraminifera indicating tidal conditions appeared to be well-preserved, but ostracods less so. Small but quite diverse assemblages of fish bone (cod, herring, flatfish, ling, mackerel, haddock, salmon and eel) and crustacean remains (crab claws) were recovered that are likely to be both naturally occurring, as well as probable food remains/refuse, along with shells of oyster, whelk, cockle and mussel.

The dry make-up deposits overlying the organic deposits at Common Staithe were quite variable, ranging from mixed sandy soil with gravel, brick, mortar and tile, to coarse brick rubble. The only evidence found for possible cellarge is in the eastern part of the site, to a depth of 4m below ground level (BH17). It is possible that this relates to a cellar or subterranean vault backfilled with rubble in the vicinity of Smethan's House (Kewley 2018, 25).

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1 INTRODUCTION

1.1 Scope of work

- 1.1.1 Oxford Archaeology (OA) was commissioned by Norfolk County Council (NCC) on behalf of Historic England to undertake a programme of archaeological borehole surveys at the sites of the Chapel Street Car Park and Common Staithe in King's Lynn, Norfolk (Fig. 1).
- 1.1.2 King's Lynn has been designated as a Heritage Action Zone (HAZ) by Historic England (<https://historicengland.org.uk/services-skills/heritage-action-zones/kingslynn/>). HAZ projects use the historic environment as a catalyst for economic growth, to stimulate local pride in the heritage and to inspire well-designed developments that draw on and further strengthen the historic character. The Borough Council of King's Lynn and West Norfolk's HAZ project aims to utilise current housing development targets set by central government to boost the social and economic vitality of King's Lynn by creating developments that complement the historic environment, reuse vacant properties and strengthen the character of conservation areas. The developments will create additional housing within the town, bringing more residents into the town centre, and will stimulate economic growth by making it an attractive place to live, work and visit. Reuse of historic buildings and safeguarding of heritage at risk are important elements.
- 1.1.3 The King's Lynn HAZ project requires a robust evidence base to support planning decisions and promote the town's heritage. To enhance the existing evidence base, Historic England has prepared research reports on two potential development sites (Chapel Street Car Park and The Common Staithe) and has commissioned the production of an Urban Archaeological Database (UAD). NCC commissioned an archaeological coring survey of the Chapel Street Car Park and the Common Staithe potential development sites, the results of which will feed into the production of the deposit model part of the UAD and will be used to inform the production of development proposals.
- 1.1.4 In response to a brief set by NCC (Robertson 2018), OA prepared Written Schemes of Investigation (WSI) for borehole surveys at the Chapel Street Car Park (Stewart 2018) and the Common Staithe (Stafford 2021). The Chapel Street site was cored between 3rd and 7th December 2018 and the Common Staithe site between 12th and 15th July 2021. The results of these investigations are presented in this report.

1.2 Location, topography and geology

- 1.2.1 The Chapel Street and Common Staithe sites are situated in the historic core of King's Lynn, a port and market town in Norfolk (Fig. 1). The Chapel Street site is centred at NGR TF 61788 20377 and the Common Staithe site at NGR TF 61550 20340.
- 1.2.2 The Chapel Street site is bounded by St Nicolas Street to the north, Chapel Street to the east and private residences to the south and west (Figs 1 and 2). Ground surface varies between 5.85m and 6.54m above Ordnance Datum (OD). The site is situated 300m to the east of the tidal River Great Ouse and has been in use since the 1960s as a car park.

- 1.2.3 The Common Staithe site is located at approximately 4.45–5.59m OD on the eastern bank of the River Great Ouse, forming the quayside (Figs 1 and 4). The site has also been in use as a car park since the 1960s.
- 1.2.4 The historic town of King's Lynn is located 6.5km to the south of the Wash estuary and is situated on the eastern bank of the River Great Ouse. The River Nar sits immediately to the south of the modern town. The town is bisected by east-west running watercourses: the Purbeck, the Gay and the Millfleet. The landscape is typically flat and low-lying and historically subject to frequent flooding.
- 1.2.5 The town sits on Tidal Flat deposits of clay and silt, formed in shoreline environments with sediment deposited in beaches and barrier islands (Matt Canti, pers. comm.; BGS 2022). These include 'silts, sands and clays, peats and channel sequences' (Brown and Hardy 2011, 84). The British Geological Survey (BGS) maps them as 'Terrington Beds', which are described as 'soft reddish brown clays with silt laminae, generally 1–2m thick, which have been deposited within the last 2000 years' (BGS Sheet 145). These deposits are up to 10m deep and intersected by a number of freshwater channels that run into the Great Ouse (Brown and Hardy 2011, 84). The bedrock geology underlying the Tidal Flat deposits is mapped as Glacial Till and Jurassic Kimmeridge Clay (BGS 2022).

1.3 Archaeological and historical background

- 1.3.1 The archaeological and historical background of the two sites has been described in detail in separate desk-based assessments produced by Historic England (Kewley 2018; Newsome 2018) and will not be reproduced here. The following summary is provided to place the borehole surveys into context.

King's Lynn

- 1.3.2 Lynn is a town of three parts, the oldest comprising what is now the parish of South Lynn. It is thought that some settlement was established at King's Lynn on the natural sandbanks that formed slightly higher ground in the marshy intertidal zone of the Great Ouse, between the Gaywood and the Nar, before the Norman Conquest of AD 1066 (Brown and Hardy 2011, 102). The higher areas within the marshes were gradually expanded through the creation of saltern mounds during salt production works and the dumping of midden material (*ibid.*, 2).
- 1.3.3 The landscape comprised several centres of Anglo-Saxon activity, such as for salt production, the estate centre represented by Bawsey and a number of other large estate holdings, including the bishop's palace at Gaywood, a strategically important location at the mouth of the Wash where silting of the River Gaywood may have necessitated the move to Lynn (Hutcheson 2006, 103). Evidence for tolls and trade in the area suggests that a sizeable population was already well established before the foundation of St Margaret's Priory in the late 11th century (*ibid.*, 99–100). However, there is little archaeological evidence of 'substantial activity or occupation' in King's Lynn, and 'no clear material evidence for Roman or Saxon settlement has been identified in the vicinity of the present town centre' (Brown and Hardy 2011, 1–3), though, this may be a result of archaeological biases, including location and depth of investigations (Hutcheson 2006, 100–1).

- 1.3.4 The second stage of the development of Lynn began when Herbert de Losigna, Bishop of Thetford, founded the priory of St Margaret in 1090, granting the priory, market and lands between the Millfleet and Purfleet, south of the two sites, to the Benedictine monks of Norwich and essentially founding the town of Bishop's Lynn. This was a formalisation of the existing scattered settlements and systems of administration and exploitation that were already in place (Hutcheson 2006, 74, 71; Brown and Hardy 2011, 2–3). This ecclesiastical control over the town was maintained until 1538 when the priory was dissolved, and the town became known as King's Lynn (Brown and Hardy 2011, 6).
- 1.3.5 The medieval settlement expanded northwards, and between 1146 and 1150 William de Turbe, Bishop of Norwich, founded St Nicholas' Chapel and granted land for settlement north of the Purfleet (known as the Newland) (Brown and Hardy 2011, 3). The town's layout was in part moulded by the various fleets, the river and the underlying sandbanks. One of these natural sandbanks may have followed a line from the west side of the Tuesday Market Place, along St Nicholas Street (at the north side of the Chapel Street site) and then up St Ann's Street (Clarke and Carter 1977, fig. 186). It has been suggested that, by 1300, the street plan of historic Lynn as it is seen today was broadly established (Parker 1971, 5).
- 1.3.6 The position of King's Lynn, on the River Great Ouse and a major east–west trading route by land, meant that the town quickly became a wealthy trading centre. Trade provided the main source of its wealth along with fishing and the processing of wool and sheep. The town rapidly developed international trading links, particularly with the Hanseatic League, and it traded with countries as diverse as Norway and France. A huge variety of products were being shipped in and out of the port. This success and prosperity continued into the 15th century and meant that, for much of the medieval period, King's Lynn was one of the richest towns in the land. By the 17th century, however, Lynn was becoming less important as the port of London began to dominate.

Chapel Street Car Park

- 1.3.7 There have been no previous archaeological investigations carried out at the Chapel Street site. A single find spot of an undated whetstone recovered when digging a fence post is recorded on the Norfolk Historic Environment Record, to the east of a surviving medieval doorway on St Nicholas Street that led to Bennett's Yard. However, analysis of historic maps suggests that the site was occupied from at least the late 13th century onwards. In the later medieval period, the area appears to have been densely developed, and it is reasonable to assume that both the street frontages on Chapel Street and St Nicholas Street would have been lined with medieval timber-framed buildings. This continued into the post-medieval period, when the area was occupied by timber-framed and possibly stone buildings, some of which survived into the 20th century (Fig. 3). Most of these buildings were houses, at least one of which also had a shop front, and some may have been of high status. The properties and their boundaries undoubtedly changed many times over the centuries.
- 1.3.8 Excavations in 1979 through the floor of the hall in Lattice House, located directly south-east of the Chapel Street site, identified the 'extraordinary survival of complex stratification and wall foundations immediately below a layer associated with the

construction of the late medieval building' (Rogerson 1979a, 2), suggesting that even where late medieval buildings were constructed, evidence for earlier activity can survive.

- 1.3.9 The nearest excavations, on the south side of the Fells Warehouse, to the south-west of the Chapel Street site, found a primary floor level at 2.3m below ground level (BGL) and archaeological deposits to a depth of at least 4.75m OD. During the Fells Warehouse excavation in 1977, 'a great depth of well-preserved and extremely complex archaeological deposits' were noted, as well as several wooden stakes and a plank protruding through the lowest deposit excavated. Limited borehole data for the area available from the BGS suggests that archaeological deposits occur at around 3m in depth on the east side of Chapel Street, north of Austin Street, whilst other cores appear to show archaeological deposits at depths of 1–2m. Excavations undertaken to the east of Chapel Street on the site of Raynham House, only 50m from the car park, revealed significant remains as a result of the waterlogged nature of the lower deposits (identified at c 1.15m BGL, 4.4m OD) and the lack of post-medieval development in the area (Cope-Faulkner 2000, 74, 76). Well-preserved organic remains, including wattle fences, a wooden bench, leather, bone and waterlogged plant macrofossils, were also recovered during several phases of investigations at the site of Marks and Spencer on Surrey Street to the south of Chapel Street (Clarke and Carter 1977, 16).

Common Staithe

- 1.3.10 It is likely that the Common Staithe site has been occupied from at least the 13th century onwards. Prior to this, the riverbank was located further east, the site itself within the channel of the Great Ouse. The eastern and southern portion of the Common Staithe site is thought to have been dry land since the 16th century; it therefore has potential to include a succession of shorelines and/or wharfs. The north-west part of the site was reclaimed from the river in the second half of the 20th century (see Kewley 2018, fig. 54). A BGS borehole collected on the Common Staithe site suggests that archaeological deposits at around 2.1m deep may be present.
- 1.3.11 The basic medieval form of the Common Staithe site, a U-shape with an opening on the river side, still survives today. The Common Staithe was one of the principal mercantile centres of early modern King's Lynn and contains a collection of historic buildings, including five listed structures, as demonstrated by 17th-century mapping. The buildings on the site include:
- Late Georgian warehouses, including a magazine;
 - Italianate public baths, the sixth oldest baths to survive in England. The reservoir that flushed out the baths may survive buried under the car park; and
 - A Victorian pilot office, including an observation tower.

Potential

- 1.3.12 Any excavation in historic King's Lynn has potential to reveal a great deal of information about past environments, especially due to waterlogging resulting from its topographic location. The town is located on 10m of 'deeply stratified sequences of

reclaimed estuarine and marine sediments...[and] comprise material relating to former tidal/intertidal environments such as sand and clays, peats and channel sequences, alongside several freshwater channels' with the marine sequences beginning 1–2m below the modern ground surface (Lillie and Smith 2011, 84). These types of tidal and intertidal deposits, particularly in the area of the Common Staithe site, have the potential to preserve evidence of changes in the environment and climate over time as indicated by preserved biological remains, e.g. diatoms, pollen and plant remains.

- 1.3.13 Despite later developments of the Chapel Street site, particularly in the 19th and 20th centuries, such as the construction of the St Nicholas Drill Hall, a number of plots were never redeveloped once the medieval buildings had been demolished (e.g. the Black Goose and 43–49 Chapel Street). This suggests that there is high potential for the survival of well-preserved sequences of medieval occupation deposits buried beneath the Chapel Street Car Park, with potential remains relating to both street frontages and yard/garden plots to the rear and associated domestic, industrial and trade activities. Analysis of excavation results from the immediate vicinity and in the wider historic town suggests that any buried deposits are also likely to be waterlogged and therefore may preserve organic material such as wood, leather and plant remains.

2 AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The primary aims of the investigations at the Chapel Street and Common Staithe sites were to provide baseline information on the extent, nature and date of the sub-surface sedimentary sequences, to assess their archaeological and palaeoenvironmental potential, and to provide recommendations for further detailed analysis if appropriate. Ultimately this information is intended to feed into the King's Lynn UAD so that the impacts of proposed developments can be understood, and mitigation strategies developed.

2.1.2 As stated in the WSIs (Stewart 2018; Stafford 2021), the specific aims of the investigations were to:

- i. characterise the sequence of sediments and patterns of accumulation beneath the site, including the depth and lateral extent of major stratigraphic units through a programme of purposive archaeological coring;
- ii. clarify the relationships between sediment sequences and other deposit types, including periods of 'soil' or peat growth, archaeological horizons and the effects of relatively recent human disturbance, including the location, extent and of 'made ground';
- iii. identify significant variations in the deposit sequence indicative of localised features such as palaeochannels, topographic highs or buried 'islands';
- iv. determine or confirm the approximate date or date range of any remains, by means of artefactual or other evidence;
- v. identify the location, extent and state of preservation of any waterlogged organic deposits and/or buried soils or land surfaces, and recover high quality cores samples for assessment of artefacts, sediments, palaeoenvironmental remains and radiocarbon dating;
- vi. based on the results of the assessment, consider the potential for further detailed analysis of the sequences; and
- vii. discuss the sequence of sediments within the wider landscape context of the known archaeological and historical background, quaternary geology and geomorphology, and referencing previous geoarchaeological and palaeoenvironmental work carried out in the vicinity.

2.1.3 The investigations took place within the general research parameters and objectives defined by the Regional Research Frameworks relevant to the area:

- *Research and Archaeology Revisited: A Revised Framework for the East of England* (Medlycott 2011)
- *Research and Archaeology: A Framework for the Eastern Counties, 1. Resource Assessment* (Glazebrook 1997); and
- *Research and Archaeology: A Framework for the Eastern Counties, 2. Research Agenda and Strategy* (Brown and Glazebrook 2000).

2.2 Methodology

- 2.2.1 All works were carried out in accordance with the WSIs (Stewart 2018; Stafford 2021) and in compliance with the Chartered Institute for Archaeologists' standards and guidelines (CIfA 2014a; 2014b) and the *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England 2015a). The borehole survey of the Chapel Street site was carried out between 3rd to 7th December 2018, while that of the Common Staithe site was undertaken between 12th to 15th July 2021.
- 2.2.2 Prior to fieldwork commencing, a ground penetrating radar survey was carried out at each site to check for any unmapped services and to compare the results with statutory service plans. Each borehole location was surveyed relative to Ordnance Datum and the National Grid.
- 2.2.3 Where necessary, concrete and/or tarmac was broken prior to drilling to a maximum thickness of 0.50m. Before drilling commenced, a hand-dug inspection pit was excavated at each borehole location as a final check for the presence of buried services. Each inspection pit was excavated to c 1.2m BGL and the deposits recorded by a geoarchaeologist. Core recovery commenced at the base of the inspection pit.
- 2.2.4 The Chapel Street and Common Staithe car parks remained open to the public for the duration of the survey, with work areas successively fenced off each day. The borehole arrays, as illustrated in Figures 2 and 4, was intended to achieve a good distribution across the sites. At Chapel Street, areas both outside and within the footprints of known former buildings were investigated, the latter specifically to determine the extent of truncation of earlier occupation horizons, i.e. to establish the presence/absence of cellarage. The borehole coverage of Common Staithe was less well distributed due to the presence of multiple live services, buildings and access roads which were required to remain unobstructed for the duration of the fieldwork. The services routes were particularly dense across the southern part of the site, and it was not possible to drill boreholes here.
- 2.2.5 The boreholes (BH) were drilled by a specialist drilling contractor (CC Ground Investigations) under the supervision of an OA geoarchaeologist.
- 2.2.6 At the Chapel Street site, 15 boreholes were drilled using a Terrier-style rig capable of recovering cores up to 10cm in diameter and 1m in length. Unfortunately, due to difficult ground conditions (i.e. a high water table and the presence of blowing sand at depth), the rig was unable to progress beyond 5–8m (see Table 1) and did not reach the Glacial Till or bedrock, despite a number of attempts at several locations. The remaining boreholes were therefore drilled to the top of the non-anthropogenic Holocene sediments, primarily to investigate the made ground and potentially complex archaeological sequences. This was achieved at all locations apart from BH13, which was abandoned due to the presence of an unmapped service. A dynamic probe was also attached to the drilling rig and deployed at four borehole locations to a maximum depth of 10m.
- 2.2.7 At the Common Staithe site, a total of 17 boreholes were drilled (see Table 2), 12 of which were drilled using a Terrier-style rig. Given the difficulties in reaching the desired

depths using the Terrier rig at the Chapel Street site, five boreholes were drilled using a more powerful Commachio multi-purpose rig capable of recovering intact cores to examine the deeper Holocene estuarine sequences. The deeper boreholes were successfully drilled to Glacial Till. Proposed BH18 and BH19 were not drilled at the Common Staithe site due to the presence of a thick concrete crane plinth.

- 2.2.8 All boreholes were cased to prevent collapse and to minimise contamination from overlying strata. Following the completion of drilling, each borehole was backfilled with bentonite pellets and the car park surface reinstated.
- 2.2.9 On completion of the fieldwork, the cores were returned to OA premises where they were opened, photographed and logged by a geoarchaeologist in line with Historic England guidance (2015b).
- 2.2.10 The sediments were described according to OA standard methodologies based on Jones *et al.* (1999). This includes a description of colour, compaction, texture, sorting, structure and inclusions. Comment was also made on the nature of observable contacts/boundaries indicative of erosion or truncation (e.g. abrupt and irregular) and any artefactual material (e.g. daub, pottery). Particular attention was given to identifying the presence of medieval or post-medieval brick and other ceramic building material (CBM), as opposed to modern material.
- 2.2.11 All identifiable artefacts were extracted from the cores, referencing depth BGL, and unique context numbers were allocated to the sediment units from which the finds and subsamples were recovered. Finds were submitted for specialist identification, analysis and reporting.
- 2.2.12 The lithological data for each borehole was digitised and input into geological modelling software (Rockworks 17) to allow the correlation of stratigraphic units. A litho-stratigraphic transect was produced based on metres OD.
- 2.2.13 Subsampling for paleoenvironmental assessment and radiocarbon dating was carried out once a preliminary understanding of the site stratigraphy was understood and in consultation with the Historic England Regional Science Advisor and NCC. Subsampling and palaeoenvironmental work was carried out in accordance with Historic England guidelines (2011). A small number of radiocarbon dates were also submitted to aid dating.
- 2.2.14 Written on-site and lab-based recording was carried out using OA *pro forma* sheets in accordance with OA's recording system and includes a daily journal and borehole logging sheets completed for each intervention.
- 2.2.15 A full photographic record, illustrating the on-site works in general and each 1m length of core during lab work, was produced and comprises high resolution digital images. A photographic register was maintained on OA *pro forma* sheets.
- 2.2.16 Subsampling for paleoenvironmental assessment and radiocarbon dating was carried out once a preliminary understanding of the site stratigraphy was understood and in consultation with the Historic England Regional Science Advisor and NCC. Subsampling and palaeoenvironmental work was carried out in accordance with Historic England guidelines (Historic England 2011). Bulk samples were extracted from the cores at both sites and processed for micro-artefacts and ecofacts. The sediment was floted onto

0.25mm mesh and the heavy residues to 0.5mm. The flots were initially bagged wet to assess the level of waterlogged plant preservation. The residues were carefully sorted and extracted material added to the hand-retrieved finds assemblages. Once the initial spot dating had been completed on the CBM and pottery, a small number of radiocarbon dates were submitted for AMS dating to clarify sequence chronology. The samples were sent to Beta Analytic in Florida for processing, with the results summarised in the stratigraphic description (see below). The reported results are conventional radiocarbon ages (Stuiver and Polach 1977) and calibration was performed using OxCal 4.4.4 and INTCAL20 (Bronk Ramsey 2009 with 2021 update, Reimer *et al.* 2020). The material dated ranges from waterlogged seeds, bark, roundwood twigs, nutshell and large mammal bone. The aim of the radiocarbon dating as a minimum - given the potential reworking within some of the tidal and occupation deposits - was to provide a reliable *terminus post quem* (TPQ) for deposition. The bulk sample selection focused on organic occupation deposits, but also tested the more minerogenic tidal sequences. The sampled sequence at Chapel Street, based on the radiocarbon dating, covers a significant time span, starting in the early Bronze Age and included peat lenses. For this reason, a small number of samples were submitted for more detailed specialist assessment to check the preservation levels of pollen, ostracods and foraminifera. At Common Staithe, the chronology covered a much shorter timeframe, at the very earliest Saxo-Norman. Taking into account the underlying natural sequences were clearly related to the tidal river foreshore, the focus on this site was the macro-remains from bulk samples, although recording of other environmental remains such as the presence of ostracods and foraminifera from flots and residues was also carried out.

- 2.2.17 Upon the approval of this report, the remaining core material recovered from the Chapel Street and Common Staithe sites will be discarded.

3 RESULTS

3.1 Introduction and presentation of results

3.1.1 The results of the borehole surveys carried out at the Chapel Street and Common Staithe sites are presented below and include a stratigraphic description of the sediments encountered in the cores. The results of the artefactual and environmental analyses are included in Appendices A-D. The detailed core descriptions are given in Appendix E and the core photographs in Appendix F.

3.1.2 Summaries of the borehole details are presented in Tables 1 and 2 and the stratigraphic profiles in Figures 6 and 7.

Bore	Easting	Northing	Elevation (m OD)	Total depth (m)
BH01	561763.7	320393.6	6.19	5
BH02	561773.4	320393.8	6.22	8
BH03	561783.8	320394	6.22	7
BH04	561767.7	320378.7	6.51	5
BH05	561773.6	320378.7	6.51	5
BH06	561783.5	320378.6	6.46	5
BH07	561793.6	320378.6	6.26	4
BH08	561803.7	320378.7	6.12	4
BH09	561808.7	320378.7	5.96	4
BH10	561773.6	320363.6	6.54	5
BH11	561788.7	320358.7	6.39	5
BH12	561798.8	320358.7	6.22	5
BH13	561808.7	320358.7	6.06	0
BH14	561813.7	320358.7	5.85	3
BH15	561773.7	320353.7	6.47	5

Table 1: Chapel Street, borehole details

Bore	Easting	Northing	Elevation (m OD)	Total depth (m)
BH01	561519.2	320365.2	4.811992	14.6
BH02	561521.9	320339.1	4.663715	11
BH03	561558.5	320359.3	4.504705	5
BH04	561549.3	320333.4	4.601128	5
BH05	561534.4	320330.2	4.579584	5
BH06	561547.4	320326	4.652088	10.5
BH07	561561	320322.1	4.761832	5
BH08	561566.2	320320.8	4.724441	5
BH09	561574.6	320317.9	4.872858	5
BH10	561584.4	320315.6	5.080176	10.5
BH11	561542.1	320350.2	4.454833	5
BH12	561553.2	320346.4	4.650102	5

Bore	Easting	Northing	Elevation (m OD)	Total depth (m)
BH13	561563.6	320342.9	4.883547	5
BH14	561578	320306.8	5.110933	5
BH15	561581.4	320292.8	5.539346	10.2
BH16	561590.1	320287.9	5.593041	5
BH17	561588.4	320278.5	5.247096	5

Table 2: Common Staithe, borehole details

3.2 Stratigraphic sequence

Chapel Street

Pre-Holocene deposits and basement topography

- 3.2.1 The underlying bedrock across the site is recorded by the BGS (2022) as Kimmeridge Clay, although none of the boreholes were deep enough to reach this deposit. There is limited reference to Kimmeridge Clay in adjacent historical BGS boreholes, as most terminate at 10–12m BGL, although Glacial Till is recorded at 9.0m and 12.9m BGL (TF62SW/219, TF62SW/86, TF62SW/77, TF62SW/216, TF62SW/81).
- 3.2.2 At Chapel Street Car Park, the use of a dynamic probe attached to the drilling rig was deployed at four locations to a maximum depth of 10m. The results from BH03 and BH04 suggest significantly increased density at 9–9.5m BGL, from BH09 at 8.5m BGL and from BH12 beyond 10m BGL.

Natural Tidal Flat sequences

- 3.2.3 The basal (natural) deposits recovered from the boreholes predominantly consist of minerogenic sand facies, with occasional interspersed lenses and laminations of sandy silt with varying amounts of gravels clasts. There is the frequent occurrence of detrital organic material within some of the sand deposits, along with thin lenses of silt and organic, sometimes peaty, silt. These deposits typically represent deposition in tidal mudflat and brackish creek systems (Appendix C). No major peat units were recorded during the survey.
- 3.2.4 In the northern extent (BH1, BH2 and BH3), in the deepest boreholes, the sequences differ from the rest of the site, suggesting a marginal edge environment at the base of the sequence. Here, the cores are dominated by sandy silts and clays with occasional thin intercalated beds of organic peaty deposits.
- 3.2.5 An organic unit was recorded in BH02 at 6.92–7.07m BGL (-0.70m to -0.85m OD) comprising a firm very dark brown (10YR2/2) organic silt. Waterlogged seeds from this organic unit were radiocarbon dated to the Early Bronze Age at 1879-1631 cal BC (Table 3). In BH3 at a similar level of 6.85–6.95m BGL (-0.63m to -0.73m OD), a soft dark brown (10YR 3/2) highly organic peat with blue grey (Gley 2 5/5B) silty clay was recorded.
- 3.2.6 An additional peat unit was recorded at a higher elevation in BH02 at 5.9–6.1m BGL (0.32–0.12m OD), described as a firm spongy very dark brown (10YR 2/2 and 3/3)

peat with <5% reed fragments and rare 5mm decayed woody fragments. At a similar elevation in BH03 at 5.80–6.18m BGL (0.42–0.04m OD), a soft dark blue grey gritty slightly fine sand mixed with abundant (~45%) spongy peat clasts (50mm in size). The boundaries with the minerogenic deposits are generally quite sharp suggesting some truncation. Wood from this deposit was radiocarbon dated to the Early Iron Age at 516-364 cal BC (Table 3). These organic deposits are likely to have been laid down in low-energy, slow-moving to still water, the palaeoenvironmental evidence indicates a saltmarsh environment (Appendix C).

Lab code	Bore	Ctxt	Depth BGL	Material	$\delta^{13}\text{C}$ (‰)	14C Age (BP)	Calibrated date BC/AD (95.4%)
Beta - 617898	BH02	18	7.00-7.04m	Seeds	-28.8	3440±30	1879 - 1840 cal BC (17.7%) 1825 - 1792 cal BC (9.2%) 1783 - 1666 cal BC (63.2%) 1659 - 1631 cal BC (5.4%)
Beta - 617899	BH06	29	2.49-2.53m	<i>Calluna/Erika</i> stem and flower frags	-29.3	850±30	Cal AD 1054 - 1059 (1%) Cal AD 1156 - 1266 (94.4%)
Beta - 617900	BH02	15	1.51-1.60m	<i>Corylus</i> round- wood	-24.8	900±30	Cal AD 1042 - 1108 (34.9%) Cal AD 1116 - 1219 (60.5%)
Beta - 617901	BH03	26	6.10-6.15m	Bark	-28.5	2340±30	516 - 364 cal BC (95.4%)

Table 3: Radiocarbon dates, Chapel Street

3.2.7 The upper part of the tidal deposits across much of the site demonstrate more complexity, with more frequently occurring organic lenses suggestive of the development of a less dynamic, low-energy environment. BH05 and BH06 contained a thick sequence of organic laminated and bedded deposits, perhaps indicative of a channel edge/marginal environment. Disturbance to the sediment structures was noted in some of the boreholes immediately underlying occupation deposits, and it is possible that this was caused by trampling and adjacent activity. Waterlogged plant material from BH06 was radiocarbon dated to the Saxo-Norman period at cal AD 1054-1266 (Table 3).

Urban make-up and anthropogenic deposits

3.2.8 Deposits overlying the tidal deposits generally comprise mixed clay soils with frequent gravel and fragments of CBM and mortar related to the occupation of the site. The majority of the CBM fragments recovered during the survey derive from these deposits and overlying demolition layers and date to the post-medieval and modern periods, providing a *terminus post quem* for deposition. The locations of these finds are

illustrated in Figure 6. Medieval artefacts recovered from the upper 1m of demolition deposits are likely to be residual. However, pottery and CBM fragments dated to the medieval period (13th–16th centuries) were recovered from occupation deposits at the base of the make-up deposits in BH06, BH09, BH10, BH12 and BH14.

- 3.2.9 The upper c 1m of the boreholes generally consist of crushed granular to half brick CBM and mortar fragments, with coarse sand layers. This is probably related to demolition of the existing structures in the 1960s prior to the change of land use into the carpark. There is a possibility that some of the lower mortar sand and brick layers are related to construction of masonry structures; however, it is difficult to differentiate between these from the narrow window provided by boreholes.
- 3.2.10 The sequences in BH10 and BH15 were difficult to interpret particularly due to the presence of possible structural remains at c 2m BGL in BH15, and the overlying sandy deposits contained fragments of mortar and other inclusions, suggesting artificial ground as opposed to natural sedimentation. A possible floor surface was also located in BH09 at c 1.65m BGL overlying an organic waterlogged sequence.
- 3.2.11 Some boreholes, such as BH12 to 1.2m BGL, had deposits of black ashy clinker that could be related to dumping and ground raising, or industrial activities performed in the buildings and yards on site.
- 3.2.12 A consolidated solid pink brick with chalky white mortar was revealed in BH03 at 0.2–0.5m BGL. This could have been part of a footing or other structural brick work possibly related to the Drill Hall to the east.

Common Staithe

Pre-Holocene deposits and basement topography

- 3.2.13 The five deep boreholes at the Common Staithe site successfully drilled to Glacial Till which was recorded at consistent level across the site at c 8.26-9.94m BGL (-3.61m to -4.84m OD). The elevations are comparable with estimated depth at Chapel Street at c -3m OD. At Common Staithe the Till appeared at a very dense dark bluish grey silty clay (Gley 2 3/10B) grey with light olive brown (2.5Y 5/4) mottling. It contained abundant rounded chalk inclusions; well sorted at <10mm.

Natural Tidal Flat sequences

- 3.2.14 The basal (natural) deposits recovered from the boreholes predominantly consist of minerogenic sand facies, both gleyed and ungleyed in the upper parts, with very frequent interspersed lenses and fine laminations of sandy silt. There was the frequent occurrence of detrital organic material within some of the sand deposits. These deposits typically represent deposition one would expect of a tidal river foreshore. No major peat units were recorded during the survey. Thin gravelly facies were recorded at the very base of the tidal sequence, overlying the Till in BH06 and BH10, but other than that there was no other evidence for shingle in the deeper sequences. A fragment of *Corylus* nutshell from the gravelly facies in BH06 was radiocarbon dated to cal AD 1054-1266 (Beta - 618458), although the latter end of the range – the 12th to 13th centuries- appears more likely (Table 4). The nutshell was recovered alongside pottery

dated to the middle 11th to late 12th centuries, and CBM dated to the late 12th to 15th centuries.

- 3.2.15 In the base of BH10 a fragment of possible Roman pottery was recorded, although this was tentative as the sherd was very abraded. In BH15, a further fragment of *Corylus* nutshell was dated to the Saxo-Norman period at cal AD 993-1155 (Beta - 618459) (Table 4). Overall, this suggests the tidal deposits overlying the Glacial Till beneath Common Staithe date no earlier than the Saxon-Norman period, and probably the latter end of this range. This contrasts markedly with the prehistoric dates produced from the Chapel Street site. Further up-profile two additional radiocarbon dates were processed from bone fragments recovered from BH06 and BH10, which produced dates within the medieval period. In BH06 the bone was dated to cal AD 1300-1408 (Beta – 618457), and in BH10 to cal AD 1225-1298 (Beta - 618456) (Table 4).
- 3.2.16 The small fish bone assemblage recovered from the tidal deposits in the deeper boreholes, BH10 and BH15, included cod (charred), crab claw, eel and herring. The small crab claws are from individuals that were probably too small for human consumption and therefore may also derive from fish guts or bird pellets or represent general washed-in or redeposited shoreline debris. The discovery of a large gadid (cod family) vertebral centrum at 9.6-9.7m in Borehole BH15 indicates that refuse was accumulating in the tidal deposits at this time (see Nicholson, Appendix D.4). This is also suggested by the occasional recovery of bone fragments of larger mammals. The shell assemblage from the tidal sands included typically cockle, oyster and mussel. A single oyster shell from BH10 at 7.85m BGL may have been shucked, indicating the oyster was either eaten raw or extracted from its shell for another purpose (see Fletcher, Appendix D.3). The two deep boreholes that were drilled beyond the post-medieval river wall (BH01 and BH02) in an area reclaimed in the mid-20th century demonstrated similar sequences at depth, The upper part of BH03 was, however noticeably clayey. This borehole, located in the area in front of the sluice for the reservoir marked on historical OS maps (Fig. 5), used to flush away the sediments building up against the river wall.

Lab code	Bore	Ctxt	Depth BGL	Material	δ13C (‰)	14C Age (BP)	Calibrated date BC/AD (95.4%)
Beta - 618456	BH10	1007	5.40m	Bone (shoulder blade, sm-med mammal)	-19.9	740±30	Cal AD 1225-1298 (95.4%)
Beta - 618457	BH06	603	6.30-7.36m	Bone (rib, large mammal)	-21.8	600±30	Cal AD 1300-1370 (70.9%) Cal AD 1377-1408 (24.5%)
Beta - 618458	BH06	604	8.07-8.27m	<i>Corylus</i> nutshell <79>	-25.3	850±30	Cal AD 1156-1266 (94.4%) Cal AD 1054-1059 (1%)

Lab code	Bore	Ctxt	Depth BGL	Material	$\delta^{13}C$ (‰)	14C Age (BP)	Calibrated date BC/AD (95.4%)
Beta - 618459	BH15	1504	9.60-9.7m	<i>Corylus</i> nutshell <112>	-25.8	990±30	Cal AD 1077-1155 (51.1%) Cal AD 993-1052 (44.3%)

Table 4: Radiocarbon dates, Common Staithe

Urban make-up and anthropogenic deposits

- 3.2.17 Deposits overlying the tidal deposits appear quite complex with mixed dark brown to black organic (waterlogged) occupation deposits containing frequent artefactual material (CBM, pottery, shell, bone, leather and fragments of wood) in places intercalated with what appear to be natural tidal sands. The cross-section across the central area (BH06-BH10) shows this most clearly where at least two horizons of organic deposits were recorded. The lowest deposit occurs to c 4.7m BGL (c 0.1m OD) in BH7 where it contained late 12th to early 14th century pottery. In this borehole the upper organic horizon occurs up to c 2.15m BGL (2.61m OD), adjacent boreholes that also contain 12th-14th century pottery. In BH15 to top of the organic deposits occurs at 2.05m BGL, albeit at a higher elevation (3.48m OD). In the central area the organic deposits appear to be absent west of BH07, and it is possible this marks the limit of waterfront activity during the medieval period as indicated on Figure 7. The intercalation of the sandy deposits may suggest this was foreshore activity open to the tide rather than a position behind a river wall or revetment. Perhaps the deposits represent incremental dumps of material and refuse prior to more formal reclamation. Mixed sandy deposits with debris tend to form the upper part of the sequence west of BH07, east of the position of the post-medieval river wall (BH04 and BH06), some of which could be related to deliberate dumping of deposits for ground raising. The sequence of deposits is less clear across the northern area (BH03, BH02 and BH13), but does follow the same general pattern with late 12th-15th century CBM recovered from the base of the organic sequence.
- 3.2.18 The make-up deposits illustrated in Figure 7 were quite variable, ranging from mixed sandy soil with gravel, brick, mortar and CBM to brick rubble. BH03 was located close to the post-medieval river wall and recovered mainly brock and rubble (relocated due to an obstruction in the original position). The rubble in BH17 is perhaps more intriguing, reaching to c 4m BGL, it may mark the position of a backfilled cellar or vault.
- 3.2.19 A cobbled surface was located within 0.5m BGL in several boreholes in the northern area (BH11, BH03 and BH12), and also BH05 and BH06 almost directly beneath the tarmac surface and is probably later post-medieval in date.

3.3 Finds and environmental summary

Chapel Street

- 3.3.1 Finds recovered from the boreholes at Chapel Street predominantly comprise CBM, mostly bricks and roof tile (Table 5 and Cotter, Appendix A). Not surprisingly, given the material derives from boreholes, it is mostly small and very fragmentary. No complete items were recovered, although a few larger pieces of brick were present. This poor overall condition limits the extent to which items can be accurately dated and while it clearly comprises a range of medieval and post-medieval material (late 12th to 20th century) only a few relatively modern items of CBM, such as brick and a single piece of drainpipe, can be dated within a century or two. Elsewhere in King's Lynn, fragments of medieval and post-medieval roof tile can usually only be assigned a date range within two or three centuries or more – even if relatively complete – as these conservative forms changed little over the course of centuries. This is also the case with early bricks. The poor condition and conservative nature of most of the material from the boreholes therefore limits the accuracy of most of the suggested 'spot-dates' here to within three or four centuries, sometimes more. In addition, much of this material is likely to have been redeposited perhaps several times over.
- 3.3.2 Only two sherds of pottery were recorded from BH06 and BH09 and are probably from cooking pots in fairly local medieval Grimston-type ware of 13th-14th century date, or perhaps 15th-century at the latest.

Bore	Pot	CBM	FC	Mortar
	No.	No.	No.	No.
BH01		6		
BH02		3		
BH03		2		
BH04				
BH05				
BH06	1	1		
BH07		9		1
BH08		2		1
BH09	1	10	1	1
BH10		24		
BH11		3		
BH12		13		
BH14		3		
BH15				
Wgt. (kg)	0.003	14.732	0.008	1.189
Total	2	76	1	3

Table 5: Finds retained, Chapel Street

- 3.3.3 A summary of palaeoenvironmental and radiocarbon dating subsamples processed from Chapel Street is presented in Table 6. The table also includes quantifications of faunal remains recovered.

Bore	Bulk	Pollen	Ostracods and foraminifera	Radiocarbon dating	Faunal remains		
					Fish bone	Shell	Mammal bone
BH02	4	2	2	2			
BH03	9	4	5	1	1	3	
BH06	5	8	2	1	1	1	
BH09	4				2	1	1
BH10	1						
BH14	4				1		2
BH15	1						
Total	28	8	9	4	5	5	3

Table 6: Palaeoenvironmental samples and faunal assemblages, Chapel Street

- 3.3.4 Of the 28 bulk samples processed, many contained well preserved waterlogged plant assemblages and woody material (Meen, Appendix C.1). The selection of samples focused on the organic deposits directly beneath the rubbly make-up, as well as the underlying natural tidal sequence, this included the peaty lenses dated to the Early Bronze Age and Early Iron Age in BH02 and BH03.
- 3.3.5 In general, seeds appear to survive best in the upper most 2m of each borehole, in the layers relating to occupation (medieval). The waterlogged seeds are frequently indicative of disturbed, open ground and often include weeds of arable cultivation. Aquatic taxa are best represented in the lower parts of Borehole BH02 (Early Bronze Age) and are also common in Boreholes BH06 and BH09 (medieval) with a relatively high diversity of taxa including numerous examples of great fen sedge. However, there are relatively few in Borehole 3; from 6.0m there is a unit of dark, well humified peat (Early Iron Age) in which few seeds are preserved, apart from heavily abraded marginal plants such as rush and bulrush.
- 3.3.6 Remains of waterlogged food plants occur occasionally, often in samples with other indicators that the material derives from mixed domestic waste, such as fish bone. Apple pips occur in both Boreholes BH06 and BH10 at depths between 2.6 and 2.8m BGL, while seeds of fig were noted from four separate samples, all of which are above 2.0m BGL (medieval). Charred plant remains occur in low quantity in medieval and post-medieval deposits and include grain of wheat and barley and oat (BH02, BH06 and BH09). Charred material was most abundant from a location in BH14, spot dated to the 13th-16th century, and which included charred arable weeds such as knapweed, ribwort plantain and knotgrass alongside cereal grain.
- 3.3.7 Charcoal occurs as fine flecks throughout most of the sequence, reflecting anthropogenic activity close by, but survives most abundantly in the upper layers of BH06 and BH09. Charcoal is notably sparser in Boreholes BH02 and BH03. The presence of both burnt and waterlogged heather stems and charred roots at a depth of 2.49–2.53m in BH06, located at the edge of a channel, may point to the burning of turves/peat (medieval). Two species of heather were noted in the samples: *Calluna vulgaris* and *Erica tetralix* (cross-leaved heath), in the form of stem fragments, leaves, and flowers. As well as being abundant in the BH6 sample, it was identified in Boreholes BH02 (1.89–2.00m BGL) and BH03 (4.50–4.6m BGL). Other plants of

- bog/fen from the site include bog myrtle and bogbean. Bog myrtle was found at three locations in Boreholes BH02, BH06 and BH09, all in the vicinity of 2m BGL.
- 3.3.8 The faunal assemblage recovered from Chapel Street was very small, comprising occasional fragments of mammal bone, including sheep/goat; along with shells of cockle, oyster, mussel and a small *Tellina* clam. Identifiable fish bones included plaice/flounder, flatfish and cod.
- 3.3.9 Following the return of the radiocarbon dates it became apparent that the natural sequences from boreholes BH02, BH03 and BH06 cover a considerable period of time (Early Bronze Age to the medieval period) and, for this reason, a small number of samples were submitted to specialists to assess the preservation of pollen, ostracods and foraminifera.
- 3.3.10 Pollen was well preserved in the Early Bronze Age organic alluvium in BH02 (7.02–7.03m BGL), suggesting open grassy palaeoenvironments, with the presence of halophytic taxa such as thrift and pollen of the goosefoot family, indicative of probable saltmarsh habitats. Freshwater environments are also present locally, an interpretation based on occurrences of pollen from aquatic plants (lesser bulrush) and freshwater algae (*Botryococcus* HdV-766). Coastal reedswamps or sedge fens may have been a source of commonly occurring sedge pollen. Tree and shrub pollen may have been derived from regional inland areas and deposited via wind or water. Pollen was poorly preserved in the peat dated to the Early Iron Age in BH03 (6.07–6.08m BGL).
- 3.3.11 Pollen preservation was moderate from the minerogenic units in BH03 (post-Iron Age) suggesting potential saltmarsh or mudflat environments, based on the relative abundance of pollen of the goosefoot family and grasses as well as halophytes such as common sea-lavender. Dinoflagellate cysts, if *in situ*, would support an environment proximal to the coast. Cereal-type pollen may have been deposited at the site via freshwater channels, with evidence for aquatic environments from pollen of bulrushes and pondweed. Tree and shrub pollen is probably wind-derived from a regional source. The quantity of pre-Quaternary reworked pollen suggests probable erosive events, as might be expected, for example, through channel migration.
- 3.3.12 Preservation was poor in the samples from the laminated channel sands in BH06 dated to the medieval period. The sample contained tree and shrub pollen included mostly heather, with alder, hazel-type and oak. Herb pollen contained a poorly diverse assemblage of grasses, pollen of the goosefoot, cabbage and daisy families, ribwort plantain and mugworts. Sphagnum moss spores were frequently recorded.
- 3.3.13 A pollen sample was taken from deposits radiocarbon dated to the medieval period in BH02 (1.58–1.59m BGL). The assemblage, on balance, reflects derivation from a probable arable source, as it is dominated by grains of wheat/oats and associated weeds of cultivation (for example, cornflower). Arable crops may have been deposited at the site following transport of taxa in freshwater channels or through discard of hay or straw used for animal food or bedding or discard of food waste. There is evidence for possible regional development of heathland, from which heather pollen may have been wind derived.

3.3.14 Overall, the preservation of foraminifera was moderate within the samples examined from the natural tidal sequences in BH02, BH03 and BH06, apart from the Early Bronze Age organic alluvium in BH02 (7.01–7.03m BGL) where only a few specimens of *Jadammina macrescens* were found indicating the development of mid to high saltmarsh. Other than that, there appears little environmental change within the sequences apart from a shift from brackish tidal creeks to estuarine brackish mudflats after the Early Iron Age, above 5.64m BGL in BH03. The foraminifera assemblages were of quite low diversity with only three species identified. Ostracods were found to be very poorly preserved with only one species identified at the base of the sequence in BH02 and BH03.

Common Staithe

3.3.15 Similar to Chapel Street, the finds recovered from the boreholes at Common Staithe, predominately comprise CBM, although a larger pottery assemblage was recovered from this site, along with a small number of leather items and other miscellaneous material (Table 7 and Appendix B).

Bore	Pot No.	CBM No.	FC No.	Glass No.	Leather No.	Clay pipe No.	Metal No.	Slag No.	Stone No.
BH01		4							
BH02		5		2					
BH03		30							2
BH04	1	3						1	
BH05									
BH06	1	19						1	
BH07	3	8			4				1
BH08	6	2			1				
BH09	1								
BH10	1	2							
BH11		20				1			
BH12	1	6	2						
BH13	1	4			1		Cua		
BH14	5	8			1		Pb	1	
BH15		10							
BH16		2							
BH17		3				2			
Wgt. (kg)	0.098	5.474	0.011	0.01	0.02	0.016	-	0.06	0.242
Total	20	126	2	2	7	3	2	3	3

Table 7: Finds retained, Common Staithe

3.3.16 No complete pieces of CBM were recovered; however, some of the material from BH11 appears to have been from large fragments of brick, or perhaps complete bricks, and the CBM from BH17 almost entirely comprises fragments of bricks. BH11 is located very close to the former river wall and is probably related, whereas BH17 material may be related to a former structure or backfilled cellar/vault where rubble extends to c

4m BGL. The bulk of the assemblage comprises roof tile and includes many small fragments; however, as with the brick, the nature of the recovery method excludes the possibility of finding complete tiles. Overall, the material, with the exception of BH02, appears to be medieval in date.

- 3.3.17 Of the 20 pottery sherds recovered, the bulk of the fabrics are Grimston-type ware, however, there were no distinctively diagnostic sherds. The pottery recovered is a domestic assemblage, with sooted sherds, some possibly representing cooking vessels and a number of Grimston-type ware jugs. The assemblage represents medieval rubbish deposition, possibly a general spread of rubbish that has built up over time, or perhaps material gathered from various sources, deliberately used to aid land reclamation.
- 3.3.18 A small assemblage of leather was recovered from organic occupation deposits in four boreholes. Much of the leather is fragile and little, if any, grain pattern survives clearly on the surface. The leather recovered from BH13 (context 1302, 4.22–4.43m BGL), is well preserved and could be parts of two straps, possibly from a medieval shoe or boot. However, this item does not show any diagnostic features such as stitching holes. A single stitch hole was observable on a fragment from BH07 (context 703, 2.6–2.8m BGL) and others may also be present; however, the condition of the leather makes identification difficult. Small notches on the edge of the single fragment of leather from BH14 (context 1403, 3.2–3.4m BGL) may be the result of stitching, as are the indentations and wear marks on the fragment of leather from BH08 (context 802, 4–5m BGL).
- 3.3.19 Regarding the stone assemblage, burnt shale from BH03 (3.08–3.29m BGL) is very probably fuel residue, although it is unknown whether it is of a domestic or industrial origin. A possible lava quern fragment from BH07 (4.35m BGL) may be from the Mayen-Niedermendig quarries in the Eifel region of Germany. Although not closely dated, the layers both above and below the fragment produced medieval pottery.
- 3.3.20 A summary of palaeoenvironmental and radiocarbon dating subsamples processed from Common Staithe is presented in Table 8. The table also includes quantifications of faunal remains recovered.

Bore	Bulk	Radiocarbon dating	Faunal remains		
			Small mammal/fish bone and crustacean	Shell	Mammal bone
BH03	2		2	4	1
BH04				1	
BH05				1	
BH06	4	2	7	9	1
BH07	4			3	4
BH08	1			8	3
BH09	3		18	3	2
BH10	5	1	5	20	4
BH12	3		12	5	8
BH13	3		11	3	2

Bore	Bulk	Radiocarbon dating	Faunal remains		
			Small mammal/fish bone and crustacean	Shell	Mammal bone
BH14	2		15	4	2
BH15	2	1	6	8	1
BH16				2	
BH17	1			1	
Total	30	4	76	72	28

Table 8: Palaeoenvironmental samples and faunal assemblages, Common Staithe

- 3.3.21 Of the 30 bulk samples processed, many contained well preserved waterlogged plant assemblages (Fosberry, Appendix D.1). As with Chapel Street, the selection of samples focused on the organic deposits directly beneath the rubbly make-up, as well as the underlying natural tidal sequence.
- 3.3.22 Carbonised plant remains are restricted to cereal grains, occurring in 10 samples, and three chaff items. The charred remains were all recovered from the upper deposits (above 4.8m BGL) and are most frequent in the boreholes from the central area, particularly BH07 and BH09. All four of the main cereal types are represented; oats barley, free-threshing wheat and rye chaff items are limited to single nodes of wheat and barley and a culm node (representing straw). The samples that contain the most charred grains are from the boreholes located next to the former Corn Exchange building. Unless charred, cereal grains are rarely preserved through waterlogging. Sometimes the outer bran fragments survive but they have not in these samples. Some species of arable weeds that would have been growing amongst and harvested with the cereals are more likely to survive in a waterlogged environment and these preserved remains at Common Staithe may derive from seed corn that was brought into the site for sale through the Corn Exchange.
- 3.3.23 This site produced a diverse assemblage of waterlogged plant remains. Seeds/nuts of possible food remains include grape, fig, sloe, cherry, damson/bullace and hazelnut. Hazelnut shell occurs most frequently and is present in samples from each of the three areas sampled. Food remains may also represent imports intended for storage in the various warehouses. Samples from the nearby Vancouver Centre excavations also produced native and exotic food plants including figs, grapes and stone fruits that were similarly mixed with fish bones and fly puparia and interpreted as probable sewage waste (Huckerby *et al.* 2011, 75). There is no such direct correlation between the food remains and fly puparia at Common Staithe, but it is possible that latrine waste may be present. There were a number of plants represented that are likely to have been arable weeds: corncockle, stinking chamomile, field penny cress, corn marigold, poppy fool's parley, wild radish, weld and fat hen, although these weed species could conceivably have arrived on site mixed with straw. Similarly, there are weed species commonly associated with grassland - ribwort plantain, grasses and rushes that could have been harvested as hay. Ruderal plants that grow on waste ground include thistles, fumitory, docks, mustards, buttercups and nipplewort.
- 3.3.24 Wetland plants were well-represented and include several species of sedge, spike rush, Great Fen sedge, gipsywort and bog-myrtle. The latter (also known as sweet gale) was recovered from the same depths in BH07 and BH09 as the stinking chamomile. It

was used as a flavouring for ale as well as having other medicinal uses. Sedges would have been of great economic importance for their use in basketry, thatch as well as for fuel. Great Fen sedge, which was one of the major vegetation types of fenland in this region, was commonly used for thatching and as fuel and it was particularly favoured for the use in bread ovens (Rowell 1986) It is represented by both its nutlets and also as leaf fragments within the Common Staithe assemblages with some of the leaf fragments appearing to have been partially burnt. Plants that prefer wet soils/shallow water include water plantain, water-crowfoot, pondweed and bogbean.

- 3.3.25 Estuarine/saltmarsh plants are represented by seablite and, possibly, by black bog-rush. A more reliable indicator of marine organisms occurs in the form of foraminifera which are most frequent in the samples from the northern range BH03, BH12 and BH13 at depths ranging from 2.8 to 4.8m BGL. They occur less frequently in the central range boreholes with the notable exception of BH09 where they are present in abundance at 2.9–3m BGL. Ostracods occur less frequently but are likely to represent estuarine species as they only occur in samples containing foraminifera.
- 3.3.26 In addition to the plant remains, samples from the Common Staithe produced a small but quite diverse assemblage of fish remains. While some of the fish are likely to have been caught locally, the overall assemblage is typical of general medieval and post medieval urban refuse and includes fish such as ling which are likely to have been brought to the site as dried and possibly salted fish (stockfish or similar product) as ling are more commonly caught in more northerly waters. It is not surprising that clupeid bones (mainly herring) are frequent as the importance of the medieval herring fishery based in East Anglia is well known (Saul 1981–3). Eels were also abundant in the fens during this period. Three-spined stickleback is a common fish of shallow coastal waters as well as of freshwater rivers and lakes. In this case the bone may have been a component of the gut contents of a larger carnivorous fish. The small crab claws are from individuals that were probably too small for human consumption and therefore may also derive from fish guts or bird pellets or represent general washed-in or redeposited shoreline debris, the latter perhaps more likely since these remains came from the deeper estuarine sands in BH10 and BH15. Considering the abundance and variety of fish remains it is likely this area was close to a location where fish were being marketed. The discovery of a large gadid (cod family) vertebral centrum at 9.6–9.7m BGL in BH15 indicates that refuse was accumulating in the estuarine silts at this time.
- 3.3.27 The shell assemblage from Common Staithe includes oyster, whelk, cockle and mussel which indicates the collection of shellfish from estuarine and shallow coastal water and intertidal areas. Their presence in a port is to be expected, although the deposits are more likely to be associated with domestic waste, rather than material from processing. A single oyster shell from BH10 (7.85m BGL) may have been shucked, indicating the oyster was either eaten raw or extracted from its shell for another purpose. No other evidence of consumption was identified.

4 DISCUSSION

4.1 Reliability of field investigation

- 4.1.1 At both sites, the core recovery from was generally good within the upper with c 4–5m of strata, although there was a little compression. Figures 6 and 7 demonstrate that all locations penetrated the base of the urban make-up deposits and sampled well into the underlying natural tidal deposits.
- 4.1.2 The distribution of borehole locations at Chapel Street Car Park and the Common Staithe is considered reliable in characterising the distribution of urban deposits across the sites. The casing of the boreholes allows a degree of confidence that the finds recovered were not the result of hole collapse due to unconsolidated sediment. Only one borehole, BH13, had to be abandoned due to hitting an obstruction.
- 4.1.3 Problems were encountered placing boreholes at the Common Staithe due to the presence of several live service corridors and drains, buildings and access routes (Fig. 4). It was not possible to drill through much of the southern area of the site and boreholes BH18 and BH19 in the southwest were abandoned due to the presence of a large concrete crane plinth. Borehole BH03 also had to be moved during fieldwork due to hitting an obstruction and the final location, avoiding blocking access to the carpark, it was closer to the post-medieval river wall than originally intended. Both sites remained open as public carparks for the duration of the fieldwork, which meant areas to be drilled needed to be coned off very early each morning.
- 4.1.4 Core recovery was not possible from the upper c 1.2m of the sequences at both sites as hand dug test pits were dug to check for services prior to drilling (1.5m for the deep boreholes at Common Staithe). These test pits were monitored on site and the deposits recorded, although visibility and recovery of finds was limited due to the very small size of the test pits (marginally wider than the borehole diameter), and it was difficult to ascertain where in the sequence material derived from. In most cases the upper 1m comprised made ground and demolition rubble. However, an original cobbled surface was detected beneath the tarmac in several boreholes at Common Staithe <0.5m BGL, particularly in the northern area (Fig. 7).
- 4.1.5 The finds recovered from the Chapel Street site was initially limited to a small assemblage of CBM, considered to be a consequence of the small amount of sediment recovered. Subsequently, a series of bulk samples extracted from the cores were processed for recovery of artefacts and ecofacts. This increased the finds assemblage a little, but not greatly (Appendix A). The specialist reports have been updated from the Interim Statement to reflect the additional material. The bulk sampling produced better results for the recovery of waterlogged plant remains assemblages reported in Appendix C.1. A similar process of bulk sampling was carried out on the cores from the Common Staithe. At this site, a useful quantity of finds was recovered that added to the overall assemblages (Appendix B).
- 4.1.6 In relation to the underlying tidal deposits, the borehole rig at the Chapel Street site struggled to reach depths beyond 5m due to the running/blowing sands, which meant that loose liquid sand seeped into the borehole when the drilling tool was removed. The deepest boreholes drilled were BH02 at 8m and BH03 at 7m. It is likely that this

was not far from the base of the sandy facies. The use of a dynamic probe in BH03, BH04, BH09 and BH12 provided some estimate of the depth of denser deposits. This is likely to be Glacial Till when comparing depths to adjacent historical boreholes, although gravel deposits could also be present at depth. The depths achieved in BH02 and BH03 is probably related to the higher clay content in the sediment stack at these locations. The use of a more powerful rig to drill the deeper boreholes at Common Staithe was more successful, all five boreholes penetrating to the Glacial Till with relatively good core recovery.

4.2 Conclusions

- 4.2.1 Overall, the borehole surveys at Chapel Street Car Park and Common Staithe have characterised the nature, extent and chronology of the sub-surface sediments related to the urban deposits. The underlying natural tidal sequences were investigated through five deep boreholes at Common Staithe whose final depths reached Glacial Till. However, only two boreholes at Chapel Street (BH02 and BH03) managed to drill significantly into these deposits and no boreholes reached the Glacial Till. Despite this, these two boreholes managed to recover datable sediments that have been subject to palaeoenvironmental assessment.
- 4.2.2 The following section provides a chronological summary of the key findings for each site.

Chapel Street

- 4.2.3 At the Chapel Street site, sediments were investigated to a depth of at least 5m BGL, incorporating the full depth of the urban make-up deposits. In general, the top of the natural, predominantly minerogenic, tidal deposits forming the base of the sampled sequence appear to occur at an average depth of 1.9m BGL (1.46–2.55m range) (Table 9). These tidal deposits appear to overlie Glacial Till at c.8.5–9.00m BGL, based on the increased density of deposits measured with a dynamic probe.

Evidence for the intertidal palaeoenvironment (c.2500 BC–AD 1000)

- 4.2.4 The tidal deposits in BH02 and BH03 contained two thin peat/organic lenses at depth, radiocarbon dated to the Early Bronze Age and Early Iron Age. Palaeoenvironmental remains (pollen plant remains and foraminifera) from the lower deposit suggests saltmarsh conditions prevailed at this time of organic accumulation, with a brackish tidal creek environment both predating and post-dating deposition. Further up-profile, the environment appears to have developed into tidal mudflats. The natural sediment sequences generally compare well with other deposits in the urban core of King's Lynn, with the character and depth of the deposits matching nearby boreholes. However, the thick peat deposits viewed in some of the BGS boreholes to the south do not appear to be present on the Chapel Street site. This could be due to either a differing depositional environment preventing the formation of the peat or erosion.
- 4.2.5 Preservation of waterlogged plant assemblages and woody material was found to be good in the lower organic parts of Borehole BH02 (Early Bronze Age) and in the laminated sediments in BH06. Preservation was poorer in the Iron Age peat in BH03.

- 4.2.6 Pollen was well preserved in the Early Bronze Age organic alluvium but less in the minerogenic units in BH03 (post-Iron Age).

Evidence for the growth of marginal land and medieval occupation (c.AD 1000–1500)

- 4.2.7 A complex of laminated deposits was recorded at the top of the tidal sequence in Chapel Street boreholes BH05 and BH06 (between c.3.5–4.2m OD). This could be related to a marginal channel edge. This laminated sequence, together with sporadic organic lenses seen within the other boreholes within this height range across the Chapel Street site, perhaps suggests the development of lower-energy environments of deposition immediately prior to reclamation. A radiocarbon date from BH06 suggests deposition during the 11th–13th centuries.
- 4.2.8 The top of the tidal sequence was also radiocarbon dated to the 11th–13th centuries in BH02, coinciding with disturbance of the natural deposits between c.4.2–4.7m OD, possibly by trampling and the deposition of mixed organic occupation deposits on a marshy ground surface. Organic deposits were also recorded in BH06, BH09 and BH14, between c.4–5.2m OD, which contained artefactual material of 13th–14th century date (pottery, CBM, shell and bone). The thickness of the deposits varied from 0.23m to 0.53m (Table 9). The assessment of bulk samples in the uppermost 2m of each borehole contained well preserved waterlogged plant assemblages and woody material. In general, seeds appear to survive best, in the layers relating to medieval occupation. Remains of waterlogged food plants occur occasionally, often in samples with other indicators such as fish bone, suggesting that the material derives from mixed domestic waste. These include apple pips and seeds of fig. Charred plant remains occur in low quantities in medieval deposits and include grains of wheat, barley and oat alongside charred arable weeds.
- 4.2.9 Apart from clear demolition deposits containing large quantities of brick and mortar, the overlying make-up layers also include deposits of a more 'soily' nature that could be indicative of related activities occurring in yard areas. The thickness of the make-up deposits average 1.75m (range 1.00–2.55m). The post-medieval buildings that once occupied the Chapel Street site do not appear to have had cellars, so it is conceivable that some of the lower parts of these deposits relate to medieval activity.
- 4.2.10 In terms of the artefactual assemblages recovered from the Chapel Street site, these were generally very small, most likely a reflection of the small sample sizes. The assemblages are dominated by CBM (mostly brick and roof tile), with only two sherds of medieval pottery recovered (Grimston-type ware). The CBM is very fragmented due to the recovery method and only datable to within a few centuries. Aside from dating purposes (already treated in the scan-catalogue) the recovered material has very little potential for further analysis.

Bore-hole	Elevation (m OD, top)				Depth (m BGL, top)				Thickness (m)		
	M	O	T	GT	M	O	T	GT	M	O	T
BH01	6.19		4.51		0.00		1.68		1.68		
BH02	6.22	4.72	4.22		0.00	1.50	2.00		1.50	0.50	
BH03	6.22		4.35	-2.78	0.00		1.87	9.00	1.87		7.13
BH04	6.51		4.51	-2.99	0.00		2.00	9.50	2.00		7.50
BH05	6.51		4.79		0.00		1.72		1.72		
BH06	6.46	5.2	4.67		0.00	1.26	1.79		1.26	0.53	
BH07	6.26		4.26		0.00		2.00		2.00		
BH08	6.12	4.4	4.17		0.00	1.72	1.95		1.72	0.23	
BH09	5.96	4.24	3.96	-4.26	0.00	1.72	2.00	8.50	1.72	0.28	6.50
BH10	6.54		4.94		0.00		1.60		1.60		
BH11	6.39		4.39		0.00		2.00		2.00		
BH12	6.22		4.22		0.00		2.00		2.00		
BH14	5.85	4.85	4.39		0.00	1.00	1.46		1.00	0.46	
BH15	6.47		3.92		0.00		2.55		2.55		

M = Make-up, O = Occupation (organic), T = Tidal deposits, GT = Glacial Till
 Shaded = Estimated

Table 9: Summary of stratigraphy, Chapel Street

Common Staithe

4.2.11 At the Common Staithe, sediments were also investigated to a depth of at least 5m BGL, incorporating the full depth of the urban make-up deposits. Five deeper boreholes investigated the deeper tidal deposits to a maximum of 14.6m BGL. In general, the top of the natural, predominantly minerogenic, tidal deposits appear to occur at a much more variable depth than Chapel Street, the surface averaging 3.6m BGL but with a range of 1.92–5.00m BGL. These tidal deposits overlie Glacial Till at c.8.26–9.94m (Table 10).

Evidence for the medieval foreshore (c.AD 1100–1500)

4.2.12 The tidal deposits predominantly consist of minerogenic sand facies, with frequent laminations and detrital organic material. These deposits typically represent deposition one would expect of a tidal river foreshore. Thin gravelly facies were recorded at the very base of the tidal sequence, overlying the Till, but other than that there was no other evidence for shingle in the deeper sequences. Radiocarbon dating and recovered finds suggest the tidal sequence at this site overlying the Till date no earlier than the medieval period – most likely the 11th–13th centuries. This contrasts markedly with the prehistoric dates produced from the Chapel Street site. Occasional artefactual material suggests some activity on the foreshore prior to more intense occupation dated to the late 12th–14th centuries.

4.2.13 This occupation is represented by accumulations of a complex sequence of mixed dark brown to black organic (waterlogged) deposits containing frequent artefactual material (CBM, pottery, shell, bone, leather and fragments of wood) in places intercalated with what appear to be natural tidal sands. At least two organic horizons were noted. The occupation deposits appear to be limited in extent, in the central area east of BH07 between c.0.1–3.1m OD, and in the northern area mainly in BH12 and

BH13, between c.-0.5–3.2m OD. It is possible this marks the limit of waterfront activity during the medieval period. Mixed sandy deposits with debris tend to form the upper part of the sequence, some of which could be related to deliberate dumping of deposits for ground raising. The sediment stack containing the organic occupation deposits and mixed sands averaged 1.78m in thickness (0.77–2.93m range). The top of the deposits occurred at 1.50–2.96m BGL (1.54–3.96m OD) (Table 10).

The medieval and later town deposits (c.AD 1500–present day)

- 4.2.14 The make-up deposits were quite variable, ranging from mixed sandy soil with gravel, brick, mortar and CBM to brick rubble. The rubble in BH17, reaching a depth of c.4m BGL, may mark the position of a backfilled cellar or vault. A cobbled surface was located within 0.5m BGL in several boreholes, almost directly beneath the tarmac surface, and is probably later post-medieval in date.
- 4.2.15 In terms of the artefactual assemblages from Common Staithe, although still small, they were larger than those recovered at Chapel Street. Once again CBM was most frequently recovered, but here it was accompanied by an assemblage of pottery – mainly late 12th–14th century Grimston-type ware recovered from the organic occupation deposits. No later pottery was recovered from these horizons. The pottery recovered is a domestic assemblage, with sooted sherds, some possibly representing cooking vessels and a number of Grimston-type ware jugs. The assemblage represents medieval rubbish deposition.
- 4.2.16 Most notably, a small assemblage of leather was recovered from the boreholes. The leather was fragmentary and fragile and diagnostic features are limited. It may be that the leather fragments are from rotted items or leather waste, either from shoemaking or more probably cobbling waste. The presence of leather indicates that the levels from which the fragments were recovered have remained waterlogged, and were probably waterlogged at the time of deposition, or soon after.
- 4.2.17 This site preserved a diverse assemblage of waterlogged plant remains. Seeds/nuts of possible food remains include grape, fig, sloe, cherry, damson/bullace and hazelnut. Food remains may also represent imports intended for storage in the various warehouses. There were a number of plants represented that are likely to have been arable weeds, although these weed species could conceivably have arrived on site mixed with straw. Similarly, there are weed species commonly associated with grassland and ruderal plants that grow on waste ground. Wetland plants were well-represented and include several species of sedge. Estuarine/saltmarsh plants are represented by seablite and, possibly, by black bog-rush. Charred remains included cereal grains, mainly recovered from the upper deposits (above 4.8m) – oats, barley, free-threshing wheat and rye. Foraminifera which are most frequent in the samples from the northern end range at depths ranging from 2.8–4.8m. They occur less frequently in the central range boreholes. Ostracods occur less frequently but are likely to represent estuarine species as they only occur in samples containing foraminifera. A small but quite diverse assemblage of fish remains was recovered, as well as shells of oyster, whelk, cockle and mussel.

Bore-hole	Elevation (m OD, top)				Depth (m BGL, top)				Thickness (m)		
	M	O	T	GT	M	O	T	GT	M	O	T
BH01	4.81		2.5	-4.69	0.00		2.31	9.50	2.31		7.19
BH02	4.66		2.74	-4.84	0.00		1.92	9.50	1.93		7.58
BH03	4.5	1.54	-0.24		0.00	2.96	4.74		2.97	1.78	
BH04	4.6	2.65	1.88		0.00	1.95	2.72		1.95	0.77	
BH05	4.58		2.03		0.00		2.55		2.55		
BH06	4.65	2.33	1.3	-3.61	0.00	2.32	3.35	8.26	2.32	1.03	4.91
BH07	4.76	2.61	0.1		0.00	2.15	4.66		2.15	2.51	
BH08	4.72	3.12	1.02		0.00	1.60	3.70		1.61	2.09	
BH09	4.87	2.97	0.91		0.00	1.90	3.96		1.91	2.06	
BH10	5.08	2.82	1.6	-4.33	0.00	2.26	3.48	9.41	2.26	1.22	5.93
BH11	4.45		-0.55		0.00		5.00		5.01		
BH12	4.65	2.07	-0.14		0.00	2.58	4.79		2.58	2.21	
BH13	4.88	3.38	0.45		0.00	1.50	4.43		1.51	2.93	
BH14	5.11	3.44	1.68		0.00	1.67	3.43		1.67	1.76	
BH15	5.54	3.79	2.21	-4.4	0.00	1.75	3.33	9.94	1.75	1.58	6.61
BH16	5.59	3.96	2.59		0.00	1.63	3.00		1.64	1.37	
BH17	5.25		1.25		0.00		4.00		3.99		

M = Make-up, O = Occupation (organic), T = Tidal deposits, GT = Glacial Till
Shaded = Estimated

Table 10: Summary of stratigraphy, Common Staithe

4.3 Significance and potential

- 4.3.1 The current work on the boreholes from Chapel Street Car Park identified waterlogged organic preservation – including a range of plant taxa – at key locations in the sediment sequence, providing an insight into the developing environment and economy at the site from the Early Bronze Age to the modern period. Processed radiocarbon dates together with assessment of the artefactual evidence have provided a basic chronology for sequence accumulation. This investigation has determined that there is sufficient material available with good preservation should future archaeological work be carried out at the site. For example, good pollen assemblages were recorded from organic deposits in BH02 relating to the Early Bronze Age. This material could be sub-sampled more closely to look at changes within the estuarine/alluvial sequences, although this deposit is very thin and potentially eroded. A second sub-sample from BH02 indicates there is the potential for evidence of Saxo-Norman palaeoenvironments and land use to be gained from full analysis of pollen samples. In contrast, the potential for further information from ostracods and foraminifera at this site appears to be low, the present assemblage relating to shifting brackish creeks and mudflat environments.
- 4.3.2 At the Common Staithe, the borehole investigation provided important dating evidence suggesting the sequences at the site relate wholly to the medieval period. This is consistent with the conclusions of the DBA that much of the site was located in the intertidal zone during the early development of the town in the medieval period, with dry ground located to the east in the vicinity of the Tuesday Market (Kewley 2018, 15). However, there is evidence for utilisation of the foreshore and perhaps dumping

of rubbish prior to major reclamation. The intercalation of tidal sands between episodes of dumping/activity suggests the foreshore was open to the river at this time.

- 4.3.3 The ecofacts and artefacts recovered from relatively small samples from the boreholes at Common Staithe have revealed details about the environment and economy of medieval foreshore at this site. The samples from the medieval occupation horizons are waterlogged and relatively rich in plant remains, and also preserve fragments of leather and wood. Preservation of plant remains was poorer in those samples from the underlying tidal sediments, but the investigation has recovered artefactual evidence from the deeper sequences, suggesting archaeological remains from sporadic foreshore activity may be recovered from the full depth of the sequences.
- 4.3.4 The only evidence found for possible cellaring in the Common Staithe boreholes is in the eastern part of the site at a depth of 4m BGL (BH17). It is possible that this relates to a cellar or vault backfilled with dry rubble in the vicinity of Smethan's House and referred to in the DBA (Kewley 2018, 25).

APPENDIX A FINDS REPORTS: CHAPEL STREET CAR PARK

A.1 Pottery

By John Cotter

Introduction

- A.1.1 A total of two sherds of medieval pottery (weight 3g) in a fairly fresh condition were recovered from two contexts in Boreholes BH06 and BH09 at the Chapel Street Car Park site.
- A.1.2 The pottery was examined during the present assessment exercise and spot-dates were provided for each context. Each context group was quantified by sherd count and weight and recorded on a spot-dating spreadsheet.
- A.1.3 The context spot-date is the date-bracket during which the latest pottery types or fabrics are estimated to have been produced or were in general circulation. Comments in Table A1 record any other attributes worthy of note (e.g. vessel form, condition, etc.). The range of pottery is described in some detail in Table A1 and therefore only summarised below.

Description

Bore	Context	Depth (m BGL)	No. Sherds	Weight (g)	Spot-Date	Comments
BH06	28	1.65-1.77	1	1	13-14C?	Small body sherd probably from a cooking pot (sooted externally) in dark grey sandy fabric. Fairly thin walled. Possibly local Grimston-type ware? Probably 13-14C, or 15C at latest? [Nb. See also CBM list from this Ctx = 6x frags L12-15C roof tile]
BH09	33	1.98	1	2	13-14C?	Small body sherd probably from a cooking pot (sooted ext.) in dark grey uniform sandy fabric with some coarse rounded quartz and flint inclusions up to 1.5mm. Fairly thin walled. Possibly local Grimston-type ware? Probably 13-14C, or 15C at latest? Same fabric/ware as pot sherd in BH06/1.65-1.77m.
Total			2	3		

Table A1: Pottery assemblage, Chapel Street

- A.1.4 The pottery comprises two small body sherds in a dark grey sandy (unglazed) fabric. These are probably from cooking pots in fairly local medieval Grimston-type ware. The limited information that can be deduced from a close examination of the sherds

suggests they are probably of 13th-14th century date, or perhaps 15th-century at the latest? Grimston-type ware (particularly the glazed version commonly used for jugs) has a core date range from the late 12th to the 14th century and is one of the commonest medieval pottery types from King's Lynn (Clarke and Carter 1977). It is also very common at Norwich (Jennings 1981). Its main value for the boreholes here is in the limited dating evidence it provides.

Recommendations regarding the conservation, discard and retention of material

- A.1.5 The pottery from this site has limited potential to inform research through re-analysis and no further work is recommended. It should, however, be retained considering that pottery of any sort is so rare from the boreholes.

A.2 Ceramic building material, fired clay and mortar

By John Cotter

Introduction

- A.2.1 The boreholes at the Chapel Street Car Park site produced a combined total of 80 pieces of CBM, fired clay (FC) and mortar weighing a total of 15,929g. This breaks down as follows: CBM 76 pieces (14,732g); FC 1 piece (8g), mortar 3 pieces (1189g). The material came from Boreholes (BH) 01,02, 03, 06, 07, 08, 09, 10, 11, 12 and 14. The range of material (particularly the CBM) is typical of sites in King's Lynn.
- A.2.2 Not surprisingly – given the method of recovery – the material is mostly small and very fragmentary. No complete items were recovered although a few fairly large pieces of brick are present. This poor over-all condition limits the extent to which items (mainly CBM) can be accurately dated and while it clearly comprises a range of medieval and post-medieval material (roughly late 12th to 20th century) only a few relatively modern items of CBM, such as brick and a single piece of drainpipe, can be dated within a century or two. Elsewhere in King's Lynn, fragments of medieval and post-medieval roof tile (one of the commonest types of CBM here) can usually only be assigned a date range within two or three centuries or more – even if relatively complete – as these conservative forms changed little over the course of the centuries; early bricks likewise. The poor condition and conservative nature of most of the material from the boreholes therefore limits the accuracy of most of the suggested 'spot-dates' here to within three or four centuries, sometimes more. In addition, much of this material is likely to have been redeposited perhaps several times over. Also, the scarcity of pottery or other more datable finds from the site offers little chance of refining spot-dates based on what is essentially medieval and post-medieval 'rubble'. Despite these limitations the dates, when sufficiently plentiful, do seem to provide a broad impression of the medieval and later development of the site.

Methodology

- A.2.3 All the material was scanned and separated into three broad categories: CBM, FC and mortar. For each borehole, context number and depth reading, the number of pieces

in each category, and their weights, were recorded in an Excel spreadsheet. A broad spot-date was then given to the latest material in the context (mainly the CBM). Other details such as condition, a fragment count of broad CBM types (brick, tile etc), fabric descriptions and occasional measurements, were recorded in a separate comments field. This scan-catalogue provides a reasonably accurate breakdown of the CBM etc assemblage and forms the basis of Table A2 in the present report (see below).

Results

Brick (38 pieces)

A.2.4 Brick fragments are slightly more common than roof tile; they also comprise around two-thirds to three-quarters of the CBM weight. They occur in every borehole except BH06 (which only has a piece of tile). Mostly fragments of early red handmade brick including thin 'Tudor-looking' bricks. Bricks appear earlier in King's Lynn than in many other English towns. They are present from c 1300 (including imported brick from the Low Countries) and fairly common during the period c 1350-1500 (Clarke and Carter 1977, 441-2, fig. 196; Cotter 2011). Distinguishing excavated 'medieval' from 'Tudor' brick in the town is quite difficult – even where most of the brick survives – as the crude manufacture, overlapping size ranges and local fabrics can be very similar. At the Vancouver Centre it was only possible to identify a small number of genuinely medieval bricks based on archaeological context (usually by association with sufficient medieval pottery). In view of the poor condition of the material from the Chapel Street boreholes no early looking brick fragments were assigned spot-dates closer than the whole 14th- to 16th-century timespan. Probable Tudor and early post-medieval brick occur in several contexts. Unfrogged 18th- and 19th-century red bricks (distinguishable by their thickness and uniformity) are present as a few examples. A very hard, dark grey, Engineer's-type brick dates from the late 19th or 20th century, while the only frogged brick from the site is a 20th-century Fletton-type brick in a granular orange fabric.

Flat roof tile (36 pieces)

A.2.5 Present in every borehole, flat roof tile fragments comprise one of the commonest types of CBM – almost as common as brick (by fragment count). The very fragmentary pieces on this site appear to be from fairly standard rectangular roof tiles. Medieval and early post-medieval roof tiles in King's Lynn are quite crudely made and generally have a single circular nailhole (or peg hole) at the upper end of the tile (Cotter 2011) but the none of the pieces here retains any trace of a nailhole. At the Vancouver Centre site, King's Lynn, two main medieval and early post-medieval roof tile fabrics occurred (*ibid*). Fabric 1 ('gritty') tiles have a coarse sandy-gritty fabric with yellowish or red-brown surfaces and a grey core. They sometimes have patches of rough greenish-yellow glaze. They are thought to date from the late 12th/early 13th century through to the 15th century and just possibly into the 16th century. These are common enough from the boreholes at Chapel Street (including some glazed pieces and corner fragments) and may be the commonest type – although it is not always possible to assign small pieces to a definite fabric type.

A.2.6 Fabric 2 ('lumpy') tiles are generally thicker, cruder, and often yellowish with a grey core, but they have noticeably less sand/quartz content but instead have very coarse inclusions and streaks of cream/yellow clay sometimes giving a streaky or marbled appearance (like local bricks). Glaze is much less common too. They overlap in date with the gritty tiles, and some hybrids of the two fabrics may occur, but the main dating of the lumpy tiles appear to be from the later 15th century to the 17th century (*ibid.*). These are also present from the boreholes but somewhat less common. Other roof tile fabrics are rare. A couple of pieces occur in a fine yellow fabric which is known from post-medieval contexts (17th to 19th century?) at the Vancouver Centre (*ibid.*). Apart, possibly, from the latter no roof tiles from the boreholes here appear to be as late as the 19th century. No definite pieces of ridge tile (in any fabric) were identified.

A.2.7 Several contexts here (mainly those at depths below 1.4 and 1.5m BGL, or deeper) produced only medieval roof tile – and no other type of CBM; in these instances, a spot-date of late 12th- to 15th-century seems probable and, in view of the absence of brick (see above), perhaps even within the late 12th to 14th-century. These contexts occur in BH06 and BH09 (mainly) but also in BH10 and BH12.

Drainpipe (1 piece)

A.2.8 A single piece of 19th-20th century brown salt-glazed stoneware drainpipe was noted from BH08.

Floor tile? (1 piece)

A.2.9 A single small scrap of possible floor tile or thick 'quarry' tile was identified. This has a fine silty fabric with a distinctive reddish-brown to maroon colour and contains abundant fine rounded calcareous inclusions. No surfaces survive however, and it may be from an unusually fine brick. A larger brick fragment with a similar but coarser fabric came from the same context which is dated to the 14th-16th century, although both appear to be residual (BH10).

Other minor categories

A.2.10 Fired clay (1 piece): A single piece was identified (weight 8g). It is a flattish fragment, currently sub-rectangular in plan (30mm x 18mm x 13mm thick). It has a low-fired, brittle, earthy fabric with common and very coarse inclusions of carbonised organic material (grasses/reeds? or chaff?). The surviving surface has a thin black 'skin' which may have been scorched and possibly has a thin (accidental) ash glaze. The core is dark grey with a brown margin. There is some possible iron-staining/dicolouration, and the piece is weakly magnetic. It may perhaps be from something like an oven or furnace. This is the only item of its kind from the site and was recovered, in isolation, from the deepest borehole (BH09, 2.15–2.25m BGL). It may perhaps be from a deposit predating the appearance of roof tile in the late 12th/13th century.

A.2.11 Mortar and concrete (3 pieces): These comprise two fairly small pieces of white lime mortar similar to mortar seen on much of the brick assemblage (including medieval or 'Tudor' brick). Grey mortar was noted on one 19th-century brick. A large flattish slab-like piece of modern concrete flooring was noted from BH9 (50mm thick, Weight 1106g).

Retention and disposal

A.2.12 Aside from dating purposes (already treated in the scan-catalogue) the material has very little potential for further analysis. All the material recorded in 2019 has already been discarded and most material looked at in 2022 can likewise be discarded after publication. The fragment of fired clay is unusual enough to retain, and a few pieces of glazed medieval roof tile might also be retained.

Bore-hole	Ctxt	Depth (m BGL)	No. CBM	CBM (g)	No. FC	FC (g)	No. Mortar	Mortar (g)	Spot-Date	Comments
01	1	0-1.2	3	2766					19-20C	1st tray of 2. All brick. Including 1x large end frag of 19-20C dark grey 'engineers' brick Thickness (T) 65mm, Width (W) 110mm, fairly battered/chipped. 2x frags of red brick - possibly 17-18C?
01	1	0-1.2	3	2060					L17-19C?	2nd tray of 2. Frags of unfrogged (UF) red brick. Includes 1 with thickness 65mm & Width of 120mm and traces of grey mortar. 1 other edge frag as latter. 1x red edge frag - possibly 17C?
02	2	0-1.2	3	293					16-18C	3x pieces CBM (293g). Including 2x worn pieces red brick incl an edge frag with a minimum thickness of 60mm - possibly 18C? Also 1x scrap med roof tile 13-14C?
03	3	1.00-1.2	1	624					L18-19C	1st tray of 2. 1x modern brick end (624g) in fine orange-brown fabric T70mm, Width 115mm = L18-19C. [Also in Ctx are 3x lumps of natural stone (3888g) including a large very heavy block of dark grey basalt(?) - possibly shaped and possibly 18-19C?]
03	3	1.00-1.2	1	202					14-16C?	2nd tray of 2. 1x handmade (HM) unfrogged (UF) early red brick edge frag T55mm (T = Thickness) possibly 14-16C? (weight 202g)
06	28	1.65-1.77	1	6					L12-15C?	CBM: 1 sherd (6g). Worn scrap of tile - probably roof tile. One sanded surface survives. Sandy fabric. Grey core with browner surfaces. Possibly burnt/discoloured. Probably medieval (after c1150/75).
07	4	0-0.6	4	1709					14-16C?	All early red brick frags. HM UF. Includes complete end of brick 50-70mm thick in very hard purplish-brown overfired fabric - probably warped and possibly a waster? The other 3 frags all from 1 brick (T60mm) in low-fired fabric with much organic material in the fabric

Bore-hole	Ctxt	Depth (m BGL)	No. CBM	CBM (g)	No. FC	FC (g)	No. Mortar	Mortar (g)	Spot-Date	Comments
07	5	0.6-1.2	5	283			1	59	14-16C?	5x CBM (238g) incl 4 scraps early red brick HM UF with lots of organic impressions on surfaces. 1x frag med roof tile edge. 1x lump of white mortar (59g)
08	6	0.5-1.2	2	385			1	24	19-20C	2x CBM (385g). Including 1 frag of 19-20C brown salt-glazed stoneware drainpipe. 1x scrap red ?Tudor brick. 1x lump white mortar (24g)
09	7	0.6-1.2	2	507			1	1106	L19-20C	1st tray of 2. Includes 1x flattish slab of modern concrete flooring (50mm thick, Weight 1106g). 2x worn scraps ?Tudor red brick (507g)
09	7	0.6-1.2	4	1761					18-19C	2nd tray of 2. Includes 1x fine red UF brick T57mm with horizontal skintling and traces of grey mortar = 18-19C. 3x lumps of ?Tudor red brick with thicknesses of 50-55mm
09	?	1.45	1	22					L12-15C?	Flat roof tile. Abraded edge. Crudely made. Coarse gritty/sandy fabric as in BH9/1.60m
09	?	1.47	1	40					L12-15C?	Flat roof tile. Fresh corner frag. Crudely made. Coarse gritty/sandy fabric as in BH9/1.60m
09	?	1.5	1	12					L12-15C?	Flat roof tile. Abraded edge frag. Crudely made. Coarse gritty/sandy fabric as in BH9/1.60m with rounded grits up to 4mm across
09	32	1.60	1	30					L12-15C?	Flat roof tile. Body sherd. Quite thick (16mm). Coarse gritty/sandy fabric with rounded quartz (often iron-stained) and sparse flint. Some coarse red ironstone. Oxidised orange-brown surfaces with a speck of clear glaze. Grey core. Medieval
09	34	2.15-2.25			1	8			Medieval?	Fired clay (FC, 1 piece 8g). Flattish fragment currently sub-rectangular in plan (30mm x 18mm x 13mm thick). Low-fired but brittle earthy fabric with very coarse inclusions of carbonised organic material (grasses/reeds?) or chaff? The 'upper' surface may be original & has a possibly scorched black 'skin' possibly with a thin ash glaze (accidental). Beneath the skin is a variable brown margin and an inner dark grey core. Possibly from an oven or furnace of some sort? Possibly some iron-staining/discolouration? The piece is weakly magnetic

Bore-hole	Ctxt	Depth (m BGL)	No. CBM	CBM (g)	No. FC	FC (g)	No. Mortar	Mortar (g)	Spot-Date	Comments
10	36	1.15	2	34					14-16C?	CBM. 1x irregular brick fragment. Poorly mixed fine silty fabric with distinctive reddish-brown to maroon colour. Few mineral inclusions but contains abundant fine rounded calcareous inclusions (reaction rims). Trace of original surface showing cream-coloured leaching (possibly made from estuarine clays?). The smaller frag is in a finer version of the same fabric as the brick. It may be another brick or a floor/quarry tile?
10	37	1.2	2	16					15-17C?	Flat roof tile. 1x smaller abraded body frag in medieval gritty roof tile fabric. 1x abraded edge frag in a distinctive harder-fired smooth fabric with abundant calcareous inclusions and voids and very fine 'marbling' caused by mixing and streaking of reddish-brown and cream-coloured clay. Leached cream/yellow surfaces. Latter more like 'lumpy' roof tile fabric from L15-17C contexts in Kings Lynn
10	37	1.3	2	10					L12-15C?	Flat roof tile. 1x edge frag in very gritty fabric as seen above - yellowish surface with grey core; contains some cindery black inclusions (organic? Or vesiculated black iron compounds?) also fine & coarse calcareous inclusions like bricks above in BH10/1.15m. 1x surface flake in a finer version of the latter fabric - redder surface
10	38	1.43-1.52	12	54					15-16C?	Small frags & scraps flat roof tile. Grey cores, oxidised surfaces, cream-coloured clay swirls in some examples (lumpy fabric tiles?) - but all very crude and similar looking. Medieval
10	39	1.60	6	108					L12-15C?	Flat roof tile including edges. Crudely made. Leached yellowish surfaces with a grey core. Sandy/gritty texture. Thin greenish glaze on some frags. Mostly from a single roof tile. Medieval
11	8	0-1.2	3	35					14-16C?	1x very small shapeless scrap of red brick. 2x scraps of medieval roof tile in gritty fabric
12	9	0-1.2	10	3187					20C	All CBM. 9x brick including 1x edge frag of granular orange frogged 'Fletton'-type brick = 20C. Residual med or Tudor red brick. 1x frag yellow flat roof tile - probably 16-18C?
12	10	1.64	1	25					L12-15C?	Small frag medieval roof tile, gritty fabric

Bore-hole	Ctxt	Depth (m BGL)	No. CBM	CBM (g)	No. FC	FC (g)	No. Mortar	Mortar (g)	Spot-Date	Comments
12	11	1.88	1	11					L12-16C?	Scrap of ?medieval roof tile
12	12	2.89	1	17					L12-16C?	Scrap of medieval roof tile
14	13	0-0.6	2	515					14-16C?	Joining frags early red brick including corner frag T45-50mm
14	14	1.35-1.4	1	20					L12-16C	Medieval flat roof tile (peg tile?) edge fragment
Total			76	14732	1	8	3	1189		

Table A2: Ceramic building material, fired clay and mortar, Chapel Street

APPENDIX B FINDS REPORTS: COMMON STAITHE

B.1 Pottery

By Carole Fletcher

Introduction

B.1.1 A small assemblage of pottery was recovered from nine boreholes, at differing depths, collected from the Common Staithe site. The Prehistoric Ceramics Research Group (PCRG), the Study Group for Roman Pottery (SGRP) and the Medieval Pottery Research Group (MPRG) *A Standard for Pottery Studies in Archaeology* (2016) and the MPRG (1998) *A Guide to the Classification of Medieval Ceramic Forms* act as standards. A simplified method of recording has been undertaken, with fabric codes assigned from Sue Anderson's unpublished post-Roman fabric series, based on Jennings (1981), with basic description and weight recorded in Table B1.

Factual data

B.1.2 The material recovered is described below by borehole, context number and depth, and dated where possible (Table B1).

Bore-hole	Context	Depth (m BGL)	Description	No.	Weight (kg)	Date
BH04	401	1.49–1.95	?Grimston-type ware sooted and abraded sherd	1	0.001	L12–14C
BH06	604 <78>	7.87–8.07	?EMW body sherd, internally sooted	1	0.001	?Mid 11–end of 12C
BH07	702	2.2–2.4	Grimston-type ware jug, glazed body sherds	2	0.006	L12–14C
	704	4.45	?Brill Jug fragment, probably part of a handle	1	0.001	L12–E14C
BH08	803	3.6	Grimston-type ware jug glazed body and base sherd; the base sherd has a kiln scar	2	0.026	L12–14C
		3.5–3.7	Grimston-type ware jug, glazed body sherds from a minimum of two vessels	3	0.01	L12–14C
			?Local medieval unglazed sooted body sherd	1	0.003	11–14C
BH09	900 <28>	2.4–2.6	Grimston-type ware, glazed body sherd	1	0.001	L12–14C
BH10	1006	8.27–9	Very abraded, reduced body sherd	1	0.001	?Roman
BH12	1201	3.88	Sooted base sherd (fabric uncertain)	1	0.012	?10–15C

Bore-hole	Context	Depth (m BGL)	Description	No.	Weight (kg)	Date
BH13	1302	2.86–2.97	?Grimston-type ware small rim sherd (externally thickened)	1	0.002	L12–14C
BH14	1402	2–2.55	Abraded jug body sherd, the surface of which looks spalled. Pale green glaze, oxidised body sherd ? internal limescale	1	0.005	13–end of 15C
	1403 <32>	2.6–2.8	?Grimston-type ware oxidised sherd with a single spot of glaze	1	0.001	Late med to post-med
	1403	3.2–3.4	?Grimston-type ware, ?internally-glazed base sherd	1	0.002	L12–14C
	1403	3.00	Grimston-type ware jug, glazed body sherd and part of strap handle where it joins the body, the sherds are internally sooted.	2	0.026	L12–14C
Total				20	0.098	

Table B1: Pottery, Common Staithe

Discussion

B.1.3 The pottery fabrics present are similar with those recovered at the Vancouver Centre (Brown and Hardy 2011) and comparably dated. The bulk of the pottery, as at the Vancouver Centre, is Grimston-type ware; however, there were no distinctively diagnostic sherds recovered from the boreholes. The pottery recovered is a domestic assemblage, with sooted sherds recovered, some possibly representing cooking vessels and a number of Grimston-type ware jugs. The assemblage represents medieval rubbish deposition, possibly a general spread of rubbish that had built up over time, or material, perhaps gathered from various sources, deliberately used to help with land reclamation at a later period than the pottery may represent.

Statement of potential

B.1.4 The fabrics recovered are similar with those recovered from the Vancouver Centre and, due to the small size of the assemblage, it is of limited value with regard to research.

B.2 Ceramic building material

By Carole Fletcher

B.2.1 A moderate assemblage of CBM was recovered from 15 boreholes at the Common Staithe site. The CBM descriptions in Drury (1993) were used as a guide and a comparative collection of brick from Duke Street Norwich (dated by Sue Anderson) was also used.

B.2.2 The material recovered is described below by borehole, sample number (if given), context number and depth (Table B2).

Bore	Context/ sample	Depth (m BGL)	Comments	Count	Weight (kg)	Date
BH01	101	7.2–8.28	Fragments of brick	4	0.165	?L13–15C+
BH02	200	1.7–1.92	Flake of brick or tile	1	0.003	NCD
		1.9–2.05	Frogged brick ?Fletton-type, 105x68mm	1	0.808	L19–20C
	201	2.7–3.26	Fletton-type brick	1	0.042	L19–20C
	202	5.7–5.8	Brick fragments	2	0.134	?L13–15C+
BH03	300	1.49–2	Flat tile, 12mm, 14mm and 15mm thick	8	0.116	L12–15C
	301	2.4–2.58	Brick, 55mm thick	1	0.33	?L13–15C+
	302	2.58–2.67	Brick fragments, one with lime mortar	3	0.009	Post-med
	303 <45>	4.4–4.6	Flat tile, 16mm thick, with patches of lime mortar on both upper and lower surface	1	0.013	L12–15C
	305	3.08–3.29	Roof tile fragments	4	0.017	L12–15C
	306	3.37–3.49	Brick fragments	4	0.051	NCD
	309 <45>	4.4–4.45	Flat tile, 15mm thick, with lime mortar on one surface	1	0.076	L12–15C
			Flat tile, 15mm thick	1	0.026	L12–15C
			Flat tile, 16mm thick	3	0.019	L12–15C
		4.5	CBM undiagnostic	1	0.006	NCD
		4.55	Flat tile, 14mm thick	1	0.013	L12–15C
		4.6	Flat tile, 15mm thick	1	0.009	L12–15C
310	4.63–4.74	Lime mortar on base	1	0.009	L12–15C	
BH04	400	1.26–1.42	Flat tile, 13mm thick	2	0.032	L12–15C
	402	2.09–2.23	Flat tile, 14mm thick	1	0.010	L12–15C
BH06	600	1.5–1.96	Brick fragment	1	0.132	?L13–15C+
			Flat tile, 14–15mm thick	7	0.086	L12–15C
	601	1.96–2.32	Flat tile, 16mm and tile fragments	5	0.059	L12–15C
	602	3–3.35	Flat tile, 12mm and 14mm thick	5	0.101	L12–15C
	604	7.75–8.26	Flat tile, sooted, 16mm thick	1	0.015	NCD
BH07	700	1.37–2	Flat tile, 14mm	1	0.029	L12–15C
	701	2–2.15	Flat tile, 14mm	1	0.007	L12–15C
			Fragment of brick	1	0.008	NCD
	703	3.6–3.65	Flat tile, 14mm thick	2	0.016	L12–15C
	704	4.10	Flat tile, 15mm thick	1	0.023	L12–15C
			Flat tile, 13mm thick	1	0.047	L12–15C
<26>	4.35–4.55	Flat tile, 13mm thick	1	0.012	L12–15C	
BH08	801	2–2.43	Flat tile, 10mm thick	1	0.006	L12–15C
	803	3.6	Flat tile, 14mm thick	1	0.007	L12–15C
BH10	1000	1.77–1.94	Undiagnostic CBM	1	0.001	NCD
	1004	6.9–7.16	Undiagnostic CBM	1	0.001	L12–15C

Bore	Context/ sample	Depth (m BGL)	Comments	Count	Weight (kg)	Date
BH11	1100	2.46–2.59	Undiagnostic CBM	1	0.002	NCD
	1101	2.71–3.00	Brick fragments, largest fragment is 52mm thick	4	0.297	?L13–15C+
	1102	3.36–3.46	Brick, 55mm thick, with lime mortar on surfaces	1	0.384	?L13–15C+
	1103	3.46–3.88	Largest fragment has lime mortar, sharp arrises and no frog, one with measurement of 55mm	5	0.39	?L13–15C+
	1104	3.46–3.89	Brick fragments, only one with measurable dimensions, 48mm thick	4	0.618	?L13–15C+
		6.9–7.16	Undiagnostic CBM	1	0.001	NCD
	1105	4–4.67	Brick fragments, including, a bit like estuarine type (purple looking) & traces of lime mortar, two fragments could be measured one 63mm thick. the other 53mm	4	0.948	?L13–15C+
BH12	1201	3.88	Flat tile, 13mm thick	1	0.007	L12–15C
		3.82–4	Flat tile, 12–13mm thick	1	0.040	L12–15C
	1202	4.05	Flat tile, 14mm thick	1	0.010	L12–15C
		4.2	CBM undiagnostic	1	0.001	NCD
	1203	4.6–4.8	CBM undiagnostic	1	0.004	NCD
	1204	4.88	Flat tile, 13mm thick	1	0.007	L12–15C
BH13	1300	1.12–1.5	Undiagnostic CBM	1	0.005	NCD
	1301	2.5–2.48	Flat tile, 9mm & 14mm thick	2	0.036	L12–15C
	1303	4.35	CBM undiagnostic	1	0.003	NCD
BH14	1400	1–1.67	Flat tile fragments, 13–14mm thick	4	0.034	L12–15C
	1402	2–2.55	Irregular fragment of brick	1	0.059	NCD
	1403	3.3	Flat tile, 13mm thick	1	0.038	L12–15C
	1403	3.2–3.4	Flat tile, 13mm thick	1	0.007	L12–15C
	1403 <32>	3.2–3.4	CBM undiagnostic	1	0.001	NCD
BH15	1500	1.2–1.75	Flat tile, 15mm and 16mm thick	5	0.072	L12–15C
	1502	2.9–3.22	Flat tile, 12mm thick	2	0.028	L12–15C
	1503	3.33–4.2	Flat (roof) tile, traces of glaze, 11–12mm thick	3	0.013	L12–15C
BH16	1600	1–1.63	Undiagnostic CBM	2	0.005	NCD
BH17	1700	1.21–2	Fragments of brick	3	0.026	NCD
Total				126	5.474	

Table B2: Ceramic building material (NCD = not closely dated), Common Staithe

Discussion

- B.2.3 Understandably, with the material having been recovered by borehole sampling, no complete pieces of CBM were recovered; however, some of the material from BH11 appears to have been from large fragments of brick, or perhaps complete bricks, and the CBM from BH11 almost entirely comprises fragments of bricks. This might suggest a deliberate reuse of brick in the reclamation process in this area, although the medieval date for the brick is tentative and it could be later in date.
- B.2.4 The bulk of the assemblage comprises roof tile and includes many small fragments; however, as with the brick, the nature of the recovery method excludes the possibility of finding complete tiles. Overall, the material, excepting from BH2, appears to be medieval in date. Some fragments of medieval flat tile were identified as such by Sue Anderson, and the remainder were compared to these. Flat tile or roofing tiles comprise the majority of fragments recovered, and this is similar to the material recovered from the Vancouver Centre (Cotter 2005, 65–9).

Statement of potential

- B.2.5 The assemblage is similar with that found elsewhere in the town, and the lack of complete examples hinders comparison on anything but fabric with other assemblages. The material has some potential to aid local research priorities within King's Lynn, providing evidence of dating the potentially the reuse of CBM in the reclamation process, though it does little to aid regional, and national research priorities.

B.3 Fired clay

By Carole Fletcher

- B.3.1 Two fragments of fired clay were recovered from a single borehole collected from the Common Staithe site.
- B.3.2 The material comprises two amorphous fragments that cannot be closely dated (Table B3).

Bore	Context	Depth (m BGL)	Comment	Count	Weight (kg)	Date
BH12	1201	3.98	Irregular fragment	1	0.008	NCD
	1203	4.62	Irregular fragment	1	0.003	NCD
Total				2	0.011	

Table B3: Fired clay (NCD = not closely dated), Common Staithe

- B.3.3 The assemblage has little potential to aid local, regional and national research priorities.

B.4 Clay pipe

By Carole Fletcher

- B.4.1 Three fragments of undecorated clay tobacco pipe stem were recovered from two boreholes at the Common Staithe site.
- B.4.2 The material recovered is described below by borehole, context number and depth (Table B4).

Bore	Context	Depth (m BGL)	Material	Count	Weight (kg)	Date
BH11	1103	3.46–3.88	Clay tobacco pipe stem	1	0.009	Post-1580
BH17	-	0.9	Clay tobacco pipe stem from two different pipes	2	0.007	Post-1580
Total				3	0.016	

Table B4: Clay tobacco pipe, Common Staithe

- B.4.3 The pipe stem is not significant, other than to indicate pipe smoking sometime around or after c 1580; it may represent casual loss or rubbish deposition.
- B.4.4 The assemblage has little potential to aid local, regional and national research priorities.

B.5 Glass

By Carole Fletcher

- B.5.1 Two fragments of glass were recovered from BH2 at the Common Staithe site.
- B.5.2 The material recovered is described below by borehole, context number and depth (Table B5).

Bore	Context	Depth (m BGL)	Material	Count	Weight (kg)	Date
BH02	200	1.7–1.92	Vessel glass	1	0.003	19th century or later
			Vessel glass	1	0.007	?18th century

Table B5: Glass, Common Staithe

- B.5.3 The glass is not significant, other than to indicate 18th- and 19th-century rubbish deposition.
- B.5.4 The assemblage has little potential to aid local, regional and national research priorities.

B.6 Leather

By Carole Fletcher

Introduction and methodology

- B.6.1 A small assemblage of leather was recovered at different depths from four boreholes at the Common Staithe site; no leather was collected from the Chapel Street boreholes. The leather is in moderate to poor condition and, after being carefully rinsed with distilled water, was examined under a microscope (x10 magnification) for evidence of grain pattern, to allow a species identification to be made, where possible.
- B.6.2 Simplified recording has been undertaken, with basic description and weight recorded in Table B6.

Factual data

- B.6.3 Much of the leather is fragile and little, if any, grain pattern survives clearly on the surface of the leather, therefore species has not been identified except for the fragment from BH08.
- B.6.4 The leather recovered from BH13 <75>, context 1302, recovered at a depth of 4.22–4.43m BGL, is the well preserved and could be parts of two straps, possibly from a medieval shoe or boot. However, the leather does not show any diagnostic features such as stitching holes. A single stitch hole is observable on a fragment from BH07 (2.6–2.8m BGL, context 703), and others may also be present; however, the condition of the leather makes identification difficult. Small notches on the edge of the single fragment of leather from BH14 (3.2–3.4m BGL, context 1403) may be the result of stitching, as are the indentations and wear marks on the fragment of leather from BH08 (4–5m BGL, context 802).
- B.6.5 The material recovered from each borehole is described below by borehole, sample number (if given), context number and depth (Table B6).

Bore	Ctxt	Depth (m BGL)	Material: Artefact	Description	No.	Weight (g)
BH07	703	2.6–2.8	Organic: leather	<p>Rectangular, slightly curved, incomplete, narrow, almost wedge-shaped (in profile) fragment of leather. Cut long edges and a shaped end, the other end being damaged and the leather split. The wedge shape suggests either, a strap with a single stitch hole visible, placed centrally on the shaped end, angled on one side and cut straight at the end of the leather, or a rand, a piece of leather fitted between a shoe upper and sole to which both are stitched. However, the lack of visible stitch holes may indicate this is not the case. 58mm x 9mm tapering to 5.1mm, 0.9–4.4mm thick, stitch hole approximately 1mm long</p> <p>Wedge-shaped fragment, cut on three sides, one slightly curved, with the shortest edge being torn. The upper surface of the leather retains traces of pore pattern; however, the pattern is too indistinct for identification. No diagnostic features were observed. 37.8mm tapering to 20.8mm x 30.9mm, 1mm thick.</p> <p>Sub-rectangular fragment of leather, the upper surface of the leather having delaminated, resulting in a thin and fragile fragment. 19.5mm x 18.9mm, 0.5mm thick.</p> <p>Tapering strip of leather 18.7–10.2mm, in poor condition, upper and lower surfaces splitting and almost torn in two, folded back on itself towards the narrower end of the strip. Cut edges at wider end, torn at the narrower end, 0.5–1.5mm thick</p>	4	3.6
BH08	802	4.0–5.0	Organic: leather	<p>Sub-rectangular, tapering strip of leather. One side is obviously cut, with the edge somewhat rounded and appears slightly scalloped, with two obvious indentations and worn areas on this edge where thread has abraded the leather, indicating it was originally part of a stitched object, most probably a shoe; the other edge and both ends of the fragment are torn. The leather is in relatively good condition, the upper surface of the leather survives and appears to be cowhide. 41mm x 3.6–7.5mm wide, 1.9mm thick</p>	1	0.5
BH13	1302	4.22–4.43	Organic: leather	<p>Sub-rectangular strip of leather in relatively good condition, cut on two edges, one straight and one slightly curved, torn at narrower ends. Upper surface survives, although the grain pattern could not be identified, and some areas of the surface are missing. 74.9 x 16.7mm tapering to 9.9mm, 1mm thick</p> <p>Sub-rectangular strip of leather in relatively good condition, cut on two edges, one straight and one slightly curved, folded in two and torn at the ends. Upper surface survives, although the grain pattern could not be identified. 73.3 x 13.9mm (folded width) tapering to 4.8mm, single piece 1mm thick, folded 1.9mm thick</p>		1.9

Bore	Ctxt	Depth (m BGL)	Material: Artefact	Description	No.	Weight (g)
BH14	1403	3.2–3.4	Organic: leather	Wedge-shaped fragment of leather. The long sides appear to be cut and it is torn at both ends and one side is torn. The more complete edge has three small notches which may be damage caused by stitching. 24mm x 18.6mm tapering to 8.6mm	1	0.3

Table B6: Leather assemblage, Common Staithe

Discussion

- B.6.6 Diagnostic features on the leather fragments from any of the boreholes are limited. It may be that the leather fragments are from rotted items or leather waste, either from shoemaking or more probably cobbling waste and may be medieval in date.
- B.6.7 The presence of leather indicates that the levels from which the fragments were recovered have remained waterlogged and were probably waterlogged at the time of deposition or soon after.

Statement of potential

- B.6.8 The assemblage is fragmentary, although it is significant that leather survives at variable levels across a range of boreholes, indicating that organic preservation is relatively good. The leather will be stabilised and retained with the archive. However, the assemblage has little potential to aid local, regional and national research priorities.

B.7 Stone

By Carole Fletcher

- B.7.1 A small assemblage of non-building stone was recovered from two of the boreholes, at differing depths, collected from the Common Staithe site. Simplified recording has been undertaken, with basic description and weight recorded in Table B7.
- B.7.2 The material recovered from each borehole is described below by borehole, context number and depth (Table B7).

Bore	Context	Depth (m BGL)	Material	Weight (kg)
BH03	305	3.08–3.29	Fragment of burnt shale	0.004
BH03	310	4.63–4.74	Fragment of limestone	0.192
BH07	704	4.35	Fragment of ?vesicular basalt lava, heavily abraded, with a small area of flat surface surviving, possibly part of a quern	0.046

Table B7: Stone, Common Staithe

- B.7.3 The burnt shale is very probably fuel residue, although it is unknown whether it is of a domestic or industrial origin. The possible lava quern fragment may be from the Mayen-Niedermendig quarries in the Eifel region of Germany. The lava is weathered, with some more recent breaks. The hard, coarse, vesicular, medium grey lava has a flat

surface that may have been part of the grinding surface of a rotary quern; however, it cannot be established if this is part of an upper or lower stone. Although not closely dated, the layers both above and below the fragment produced medieval pottery.

B.7.4 The assemblage has little potential to aid local, regional and national research priorities.

APPENDIX C ENVIRONMENTAL REPORTS: CHAPEL STREET CAR PARK

C.1 Environmental samples

By Julia Meen

Introduction

- C.1.1 A total of 14 boreholes were drilled in three transects across Chapel Street Car Park in Kings Lynn. Following logging of these boreholes and the creation of a model of the sequence, representative locations for subsampling were chosen to evaluate the potential for palaeoenvironmental work from the sequence both spatially and through time. A total of 28 subsamples were selected. Subsampling was undertaken primarily to assess the survival of plant remains preserved through waterlogging (waterlogged plant remains; WPR) but also aimed to assess presence of other palaeoenvironmental proxies including charcoal, ostracods and foraminifera.
- C.1.2 The upper layers of the sequence encompass post medieval occupation layers from the town of King's Lynn, but the boreholes extend into prehistoric levels. Saxon-Norman dates were obtained at a depth of 2.49–2.53m in BH06 and at 1.51–1.60m in BH02. An Iron Age date was obtained at a depth of 6.10–6.15m in BH03, while an Early Bronze Age date came from 7m depth in BH02. Organic lenses, including peats, occur throughout the sequence and these were a focus for sampling, while a probable channel with clear laminations, identified in BH06, has also been targeted for assessment.
- C.1.3 This preliminary assessment aims to evaluate the degree of waterlogged preservation, relating to the diversity and quantity of plant taxa preserved, and to the quality of preservation, with reference to Historic England guidance (2016). It aims to provide recommendations on the potential for further, more detailed analytical work.

Methodology

- C.1.4 Samples taken from the targeted locations were between 50–150mm wide, and the volumes recovered consequently ranged from 0.2L to 1L, depending on width. 100% of sediment taken from each sampling location was processed; sediment volumes are given in Table C1. Samples were processed using the 'wash over technique' of bucket flotation with flot and residue from each sample collected separately into 250µm mesh. Residues were scanned for artefacts, particularly those such as ceramic building material and pottery which might add to the dating of the sequence.
- C.1.5 Each flot was examined using a LEICA EZ4D stereomicroscope at up to x40 magnification and the presence, quantity and condition of plant macrofossils was recorded, with reference to the terminology outlined in HE guidance: *Preserving Archaeological Remains Appendix 2 - Preservation Assessment Techniques*. For most flots, 100% of the flot was examined. For some of the larger flots, a representative fraction (either half or a quarter) was examined instead; where this is the case it is noted in Table C1. Where fewer than 25 seeds of an individual taxon were present, a figure of overall abundance was recorded; where more than 25 items are present, and

for non-seed items such as wood fragments, abundance was recorded using the following scale:

= 1-5, ## = 6-25, ### = 26-100, #### = 100-500, ##### 500+ items

- C.1.6 Identifications were made with comparison to the modern reference collection held at Oxford Archaeology South and with reference to published guides (Cappers *et al.* 2006 and Jacomet 2006). Plant nomenclature follows Stace (2010).

Results

Borehole BH02

- C.1.7 At 1.51–1.60m preservation of both seeds and insects is very good; the most common seeds are cabbages (*Brassica* spp.) and the surface sculpturing is clearly preserved. Overall, the assemblage is dominated by arable weeds, including numerous seeds of stinking chamomile (*Anthemis cotula*) and pale persicaria (*Periscaria lapathifolia*) and with examples of poppy (*Papaver* sp.), sowthistle (*Sonchus* sp.), knapweed (*Centaurea* sp.) and shepherd's needle (*Scandix pectens-veneris*). There are several seeds of cultivated flax (*Linum usitatissimum*).
- C.1.8 At 1.89–2.00m, organic material is dominated by plant stems, including grass and rush/sedge. Charcoal flecks are common and insects are well preserved and frequent. Seeds generally survive in good condition and a large number of taxa are present, although only small numbers of each were observed. The most common seeds were those of disturbed or cultivated ground, including Amaranthaceae (goosefoots, oraches), cabbages, stinking chamomile, persicaria and corncockle. Stem fragments of heather (*Calluna vulgaris*) and leaves of cross-leaved heath (*Erica tetralix*) and bracken (*Pteridium aquilinum*) leaves were also noted. Other bog/fenland plants include bog myrtle (*Myrica gale*) fruits and bogbean (*Menyanthes trifoliata*).
- C.1.9 At 6.95–7.00m, peat is moderately well humified, with frequent wood inclusions and occasional partially degraded small twigs. Seeds of bulrush (*Typha* sp.) are very common, with other aquatic/marginal plants present but in relatively low number: pondweed (*Potamogeton* sp.), sedge (*Carex* sp.), water crowfoot (*Ranunculus* subgenus *Batrachium*) and marsh pennywort (*Hydrocotyle vulgaris*).
- C.1.10 At the deepest point of subsampling, at 7.00–7.04m BGL, the organic content was mostly composed of fine roots, with only occasional fragments of wood. Seeds are rare and limited to a small number of crowfoots, sedges and club-rushes (*Schoenoplectus* sp.), with a single winged seed of birch (*Betula* sp.) which may have blown in from some distance from the deposit.

Borehole BH03

- C.1.11 The first location for sampling focused on an organic unit between 2.21–2.6m below ground level. In the upper 15cm of this unit, most of the organic material recovered in the floated component ("flot") is wood based, degraded to fine fragments. Small pieces of charcoal less than 2mm in size are fairly common. Seeds of a range of types are present but with few examples of each and many are fragmented; many are aquatics such as water plantain (*Alisma plantago-aquatica*), sedge family (Cyperaceae), water crowfoot and pondweed.

- C.1.12 In comparison, the lower part of this unit, between 2.5–2.6m BGL, little organic material was preserved. Most material consisted of fine flakes of wood and plant root, with fine charcoal flecks common. There are several seeds of the Amaranthaceae family although they are in a poor state, with the seed coat generally damaged or absent. There are occasional seeds of rush (*Juncus* sp.) and a partial seed of great fen-sedge (*Cladium mariscus*), and one well preserved seed of hairy buttercup (*Ranunculus sardous*) with the seed coat intact. A single mollusc shell, *Carychium* sp., was also noted.
- C.1.13 A third subsample, taken at a depth of 3.5–3.6m, produced very little organic material, with much of the flot composed of highly degraded plant stem and root. Seeds were very rare and seed coats were highly eroded, mostly rush and bulrush, with examples of great fen-sedge, common chickweed (*Stellaria media*) and stinking chamomile.
- C.1.14 At 4.5–4.6m, the sampled material becomes more minerogenic, with organic remains sparse and principally consisting of degraded root material. There are a small number of heather (*Calluna vulgaris*) vegetation fragments, with seeds limited to a very small number of highly eroded sedge nutlets (*Carex* sp.) and rush seeds. However, ostracods, foraminifera, charophyte oogonia and molluscs were all present.
- C.1.15 At 5.6–5.7m all organic material was more degraded, composed mostly of fine plant stem and root particles. There are a small number of rush seeds, with preservation variable; some are entire whilst others are present only as scraps of seed coat. Fine charcoal flecks are, however, common.
- C.1.16 Between 6.00 and 6.19m there is a unit of dark, well humified wood peat from which four samples were examined. Preservation of seeds was generally poor. Between 6.00–6.05m there is a single partial sedge seed with moderate erosion and rare bulrush and duckweed (*Lemna* sp.), while duckweed is also present at 6.05–6.10m alongside common chickweed and bramble (*Rubus* sp.); all are well eroded. No seeds are preserved at all between 6.10 and 6.15m BGL while at 6.15–6.19m they are rare and are highly eroded, mostly rush and bulrush, plus two further seeds of bramble.

Borehole BH06

- C.1.17 Between 1.45m and 1.77m there unit consisting of disturbed, mixed sediment. The upper samples, taken at a depth of 1.45–1.55m, was strongly dominated by wood charcoal, with a small number of charred cereal grains and occasional fish bone, which corroborate that this is a mixed refuse deposit. Waterlogged remains are sparse but seeds of rush and weld (*Reseda luteola*) are most common, with examples of sedge, mint (*Mentha* sp.) and bramble observed.
- C.1.18 By 1.55–1.65m charcoal is still very frequent but is more finely fragmented and much more mixed with waterlogged wood fragments – it appears to be material that has percolated down to the base of the dump unit. Waterlogged seeds are much more diverse and in greater numbers than in the overlying sample and are generally well preserved with minimal fragmentation and moderate erosion of the seed coat. The most abundant seeds are those of Amaranthaceae, sedges, and weld, with other common taxa including great fen-sedge, cabbages (*Brassica* spp.) and buttercup (*Ranunculus* sp.). Seeds of disturbed ground include stinking chamomile, cornflower

(*Centaurea cyanus*), and wild radish (*Raphanus raphanistrum*), while there are several charred cereal grains (barley, *Hordeum vulgare* and oat, *Avena* sp.). There are also several fig (*Ficus carica*) seeds and both mammal and fish bone, indicating, as in the overlying sample, that domestic refuse forms part of this unit. Wetland seeds include bogbean, water-cress (*Nasturtium* sp.), marsh pennywort and club-rush.

- C.1.19 In the lower part of this unit, between 1.65–1.77m, there is a fairly even mixture of charred material (mostly fine charcoal fragments) and waterlogged material (predominately fine plant stem and wood fragments). However, some larger wood pieces do occur. Seeds are common and moderately well preserved and include a similar range of arable/disturbed ground and wetland plants to those in the overlying sample.
- C.1.20 Between 2.2 m and 3.0m the sediment shows clear laminations indicative of a channel margin. At 2.49–2.53m is a deposit radiocarbon dated as Saxo-Norman which consists largely of charred material: frequently this is charcoal, but also burnt roots and fragments of heather stems and flowers. To a large extent the waterlogged material is similar in content as the charred, suggesting it is from the same source but was only partially charred. The heather remains are of both *Calluna vulgaris* (heather) and *Erica tetralix* (cross-leaved leaved), and fruits of bog-myrtle are also present. Occasional eggshell fragments were noted, indicating some food consumption in association with the deposit. Given its location and the makeup of the charred items, it is possible that these derive from the burning of turves.
- C.1.21 At 2.74–2.80m much of the material is charred, with frequent charcoal and some charred plant stem/root. Some of the seeds, in particular those of great fen-sedge, are also charred. However, seeds preserved through waterlogging are common, with weld seeds especially abundant. Other seeds are mostly of disturbed and damp ground and include sedge, Amaranthaceae, bogbean, dock (*Rumex* sp.) and spike-rush (*Elecocharis* sp.). A charred wheat (*Triticum* sp.) grain, an apple (*Malus* sp.) pip, and fish bone point to human refuse comprising part of the deposit.

Borehole BH09

- C.1.22 At a depth of 1.84–1.94m, the material is wood derived and lightly degraded. Seeds show light to moderate fragmentation, but seed coats show little erosion. Seeds are diverse although rarely in large quantity and are particularly dominated by seeds of arable fields and disturbed ground, indicating that human activity was shaping the vegetation here. Wood charcoal occurs frequently, mostly as fine flecks but with some larger (greater than 2mm) items.
- C.1.23 By 1.94–2.00m, the wood that makes up much of the flot is mostly highly fragmented, with charred plant stem and charcoal forming a lesser component. Seeds are sparse and limited to a few of each type, but of a range including great fen-sedge, bog myrtle, spike-rush, sedges, henbane (*Hyoscyamus niger*), lesser stitchwort (*Stellaria graminea*) and weld.
- C.1.24 At 2.15–2.25m the organic material is well preserved, with much of it composed of plant stems (including grass culm) with some wood, including small twigs. Insect remains are frequent and well preserved. The waterlogged seeds are fairly sparse but

have minimal fragmentation and erosion and include a fairly diverse range, predominantly of wetland taxa: rush, club-rush, bogbean, alder (*Alnus glutinosa*), sedge, great fen-sedge and marshwort (*Apium* sp.). There are also seeds of grassland and disturbed ground such as hawkbit (*Leontodon* sp.), fairy flax (*Linum catharticum*), buttercup and weld. Charcoal is present as a minor component

- C.1.25 At a depth of 2.25–2.35m abundant organic material is preserved, producing a flot of 200ml from 1 litre of processed sediment. This material is mixed, and includes wood, plant stem of a variety of types, moss and charcoal. Seeds are common and generally well preserved, with light erosion of seed coats. The most common seeds are of grasses, sedges and rushes, but the range of taxa represented is fairly diverse and includes a range of species of damp, disturbed or cultivated ground. These include great fen-sedge, common chickweed, forget-me-not (*Myosotis* sp.), poppy (*Papaver* sp.), buttercup, ragged robin (*Silene flos-culculi*) and stinking chamomile. Insects are well preserved and include a charred weevil, with the fact it had come into contact with fire possibly indicating it was a pest of human activity. Fragments of heather stem were also noted.

Borehole BH10

- C.1.26 Waterlogged remains from a single location, at a depth of 2.60–2.75m, was assessed. Organic preservation was very good, with a high proportion composed of lightly degraded wood fragments and small twigs. Plant stem including grass culm was also present. Seeds were present in good quality and diversity, with occasional fragmentation and minimal erosion of seed coat. Seeds were mostly waterlogged but some examples were charred, including seeds of sedges, docks and hemlock (*Conium maculatum*). Seeds include many found in wetlands; however there is also a strong anthropogenic component, with weeds seeds common to arable fields such as stinking chamomile, corn spurrey (*Spergula arvense*), common chickweed and also food plants including apple and strawberry (*Fragaria vesca*). Small charcoal fragments were common.

Borehole BH14

- C.1.27 A subsample from 1.25–1.30m encompassed an occupation deposit spot dated to the 13-16th century. This horizon contains much burnt plant material, including charcoal fragments and burnt grass culms. Occasional remnants of charred cereal crops are present, including barley and wheat grain, barley rachis, and oat awn. There are a range of charred weed seeds: thistle (*Cirsium/Carduus*), knapweed (*Centaurea* sp.), ribwort plantain (*Plantago lanceolata*), grasses (Poaceae), stinking chamomile, buttercup, knotgrass (*Polygonum aviculare*) and clover/medicks/melilots (*Trifolium/Medicago/Melilotus*). Waterlogged weed seeds are abundant, diverse and well preserved, with the wetland plants spike rush, sedge, rush and club-rush being especially common. Seeds of common nettle (*Urtica dioica*) are also highly abundant. Other weed seeds include narrow fruited cornsalad (*Valerianella dentata*), knotweed (*Persicaria* sp.), cinquefoil (*Potentilla* sp.) and scarlet pimpernel (*Anagallis arvensis*).
- C.1.28 At 1.81–1.86m the organic material is predominately composed of wood fragments, mostly amorphous with occasional twigs. Aside from seeds of rush, other waterlogged seeds are fairly sparse but, while limited to a few examples per taxa, a fairly wide range

is present, including small grasses, sheep's sorrel (*Rumex acetosella*), sedge, buttercup and knotgrass. A single seed of fig was noted.

- C.1.29 At a depth of 1.88–1.90m there is well preserved organic material, much of which is composed of plant stem and culm – rush, grass, cereal, including occasional cereal rachis, and also wood fragments including small twigs. Seeds of club rush are by far the most abundant, with seeds of small grasses and rush also common. Sedge and spike-rush are also present but in far lower numbers. The remainder of the seed assemblage primarily comprises seeds of grassy, disturbed or cultivated ground, with numbers of seeds within individual taxa low. These include sowthistle (*Sonchus* sp.), hawkbit, stinking chamomile, selfheal (*Prunella vulgaris*), cinquefoil, corn marigold (*Glebionis segetum*), knapweed, bur-marigold (*Bidens* sp.) and campion (*Silene* sp.).
- C.1.30 At 2.00–2.15m, material is predominately wood based with a moderate amount of fine wood charcoal mixed in. Seeds are common and well preserved, with a wide range of species represented. Most common are small-seeded grasses (*Poa/Phleum*; meadowgrasses and cat's tails), common chickweed, Amaranthaceae, buttercups and stinking chamomile; the range reflects damp grassland and arable ground.

Borehole BH15

- C.1.31 Material from an organic lens at a depth of 4.40–4.55m was almost entirely composed of well-preserved wood, often surviving as large (>10mm) pieces. Most are radially fractured pieces with occasional roundwood. Seeds are rare but well preserved where present; the range of taxa is limited but includes stinking chamomile, pale persicaria, rush and corncockle (*Agrostemma githago*) seed coat fragments. There are occasional small charcoal fragments.

Discussion

- C.1.32 By looking at subsamples from across the sequence, it can be observed that different depositional environments are represented, and that these correspond to varying levels of plant macrofossil preservation and diversity. In general, seeds survive best in the upper most 2m of each borehole, in the layers relating to later occupation. In this upper unit waterlogged seeds are often indicative of disturbed, open ground and often include weeds of arable cultivation. Aquatic taxa are best represented in the lower parts of Borehole BH02 and are also common in Boreholes BH06 and BH09 with a relatively high diversity of taxa including numerous examples of great fen sedge. However, there are relatively few seeds in Borehole BH03; from 6.0m there is a unit of dark, well humified peat in which few seeds are preserved, apart from heavily abraded marginal plants such as rush and bulrush.
- C.1.33 Remains of waterlogged food plants occur occasionally, often in samples with other indicators that the material derives from mixed domestic waste, such as fish bone. Apple pips occur in both Boreholes BH06 and BH10 at depths between 2.6 and 2.8m BGL, while seeds of fig were noted from four separate samples, all of which are above 2.0m BGL.
- C.1.34 Charred plant remains occur in low quantity but are focused on particular locations within the sequence which correspond to identified medieval and post-medieval occupation deposits. Charred grain of wheat and barley occurs between 1.5 and 2m in

Borehole 2, while wheat, barley and oat grain occur at a depth of 1.45–1.77m in Borehole BH06 and 1.94m and 2.25m in Borehole 9. Charred material was most abundant from a location in Borehole BH14 spot dated to the 13th-16th century, and which included charred arable weeds such as knapweed, ribwort plantain and knotgrass alongside cereal grain.

- C.1.35 Charcoal occurs as fine flecks throughout most of the sequence, reflecting anthropogenic activity close by, but survives most abundantly in the upper layers of Boreholes BH06 and BH09. Charcoal is notably sparser in Boreholes 2 and 3. The presence of both burnt and waterlogged heather stems and charred roots at a depth of 2.49–2.53 in Borehole BH06, located at the edge of a channel, may point to the burning of turves/peat.
- C.1.36 Two species of heather were noted in the samples: *Calluna vulgaris* (heather) and *Erica tetralix* (cross-leaved heath), in the form of stem fragments, leaves, and flowers. As well as being abundant in the Borehole BH06 sample, it was identified in Borehole BH02 (1.89–2.00m) and Borehole BH03 (4.50–4.6m). Other plants of bog/fen from the site include bog myrtle and bogbean. Bog myrtle was found at three locations in Boreholes BH02, BH06 and BH09, all in the vicinity of 2m BGL, and was also found in one of the samples from Common Staithe.
- C.1.37 While ostracods and foraminifera occur in a number of locations in the Common Staithe boreholes, they are more limited in the Chapel Street samples. Ostracods occur at a depth of 1.55–1.65m in borehole BH06, and at 4.5–4.6m in borehole BH03; foraminifera were noted in the latter sample only. Their limited presence potentially reflects the location of the Chapel Street transects away from estuarine deposits.

Statement of potential and recommendations for further work

- C.1.38 The current work on the boreholes from Chapel Street has identified the range of taxa present at key locations in the sequence and have provided an insight into the developing environment and economy at the site. While there is sufficient material available with good preservation that further analysis would be possible, it could be argued that further work would add little to the information already recorded. Therefore, no further work is recommended for the boreholes from Chapel Street.

Retention, dispersal and display

- C.1.39 The waterlogged flots and residue have been retained wet and are currently stored in a dark, cool environment to reduce decay of the organic remains. However, this is not appropriate for long-term archive and if any further work is judged appropriate, this should be completed as soon as possible to reduce the chance of degradation.

Borehole			2	2	2	2	3	3	3	3	3	3	3	3	3
Depth m BGL			1.51-1.60	1.89-2.00	6.95-7.00	7.00-7.04	2.21-2.26	2.5-2.6	3.5-3.6	4.50-4.60	5.6-5.7	6.00-6.05	6.05-6.10	6.10-6.15	6.15-6.19
Flot size (ml)			80	120	100		20	10	10	10	15	70	70		40
% Scanned			50	50	100	100	100	100	100	100	100	100	100	100	100
CHARRED															
<i>Triticum</i> sp	wheat	grain	2												
<i>Hordeum vulgare</i>	barley	grain		1											
<i>Avena</i> sp.	oat	grain													
Cereale	indet cereal	grain													
<i>Hordeum vulgare</i>	barley	rachis node													
<i>Avena</i> sp.	oat	awn													
Cereale	indet cereal	rachis													
<i>Trifolium/Melilotus/Medicago</i>	clover/melilot/medick	seed													
<i>Ranunculus</i> sp.	buttercup	seed													
<i>Polygonum aviculare</i> L.	knotgrass	seed													
<i>Plantago lanceolata</i> L.	ribwort plantain	seed													
<i>Centaurea</i> sp.	knapweed	seed													
<i>Cirsium/Carduus</i> sp.	thistle	seed													
<i>Anthemis cotula</i> L.	stinking chamomile	seed	1	4											
<i>Eleocharis</i> sp.	spike-rush	seed													
<i>Juncus</i> sp.	rush	seed													
Poaceae	grass (large)	seed													
Poaceae	grass (medium)	seed													
Poaceae	grass (small)	seed													
Poaceae	grass (large)	seed					1								
WATERLOGGED															
Cultivars															
Cereale	indet cereal	culm node													
Cereale	indet cereal	rachis													
<i>Malus</i> sp.	apple	seed													
<i>Fragaria vesca</i> L.	wild strawberry	seed													
<i>Ficus carica</i> L.	fig	seed													
Plants of waste, cultivated or open ground															
<i>Papaver</i> sp.	poppy	seed	2												
<i>Aphanes</i> sp.	parsley-piert	seed					1								
<i>Urtica dioica</i> L.	common nettle	seed					2								

Borehole			2	2	2	2	3	3	3	3	3	3	3	3	3
Depth m BGL			1.51-1.60	1.89-2.00	6.95-7.00	7.00-7.04	2.21-2.26	2.5-2.6	3.5-3.6	4.50-4.60	5.6-5.7	6.00-6.05	6.05-6.10	6.10-6.15	6.15-6.19
<i>Urtica urens</i> L.	small nettle	seed		1											
<i>Linum usitatissimum</i> L.	flax	seed	3												
<i>Reseda luteola</i> L.	weld	seed					1								
<i>Brassica</i> sp.	cabbages	seed	####	7											
<i>Raphanus raphanistrum</i> L.	wild radish	seed capsule													
<i>Thlaspi arvense</i> L.	field penny-cress	seed													
<i>Persicaria</i> sp.	knotweed	seed													
<i>Persicaria lapathifolia</i> (L.) Delarbre	pale persicaria	seed	17	5											
<i>Polygonum aviculare</i> L.	knotgrass	seed	1												
<i>Fallopia convolvulus</i> (L.) A. Love	black-bindweed	seed													
<i>Stellaria media</i> (L.) Vill.	common chickweed	seed		1					1				1		
<i>Spergula arvensis</i> L.	corn spurrey	seed													
<i>Agrostemma githago</i> L.	corncockle	seed		3											
<i>Agrostemma githago</i> L.	corncockle	seed coat fragment		##						1					
<i>Anagallis arvensis</i> L.	scarlet pimpernel	seed													
<i>Hyoscyamus niger</i> L.	henbane	seed													
<i>Plantago major</i> L.	greater plantain	seed	1				1								
<i>Centaurea</i> sp.	knapweed	seed	2												
<i>Sonchus</i> sp.	sowthistle	seed	2												
<i>Anthemis cotula</i> L.	stinking chamomile	seed	17			1			1						
<i>Glebionis segetum</i> (L.) Fourr.	corn marigold	seed		1											
<i>Valerianella dentata</i> (L.) Pollich	narrow-fruited cornsalad	seed													
<i>Scandix pecten-veneris</i> L.	shepherd's needle	seed	1												
<i>Conium maculatum</i> L.	hemlock	seed													
Wood, scrub and hedgerow plants															
<i>Alnus glutinosa</i> (L.) Gaertn.	alder	seed													
<i>Betula</i> sp.	birch	seed				1									
<i>Corylus avellana</i> L.	hazel	nutshell fragment	8	5											
Grassland plants															
<i>Stellaria graminea</i> L.	lesser stitchwort	seed													
<i>Hypochaeris</i> sp.	cat's-ears	seed													
<i>Leontodon</i> sp.	hawkbit	seed		2											
<i>Picris</i> sp.	hawkweed oxtongue	seed		1											
Poaceae	grass (small)	seed	7	3											
Wet ground and aquatic plants															
<i>Ranunculus sceleratus</i> L.	celery-leaved buttercup	seed		1											
<i>Ranunculus</i> subgenus <i>Batrachium</i>	crowfoot	seed			5	8	1								

Borehole			2	2	2	2	3	3	3	3	3	3	3	3	3
Depth m BGL			1.51-1.60	1.89-2.00	6.95-7.00	7.00-7.04	2.21-2.26	2.5-2.6	3.5-3.6	4.50-4.60	5.6-5.7	6.00-6.05	6.05-6.10	6.10-6.15	6.15-6.19
<i>Myrica gale</i> L.	bog-myrtle	fruit		1											
<i>Nasturtium</i> sp.	water-cress	seed													
<i>Silene flos-culculi</i> (L.) Clairv.	ragged-robin	seed	1												
<i>Lycopus europaeus</i> L.	gypsywort	seed													
<i>Menyanthes trifoliata</i> L.	bogbean	seed		1											
<i>Bidens</i> sp.	bur-marigold	seed													
<i>Hydrocotyle vulgaris</i> L.	marsh pennywort	seed		1	6										
<i>Oenanthe</i> sp.	water-dropwort	seed													
<i>Apium</i> sp.	marshwort	seed													
<i>Lemna</i> sp.	duckweed	fruit			2							2	4		
<i>Alisma plantago-aquatica</i> L.	water-plantain	seed		1	1		1								
<i>Potamogeton</i> sp.	pondweed	seed			15		1								
<i>Sparganium erectum</i> L.	branched bur-reed	fruit													
<i>Typha</i> sp.	bulrush	seed			####				1			13	5		3
<i>Juncus</i> sp.	rush	seed	####	##		##		#	#	##	##				10
Cyperaceae	sedge family	seed					1								
<i>Schoenoplectus</i> sp.	club-rush	seed	3	6	1	3									
<i>Eleocharis</i> sp.	spike-rushes	seed		1											
<i>Cladium mariscus</i> (L.) Pohl	great fen-sedge	seed	1	2			1	1	1						
<i>Carex</i> sp.	sedge	seed	3	2	3	2				2		1			
Plants from broad ecological groupings															
<i>Ranunculus</i> sp.	buttercup	seed	3	2	1	1		1							
<i>Rubus</i> sp.	bramble	seed											2		2
<i>Potentilla</i> sp.	cinquefoil	seed													
<i>Viola</i> sp.	violet	seed					1								
<i>Linum catharticum</i> L.	fairy flax	seed													
<i>Hypericum</i> sp.	St John's-wort	seed													
<i>Epilobium</i> sp.	willow-herb	seed													
<i>Lepidium</i> type	pepperwort	seed		1											
<i>Rumex</i> sp.	dock	seed	2	1									#		
<i>Cerastium</i> sp.	mouse-ear	seed													
<i>Silene</i> sp.	campion	seed	3												
Amaranthaceae	goosefoot family	seed	###	16		1		#							
<i>Calluna vulgaris</i> (L.) Hull	heather	seed													
<i>Calluna vulgaris</i> (L.) Hull	heather	stem fragments		6						2					
<i>Calluna vulgaris</i> (L.) Hull	heather	flower			1					1					
<i>Erica tetralix</i> L.	cross-leaved heath	leaves		2											
<i>Myosotis</i> sp.	forget-me-not	seed													

Borehole			2	2	2	2	3	3	3	3	3	3	3	3	3
Depth m BGL			1.51-1.60	1.89-2.00	6.95-7.00	7.00-7.04	2.21-2.26	2.5-2.6	3.5-3.6	4.50-4.60	5.6-5.7	6.00-6.05	6.05-6.10	6.10-6.15	6.15-6.19
<i>Solanum</i> sp.	nightshade	seed		1											
<i>Ajuga reptans</i> L.	bugle	seed													
<i>Prunella vulgaris</i> L.	selfheal	seed		1											
<i>Mentha</i> sp.	mint	seed		1	3		4								
<i>Euphrasia/Odontites</i>	eyebright/bartsia	seed		1											
<i>Cirsium/Carduus</i> sp.	thistle	seed	1												
<i>Lapsana communis</i> L.	nipplewort	seed													
Senecioneae	ragworts	seed													
<i>Sambucus nigra</i> L.	elder	seed													
Apiaceae	carrot family	seed													
<i>Torilis</i> sp.	hedge-parsley	seed	1												
Waterlogged plant stem			##	####					#						
Waterlogged Wood			###	##	##	##	###					##	##	##	##
Charcoal <2mm			###	##	##		##	###			##				
Charcoal >2mm			##												
Insects			###	###	##		#								
Moss															
Formanifera										##					
Ostracods										##					
Chara					#					#					
Molluscs								#		#					
Fish/Animal bone			#	#											

Table C1: Assessment of environmental bulk samples, Chapel Street

Borehole			6	6	6	6	6	9	9	9	9	10	14	14	14	14	15
Depth m BGL			1.45-1.55	1.55-1.65	1.65-1.77	2.49-2.53	2.74-2.80	1.84-1.94	1.94-2.00	2.15-2.25	2.25-2.35	2.60-2.75	1.25-1.40	1.81-1.86	1.88-1.90	2.00-2.15	4.40-4.55
Flot size (ml)			80	100	120		70	100	40	120	200	60	50	70	100	100	200
% Scanned			100	100	50	100	100	100	100	50	25	100	100	100	100	100	100
CHARRED																	
<i>Triticum</i> sp	wheat	grain	1				1			1			1				
<i>Hordeum vulgare</i>	barley	grain	2	2	2					1			3				
<i>Avena</i> sp.	oat	grain	1	2					1								
Cereale	indet cereal	grain			1									1			
<i>Hordeum vulgare</i>	barley	rachis node											1				
<i>Avena</i> sp.	oat	awn											1				
Cereale	indet cereal	rachis						1									
<i>Trifolium/Melilotus/Medicago</i>	clover/melilot/medick	seed											2				
<i>Ranunculus</i> sp.	buttercup	seed											1				
<i>Polygonum aviculare</i> L.	knotgrass	seed											2				
<i>Plantago lanceolata</i> L.	ribwort plantain	seed											1				
<i>Centaurea</i> sp.	knapweed	seed											1				
<i>Cirsium/Carduus</i> sp.	thistle	seed											1				
<i>Anthemis cotula</i> L.	stinking chamomile	seed											1				
<i>Eleocharis</i> sp.	spike-rush	seed		1									2				
<i>Juncus</i> sp.	rush	seed											2				
Poaceae	grass (large)	seed											3				
Poaceae	grass (medium)	seed					1			2			1				
Poaceae	grass (small)	seed		1									4				
Poaceae	grass (large)	seed															
WATERLOGGED																	
Cultivars																	
Cereale	indet cereal	culm node												1			
Cereale	indet cereal	rachis				1									2		
<i>Malus</i> sp.	apple	seed					1					2					
<i>Fragaria vesca</i> L.	wild strawberry	seed								1		1					
<i>Ficus carica</i> L.	fig	seed		3	1			1						1			
Plants of waste, cultivated or open ground																	
<i>Papaver</i> sp.	poppy	seed	1					1			1	2					1
<i>Aphanes</i> sp.	parsley-piert	seed															1
<i>Urtica dioica</i> L.	common nettle	seed											####				1
<i>Urtica urens</i> L.	small nettle	seed											1				
<i>Linum usitatissimum</i> L.	flax	seed															
<i>Reseda luteola</i> L.	weld	seed	13	###	17	12	####	16	6	10	4						1

Borehole			6	6	6	6	6	9	9	9	9	10	14	14	14	14	15
Depth m BGL			1.45-1.55	1.55-1.65	1.65-1.77	2.49-2.53	2.74-2.80	1.84-1.94	1.94-2.00	2.15-2.25	2.25-2.35	2.60-2.75	1.25-1.40	1.81-1.86	1.88-1.90	2.00-2.15	4.40-4.55
<i>Brassica</i> sp.	cabbages	seed	1	9	10	3	1	2		3		1	3	3		2	
<i>Raphanus raphanistrum</i> L.	wild radish	seed capsule		1		1											
<i>Thlaspi arvense</i> L.	field penny-cress	seed						1									
<i>Persicaria</i> sp.	knotweed	seed		2						2	2		4		2		
<i>Persicaria lapathifolia</i> (L.) Delarbre	pale persicaria	seed										4		1		1	3
<i>Polygonum aviculare</i> L.	knotgrass	seed		#	1			1				1		4	1		
<i>Fallopia convolvulus</i> (L.) A. Love	black-bindweed	seed			1												
<i>Stellaria media</i> (L.) Vill.	common chickweed	seed		1	1	1	1	3			6	4	1	5		19	
<i>Spergula arvensis</i> L.	corn spurrey	seed										3					
<i>Agrostemma githago</i> L.	corncockle	seed						2				1				1	
<i>Agrostemma githago</i> L.	corncockle	seed coat fragment			#					#	##	###			4	#	##
<i>Anagallis arvensis</i> L.	scarlet pimpernel	seed										1	2				
<i>Hyoscyamus niger</i> L.	henbane	seed			1			3	2					1			
<i>Plantago major</i> L.	greater plantain	seed		1		2									1	2	
<i>Centaurea</i> sp.	knapweed	seed		1	1			1		2					1	1	
<i>Sonchus</i> sp.	sowthistle	seed									1	1			2	1	
<i>Anthemis cotula</i> L.	stinking chamomile	seed		1	2	1	1	1		4	5	8	1	1	5	12	3
<i>Glebionis segetum</i> (L.) Fourr.	corn marigold	seed												1	1		
<i>Valerianella dentata</i> (L.) Pollich	narrow-fruited cornsalad	seed			1								2				
<i>Scandix pecten-veneris</i> L.	shepherd's needle	seed															
<i>Conium maculatum</i> L.	hemlock	seed										1					
Wood, scrub and hedgerow plants																	
<i>Alnus glutinosa</i> (L.) Gaertn.	alder	seed								1							
<i>Betula</i> sp.	birch	seed															
<i>Corylus avellana</i> L.	hazel	nutshell fragment			1				1			10F				1	
Grassland plants																	
<i>Stellaria graminea</i> L.	lesser stitchwort	seed							2							1	
<i>Hypochaeris</i> sp.	cat's-ears	seed		1				1									
<i>Leontodon</i> sp.	hawkbit	seed								1		2		1	2	2	
<i>Picris</i> sp.	hawkweed oxtongue	seed															
Poaceae	grass (small)	seed		1	3	4		2			###	3	1	9	###	###	
Wet ground and aquatic plants																	
<i>Ranunculus sceleratus</i> L.	celery-leaved buttercup	seed														1	
<i>Ranunculus</i> subgenus <i>Batrachium</i>	crowfoot	seed				1		1		1			1	1		1	

Borehole			6	6	6	6	6	9	9	9	9	10	14	14	14	14	15
Depth m BGL			1.45-1.55	1.55-1.65	1.65-1.77	2.49-2.53	2.74-2.80	1.84-1.94	1.94-2.00	2.15-2.25	2.25-2.35	2.60-2.75	1.25-1.40	1.81-1.86	1.88-1.90	2.00-2.15	4.40-4.55
<i>Myrica gale</i> L.	bog-myrtle	fruit				5			2								
<i>Nasturtium</i> sp.	water-cress	seed		1													
<i>Silene flos-culculi</i> (L.) Clairv.	ragged-robin	seed									1						
<i>Lycopus europaeus</i> L.	gypsywort	seed			1												
<i>Menyanthes trifoliata</i> L.	bogbean	seed		1	1	1	3			1	1						
<i>Bidens</i> sp.	bur-marigold	seed													1		
<i>Hydrocotyle vulgaris</i> L.	marsh pennywort	seed	1	1	2	12		1									
<i>Oenanthe</i> sp.	water-dropwort	seed				1										1	
<i>Apium</i> sp.	marshwort	seed							1	2						2	
<i>Lemna</i> sp.	duckweed	fruit															
<i>Alisma plantago-aquatica</i> L.	water-plantain	seed															
<i>Potamogeton</i> sp.	pondweed	seed			1	1											1
<i>Sparganium erectum</i> L.	branched bur-reed	fruit												2			
<i>Typha</i> sp.	bulrush	seed															
<i>Juncus</i> sp.	rush	seed	###	###	###	##		###	##	##	##	###	####	####	###	####	###
Cyperaceae	sedge family	seed															
<i>Schoenoplectus</i> sp.	club-rush	seed		3	7			5	1	3	2		###	2	####	4	1
<i>Eleocharis</i> sp.	spike-rushes	seed		3	3		3	1	1		2	1	####	2	4	7	
<i>Cladium mariscus</i> (L.) Pohl	great fen-sedge	seed		6	7	12	25	11	6	11	4	1		1		2	
<i>Carex</i> sp.	sedge	seed	5	###	11	6	8	10	3	3	15	6	###	3	9	4	1
Plants from broad ecological groupings																	
<i>Ranunculus</i> sp.	buttercup	seed	2	10	6		1	10	2	7	10	9	12	4	3	11	
<i>Rubus</i> sp.	bramble	seed	1														
<i>Potentilla</i> sp.	cinquefoil	seed			1	1			1	1		2	9		2	1	
<i>Viola</i> sp.	violet	seed									1						
<i>Linum catharticum</i> L.	fairy flax	seed								1							
<i>Hypericum</i> sp.	St John's-wort	seed			1												
<i>Epilobium</i> sp.	willow-herb	seed															
<i>Lepidium</i> type	pepperwort	seed						1			4	3	1	1			
<i>Rumex</i> sp.	dock	seed	1	3	7		4	2	2		7	5	4	2	2	4	
<i>Cerastium</i> sp	mouse-ear	seed									2						
<i>Silene</i> sp.	campion	seed		1	2	2	1	2			2		1		1	9	
Amaranthaceae	goosefoot family	seed	4	###	23	2	7	9	2	4	5	18	###	9		14	1
<i>Calluna vulgaris</i> (L.) Hull	heather	seed				3											
<i>Calluna vulgaris</i> (L.) Hull	heather	stem fragments				####	1				1						
<i>Calluna vulgaris</i> (L.) Hull	heather	flower				###											
<i>Erica tetralix</i> L.	cross-leaved heath	leaves				###											

Borehole			6	6	6	6	6	9	9	9	9	10	14	14	14	14	15	
Depth m BGL			1.45-1.55	1.55-1.65	1.65-1.77	2.49-2.53	2.74-2.80	1.84-1.94	1.94-2.00	2.15-2.25	2.25-2.35	2.60-2.75	1.25-1.40	1.81-1.86	1.88-1.90	2.00-2.15	4.40-4.55	
<i>Myosotis</i> sp.	forget-me-not	seed									2							
<i>Solanum</i> sp.	nightshade	seed						2										
<i>Ajuga reptans</i> L.	bugle	seed						1										
<i>Prunella vulgaris</i> L.	selfheal	seed			1										1			
<i>Mentha</i> sp.	mint	seed	1		1	1					1			1	1	1	1	
<i>Euphrasia/Odontites</i>	eyebright/bartsia	seed										3		1				
<i>Cirsium/Carduus</i> sp.	thistle	seed					1	1										
<i>Lapsana communis</i> L.	nipplewort	seed						1		1			1					
Senecioneae	ragworts	seed			1													
<i>Sambucus nigra</i> L.	elder	seed								1								
Apiaceae	carrot family	seed		1								1						
<i>Torilis</i> sp.	hedge-parsley	seed																
Waterlogged plant stem					###		##			####	###	###		#	####			
Waterlogged Wood																	####	
Charcoal <2mm			####	###	###	##	##	####	###	###	###	####	###	####	###	####	##	###
Charcoal >2mm			###	#	##			##			#							
Insects			##		##			##	##	###	##	###		#	##			
Moss						##		##			#	##		#	#	#		
Formanifera																		
Ostracods				#														
Chara			#						#								#	
Molluscs				#	#				#									
Fish/Animal bone			#	##	#		1		#									

Table C1 cont.: Assessment of environmental bulk samples, Chapel Street

C.2 Pollen

By Mairead Rutherford

Introduction

C.2.1 Eight sub-samples from three boreholes from the Chapel Street Car Park site were submitted to Oxford Archaeology North, for pollen assessment.

Methodology

C.2.2 The samples for pollen assessment were prepared by Neil Jones at PalaeoStrat Ltd., using a standard chemical procedure (method B of Berglund and Ralska-Jasiewiczowa 1986), using HCl, NaOH, sieving, HF, and Erdtman's acetolysis, to remove carbonates, humic acids, particles > 170 microns, silicates and cellulose, respectively. The samples were then stained with safranin, dehydrated in tertiary butyl alcohol, and the residues mounted in 2000cs silicone oil. Slides were examined at a magnification of 400x by ten equally spaced traverses across at least two slides to reduce the possible effects of differential dispersal on the slides (Brooks and Thomas 1967) or until at least 100 pollen grains were counted, where the total land pollen (TLP) count is comprised of trees, shrubs and herbs. Fern spores and pollen of aquatic plants are counted separately. Pollen identification was made following the keys of Moore *et al.* (1991), Faegri and Iversen (1989), and a small modern reference collection. Identification of non-pollen palynomorphs (NPP) follows van Geel (1978). Plant nomenclature follows Stace (2010). The preservation of the pollen was noted, and an assessment was made of the potential for further analysis.

Results

C.2.3 Sub-samples assessed for pollen are listed below in Table C2.1.

Borehole	Depth (m BGL)	Lithology	Interpretation	Age	Pollen Recovery
BH02	1.58-1.59	Organic silty sand	Organic pre-occupation surface	Saxon/Norman	Good
BH02	7.02-7.03	Organic silt	Organic alluvium	Early Bronze Age	Good
BH03	2.50-2.51	Sandy silt	Sandy alluvium	-	Medium
BH03	4.50-4.51	Organic silty clay	Fine alluvium	-	Medium
BH03	6.07-6.08	Sand/peat clasts	Organic alluvium	Iron Age	Poor
BH03	6.17-6.18	Sand/peat clasts	Organic alluvium	Iron Age	Poor
BH06	2.50-2.51	Peat	Peat	Saxon/Norman	Poor
BH06	2.77-2.78	Sandy silt	Organic alluvium		Poor

Table C2.1: Details of pollen sub-sampling, Chapel Street

Pollen assessment

- C.2.4 The pollen assemblages derived from the borehole spot-samples outlined in Table C2.1 (above), are described, and then interpreted. The results are given in Table C2.2.

Borehole BH02

- C.2.5 Pollen sub-samples from an upper organic unit at 1.58–1.59m, dated to the Saxon-Norman period and from an organic silt layer from 7.02–7.03m, dated to the Early Bronze Age, produced good pollen assemblages. The oldest sub-sample contained relatively little tree and shrub pollen, with records of alder (*Alnus*), hazel-type (*Corylus avellana*-type), oak (*Quercus*), elm (*Ulmus*) and birch (*Betula*). Herb pollen recorded an abundance of grasses (Poaceae) with commonly occurring sedges (Cyperaceae) and pollen of the goosefoot family (Amaranthaceae, formerly Chenopodiaceae, a large group including plants of arable ground such as fat-hen (*Chenopodium album*), as well as coastal/saltmarsh taxa including, for example, glassworts (*Salicornia*-type), oraches (*Atriplex*-type) and sea-blites (*Suaeda*-type). Occurrences of pollen of the daisy family (Asteraceae, another large plant group which could include, for example, sea aster (*A. tripolium*), mugworts (*Artemisia*-type), docks/sorrels (*Rumex*-type), thistles (*Cirsium*-type), ribwort plantain (*Plantago lanceolata*) and the halophyte plant, thrift (*Armeria maritima*) were also recorded. Rare fern spores included occurrences of common polypody (*Polypodium vulgare*), bracken (*Pteridium aquilinum*) and monolete ferns (Pteropsida). Pollen from aquatic plants includes occurrences of lesser bulrush (*T. angustifolia*). The freshwater algal type *Botryococcus* (HdV-766) is present. Marine foraminiferal test linings as well as fragments of marine plankton, preserved as dinoflagellate cysts, are also recorded. Microcharcoal is recorded in small quantities.
- C.2.6 The upper sub-sample dated to the Saxon-Norman period, contains a very different pollen assemblage to that described above from the Early Bronze Age assemblage. Tree and shrub pollen is rare, with the most frequent record being that of heather (*Calluna*). Herbs are dominated by pollen of cereal-types, the dimensions suggesting probable wheat/oats (*Triticum/Avena*), although the possibility of these grains representing wild rather than cultivated grasses cannot be ruled out (Andersen 1979). A diverse range of herb pollen includes common occurrence of grasses, goosefoot and daisy families, cornflower (*Centaurea cyanus*), ribwort plantain, and cabbage family (Brassicaceae, a large group including cabbages, separately identified as part of the waterlogged remains from 1.51–1.60m in BH2 (J. Meen, this report)). Occurrences of common knapweed (*C. nigra*), thistles, bindweed (*Calystegia*-type), docks/sorrels, mugworts and sedges are also recorded. Pollen of the aquatic plant, pondweed (*Potamogeton*) is recorded. Microcharcoal counts are moderate.

Borehole BH03

- C.2.7 Four sub-samples were assessed. The two deepest sub-samples, at 6.07–6.08m and 6.17–6.18m, from an organic alluvium deposit, dated to the Iron Age, produced very little pollen. Pollen slides from both depths contained abundant mineralised organic matter with clumps of cellular plant debris. Pollen grains of alder, hazel-type, birch and oak were recorded, along with pollen of the goosefoot family (in the deeper sub-sample only).

- C.2.8 A spot sub-sample, at 4.50–4.51m, produced a moderate pollen assemblage, with pollen of the goosefoot family and grasses the dominant pollen types recorded. Tree and shrub pollen included occurrences of birch, pine (*Pinus*), lime (*Tilia*), alder, hazel-type, oak and heather. Amongst the herbs, cereal-type pollen is present in low numbers, along with occurrences of ribwort plantain, docks/sorrels, sedges and dandelion-types. Fern spores and some *Sphagnum* moss spores are also recorded. Pollen from aquatic plants includes occurrences of lesser bulrush and pondweed. Dinoflagellate cysts are present in low frequency and include *O. centrocarpum* and *Spiniferites* spp. Of significance is the quantity of reworked (pre-Quaternary) pollen. Low frequencies of microcharcoal are present.
- C.2.9 The spot sub-sample at 2.5m provided an apparently rich assemblage of pollen, but on assessment, this proved to be a mixed assemblage of Holocene pollen and a greater proportion of reworked pre-Quaternary pollen. The Holocene assemblage is dominated by pollen of the goosefoot family and grasses, with occurrences of docks/sorrels, sedges, pollen of the cabbage family, rare cereal-types and ribwort plantain. One grain of common sea lavender (*Limonium vulgare*) is recorded. Tree and shrub pollen include occurrences of hazel-type, alder, pine, birch, oak and elm. Monoletate fern spores are commonly present as well as rare occurrence of common polypody and bracken. The dinoflagellate cyst assemblage includes relatively commonly occurring *O. centrocarpum*, with presence of *Bitectatodinium tepikiense*, *Spiniferites ramosus* and *Spiniferites* spp. Foram test linings are also recorded. Microcharcoal is relatively commonly recorded.

Borehole BH06

- C.2.10 Two spot sub-samples were assessed from BH06, from a thin peat and sandy silt alluvial deposit. Neither sub-sample produced good pollen assemblages, with the deepest sub-sample containing largely black mineral and microcharcoal. The sub-sample at 2.50–2.51m, dated to the Saxon-Norman period, contained tree and shrub pollen including mostly heather, with alder, hazel-type and oak. Herb pollen contained a poorly diverse assemblage of grasses, pollen of the goosefoot, cabbage and daisy families, ribwort plantain and mugworts. *Sphagnum* moss spores are frequently recorded. Microcharcoal particles are also present.

Pollen interpretation

- C.2.11 The only sub-samples with sufficient pollen from which to draw an interpretation are from BH02 (1.58–1.59m and 7.02–7.03m) and, with less reliability, from BH03 at 2.50–2.51m and 4.50–4.51m.
- C.2.12 BH02 – the Early Bronze Age (sub-sample 7.02–7.03m): the pollen assemblages may be interpreted to suggest largely open grassy palaeoenvironments, with the presence of halophytic taxa such as thrift and pollen of the goosefoot family, indicative of probable saltmarsh habitats. Dinoflagellate cysts and foram test linings, if *in situ*, are indicative of marine influence. Freshwater environments are also present locally, an interpretation based on occurrences of pollen from aquatic plants (lesser bulrush) and freshwater algae (*Botryococcus* HdV-766). Coastal reedswamps or sedge fens may

have been a source of commonly occurring sedge pollen. Tree and shrub pollen may have been derived from regional inland areas and deposited via wind or water.

- C.2.13 BH02 – Saxon-Norman (sub-sample 1.58–1.59m): The pollen assemblage, on balance, reflects derivation from a probable arable source, as it is dominated by grains of wheat/oats and associated weeds of cultivation (for example, cornflower). Arable crops may have been deposited at the site following transport of taxa in freshwater channels or through discard of hay or straw used for animal food or bedding or discard of food waste. There is evidence for possible regional development of heathland, from which heather pollen may have been wind derived.
- C.2.14 BH03 – 4.50–4.51m – undated but no older than Iron Age: The assemblage may be interpreted to suggest potential saltmarsh or mudflat environments, based on the relative abundance of pollen of the goosefoot family and grasses. Dinoflagellate cysts, if *in situ*, would support an environment proximal to the coast. Cereal-type pollen may have been deposited at the site *via* freshwater channels, with evidence for aquatic environments from pollen of bulrushes and pondweed. Tree and shrub pollen is probably wind-derived from a regional source. The quantity of pre-Quaternary reworked pollen suggests probable erosive events, as might be expected, for example, through channel migration.
- C.2.15 BH03 – 2.50–2.51m – undated but no older than Iron Age: The pollen assemblage derived from this upper estuarine clay series yields abundant pollen of the goosefoot family as well as halophytes such as common sea-lavender, together interpreted as indicative of possible saltmarsh or mudflat coastal environments. The presence of foram test linings and dinoflagellate cysts further support marine environments. The dinoflagellates include types commonly found in marine Holocene sediments around the coast of the UK (including *Operculodinium centrocarpum*, *Spiniferites ramosus*, *Bitectatodinium tepikiense* and *Spiniferites* spp.) but could also derive from Pleistocene or older rocks. There is no clear way of knowing if these taxa are *in situ* or reworked but they could have been deposited, for example, following channels of sea water migrating through mudflats and saltmarshes. *B. tepikiense* is a common component in Quaternary sequences around the British Isles and has previously been reported from estuarine environments (Harland 1983). Evidence for pre-Quaternary reworking is strong, with more reworked pollen than *in situ* Holocene pollen recorded; this is interpreted to suggest probable erosion and transport through channelling.

Recommendations

- C.2.16 The assessed pollen data provide evidence of mixed recovery of pollen. The Early Bronze Age organic deposit, from which good pollen assemblages were recorded from BH02 (7.02–7.03m), could be sub-sampled more closely (at 0.02m intervals) to look at changes through the thin organic deposit within the estuarine/alluvial sequences. This would provide data not just on local and regional former environments but data that could, potentially, be linked to the sea level curve for the Wash (Shennan and Horton 2002). The second sub-sample from BH02 (1.58–1.59m) provides evidence of Saxon-Norman palaeoenvironments and potential land use, and along with further sub-samples from the organic interval, could also be subject to full analysis.

C.2.17 The pollen assessed from BH03, at both 2.50–2.51m and 4.50–4.51m, contains some Holocene pollen but also abundant reworked pre-Quaternary pollen. Both sub-samples appear to provide evidence for saltmarsh and/or mudflat palaeoenvironments. Further work on these samples is unlikely to alter the assessment interpretation and analysis would be compromised by the abundance of reworked pollen, which could also impact further radiocarbon dating.

C.2.18 Sub-samples assessed from the deeper organic deposits from BH03 and sub-samples from BH06 did not provide sufficient pollen to warrant further work.

Borehole		BH02	BH02	BH03	BH03	BH03	BH03	BH06	BH06
Preservation		Good	Good	Good	Good	Good	Good	Good	Mixed
Potential		YES	YES	NO	NO	NO	NO	NO	NO
Depth (m)		1.58- 1.59	7.02- 7.03	2.50- 2.51	4.50- 4.51	6.07- 6.08	6.17- 6.18	2.50- 2.51	2.77- 2.78
Trees/Shrubs									
<i>Alnus</i>	Alder	3	2	4	4	1	4	3	
<i>Betula</i>	Birch		1	1	5		1		
<i>Quercus</i>	Oak	1	6	5	9		2	1	
<i>Corylus avellana</i> -type	Hazel-type	5	3	6	5	1	2	7	
<i>Pinus</i>	Pine			3	4				
<i>Ulmus</i>	Elm		1	1					
<i>Calluna</i>	Heather	12			1			10	
<i>Tilia</i>	Lime				1				
Crops									
<i>Cerealia</i>	Cereal-type	46		2	2				
Herbs									
Amaranthaceae/ Chenopodiaceae	Goosefoot family	5	9	41	13		2	1	
<i>Armeria maritima</i>	Thrift		1						
<i>Artemisia</i> -type	Mugworts	1	1					1	
Asteraceae	Daisy family	3	1					2	
Brassicaceae	Cabbage family	3		2				1	
<i>Calystegia</i> -type	Bindweeds	2							
Caryophyllaceae	Pinks family								
<i>Centaurea cyanus</i>	Cornflower	4							
<i>Centaurea nigra</i>	Common knapweed	1							
<i>Cirsium</i> -type	Thistles	1	1						
Cyperaceae	Sedges	1	15	3	1				
Fabaceae	Pea family	1		1	2				
<i>Mentha</i> -type	Mints								
<i>Limonium vulgare</i> -type	Common sea-lavender			1					
<i>Plantago lanceolata</i>	Ribwort plantain	5	2	5	3			1	
Poaceae	Grasses	12	71	9	9			5	
<i>Rumex</i> spp.	Docks/Sorrels	2	2	2	1				
<i>Scutellaria</i> -type	Skullcaps			1					
<i>Taraxacum</i> -type	Dandelion-type	2		2	1				
<i>Trifolium</i> -type	Clover-type								
	Total land pollen	110	116	89	61	2	11	32	0
	Traverses	3	2	10	10	10	10	10	10
Fern spores									
<i>Polypodium vulgare</i>	Polypodies		1	1	1				
<i>Pteridium aquilinum</i>	Bracken		1	1	1				
Pteropsida	Monolete ferns	1	1	9	6		8	4	
Aquatics									
<i>Potamogeton</i> -type	Pondweeds	1			1				
<i>Typha angustifolia</i>	Lesser Bulrush		9	2	2				
Mosses									
<i>Sphagnum</i>	Moss spores	1		1	3			8	
Microscopic charcoal		35	8	20	4			25	35
Green algae									
<i>Botryococcus</i> HdV-766		1	1	1	1				
<i>Pediastrum</i> HdV-760				1					
NPP									

Borehole	BH02	BH02	BH03	BH03	BH03	BH03	BH06	BH06
Preservation	Good	Good	Good	Good	Good	Good	Good	Mixed
Potential	YES	YES	NO	NO	NO	NO	NO	NO
Depth (m)	1.58- 1.59	7.02- 7.03	2.50- 2.51	4.50- 4.51	6.07- 6.08	6.17- 6.18	2.50- 2.51	2.77- 2.78
HdV-114			1		1	2		
HdV-128		2		1	1	2		
<i>Glomus</i> HdV-207			1					
<i>Sordaria</i> HdV-55A/B			1					
Dinoflagellate cysts								
Dinocyst spp. (fragments)		1	6	3				
<i>Bitectatodinium tepikiense</i>			3					
<i>Operculodinium centrocarpum</i>			6	3				
<i>Spiniferites ramosus</i>			1					
<i>Spiniferites</i> spp.			3	1				
<i>Tectatodinium</i> spp.			1					
Foraminiferal test linings		1	2					
Deteriorated								
Broken grains	2	1	1	1				
Concealed grains	4	2	1	1				
Crumpled grains		4	1	2			1	
Reworked		2	108	71		3		

Table C2.2: Pollen assemblages, Chapel Street

C.3 Ostracods and Foraminifera

By John Whittaker

Introduction

C.3.1 Nine samples from three boreholes (BH02, BH03 and BH06) were submitted for assessment from the Chapel Street site, just to east of the River Great Ouse in Kings Lynn. The sediments are estuarine in nature, predominantly minerogenic silt clays dating from the Bronze Age to the medieval period. The purpose of the assessment was to ascertain the level of preservation of foraminifera and ostracod assemblages and consider the potential of the sequences for detailed analysis with reference to palaeohydrology.

Method

C.3.2 The samples were first placed in ceramic bowls and dried in an oven. After drying a small quantity of sodium carbonate was added to facilitate the removal of the clay fraction and to ease the separation of the organic matter. The sediment mix was immersed in hot water and left to soak overnight. Sediment was then washed through a 75 micron sieve with hand-hot water, the resulting residue being returned to the bowl for drying. Once thoroughly dry the residue was transferred to plastic labelled bags for storage and picking. For examination, the residue was first sieved through a nest of >500 μ , >250 μ and >150 μ sieves. Sediment from each grade was then picked by sprinkling a small amount of residue onto a tray and examining it under a binocular microscope. A representative selection of material from each sample of potential environmental value was picked out into 3x1" plastic faunal slides and recorded on a presence/absence basis. Detailed recording of the foraminiferal species was finally undertaken and is presented as semi-quantitative indications (Table C3).

Results

- C.3.3 Two samples were examined for ostracods and foraminifera from BH02. Although the faunas are of low diversity and small in size (probably due to low salinity), the results are clear cut. The lowest sample is from gleyed bluish grey minerogenic silt clay at 7.20–7.24m, below the organic horizon dated to the Early Bronze Age. It contains the foraminifera species *Haynesina germanica*, typical of brackish mudflats. Together with the ostracod *Cyprideis torosa* this suggests a sheltered brackish creek.
- C.3.4 The upper Early Bronze Age sample at 7.01–7.03m was very organic and contained the agglutinating foraminifera *Jadammina macrescens*, a herbivore and detritivore typical of mid-high saltmarsh.
- C.3.5 Five samples were examined from borehole BH03, covering the interval 2.50m to 6.54m BGL. This is equivalent to deposits at similar depths in adjacent BH02 and predominantly consists of bluish grey gleyed silt clays, although weathered sand occurs above 3m BGL.
- C.3.6 Initially at 6.50–6.54m, of probable Early Bronze age to Early Iron age date, the presence of *Haynesina germanica* and *Cyprideis torosa* suggest a similar environment to BH02 at 7.20–7.24m, a sheltered brackish creek. However, in the samples between 5.60m and 2.50m (post-Iron Age) the environment was probably more open estuarine mudflats with the brackish foraminifera *Haynesina germanica* more common and the addition of *Ammonia* sp. Towards the top of the sequence in BH03 at 2.50–2.54m brown mineral within the sample suggests a weathered sand horizon, not far below a horizon dated to the medieval period in BH02.
- C.3.7 The two samples from BH06, deriving from the laminated sands from the channel edge dated to the medieval period contain evidence of human occupation (e.g. charred plant remains), in a similar brackish environment, although no microfossils were noted at 2.58–2.71m.

Conclusions

- C.3.8 Overall preservation of foraminifera was moderate within the samples examined from the natural tidal sequences, apart from the Early Bronze Age organic alluvium in BH02 (7.01–7.03m BGL) where only a few specimens of *Jadammina macrescens* were found indicating the development of mid to high saltmarsh. Other than that, there appears little environmental change within the sequences apart from a shift from brackish tidal creeks to estuarine brackish mudflats after the Early Iron Age, above 5.64m BGL. The foraminifera assemblages were of quite low diversity with only three species identified and offer limited potential for further analysis to provide significant additional data.
- C.3.9 Ostracods were found to be very poorly preserved with only one species identified at the base of the sequence and there is no potential for detailed analysis.

Borehole	BH02		BH03				BH06		
Depth (m BGL)	7.20-7.24	7.01-7.03	6.50-6.54	5.60-5.64	4.50-4.54	3.50-3.54	2.50-2.54	2.58-2.62	2.67-2.71
Contained material									
brown mineral							x		
plant remains (charred)								x	x
sand/grit cemented								x	x
bone fragments (? fish)									x
molluscs/shell fragments	x				x		x		x
plant debris	x	x	x	x	x	x	x		
brackish foraminifera	x	x	x	x	x	x	x		x
brackish ostracods	x		x						
Ecology	<i>Brackish creek</i>	<i>Salt marsh</i>	<i>Brackish creek</i>	<i>Brackish estuarine mudflats</i>		<i>Weat hered</i>	<i>Brackish with human habitation</i>		
Brackish Foraminifera									
<i>Jadammina macrescens</i>		+							
<i>Haynesina germanica</i>	++		+	++	++	++	++		++
<i>Ammonia</i> (brackish sp.)				+	+		++		+
Brackish Ostracods									
<i>Cyprideis torosa</i>	+		+						

present = x, + = several specimens, ++ = common

Table C3: Foraminifera and ostracod assemblages, Chapel Street.

C.4 Faunal remains

By Rebecca Nicholson

Introduction and methodology

- C.4.1 During sub-sampling of the boreholes at the Chapel Street site, a small number of mammal and fish bone fragments were recovered, as well as occasional marine shells. These were identified with the aid of the faunal reference collections held at Oxford Archaeology South and by the author. The results are presented in Table C4.
- C.4.2 All of the faunal remains come from deposits of medieval date or later and are likely to derive from general urban refuse. The small bivalves in BH03 may have been accidentally harvested with larger shellfish.
- C.4.3 The faunal remains have no additional research potential, they have been recorded and do not merit retention in the archive.

Bore	Depth (m BGL)	Context	Material	Notes
BH03	1.35-1.45m	20	Fish	Five indeterminate fragments of fish bone, in poor condition.
BH03	1.45-1.55m	20	Shell	A single tiny clam, cf <i>Tellina</i> sp.
BH03	1.55-1.65m	20	Shell	A single immature cockle (<i>Cerastoderma edule</i>) left valve.
BH03	1.65-1.75m	21	Shell	A single fragment of cockle (<i>Cerastoderma</i> sp.) shell
BH06	1.65-1.77m	28	Shell	A single fragment of an oyster (<i>Ostrea edulis</i>) right valve
BH06	1.65-1.77m	28	Fish	A single indeterminate fish fin ray

Bore	Depth (m BGL)	Context	Material	Notes
BH09	1.84-1.94m	33	Fish	A single plaice (<i>Pleuronectes platessa</i>) or flounder (<i>Platichthys flesus</i>) precaudal vertebra.
BH09	1.84-1.94m	33	Shell	A single fragment of mussel (cf <i>Mytilus</i> sp.) shell
BH09	2.15-2.25m	34	Fish	A single eroded fragment of a probable flatfish (Pleuronectidae/Scophthalmidae) quadrate.
BH09	2.25-2.36m	35	Bone	A sheep/goat (<i>Ovis/Capra</i>) first phalange, fused.
BH14	1.25-1.40m	14	Bone	A fragment of large mammal vertebra, both epiphyses unfused, possibly calf. Chopped through in the median sagittal plane.
BH14	1.25-1.40m	14	Bone	A fragment of mammal vertebra, neural arch
BH14	1.25-1.40m	14	Fish	A large fish branchiostegal ray, probably Gadidae in 3 pieces and an indeterminate fragment of fish fin ray or spine.

Table C4: Faunal remains, Chapel Street

APPENDIX D ENVIRONMENTAL REPORTS: COMMON STAITHE

D.1 Environmental samples

By Rachel Fosberry

Introduction

- D.1.1 Twenty-nine sub-samples considered representative of the site sequences were taken from 17 boreholes at the Common Staithe site for the purpose of assessment of palaeoenvironmental remains.
- D.1.2 The aim of the assessment is to address the condition of preservation and provide a preliminary indication of taxonomic content in order to provide basic information on the degree of waterlogging informed by Historic England guidance (2016) and associated environments of deposition for the main stratigraphic units across the site. The assessment will also provide recommendations on the potential for further, more detailed analytical work.
- D.1.3 The samples are thought to derive from medieval and post-medieval contexts that possibly relate to occupation layers but may also have been subject to redeposition through changing ground levels as the area was developed into a working quay and mercantile area, with several warehouses and a Corn Exchange recorded in the Heritage Action Zone (Kewley 2018).

Methodology

- D.1.4 The samples measured 1L in volume. An initial attempt to process the samples using bucket flotation proved too time-consuming and the remaining samples were processed by tank flotation using modified Siraff-type equipment. The flot was collected in a 0.25mm mesh and the residue was washed through a 10mm, 5mm and 0.5mm sieve. The flots were subsequently assessed for plant remains whilst wet. The residues were then dried and sorted using a binocular microscope at low power for any artefacts and ecofacts before being bagged up and retained. The flots were assessed using a binocular microscope at magnifications up to x 80. The peat samples proved extremely difficult to sort and they were allowed to dry slightly which allowed waterlogged seeds and charred grains to become more obvious. For waterlogged plant macrofossils the degree of fragmentation and erosion/corrosion was assessed according to HE guidelines: *Preserving Archaeological Remains Appendix 2 - Preservation Assessment Techniques*. A list of the recorded remains is presented in Table D1.
- D.1.5 A portion of the flot was completely dried to allow rapid scanning to detect the presence of foraminifera and ostracods. This proved very effective as these items could not be seen in the wet samples.
- D.1.6 Identification of plant remains is with reference to the Digital Seed Atlas of the Netherlands (Cappers *et al.* 2006) and the authors' own reference collection. Nomenclature is according to Zohary and Hopf (2000) for cereals and Stace (2010) for other plants. Plant remains have been identified to species where possible. The

identification of cereals has been based on the characteristic morphology of the grains and chaff as described by Jacomet (2006).

Quantification

D.1.7 For the purpose of this assessment, items such as seeds and cereal grains have been scanned and recorded qualitatively according to the following categories: # = 1-5, ## = 6-25, ### = 26-100, #### = 100+ specimens. Items that cannot be easily quantified such as foraminifera and ostracods have been scored for abundance: + = rare, ++ = moderate, +++ = abundant, w=waterlogged, f = fragment.

Results

- D.1.8 Preservation of plant remains is predominantly by waterlogging along with occasional cereal remains preserved by carbonisation and small fragments of charcoal and coal. A waterlogged environment is anoxic in that oxygen is excluded which inhibits the decay-causing bacterial leading to the preservation of organic remains such as plants, leather, insects and wood. The state of preservation of the waterlogged plant remains from this site are variable and is favoured to more robust seeds. These seeds show low levels of deterioration. Most have a fragmentation score of 0 with a notable exception for corncockle (*Agrostemma githago*) which only occurs in a fragmented state with scores of both 3 and 4. The level of deterioration by erosion/corrosion of waterlogged seeds is also variable with some seeds such as sedges (*Carex* spp.) sometimes retaining their outer utricle whilst most seeds exhibit erosion/corrosion scores of 1 (25% erosion/corrosion). Stems of reeds/sedges are occasionally preserved as short fragments (Fragmentation score 3). Insects were noted in several of the samples, most commonly as fragmented body parts but also as whole fly puparia.
- D.1.9 With regards to observable bias due to collection and sampling strategies, there is potential for down hole contamination as the boreholes were cut and also for material to have moved within the sequences by water action. Some of the deposits are likely to represent made-up ground which could also contribute to intrusive/residual contamination.
- D.1.10 Carbonised plant remains are restricted to cereal grains, occurring in 10 samples, and three chaff items. The charred remains were all recovered from the upper deposits (above 4.8m BGL) and are most frequent in the boreholes from the central area, particularly boreholes BH07 and BH09. All four of the main cereal types are represented; oats (*Avena* sp.), barley (*Hordeum vulgare/distichon*), free-threshing wheat (*Triticum aestivum/turgidum/durum*) and rye (*Secale cereale*). Chaff items are limited to single noes of wheat and barley and a culm node (representing straw).
- D.1.11 Waterlogged plant remains occur in all of the samples with a moderate range of diversity but numbers of specimens of each taxa are low, most often occurring as single items. Seeds/nuts of possible food remains include grape (*Vitis vinifera*), fig (*Ficus carica*), sloe (*Prunus spinosa*), cherry (*Prunus cerasus/cerasifera*), damson/bullace (*Prunus domestica*) and hazelnut (*Corylus avellana*). Hazelnut shell occurs most frequently and is present in samples from each of the three areas sampled.

- D.1.12 Cereal remains, notably bran and chaff, were not noted as waterlogged remains but there are a number of plants represented though waterlogged seeds that are likely to have been arable weeds. These include corncockle (*Agrostemma githago*), stinking chamomile (*Anthemis cotula*), field penny cress (*Thlaspi arvense*), corn marigold (*Glebionis segetum*), poppy (*Papaver* sp.), fool's parley (*Aethusa cynapium*), wild radish (*Raphanus raphanistrum*), weld (*Reseda luteola*) and fat hen (*Chenopodium album*) although these weed species could have conceivably arrived on site mixed with straw. Similarly, there are weed species commonly associated with grassland such as ribwort plantain (*Plantago lanceolata*), grasses (Poaceae) and rushes (*Juncus* spp.) that could have been harvested as hay. Ruderal plants that grow on waste ground include thistles (*Carduus/Cirsium* sp.), fumitory (*Fumaria* sp.), docks (*Rumex* spp.), mustards (*Brassica/Sinapis* sp.), buttercups (*Ranunculus* spp.) and nipplewort (*Lapsana communis*). Several of the aforementioned species have more than one habitat type.
- D.1.13 Wetland plants are well-represented and include several species of sedge (*Carex* spp.), spike rush (*Eleocharis* sp.), Great Fen sedge (*Cladium mariscus*), gipsywort (*Lycopus europaeus*), blinks (*Montia fontana* ssp. *chondrosperma*) and bog-myrtle (*Myrica gale*). Plants that prefer wet soils/shallow water include water plantain (*Alisma plantago-aquatica*), water-crowfoot (*Ranunculus* subgenus *batrachium*-type), pondweed (*Potamogeton* spp.) and bogbean (*Menyanthes trifoliata*). Estuarine/saltmarsh plants are represented by seablite (*Suaeda maritima*) and, possibly, by black bog-rush (*Shoenus nigricans*). A more reliable indicator of marine organisms occurs in the form of foraminifera which are most frequent in the samples from the northern range. Ostracods were also noted in some samples and may represent marine and/or freshwater forms.
- D.1.14 Other ecofact and artefacts recovered from the bore hole samples include animal and fish bones, avian eggshell and the shells of marine molluscs, leather, pottery, ceramic building material, metalworking debris and coal.

Discussion

- D.1.15 The environmental samples from this site have produced a diverse assemblage of waterlogged seeds and a more limited assemblage of charred plant remains. The species represented is remarkably similar with those preserved at The Vancouver Centre, King's Lynn, particularly Zones B and C (Huckerby *et al.* 2011). At this site charred cereal grains were recovered in greater quantities but were considered to include grain that had been discarded along with other settlement debris which is most likely the explanation for the charred material retrieved from the Common Staithe boreholes. The samples that contain the most charred grains are from the boreholes located next to the former Corn Exchange building. Unless charred, cereal grains are rarely preserved through waterlogging. Sometimes the outer bran fragments survive but they have not in these samples. Some species of arable weeds that would have been growing amongst and harvested with the cereals are more likely to survive in a waterlogged environment and these preserved remains at Common Staithe may derive from seed corn that was brought into the site for sale through the Corn Exchange. Other food remains may also represent imports intended for storage in the various warehouses. The Vancouver Centre samples also produced native and

exotic food plants including figs, grapes and stone fruits that were similarly mixed with fish bones and fly puparia and interpreted as probable sewage waste (Huckerby *et al.* 2011, 75). There is no such direct correlation between the food remains and fly puparia at Common Staithe, but it is possible that latrine waste may be present.

D.1.16 The weed seeds at Common Staithe include a few species that have ecological requirements such as stinking chamomile which is an arable weed that prefers clay soils (Kay 1971). This species is only found in the boreholes close to the Corn Exchange building at depths between 2.2–2.4m (BH07), 3.85–3.95m (BH09) and 2.6–2.8m (BH14). Great Fen sedge prefers base-rich soils (Stace 2019, 998). It is also commonly found in the BH07 and BH09. Spike rush seeds are often found as a cereal contaminant despite requiring damp/wet soils and they are most common in BH07 at depths of 2.2 to 4.55m. There are species of spike rushes that are more commonly found in coastal areas, and it is possible that the seeds represent local flora. Bogbean and bog-myrtle, as their names suggest, are found in bogs and fens. It is interesting to note that bog-myrtle (also known as sweet gale) was recovered from the same depths in BH07 and BH09 as the stinking chamomile. It was used as a flavouring for ale as well as having other medicinal uses. Bog-bean is a plant that grows in shallow water (Stace 2019, 713) and is more likely to represent locally growing flora. It is also found in the boreholes around the Corn Exchange and is most frequent in BH12 and BH13 at the rear of the building. It is recorded from depths of 2.2m to 4.8m and may represent the use of dredged silt being used to level areas. Sedges are another freshwater/marshy land indicator, and these wetland resources would have been of great economic importance for their use in basketry, thatch as well as for fuel. Great Fen sedge which was one of the major vegetation types of fenland in this region and was commonly used for thatching and as fuel and it was particularly favoured for the use in bread ovens (Rowell 1986). It is represented by both its nutlets and as leaf fragments within the Common Staithe assemblages with some of the leaf fragments appearing to have been partially burnt.

D.1.17 Evidence for estuarine muds/saltmarsh flora is more limited. Black bog-rush grows in bogs and fens and on saltmarshes (Stace 2019, 997) and is found in BH09. A more specific plant indicator is sea-blite which grows in middle and lower parts of saltmarshes (Stace 2019, 525) and is found in BH10 (8.6–8.8m), BH13 (2.86–4.43m) and BH15 (9.6–9.7m). Foraminifera are mostly marine organisms and are the most reliable indicator for estuarine muds/saltmarsh at Common Staithe. They occur consistently in BH03, BH12 and BH13 (Northern range) at depths ranging from 2.8m to 4.8m. They occur less frequently in the central range boreholes with the notable exception of BH09 where they are present in abundance at 2.9–3m. Ostracods occur less frequently but are likely to represent marine species as they only occur in samples containing foraminifera.

D.1.18 The similarity of the plant assemblages at Common Staithe and The Vancouver Centre signifies that this vicinity shared common origins with the probability of areas of waste, possibly cultivated ground with marine incursion/s that have resulted in the preservation of organic remains including dietary waste in the form of cereals, fruit and nuts, animal and fish bone, shell fish and eggs in addition to providing information on the flora that may have been growing in the vicinity of the areas sampled.

Statement of potential and recommendations for further work

D.1.19 The ecofacts and artefacts recovered from relatively small samples from the boreholes at Common Staithe have provided an insight into the environment and economy in the medieval and post-medieval periods at King's Lynn. The samples from the occupation horizons are relatively rich in plant remains whereas those from the underlying alluvial sediments are not, and consequently have very low potential regarding plant macrofossils. The samples have been sorted and have limited potential for further work. If required, more accurate identification to species could be attempted on some of the better-preserved seeds using reference material.

D.1.20 There is good potential for the identification of foraminifera and ostracods, ideally through specific sampling if further excavations take place. Analysis of foraminifera and ostracods from a saltern site at Lynnsport (Timberlake in Clarke, forthcoming) enabled identification of several species originating from the Lower Saltmarsh/Upper Tidal Mudflats of this area of King's Lynn.

Retention, dispersal and display

D.1.21 The waterlogged flots have been divided with one portion retained wet and the other dried. The residues have been dried and retained.

Sample Number		44	45	56	71	72	73	74	75	76	77	78	79	7	8	13	26
Borehole		3	3	12	12	12	13	13	13	6	6	6	6	7	7	7	7
Context number		303	309	1201	1202	1203	1301	1302	1303	603	603	604	604	702	702	703	704
Depth BGL (m)		2.80-3.00	4.40-4.60	3.88-3.98	4.02-4.2	4.6-4.8	2.5-2.83	2.86-2.97	4.22-4.43	6.5-6.7	7.15-7.35	7.87-8.07	8.07-8.27	2.2-2.4	2.6-2.8	3.5-3.65	4.35-4.55
CHARRED Cereals																	
<i>Avena sp. caryopsis</i>	Oat (wild or cultivated)													#			#
<i>Hordeum distichon/ vulgare l. caryopsis</i>	Barley grain				#												#
<i>Secale cereale l. caryopsis</i>	Rye grain																
<i>Triticum sp. caryopsis</i>	Wheat grain					#		#	#					#			#
Cereal indet. caryopsis	Indeterminate cereal grain																#
CHARRED Chaff																	
<i>Triticum aestivum s.l rachis internode</i>	Free threshing wheat chaff																
Culm node	cereal straw					#											
Charred legumes																	
<i>Vicia faba</i>	bean					#											
WPR																	
<i>Agrostemma githago L. seed</i>	Corncockle					#	#							#			
<i>Anthemis cotula L. seed</i>	Stinking Chamomile													#			
Asteraceae	Daisy family													#	#		
<i>Anagallis arvensis L. seed</i>	Scarlet/Blue Pimpernel																
<i>Aethusa cynapium L. kernel</i>	Fool's Parsley															#	
Apiaceae indet	Carrot family							#						#	#		
Brassica spp. Seed	mustards			#	#	#			#					#	#	#	#
<i>Brassica/Sinapis sp. seed kernel</i>	Cabbages/Mustards kernel																
<i>Bupleurum rotundifolium L. seed</i>	Thorow wax													#			
<i>Carduus/Cirsium sp. seed</i>	Thistles																
<i>Chenopodium album L. seed</i>	Fat-hen						#		#					#	#		#
<i>Chenopodiaceae indet. seed</i>	Goosefoot Family	#				#	#	#									
<i>Centaurea sp. achene</i>	Cornflower-type														#		#
<i>Cerastium sp. Seed</i>	mouse-ear chickweed																#
<i>Convolvulus arvensis L. seed</i>	Field bindweed																#
<i>Fumaria officinalis L. achene</i>	Common Fumitory							#	#					#	#		
cf. <i>Foeniculum vulgare L. seed</i>	Fennel											#					
<i>Fallopia convolvulus (L.) Á. Löve achene</i>	Black-bindweed																
Geranium spp. seed	Geraniums				#	#		#						###			
<i>Glebionis segetum Cass. seed</i>	Corn marigold													#	#		#
<i>Lapsana communis L. achene</i>	Nipplewort													#			
<i>Papaver dubium/rhoeas L. seed</i>	Rough/common Poppy													#			
<i>Persicaria lapathifolia/maculosa l. (Gray) seed</i>	Pale persicaria/redshank				#	#		#									#

Sample Number		44	45	56	71	72	73	74	75	76	77	78	79	7	8	13	26
Borehole		3	3	12	12	12	13	13	13	6	6	6	6	7	7	7	7
Context number		303	309	1201	1202	1203	1301	1302	1303	603	603	604	604	702	702	703	704
Depth BGL (m)		2.80-3.00	4.40-4.60	3.88-3.98	4.02-4.2	4.6-4.8	2.5-2.83	2.86-2.97	4.22-4.43	6.5-6.7	7.15-7.35	7.87-8.07	8.07-8.27	2.2-2.4	2.6-2.8	3.5-3.65	4.35-4.55
Plantago lanceolata L. seed	Ribwort plantain																
Montia fontanasp.chondrosperma(Fenzl) Walters seed	Blinks															#	
Picris echioides L. seed	Bristly ox-tongue														#		
medium Poaceae indet. [3-4mm]	medium-seeded Grass Family													#			
Potentilla sp. seed	cinquefoils																
Polygonum aviculare L. achene	Knotgrass		#					#									#
Polygonum sp. seed	Knotgrasses	#															
Ranunculus cf. acris L./repens L./bulbosus L. achene	cf. Meadow/Creeping/Bulbous Buttercup	#						##						##	#		#
Ranunculus cf. lingua L. seed	Greater spearwort																
Ranunculus sp. seed	Buttercups					#											
Raphanus raphanistrum L. sequilla	Wild radish seed case																
Rumex sp. Achene	small-seeded Docks	#						#						#			
Reseda luteola sp. seed	weld	#	#		#	#											
Silene sp. Seed	Campions	#				#	#	#						#	#		#
Sonchus asper L. Hill achene	Prickly sow-thistle				#												
Stellaria media (L.) Vill. Seed	Common Chickweed										#						
smallTrifolium spp. (<1mm) seed	small-seeded Clovers																
largeTrifolium/Medicagospp. (2-3mm) seed	large-seeded Clovers/Medicks																
Thapsi arvensis L. seed	Field penny cress																
Urtica dioica L. seed	Common Nettle		#		#												
INDET SEEDS			#					##						#			#
Wetland/aquatic plants																	
Alisma plantago aquatica																	
elongate lenticular Carex spp. nut	elongate & flat-seeded Sedges	#				#								#	#	#	
Trigonous Carex sp.p. nut	Trigonous sedges			#	#	#	#	#	#					#	#		#
Cladium mariscus (L.) Pohl nut	Great Fen sedge nut					#									#		#
Cladium mariscus (L.) Pohl leaf	Great Fen sedge leaf						#							#	#		
Eleocharis sp.Nut	Spike-rush					#								#	#	#	#
Lycopus europaeus L. nutlet	Gypsywort																
Menyanthes trifoliata L. seed	Bog bean			#		#	#		#					#			

Sample Number		44	45	56	71	72	73	74	75	76	77	78	79	7	8	13	26
Borehole		3	3	12	12	12	13	13	13	6	6	6	6	7	7	7	7
Context number		303	309	1201	1202	1203	1301	1302	1303	603	603	604	604	702	702	703	704
Depth BGL (m)		2.80-3.00	4.40-4.60	3.88-3.98	4.02-4.2	4.6-4.8	2.5-2.83	2.86-2.97	4.22-4.43	6.5-6.7	7.15-7.35	7.87-8.07	8.07-8.27	2.2-2.4	2.6-2.8	3.5-3.65	4.35-4.55
Juncus spp. seed	Rushes		#														###
Myrica gale L. nutlet	Bog myrtle														#		
Potamogeton sp. nutlet	pondweed																
Ranunculus subgenus Batrachium L. achene	Water-crowfoot																
Schoenus nigricans L. nut	Black bog rush																
Sueada maritima (L.) Dumort. Seed	Sea blite							#	#								
Fruit/nuts																	
Corylus avellana L. shell	Hazelnut shell			#	#	#							#	#	#		#
Ficus carica					#w	#w	#w										
Prunus cerasus L. seed	Cherry													#			
Prunus domestica L. seed	Damson/bullace			#					#								
Prunus spinosa L. seed	Sloe	#															
Rubus sp. seed	Bramble																
Sambucus nigra L. seed	Elderberry	#															
Vitis vinifera																	#w
Other plant macrofossils																	
coal																	
Charcoal <2mm		#v	#v		#v	#	#							#	#	#	
Charcoal >2mm		#v	#v		#v	#	#										
Charcoal >10mm				#	#v	#			#								
Charred root/stem																	
Waterlogged root/stem		+++	+++	+	+++	+++	+++	+	+++	+++	+		+	+++	+++	+++	+++
Other remains																	
Molluscs																	
Ceciloides																	
Small bones																	
waterlogged fly pupae									#							#	
Mineralised insects																	
Eggshell																	
Fish bone/scale																	
Bryophyte					#	#			#					#	#		#
Forams		++++	+++	++	++++	+++	+++		+	+		+	+				
Ostracods			++		++	++	++										
Cladoceran ephippia					+												
Waterlogged arthropod remains		++							+								

Sample Number		44	45	56	71	72	73	74	75	76	77	78	79	7	8	13	26
Borehole		3	3	12	12	12	13	13	13	6	6	6	6	7	7	7	7
Context number		303	309	1201	1202	1203	1301	1302	1303	603	603	604	604	702	702	703	704
Depth BGL (m)		2.80-3.00	4.40-4.60	3.88-3.98	4.02-4.2	4.6-4.8	2.5-2.83	2.86-2.97	4.22-4.43	6.5-6.7	7.15-7.35	7.87-8.07	8.07-8.27	2.2-2.4	2.6-2.8	3.5-3.65	4.35-4.55
Volume of flot (mls)																	
Roots																	
Potential	PR																
	Charcoal																
	Snails																

Table D1: Assessment of environmental bulk samples, Common Staithe

(# = 1-5, ## = 6-25, ### = 26-100, #### = 101-500, ##### = >500)

Sample Number		27	28	29	30	92	99	109	110	111	31	32	112	113	43
Borehole		8	9	9	9	10	10	10	10	10	14	14	15	15	17
Context number		803	900	901	903	1007	1004	1006	1006	1006	1403	1403			
Depth BGL (m)		3.5-3.7	2.6-2.8	2.9-3.0	3.85-3.95	5.67-5.87	6.9-7.15	8.4-8.6	8.6-8.8	8.8-9.0	2.6-2.8	3.2-3.4	9.6-9.7	9.8-10.0	4.5-4.7
CHARRED Cereals															
<i>Avena sp. caryopsis</i>	Oat (wild or cultivated)		#								#				
<i>Hordeum distichon/ vulgare l. caryopsis</i>	Barley grain		#												
<i>Secale cereale l. caryopsis</i>	Rye grain		#												
<i>Triticum sp. caryopsis</i>	Wheat grain	#	#								#				
Cereal indet. caryopsis	Indeterminate cereal grain			#											
CHARRED Chaff															
<i>Triticum aestivum s.l rachis internode</i>	Free threshing wheat chaff		#												
Culm node	cereal straw														
Charred legumes															
<i>Vicia faba</i>	bean														
WPR															
<i>Agrostemma githago L. seed</i>	Corncockle	#		#	#										
<i>Anthemis cotula L. seed</i>	Stinking Chamomile				#						#				
Asteraceae	Daisy family	#													
<i>Anagallis arvensis L. seed</i>	Scarlet/Blue Pimpernel			#											
<i>Aethusa cynapium L. kernel</i>	Fool's Parsley														
Apiaceae indet	Carrot family	#													
Brassica spp. Seed	mustards	#	#	#											
<i>Brassica/Sinapis sp. seed kernel</i>	Cabbages/Mustards kernel														
<i>Bupleurum rotundifolium L. seed</i>	Thorow wax														
<i>Carduus/Cirsium sp. seed</i>	Thistles	#													

Sample Number		27	28	29	30	92	99	109	110	111	31	32	112	113	43
Borehole		8	9	9	9	10	10	10	10	10	14	14	15	15	17
Context number		803	900	901	903	1007	1004	1006	1006	1006	1403	1403			
Depth BGL (m)		3.5-3.7	2.6-2.8	2.9-3.0	3.85-3.95	5.67-5.87	6.9-7.15	8.4-8.6	8.6-8.8	8.8-9.0	2.6-2.8	3.2-3.4	9.6-9.7	9.8-10.0	4.5-4.7
<i>Chenopodium album</i> L. seed	Fat-hen														
<i>Chenopodiaceae</i> indet. seed	Goosefoot Family								#						
<i>Centaurea</i> sp. achene	Cornflower-type	#										#			#
<i>Cerastium</i> sp. Seed	mouse-ear chickweed														
<i>Convolvulus arvensis</i> L. seed	Field bindweed														
<i>Fumaria officinalis</i> L. achene	Common Fumitory										#				
cf. <i>Foeniculum vulgare</i> L. seed	Fennel												#		
<i>Fallopia convolvulus</i> (L.) Á. Löve achene	Black-bindweed												#		
<i>Geranium</i> spp. seed	Geraniums		##	#											
<i>Glebionis segetum</i> Cass. seed	Corn marigold														
<i>Lapsana communis</i> L. achene	Nipplewort				#										
<i>Papaver dubium/rhoeas</i> L. seed	Rough/common Poppy		#												
<i>Persicaria lapathifolia/maculosa</i> l. (Gray) seed	Pale persicaria/redshank	#		#	#						#	#			
<i>Plantago lanceolata</i> L. seed	Ribwort plantain				#										
<i>Montia fontanasp.chondrosperma</i> (Fenzl) Walters seed	Blinks														
<i>Picris echioides</i> L. seed	Bristly ox-tongue														
medium <i>Poaceae</i> indet. [3-4mm]	medium-seeded Grass Family														
<i>Potentilla</i> sp. seed	cinquefoils					#					#	#			
<i>Polygonum aviculare</i> L. achene	Knotgrass	#													
<i>Polygonum</i> sp. seed	Knotgrasses														
<i>Ranunculus</i> cf. <i>acris</i> L./ <i>repens</i> L./ <i>bulbosus</i> L. achene	cf. Meadow/Creeping/Bulbous Buttercup	#		#	#						##	#			
<i>Ranunculus</i> cf. <i>lingua</i> L. seed	Greater spearwort	#													
<i>Ranunculus</i> sp. seed	Buttercups					#	#						#		
<i>Raphanus raphanistrum</i> L. sequilla	Wild radish seed case				#										
<i>Rumex</i> sp. Achene	small-seeded Dock				#						#	#			
<i>Reseda luteola</i> sp. seed	weld														
<i>Silene</i> sp. Seed	Campions				#							#			
<i>Sonchus asper</i> L. Hill achene	Prickly sow-thistle														
<i>Stellaria media</i> (L.) Vill. Seed	Common Chickweed														
small <i>Trifolium</i> spp. (<1mm) seed	small-seeded Clovers														
large <i>Trifolium</i> / <i>Medicago</i> spp. (2-3mm) seed	large-seeded Clovers/Medicks	#													
<i>Thapsi arvensis</i> L. seed	Field penny cress	#													
<i>Urtica dioica</i> L. seed	Common Nettle			#											

Sample Number		27	28	29	30	92	99	109	110	111	31	32	112	113	43
Borehole		8	9	9	9	10	10	10	10	10	14	14	15	15	17
Context number		803	900	901	903	1007	1004	1006	1006	1006	1403	1403			
Depth BGL (m)		3.5-3.7	2.6-2.8	2.9-3.0	3.85-3.95	5.67-5.87	6.9-7.15	8.4-8.6	8.6-8.8	8.8-9.0	2.6-2.8	3.2-3.4	9.6-9.7	9.8-10.0	4.5-4.7
INDET SEEDS		##	##												
Wetland/aquatic plants															
<i>Alisma plantago aquatica</i>						#									#
<i>elongate lenticular Carex spp. nut</i>	elongate & flat-seeded Sedges	##	#						#		#	#	#		
Trigonous <i>Carex</i> sp.p. nut	Trigonous sedges	#	#		#		#					#			
<i>Cladium mariscus</i> (L.) Pohl nut	Great Fen sedge nut		#												
<i>Cladium mariscus</i> (L.) Pohl leaf	Great Fen sedge leaf		#												
<i>Eleocharis</i> sp.Nut	Spike-rush	#									#				
<i>Lycopus europaeus</i> L. nutlet	Gypsywort											#			
<i>Menyanthes trifoliata</i> L. seed	Bog bean	#									#				
<i>Juncus</i> spp. seed	Rushes		#								##				
<i>Myrica gale</i> L. nutlet	Bog myrtle				#										
<i>Potamogeton</i> sp. nutlet	pondweed					#					#	#			#
<i>Ranunculus subgenus</i> <i>Batrachium</i> L. achene	Water-crowfoot						#								
<i>Schoenus nigricans</i> L. nut	Black bog rush		#												
<i>Sueada maritima</i> (L.) Dumort. Seed	Sea blite								#				#		
Fruit/nuts															
<i>Corylus avellana</i> L. shell	Hazelnut shell	#			#						#	#	#		
<i>Ficus carica</i>															
<i>Prunus cerasus</i> L. seed	Cherry														
<i>Prunus domestica</i> L. seed	Damson/bullace														
<i>Prunus spinosa</i> L. seed	Sloe														
<i>Rubus</i> sp. seed	Bramble				#		#								
<i>Sambucus nigra</i> L. seed	Elderberry														
<i>Vitis vinifera</i>					#w										
Other plant macrofossils															
coal											#				#
Charcoal <2mm		#	#								#				#
Charcoal >2mm			#												
Charcoal >10mm			#												
Charred root/stem															
Waterlogged root/stem		+++	+++	+++	+++	+	+	+	+	+	+++	+++	+	+	+
Other remains															
Molluscs						++									++
Ceciloides															
Small bones															

Sample Number		27	28	29	30	92	99	109	110	111	31	32	112	113	43
Borehole		8	9	9	9	10	10	10	10	10	14	14	15	15	17
Context number		803	900	901	903	1007	1004	1006	1006	1006	1403	1403			
Depth BGL (m)		3.5- 3.7	2.6- 2.8	2.9- 3.0	3.85- 3.95	5.67- 5.87	6.9- 7.15	8.4- 8.6	8.6- 8.8	8.8- 9.0	2.6- 2.8	3.2- 3.4	9.6- 9.7	9.8- 10.0	4.5- 4.7
waterlogged fly pupae				#								#			
Mineralised insects															
Eggshell															
Fish bone/scale															
Bryophyte		#													
Forams				++++		+	+	+		++				+	
Ostracods			+	++				+					+	+	
Cladoceran ephippia															
Waterlogged arthropod remains			++	+							+				
Volume of flot (mls)															
Roots															
Potential	PR														
	Charcoal														
	Snails														

Table D1 *cont.*: Assessment of environmental bulk samples, Common Staithe

(# = 1-5, ## = 6-25, ### = 26-100, #### = 101-500, ##### = >500)

D.2 Animal bone

By Zoë Uì Choileàin

Introduction and methodology

D.2.1 A very fragmentary assemblage of 28 animal bone fragments was found whilst excavating boreholes at the Common Staithe site. Only five fragments are identifiable to taxa: three fragments of cattle bone and two fragments of sheep/goat. A further two fragments of bone from contexts 1002 and 1203 are identified as bird, and context 1006 produced two fish ribs.

D.2.2 All bone was identified using Schmid (1972). Surface preservation was evaluated using the 0–5 scale devised by McKinley (2004, 14–15).

Results

D.2.3 A full catalogue of recorded bone is presented in Table D2.

D.2.4 The condition of the bone is variable, ranging from McKinley (2004) grades 1 to 3. The bone is highly fragmented, meaning little is identifiable to taxon. The minimum number of individuals (MNI) present for sheep/goat is 1. The MNI for cattle is two, as both adult and juvenile teeth are present. It is possible that the bird and fish bone could be more closely identified, but the small size of the assemblage is such that this would be of minimal significance in further characterising the nature of the site. No further work is required unless further excavations take place at this site, in which case this assemblage should be incorporated into the main catalogue.

Retention, dispersal and display

D.2.5 All bone should be retained for the archaeological record.

Bore	Context	Depth (m BGL)	Taxon	Element	Condition	Count
BH03	303	2.67–2.96	Large mammal	Long Bone	3	1
BH06	603	6.3–7.36	Large mammal	Rib*	2	1
BH07	702	2.15–2.83	Medium mammal	Rib	2	3
BH07	703	3.5–3.65	Medium mammal	Pelvis	2	1
BH08	801	2–2.43	Large mammal	Rib	1	1
BH08	802	2.72–2.77	Bird	Pelvis	1	1
BH08	803	3.6	Sheep/goat	Radius	1	1
BH09	902	3.36–3.68	Medium mammal	Rib	2	1
BH09	903	3.68–3.96	Cattle	Mandible	1	1
BH10	1002	2.48–3	Bird	Tarsometatarsus	1	1
BH10	1003	3–3.48	Medium mammal	Pelvis	1	1
BH10	1004	6.9–7.16	Medium mammal	Rib		1
BH10	1006	8.27–9	Fish	Rib	2	1
BH10	1007	5.4	Small/medium mammal	Shoulder Blade *	2	1
BH12	1200	3.45–3.49	Medium mammal	Rib	1	1

Bore	Context	Depth (m BGL)	Taxon	Element	Condition	Count
BH12	1201	3.95	Cattle	Loose maxillary cheek tooth	2	1
BH12	1202	4.3–4.43	Sheep/goat	Humerus	1	1
BH12	1203	4.6	Large mammal	Skull	2	1
BH12	1203	4.62	Large bird	Clavicle	2	1
BH12	1203	4.62	Large bird	Clavicle	2	1
BH12	1203	4.62	Medium mammal	Long Bone	1	1
BH12	1203	4.8	Large bird	Rib	2	1
BH13	1302	2.84–3	Cattle	Ulna	2	1
BH13	1303	4.05–4.43	Large mammal	Scapula	2	1
BH14	1402	2–2.55	Large mammal	Long bone	2	1
BH14	1403	3.2	Large mammal	Rib	2	1
BH15	1502	2.9–3.22	Medium mammal	Vertebra	2	1

Table D2: Catalogue of animal bone by borehole and context (*sent for radiocarbon dating)

D.3 Shell

By Carole Fletcher

Introduction and methodology

D.3.1 A small assemblage of shell was recovered from 14 of the Common Staithe boreholes at differing depths. A single fragment of shell recovered from BH06 was not found on re-examination of the recovered material. The shell assemblage was weighed and recorded by species, with right and left valves noted for bivalves, when identification could be made, using Winder (2011; 2017) as a guide. The minimum number of individuals (MNI) was not established, due to the small size of the assemblage from the deposits. The results are recorded in Table D3.

Factual data

D.3.2 The material recovered from each borehole is described below by borehole, context number and depth (Table D3).

Bore	Context	Depth (m BGL)	Species common name	Description	Count	Weight (kg)
BH03	304	2.96–3	Oyster	Near-complete left valve with a cut across the shell	1	0.011
	308	4.1–4.21	Whelk	Fragmented shell	2	0.002
	309	4.4–4.45	Oyster	Complete right valve	1	0.006
BH04	400	1.26–1.42	Cockle	Fragment of shell	1	0.001
BH05	500	4.46–5	Mussel	Fragment of indeterminate valve	1	0.001
BH06	603	6.6	Cockle	Incomplete small right valve	1	0.002

Bore	Context	Depth (m BGL)	Species common name	Description	Count	Weight (kg)
		6.65–6.69	Oyster	Near-complete small right valve with two spats attached, an incomplete small right valve, two fragments of left valve	4	0.021
	604	7.9	Oyster	Fragments of left valve	2	0.004
			Cockle	Small/medium complete left valve	1	0.003
		7.75–8.26	Shell	Fragment of shell (not found on re-examination)	1	0.001
BH07	700	1.37–2	Oyster	Incomplete right valve and fragment of left valve	2	0.009
			Cockle	Fragment, less than 1g	1	0.001
BH08	801	2–2.43	Oyster	Incomplete right valve and fragment of left valve	4	0.031
	803	3.5	Oyster	Complete right valve with attached small near-complete spat	2	0.013
			Whelk	Fragmented shell	1	0.004
		3.48–3.69	Oyster	Near-complete right valve	1	0.006
BH09	900	2.2–2.8	Oyster	Incomplete left and right valves	2	0.009
			Cockle	Fragment of shell	1	0.001
BH10	1001	2.26–2.48	Mussel	Small incomplete left valves	2	0.002
			Cockle	Near-complete right valve	1	0.001
	1002	2.48–3	Mussel	Incomplete right valve	1	0.002
	1003	3–3.48	Whelk	Complete small-medium shell	1	0.005
			Cockle	Complete medium left valve	1	0.003
			Oyster	Near-complete small right valve, Incomplete right valve and an incomplete left valve	3	0.024
	1004	7.15	Oyster	Incomplete left valve	1	0.004
		6.9–7.16	Oyster	Fragment of shell	1	0.001
	1005	7.85	Oyster	Near-complete small right valve with possible shucking mark and a fragment of left valve	1	0.006
		7.5–8.27	Mussel	Complete left valve broken in two	2	0.002
	1006	8.27–9	Mussel	Shell fragments	3	0.001
			Cockle	Two small complete right valves and a left valve	3	0.002
	BH12	1202	4.3–4.43	Cockle	Small left valve	1
1203		4.8	Mussel	Incomplete right valve	1	0.002

Bore	Context	Depth (m BGL)	Species common name	Description	Count	Weight (kg)
		4.59–4.79	Mussel	Incomplete left valve	1	0.001
			Cockle	Fragment of shell	1	0.001
	1204	4.9	Oyster	Incomplete left valve	1	0.007
BH13	1301	2.6	Oyster	Near-complete left valve	1	0.005
		2.5–2.48	Cockle	Incomplete right valve	1	0.003
		2.8	Oyster	Incomplete right valve	1	0.006
BH14	1402	2–2.55	Oyster	Fragment of right valve	1	0.003
	1403	3.2	Mussel	Incomplete left valve	2	0.003
Oyster			Fragment of right valve	1	0.001	
BH15	1501	2.05–2.7	Whelk	Incomplete shell	1	0.002
			Cockle	Incomplete right valve	1	0.002
	1504	8.7–9.94	Cockle	Small near-complete right valve and a small incomplete left valve	2	0.002
			Cockle	One complete medium to large right valve, one incomplete medium to large left valve, one complete small left valve	3	0.006
			9.9	Mussel or Clam	Fragment of valve but uncertain of species id	1
BH16	1600	4.08–4.57	Oyster	Small near-complete right valve, incomplete left valve	2	0.007
BH17	1701	3.24–3.8	Cockle	Incomplete left valve, filled with lime mortar	1	0.005
Total					72	0.245

Table D3: Shell assemblage, Common Staithe

Discussion

D.3.3 The shells represent the same species present in the Vancouver Centre assemblage (Brown and Hardy 2011), which includes oyster, whelk, cockle and mussel shells, and indicate the collection of shellfish from estuarine and shallow coastal water and intertidal areas. Their presence in a port is to be expected, although the deposits are more likely to be associated with domestic waste, rather than material from processing. A single oyster shell from BH10 may have been shucked, indicating the oyster was either eaten raw or extracted from its shell for another purpose. No other evidence of consumption was identified.

Statement of potential

D.3.4 The assemblage recovered is similar with that from the Vancouver Centre, and due to the small size of the assemblage, it is of limited value regarding further research.

D.4 Fish, small mammal and crustacean remains

By Rebecca Nicholson

Introduction

- D.4.1 A small assemblage, mainly of fish remains, was recovered from eight of the boreholes at the Common Staithe site, from a total of 19 of the samples that were processed for the recovery of plant remains, bones and artefacts. Most of the samples come from medieval or post-medieval occupation and reclamation deposits and were 1L in volume prior to processing. Most of the fish bones are in fair condition, although those from BH15 are extremely degraded and encrusted with iron oxide.
- D.4.2 The aim of the assessment is to provide a broad taxonomic overview of the material and to provide an indication of the abundance and condition of fishbone from the main stratigraphic units across the site.

Methodology

- D.4.3 The bones were identified with reference to the author's comparative fish bone collection and the faunal collection held at Oxford Archaeology South but should be considered preliminary. Further identification of some of the flatfish bones in particular, and the crustacean remains, may be possible with recourse to additional resources.

Results

- D.4.4 The contents of each bag are described below in Table D4, by borehole, sample and context number as well as sample depth.

Discussion

- D.4.5 The fish assemblage from Common Staithe is significant, particularly considering the small size of individual samples. It includes a relatively wide range of taxa for such small samples and is similar in terms of taxonomic composition to the fish assemblage recovered from pre-occupation dump deposits and alluvial sediments at the nearby Vancouver Centre (Nicholson 2011).
- D.4.6 Whilst some of the fish are likely to have been caught locally, the assemblage as a whole is typical of general medieval and post medieval urban refuse and includes fish such as ling which are likely to have been brought to the site as dried and possibly salted fish (stockfish or similar product) as ling are more commonly caught in more northerly waters. It is not surprising that clupeid bones (mainly herring) are frequent as the importance of the medieval herring fishery based in East Anglia is well known (Saul 1981–3). Eels were also abundant in the fens at this time.
- D.4.7 Three-spined stickleback, also recorded at the Vancouver Centre, is a common fish of shallow coastal waters as well as of freshwater rivers and lakes. In this case the bone may have been a component of the gut contents of a larger carnivorous fish. The small crab claws are from individuals that were probably too small for human consumption and therefore may also derive from fish guts or bird pellets or represent general

washed-in or redeposited shoreline debris, the latter perhaps more likely since these remains came from the deeper estuarine sands in Boreholes BH10 and BH15.

D.4.8 Considering the abundance and variety of fish remains particularly in the medieval deposits such as in BH09 at 2.6–2.8m BGL and late or post-medieval deposits in Boreholes 12 and 13, it must be possible that this area was close to a location where fish were being marketed. The discovery of a large gadid (cod family) vertebral centrum at 9.6–9.7m BGL in Borehole BH15 indicates that refuse was accumulating in the estuarine silts at this time.

Retention, dispersal and display

D.4.9 All fish bone will be retained and deposited with the archive.

Borehole	Sample	Context	Depth (m BGL)	
BH03	44	303	2.8-3.0	1 calcined micromammal radius fragment 1 indeterminate mammal/bird bone fragment
BH06	76	603	6.5-7.5	1 herring (<i>Clupea harengus</i>) caudal vertebra 1 eel (<i>Anguilla anguilla</i>) caudal vertebra 2 indeterminate fragments
	77	603	7.15-7.35	2 indeterminate fragments
	78	604	7.87-8.01	Indeterminate fragments of ribs/rays
BH09	28	900	2.6-2.8	1 three-spined stickleback (<i>Gasterosteus aculeatus</i>) dorsal spine 2 eel vertebrae 4 herring vertebrae 1 small clupeid (Clupeidae) vertebra 1 small salmonid (Salmonidae) vertebral fragment 1 small gadid (Gadidae) caudal vertebra 1 right-eyed flatfish (Pleuronectidae) caudal vertebra 1 probable plaice (cf. <i>Pleuronectes platessa</i>) cleithrum fragment 1 small flatfish caudal vertebra, calcined 1 indeterminate opercular fragment and 1 indeterminate articular fragment.
	29	901	2.90-3.0	1 herring precaudal vertebra 1 clupeid hypural 1 clupeid ceratohyal fragment 1 fragment of possible large gadid vertebra.
BH10	99	1004	6.90-7.15	Indeterminate fragments
	109	1006	8.4-8.6	1 indeterminate rib/ray fragment
	110	1006	8.6-8.8	1 fragment of possible gadid prefrontal, charred 1 small crab claw
	111	1006	8.8-9.0	1 indeterminate fragment
BH12	56	1201	3.88-3.98	1 tiny flatfish caudal vertebra

Borehole	Sample	Context	Depth (m BGL)	
	71	1202	4.02-4.20	1 fragment of probable small/tiny flatfish cleithrum 8 indeterminate fragments 1 probable eel precaudal vertebra 1 right eyed flatfish caudal vertebra, fish c. 250-300mm total length
	72	1203	4.6-4.8	1 small mackerel (<i>Scomber scombrus</i>) caudal vertebra 1 herring caudal vertebra Indeterminate fragments.
BH13	73	1301	2.50-2.83	1 small right-eyed flatfish caudal vertebra 2 indeterminate fragments
	74	1302	2.86-2.97	1 clupeid precaudal vertebra 1 small flatfish quadrate 2 small and 1 tiny flatfish vertebrae.
	75	1303	4.22-4.43	1 herring precaudal vertebra and 1 clupeid hypural fragment, probably herring 1 fragment of a large ling (<i>Molva molva</i>) caudal vertebra 2 small flatfish caudal vertebrae.
BH14	31	1403	2.6-2.8	1 fragment of haddock (<i>Melanogrammus aeglefinus</i>) caudal vertebra 1 gadid pharyngeal bone fragment 1 fish tooth 1 cat (<i>Felis catus</i>) distal metacarpal. 1 small mammal metapodial (squirrel-sized) Indeterminate bone fragments
	32	1403	3.2-3.4	A minimum of 6 shark/ray (Elasmobranchii) vertebrae (possibly dogfish: <i>Scyliorhinus</i> sp.) 1 small ray (Rajidae) dermal denticle 2 herring caudal vertebrae 1 tiny flatfish caudal vertebra.
BH15	112		9.6-9.7	Several very degraded fragments of a large gadid vertebral centrum. 1 small crab claw.
	113		9.3-10.0	1 unidentified epihyal and 3 indeterminate fishbone fragments 3 small crab claws.

Table D4: Fish, small mammal and crustacean remains, Common Staithe

APPENDIX E CORE DESCRIPTIONS

Chapel Street Carpark

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH1	0	0.2	Yellow sand and gravel, asphalt, sharp boundary. Carpark surface	Sand and Gravel (made ground)	Make-up deposits	1	■ 19-20C, 17-19C
BH1	0.2	0.5	Mid dark brownish grey sand with frequent mortar fragments <10mm in size, granular to half brick CBM fragments, sharp boundary. Made ground, demolition and levelling	Dump deposit	Make-up deposits		
BH1	0.5	1.2	Light yellow brown coarse sand with frequent fine to medium red brick fragments, x1 large cobble, frequent fine to medium mortar fragments sharp boundary. Made ground, demolition and levelling	Rubble	Make-up deposits		
BH1	1.2	1.3	Loose brownish yellow (10YR 6/6) medium SAND sharp boundary. Construction sand.	Dump deposit	Make-up deposits		
BH1	1.3	1.4	Compact very pale brown (10YR 7/4) to yellow (10YR 7/8) medium to coarse SAND. Sharp boundary. Construction sand	Dump deposit	Make-up deposits		
BH1	1.4	1.47	Compact very dark grey, brown (10YR 3/2) slightly silty fine SAND. Sharp boundary. Made ground.	Dump deposit	Make-up deposits		
BH1	1.47	1.49	Compact very pale brown (10YR 8/3) MORTAR, sharp boundary, Yard surface?	Surface	Make-up deposits		
BH1	1.49	1.58	Bands of yellow medium SAND and light grey (10YR 7/1) gritty silt, with 90x40mm cobble inside of core, irregular boundary. Made ground	Dump deposit	Make-up deposits		
BH1	1.58	1.68	Mixed yellowish brown (10YR 5/8) to black (10YR 2/1) SAND to sandy silt with rare ashy clinker and mortar. Sharp boundary. Made ground	Dump deposit	Make-up deposits		
BH1	1.68	1.74	Soft black (10YR 2/1) odorous silt (organic?) wavy irregular boundary. Base of occupation layer (trample)? Organic	Organic Alluvium	Tidal deposits		
BH1	1.74	2	Firm very pale brown (10YR 7/3) SILTY CLAY with rare medium (25mm) mussel shell. Weathered alluvium	Alluvium (clay and silt)	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH1	2	2.5	Firm very pale brown (10YR 7/3) SILTY CLAY with black Mn flecks becoming slightly fine sandy from 2.35-2.50m bgl. Gradual boundary	Alluvium (clay and silt)	Tidal deposits		
BH1	2.5	2.85	Soft wet grey brown (10YR 5/2) slightly sandy SILTY CLAY, black mottling, sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH1	2.85	3	Firm grey (10YR 5/1) slightly sandy CLAY SILT	Alluvium (clay and silt)	Tidal deposits		
BH1	3	3.5	Firm grey brown (10YR 5/2) SILTY CLAY with patches of ephemeral sand. Diffuse boundary	Alluvium (clay and silt)	Tidal deposits		
BH1	3.5	4	Soft wet light grey brown (10YR 5/2) ephemerally sandy CLAY SILT	Alluvium (clay and silt)	Tidal deposits		
BH1	4	4.35	Soft wet grey brown CLAY SILT with rare <1% 5mm organic flecks decreasing with depth. Diffuse boundary	Alluvium (clay and silt)	Tidal deposits		
BH1	4.35	4.95	Soft wet grey brown sandy SILTY CLAY sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH1	4.95	5	Soft wet dark grey brown (10YR 4/2) organic silty clay. No visible plant remains	Organic Alluvium	Tidal deposits		
BH2	0	0.2	Indurated yellowish brown coarse sandy fine to medium subrounded to subangular GRAVEL. Carpark surface	Sand and Gravel (made ground)	Make-up deposits	2	■ 16-18C
BH2	0.2	0.85	Mixed compact dark grey brown ashy clinker with moderate fine to medium red brick fragments and rare coarse brick fragments, moderate white mortar fragments subangular to subrounded fine to coarse. Sharp boundary. Carpark surface	Dump deposit	Make-up deposits		
BH2	0.85	0.9	Loose black ASH	Dump deposit	Make-up deposits		
BH2	0.9	1.2	Loose light greyish yellow fine to medium SAND. Builder's sand, footing?	Dump deposit	Make-up deposits		
BH2	1.2	1.3	Loose medium (20-40mm) subangular to subrounded clast supported flint GRAVELS infilled with coarse brownish yellow (10YR 6/8) silty sand, sharp boundary. Construction / demolition debris	Sand and Gravel (made ground)	Make-up deposits		
BH2	1.3	1.4	Loose brownish yellow (10YR 6/8) slightly silty medium SAND. Builder's sand?	Dump deposit	Make-up deposits		
BH2	1.4	1.5	Loose yellow (10YR 7/6) to grey (10YR 6/2) medium SAND, sharp boundary. Builder's sand?	Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH2	1.5	1.65	Mixed soft very dark grey (10YR 3/1) to light grey (10YR7/1) organic slightly silty fine sand. Gradual boundary. Preoccupation surface (organic)	Organic Alluvium (mixed)	Occupation	15	Wood, cal AD 1042-1219
BH2	1.65	1.9	Loose grey (10YR 6/1) medium sand with black (10YR1/1) flecks (organic, odorous). Sharp boundary	Sand and silt	Occupation		
BH2	1.9	2	Soft very dark brown (10YR 2/2) fine sandy organic silt with fine flecks of decayed vegetation matter. Quite mixed	Organic Alluvium (mixed)	Occupation	16	
BH2	2	2.75	Firm light grey (10YR 7/2) fine slightly sandy SILTY CLAY becoming sandier with depth. Sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH2	2.75	3	Soft light blueish grey (GLEY 2 7/1) with light grey mottling (10YR 7/2) SILTY CLAY and rare flecks of organic silty	Alluvium (clay and silt)	Tidal deposits		
BH2	3	4	Firm greyish brown (10YR 4/2) fine sandy CLAY SILT	Alluvium (clay and silt)	Tidal deposits		
BH2	4	5	Firm light-yellow brown (10YR 6/4) mottled with grey (10YR 5/1) fine slightly sandy CLAY SILT mixed down to 4.70m bgl some limited evidence for horizontal laminations from 4.70 -5.00m 5mm thick fine sand with gaps of 40-50mm	Alluvium (clay and silt)	Tidal deposits		
BH2	5	5.1	Firm brown (10YR5/3) SILTY CLAY with a 5mm lamination of fine grey (20YR 5/1) sand. Sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH2	5.1	5.6	Soft brownish yellow (10YR 6/6) SILTY CLAY. Irregular boundary	Alluvium (clay and silt)	Tidal deposits		
BH2	5.6	5.9	Wet sticky CLAY SILT blue grey (10YR 6/1) with fine pockets 5-15mm of ripped up peat clasts from 5.75-5.90m bgl. Irregular boundary	Alluvium (clay and silt)	Tidal deposits		
BH2	5.9	6	Firm springy very dark brown (10YR 2/2) PEAT with <5% reed fragments	Peat	Tidal deposits		
BH2	6	6.1	Soft dark brown (10YR 3/3) well-formed peat rare <1% 5mm decayed wood fragments. Irregular boundary	Peat	Tidal deposits		
BH2	6.1	6.6	Soft sticky blue grey (GLEY 2 5/1) SILTY CLAY with rare <1% 5mm peaty flecks throughout decreasing with depth, Diffuse 50mm boundary	Alluvium (clay and silt)	Tidal deposits		
BH2	6.6	6.92	Soft grey (10YR5/1) CLAY SILT. Sharp boundary	Alluvium (clay and silt)	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH2	6.92	7	Soft very dark brown (10YR2/1) organic SILTY CLAY with ephemeral fine sands	Organic Alluvium	Tidal deposits	17	
BH2	7	7.07	Firm very dark brown (10YR2/2) organic SILT with fine decayed flecks of vegetative matter. Irregular boundary	Organic Alluvium	Tidal deposits	18	'Seeds, 1879-1631 cal BC
BH2	7.07	7.5	Soft plastic (GLEY 2 5/1) blue grey SILTY CLAY. Gradual 5mm boundary	Alluvium (clay and silt)	Tidal deposits	19	
BH2	7.5	8	Soft wet dark blue grey (GLEY 2 4/1) clayey silt	Alluvium (clay and silt)	Tidal deposits		
BH3	0	0.1	Indurated yellow grey GRAVEL. Carpark surface	Sand and Gravel (made ground)	Make-up deposits		
BH3	0.1	0.2	Black compact asphalt and medium to coarse subangular to subrounded gravels. Demolition	Sand and Gravel (made ground)	Make-up deposits		
BH3	0.2	0.5	Pink BRICK with chalky mortar, solid. Structure?	Rubble	Make-up deposits		
BH3	0.5	0.9	subrounded CHALK cobbles. Footing	Rubble	Make-up deposits		
BH3	0.9	1.35	Soft mid yellowish brown mottled with green brown medium to coarse sandy CLAY SILT with frequent mortar pockets granular mortar and occasional 20% charcoal flecks 5mm, rare shell fragments granular to fine (Oyster). Made ground	Dump deposit	Make-up deposits	3	■ L18-19C, 14-16C
BH3	1.35	1.65	Firm dark grey brown (10YR 4/2) sandy CLAY with frequent 5-15mm flecks of yellow (10YR 8/6) mortar. Sharp boundary. Made ground	Dump deposit	Make-up deposits	20	B, S
BH3	1.65	1.8	Soft very dark grey brown (10YR4/2) silty fine SAND irregular boundary. Consolidation layer	Dump deposit	Make-up deposits	21	S
BH3	1.8	1.87	50mm subangular to angular GRAVEL (flint) in a matrix of light grey (10YR 7/1) silty sand. Irregular boundary. Ground raising and stabilisation	Sand and Gravel (made ground)	Make-up deposits		
BH3	1.87	2	Compact very dark grey (10YR 5/1) fine to medium sand	Sand and silt	Tidal deposits		
BH3	2	3	Mid grey medium sandy silt	Sand and silt	Tidal deposits	22	
BH3	3	3.6	Soft brown (10YR5/3) slightly sandy SILTY CLAY getting sandier with depth. Irregular boundary	Alluvium (clay and silt)	Tidal deposits	23	

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH3	3.6	4	soft light brownish grey (10YR 6/2) fine sandy CLAYEY SILT	Alluvium (clay and silt)	Tidal deposits		
BH3	4	4.65	Soft light brownish grey (10YR 6/2) SILTY CLAY slightly gritty at base, rare flecks of decayed organics 5mm in size 4.00-4.20m bgl	Alluvium (clay and silt)	Tidal deposits	24	
BH3	4.65	4.88	Soft wet dark grey (10YR4/1) silty fine SAND, sharp boundary	Sand and silt	Tidal deposits		
BH3	4.88	5	Soft wet brownish yellow (10YR 6/8) CLAY SILT with rare fine sand through. Weathered alluvium.	Alluvium (clay and silt)	Tidal deposits		
BH3	5	5.2	Liner smashed. Soft blueish grey (10YR 6/5B) wet sticky slightly clayey SILT rare <1% flecks of organic matter	Alluvium (clay and silt)	Tidal deposits		
BH3	5.2	5.4	Soft light yellowish brown (10YR6/4) SILTY CLAY with rare flecks of <5mm organic matter <5%, wavy boundary	Alluvium (clay and silt)	Tidal deposits		
BH3	5.4	5.5	Soft blue grey (GLEY 2 5/5PB) medium SAND, sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH3	5.5	5.73	Soft very dark blue grey (GLEY 2 3/5PB) fine sandy SILTY CLAY decreasing in sandiness with depth. Sharp boundary	Alluvium (clay and silt)	Tidal deposits	25	
BH3	5.73	5.8	soft dark blue grey GLEY 2 3/5PB fine sandy SILTY CLAY Sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH3	5.8	6	(in bulk bag) mix of dark blue grey (GLEY 2 4/5PB) fine sandy silt and spongy peat clast, dark brown (10YR3/3)	Void	Tidal deposits		
BH3	6	6.18	Soft wet dark blue grey (GLEY 2 4/1 5PB) gritty slightly fine sand with abundant ~45%v spongy peat clasts 50mm in size	Peat	Tidal deposits	26	Wood, 516-364 cal BC
BH3	6.18	6.5	Soft light blue grey (GLEY 2 7/5B) SILTY CLAY with occasional (20%) fine to medium 5-15mm wood and plant remains decayed, decreasing with depth, diffuse boundary 100mm	Alluvium (clay and silt)	Tidal deposits		
BH3	6.5	6.85	Soft light blue grey (GLEY 2 7/5B) mottled with very pale brown (10YR 7/4) SILTY CLAY with rare <5mm organics <5%, wavy boundary	Alluvium (clay and silt)	Tidal deposits	27	
BH3	6.85	6.95	Soft dark brown (10YR 3/2) well-formed highly organic peat with blue grey (GLEY 2 5/5B) SILTY CLAY. Sharp boundary	Peat	Tidal deposits		
BH3	6.95	7	Soft blue grey (GLEY 2 5/5B) SILTY CLAY	Alluvium (clay and silt)	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH4	0	0.1	Compact beige gravel, small concrete fragments and asphalt. Carpark surface	Sand and Gravel (made ground)	Make-up deposits		
BH4	0.1	1.35	Black ashy clinker with 10-50mm white mortar and red brick fragments throughout. Made ground, demolition, and levelling	Rubble	Make-up deposits		
BH4	1.35	2	Firm greyish brown (10YR 5/2) silty fine sand with abundant white (10YR 8/1) Mortar (25%) from granular to 200mm also fine 100mm CBM fragments light red (2.5YR 6/6) from 1.90-200. Occupation deposit	Dump deposit	Make-up deposits		
BH4	2	2.23	Void	Void			
BH4	2.23	2.7	Loose wet dark greyish brown (10YR 4/2) fine sandy silt with rare <1% mussel shell. Occasional 10% fine 10mm subrounded gravels. Mixed from 2.23-2.45m BGL. Gradual boundary	Sand and silt	Tidal deposits		
BH4	2.7	2.86	Soft dark brown (10YR3/3) soft very slightly organic fine silty sand rare small twig 25mm long 5mm wide and rare small wood fragments 25mm square. Sharp boundary	Sand and silt	Tidal deposits		
BH4	2.86	3	Black (10YR 2/1) soft wet highly organic slightly silty fine sand.	Organic Alluvium	Tidal deposits		
BH4	3	4	Soft wet blueish grey (GLEY 2 6/1) grading to dark bluish grey (GLEY 2 4/1), at base fine slightly sandy clay, organic odour	Alluvium (clay and silt)	Tidal deposits		
BH4	4	5	Soft dark blueish grey (GLEY2 4/5SP) fine slightly sandy silt rare rounded 10mm gravel clasts at 4.08 and 4.66m BGL very slightly sandier at base	Sand and silt	Tidal deposits		
BH5	0	0.15	Gravel surface, tarmac, concrete fragments. Carpark surface	Sand and Gravel (made ground)	Make-up deposits		
BH5	0.15	1.22	Black ashy clinker. Made ground	Dump deposit	Make-up deposits		
BH5	1.22	1.32	Compact dark greyish brown (10YR 4/2) medium SAND with abundant (40%) granular CBM fragments and granular to medium (30mm) white mortar fragments. Made ground	Dump deposit	Make-up deposits		
BH5	1.32	1.36	Loose very pale brown (10YR7/3) medium SAND. Construction	Dump deposit	Make-up deposits		
BH5	1.36	1.38	Compact dark greyish brown (10YR 4/2) medium SAND with abundant (40%) granular CBM fragments. Made ground	Rubble	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH5	1.38	1.45	Large mortar/sandstone fragment. Sharp boundary. Made ground	Rubble	Make-up deposits		
BH5	1.45	1.66	Loose yellow (10YR 8/6) medium SAND. Diffuse boundary. Construction	Dump deposit	Make-up deposits		
BH5	1.66	1.69	Loose reddish yellow (7.5YR 6/6) fine SAND. Construction	Dump deposit	Make-up deposits		
BH5	1.69	1.72	Black (10YR 2/1) silty slightly organic fine SAND with granular red brick. Made ground	Dump deposit	Make-up deposits		
BH5	1.72	2	Loose grey (10YR 6/1) fine to medium SAND becoming medium with depth. Natural sands (preoccupation surface)	Sand	Tidal deposits		
BH5	2	2.3	Loose wet poorly recovered light grey (10YR 7/1) fine sand. Sharp boundary	Sand	Tidal deposits		
BH5	2.3	3	Compact light brownish grey (10YR 6/2) to grey (10YR 5/1) fine SAND grading to medium sand rare flecks of decayed vegetative matter Pockets (40mm) of black (10YR 2/1) organic silty fine sand throughout.	Laminated sand	Tidal deposits		
BH5	3	3.5	Soft grey 10YR 5/1 fine slightly sandy SILT. Diffuse boundary	Sand and silt	Tidal deposits		
BH5	3.5	3.65	Soft dark grey (10YR 4/1) silty fine SAND. Diffuse boundary	Sand and silt	Tidal deposits		
BH5	3.65	3.84	Soft dark grey (10YR 4/1) silty fine SAND with thin laminations of sandy silt roughly every 20mm. Sharp boundary	Laminated alluvium	Tidal deposits		
BH5	3.84	4	compact dark grey (10YR 4/1) fine SAND	Sand and silt	Tidal deposits		
BH5	4	4.6	Soft wet (grey 10YR5/1) silty fine sand, decayed wood 30mm in size at 4.20m bgl gradual boundary	Sand and silt	Tidal deposits		
BH5	4.6	4.9	Soft wet sticky grey (10YR 5/1) fine sandy SILT	Sand and silt	Tidal deposits		
BH5	4.9	5	Soft wet grey (10YR 6/1) fine slightly sandy SILT	Sand and silt	Tidal deposits		
BH6	0	0.2	indurated yellow brown coarse sandy fine to medium GRAVEL. Carpark surface	Sand and Gravel (made ground)	Make-up deposits		
BH6	0.2	1.2	Compact slightly silty black ashy clinker with frequent fine to medium subangular to subrounded brick fragments occasional small white mortar fragments. From 0.95m clasts of grey brown clay, mottled with yellow brown, about 50mm in size. Made ground, demolition	Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH6	1.2	1.26	Soft yellowish brown (10 YR 5/6) SILTY CLAY mottled with yellow (10YR 8/6) fine 100mm fragments of degraded mortar. Made ground, demolition	Dump deposit	Make-up deposits		
BH6	1.26	1.5	Soft very pale brown (10YR 8/2) mottled with light grey (10YR 7/1) SILTY CLAY with rare granular shell fragments and flecks of sand	Alluvium (clay and silt)	Occupation		
BH6	1.5	1.79	Mixed firm very pale brown (10YR 7/3) mottled with very dark brown (10YR 2/2) black organic silt, silty sand and sandy SILTY CLAY sharp boundary	Organic Alluvium (mixed)	Occupation	28	▲■ 13-14C, S, B
BH6	1.79	1.8	Compact brownish yellow fine to medium SAND irregular boundary	Sand	Tidal deposits		
BH6	1.8	1.93	Loose yellow brown (10YR 4/4) medium SAND sharp boundary	Sand	Tidal deposits		
BH6	1.93	2	Firm dark yellowish brown (10YR 4/4) SILTY CLAY, black and highly organic at base 1.99m bgl	Alluvium (clay and silt)	Tidal deposits		
BH6	2	2.3	VOID with remnants of wet very dark greyish brown fine SANDY SILT	Void	Tidal deposits		
BH6	2.3	2.42	Soft mixed greyish brown (10YR 5/2) mottled with grey (10YR 6/1), mixed fine slightly sandy CLAY SILT with rare pockets of organic sediment. Irregular wavy boundary	Alluvium (clay and silt)	Tidal deposits		
BH6	2.42	2.48	Compact very dark brown (10YR 2/2) slightly silty fine SAND with rare flecks of decayed plant material sharp boundary	Sand	Tidal deposits		
BH6	2.48	2.53	Compact very dark brown well-formed PEAT. Sharp boundary	Peat	Tidal deposits	29	Seeds, cal AD 1054-1266
BH6	2.53	2.55	Compact grey (10YR 6/1) silty fine sand. Sharp Boundary	Laminated sand	Tidal deposits	30	
BH6	2.55	2.61	Alternating bands of 5mm thick black 10YR2/2) stable sweeping/ well-formed peat with thin laminations of grey (10YR 6/1) coarse sands. Sharp boundary		Tidal deposits		
BH6	2.61	2.64	Soft black (10YR 2/1) humic silt rare <1% flecks of decayed plant matter		Tidal deposits		
BH6	2.64	2.69	Compact light grey (10YR 7/1) silty fine SAND		Tidal deposits		
BH6	2.69	2.7	Soft black organic silty fine SAND. Wavy boundary		Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH6	2.7	2.73	Compact light grey (10Yr 7/1) medium SAND		Tidal deposits		
BH6	2.73	2.74	Soft black (10YR 2/1) silty fine sand highly organic. Sharp boundary		Tidal deposits		
BH6	2.74	2.75	Compact light grey coarse sand with granular to fine gravels. Sharp boundary		Tidal deposits		
BH6	2.75	2.8	Firm black (10YR 2/1) highly organic fine sandy SILT>. Sharp boundary		Tidal deposits		
BH6	2.8	2.84	Soft light grey (10Yr7/1) medium to coarse SAND.		Tidal deposits		
BH6	2.84	2.87	Soft greyish brown (10YR 5/2) SILTY CLAY. Sharp boundary		Tidal deposits		
BH6	2.87	2.92	Soft black (10YR 2/1) clayey highly organic PEAT with frequent coarse sands and granular gravels		Tidal deposits		
BH6	2.92	3	Soft pale brown (10YR 6/3) fine slightly sandy SILT	Alluvium (clay and silt)	Tidal deposits		
BH6	3	3.15	Soft light grey (10YR 7/1) CLAY with rare flecks of darker organic clay (10YR 5/1). Gradual boundary	Alluvium (clay and silt)	Tidal deposits		
BH6	3.15	3.77	Soft light brownish grey SILTY CLAY (10YR 6/2) with ephemeral fine sands x1 10mm pocket of black peat. Rare <1% shell fragments. Sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH6	3.77	4	Soft light brownish grey SILTY CLAY (10YR 6/2) with ephemeral fine sands x1 10mm pocket of black peat. Rare <1% shell fragments rare less than 5mm flecks of organics. Sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH6	4	4.3	Soft grey (10YR 5/1) SILTY CLAY with rare flecks of dark organic. Gradual boundary	Alluvium (clay and silt)	Tidal deposits		
BH6	4.3	4.77	Soft dark grey brown (10YR4/2) ephemerally fine sandy SILTY CLAY. 4.65 - 4.77m bgl <1% rare peat clasts. Sharp boundary	Alluvium (clay and silt)	Tidal deposits		
BH6	4.77	5	Soft dark grey brown (10YR4/2) ephemerally fine sandy SILTY CLAY rare fine shell fragments very thin laminations of peat at boundary	Alluvium (clay and silt)	Tidal deposits		
BH7	0	0.1	Indurated yellowish brown/golden course sandy fine to medium GRAVEL subangular to subrounded. Made ground, demolition and levelling	Sand and Gravel (made ground)	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH7	0.1	0.6	Compact black ashy CLINKER with rare grey vitreous ash <1cm, rare fine to medium brick fragments. Made ground, demolition, and levelling	Dump deposit	Make-up deposits	4	■ 14-16C
BH7	0.6	1.2	Granular white mortar, ashy and shelly with rare oyster shell fine to medium fragments of mortar. Made ground, demolition, and levelling	Dump deposit	Make-up deposits	5	■ 14-16C
BH7	1.2	1.4	Loose white (2.5YR 8/1) fine to medium MORTAR fragments with rare 1% fine to medium (10-40mm) subrounded gravels. Sharp boundary. Made ground, demolition, and levelling	Rubble	Make-up deposits		
BH7	1.4	1.55	Compact white (2.5y 8/1) to pale yellow (2.5Y 8/3) fine to medium (10-40mm) sandy mortar fragments with occasional (20%) reddish brown (2.5YR 5/4) rounded CBM fragments. Made ground, demolition, and levelling	Rubble	Make-up deposits		
BH7	1.55	1.69	Fairly well consolidated reddish brown (2.5YR 5/4) fine (5-10mm) to granular CBM fragments with abundant (45%) white mortar (2.5YR 8/1) mottled with yellow (2.5YR 8/3). Sharp irregular boundary. Made ground, demolition and levelling	Rubble	Make-up deposits		
BH7	1.69	1.75	Soft wet olive yellow (2.5YR 6/6) fine to medium sand. Made ground, demolition and levelling	Dump deposit	Make-up deposits		
BH7	1.75	1.76	Very dark brownish grey fine SAND slightly silty. Sharp boundary	Dump deposit	Make-up deposits		
BH7	1.76	2	Compact very pale brown (10YR 8/1) to 10YR8/4) sandy MORTAR, basal 0.05m loose. Made ground, demolition, and levelling	Dump deposit	Make-up deposits		
BH7	2	2.12	Compact blueish grey (GLEY 2 6/1) medium SAND	Sand	Tidal deposits		
BH7	2.12	2.2	Soft black (10YR 2/1) highly organic silt with moderate plant fragments, rare 10mm subrounded pebble with lenses of blue grey (GLEY2 6/1) medium sand	Organic Alluvium	Tidal deposits		
BH7	2.2	3	Compact blue grey (Gley 2 6/1) medium sand with rare <1% flecks of organic plant remains decreasing with depth	Sand	Tidal deposits		
BH7	3	3.3	Wet loose very pale brown (10YR 8/4) light slightly silty SAND	Sand	Tidal deposits		
BH7	3.3	3.4	Wet dark grey (GLEY 4/N) fine very slightly silty SAND	Sand	Tidal deposits		
BH7	3.4	3.54	Wet loose greenish grey (Gley 1 6/10y) medium SAND with rare (<5%) flecks of dark organics	Sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH7	3.54	3.58	Soft wet very dark brown (10YR 2/2) organic silt. Sharp boundary	Organic Alluvium	Tidal deposits		
BH7	3.58	3.8	Loose wet blue grey (10YR 6/1) fine to medium SAND. Sharp boundary	Sand	Tidal deposits		
BH7	3.8	3.9	Soft slightly fine sandy organic SILT very dark brown (10YR 2/2). Sharp boundary	Organic Alluvium	Tidal deposits		
BH7	3.9	4	Compact dark blue grey (Gley 2 4/1) medium SAND. Carpark surface	Sand	Tidal deposits		
BH8	0	0.5	Indurated yellow grey fine to medium GRAVEL and medium to coarse sand	Sand and Gravel (made ground)	Make-up deposits		
BH8	0.5	1	Compact black ashy SILT with frequent granular to fine dark brown red CBM fragments rare fine yellow stock 10% moderate light grey ashy /vitreous fragments from 0.9m bgl. Modern demolition	Dump deposit	Make-up deposits	6	■ 19-20C
BH8	1	1.2	Compact shelly sand light yellowish white mortar with rare fine to medium cement fragments (<10-50mm). Modern demolition	Dump deposit	Make-up deposits		
BH8	1.2	1.23	Crushed white MORTAR (10YR 6/1) In a fine sandy silt matrix. Modern demolition	Dump deposit	Make-up deposits		
BH8	1.23	1.34	Loose pale brown (10YR6/3) silty fine SAND with 10mm thick band of yellowish brown (10YR 5/8) staining at base (fe staining?). Modern demolition	Dump deposit	Make-up deposits		
BH8	1.34	1.6	Loose damp dark greyish brown (10YR 4/2) fine SAND with rare <1% coarse subrounded gravels, rare irregular laminations of black (10YR3/1) organic sand sharp boundary.	Dump deposit	Make-up deposits		
BH8	1.6	1.72	Compact light brownish grey (10YR 6/2) fine slightly silty SAND with rare <1% 10mm pockets of decayed organic matter/organic sand (ripped from below?) irregular boundary.	Dump deposit	Make-up deposits		
BH8	1.72	1.95	Spongy wet very dark brown highly organic peaty SILT with ephemeral fine sand throughout also rare <5% small 40mm pockets of grey (10YR6/1) medium sand. Sharp boundary. Occupation deposit (organic)	Organic Alluvium (mixed)	Occupation		
BH8	1.95	2	Loose light grey (10YR7/2) coarse SAND	Sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH8	2	2.5	Compact light brownish grey (10YR 6/2) fine with some medium sand, no bedding or inclusions, poor recovery	Sand	Tidal deposits		
BH8	2.5	2.6	Compact wet dark greyish brown (10YR4/2) silty medium SAND with sub angular to sub rounded fine to medium (5-30mm) gravel at 20%	Gravelly sand	Tidal deposits		
BH8	2.6	2.7	Loose medium 20-40mm sub rounded clast supported GRAVEL, infilled with a greyish brown (10YR4/4) fine sandy silt	Gravelly sand	Tidal deposits		
BH8	2.7	2.9	Soft wet dark grey (10YR 4/1) fine silty SAND with possible ephemeral flecks of organic	Sand and silt	Tidal deposits		
BH8	2.9	3	Compact pale brown (10YR 6/3) medium SAND	Sand	Tidal deposits		
BH8	3	4	Compact brown (10YR 4/3) to greyish brown (10R 5/2) medium SAND rare 15mm rounded pebble x1, x1 5mm shell fragment	Sand	Tidal deposits		
BH9	0	0.05	Yellow brown indurated coarse sands and fine to medium GRAVELS. Made ground, demolition and levelling	Sand and Gravel (made ground)	Make-up deposits		
BH9	0.05	0.6	Black ashy CLINKER, frequent off white chalky mortar fragments 10-30mm in size and granular moderate fine to medium red brick fragments occasional half bricks, rare slate. Made ground, demolition and levelling	Dump deposit	Make-up deposits		
BH9	0.6	1.2	Soft light yellowish grey mottled with dark grey brown fine sandy CLAY with pockets of granular mortar and frequent charcoal flecks, rare small red tile fragments, some pockets of soft black organics. Sharp boundary	Dump deposit	Make-up deposits	7	■ L19-20C, 18-19C
BH9	1.2	1.35	Void	Void			
BH9	1.35	1.55	Wet very pale brown (10YR8/4) coarse sandy CLAY, 1.46-1.49m large CBM fragment. Sharp boundary. Made up / ground raising	Dump deposit	Make-up deposits	31	■ L12-15C
BH9	1.55	1.65	Compact very dark brown (10YR 2/2) mottled with very pale brown (10YR 8/4) fine to coarse sand with 20% 50mm granular sandy mortar and x1 50mm CBM fragment. Sharp boundary. Occupation? Floor surface	Surface	Make-up deposits	32	■ L12-15C
BH9	1.65	1.72	Compact brownish yellow (10YR 6/6) fine to coarse slightly silty SAND. Sharp boundary. Floor/yard surface?	Surface	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH9	1.72	2	Wet mixed very dark grey (10YR 3/1) mottled with grey (10YR 6/1) organic clayey fine to coarse SAND with rare fine 10mm gravel becoming more organic with depth	Organic Alluvium (mixed)	Occupation	33	'▲ 13-14C, B, S,
BH9	2	2.15	Void with loose 50mm fragments of wet soft fibrous organics, slightly clayey, fine sand, rare large 50mm twigs (10YR 2/1)	Void			
BH9	2.15	2.25	Loose wet soft fibrous organic slightly clayey, fine sand (10YR 2/1). Sharp boundary	Organic Alluvium	Tidal deposits	34	■ Med?, B
BH9	2.25	2.35	Soft brown (10YR 4/3) highly organic SILT compacted plant matter at basal 10mm. Sharp boundary	Organic Alluvium	Tidal deposits	35	B
BH9	2.35	2.43	Loose grey (10YR 6/1) fine to medium slightly silty SAND. Sharp boundary	Sand and silt	Tidal deposits		
BH9	2.43	2.46	Soft black (10Y2/1) highly organic SILT with frequent degraded plant matter rare fine <10mm shell fragments <1%. Sharp boundary	Organic Alluvium	Tidal deposits		
BH9	2.46	2.6	Soft light yellowish brown (10YR 6/4) slightly silty fine SAND mottled with black (10YR 2/1) rare laminations of <1mm of organic at 2.50m bgl and light grey clay 2.56m. Sharp boundary	Sand and silt	Tidal deposits		
BH9	2.6	2.7	Soft dark brown (10YR 3/2) organic SILT with ephemeral fine sand, degraded organics, gradual boundary 30mm	Organic Alluvium	Tidal deposits		
BH9	2.7	3	Compact light brownish yellow (10YR6/6) grading to brown (10YR5/3) silty fine to medium SAND grading slightly to silt at base	Sand and silt	Tidal deposits		
BH9	3	3.3	Compact light brownish yellow (10YR 6/2) slightly silty fine SAND Sharp boundary	Sand and silt	Tidal deposits		
BH9	3.3	3.45	Loose fine SAND very pale brown (10YR 7/4). Sharp boundary	Sand	Tidal deposits		
BH9	3.45	3.6	Compact light brownish grey (10YR 6/2) fine to medium SAND with 1mm laminations of black (10YR 2/1) every 20mm, with 2mm laminations at base	Laminated sand	Tidal deposits		
BH9	3.6	4	Compact light brownish grey (10YR 6/2) fine to medium SAND with laminations of black (10YR 2/1), laminations disrupted, mixed (bioturbated?).	Laminated sand	Tidal deposits		
BH10	0	0.15	Gravel car park surface	Sand and Gravel (made ground)	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH10	0.15	1.2	Mixed greyish yellow medium sand and dark grey brown sand with frequent pink red fine to half brick sized and rare whole unfrogged red brick, 220x130x550mm, white mortar, rare fine glass fragments, rare yellow brick fragments. Demolition	Dump deposit	Make-up deposits	36	■ 14-16C
BH10	1.2	1.34	Firm dark greyish brown (10YR 4/2) silty clay with occasional medium to coarse subangular to subrounded gravels (45%), granular to medium (5-50mm) subrounded red CBM fragments. Sharp boundary. Demolition	Dump deposit	Make-up deposits	37	■ 15-17C, L12-15C
BH10	1.34	1.38	Loose brownish yellow (10YR 6/6) fine to medium sand. Builder's sand	Dump deposit	Make-up deposits		
BH10	1.38	1.44	Compact yellowish brown (10YR 6/1) silty fine SAND to fine sandy silt with granular off-white sandy mortar fragments. Sharp boundary. Demolition	Dump deposit	Make-up deposits	38	■ 15-16C
BH10	1.44	1.51	Compact red and white fine to medium CBM fragments 5-30mm, x1 large very pale brown (10YR 8/2) mortar fragment 70mm. Sharp boundary. Demolition	Dump deposit	Make-up deposits		
BH10	1.51	1.6	Compact granular to fine yellow (10YR 8/8) mortar fragments. Demolition	Dump deposit	Make-up deposits	39	■ L12-15C
BH10	1.6	1.73	Firm light yellowish brown (10YR 6/4) fine sandy SILT with rare <5% flecks of sandy mortar	Sand and silt	Tidal deposits		
BH10	1.73	1.86	Compact brownish yellow (10YR 8/8) medium SAND. Sharp boundary	Sand	Tidal deposits		
BH10	1.86	1.96	Compact yellow (10YR 7/6) medium to coarse sand. Sharp boundary	Sand	Tidal deposits		
BH10	1.96	2	Wet loose yellowish brown (10YR 5/6) fine to medium slightly silty SAND.	Sand	Tidal deposits		
BH10	2	2.25	Poor recovery	Void	Tidal deposits		
BH10	2.25	2.45	Compact dark grey brown (10YR 4/2) fine to medium SAND mottled with irregular black disturbed seemingly random laminations (10YR 2/1). Sharp boundary	Sand	Tidal deposits		
BH10	2.45	2.5	Soft wet light brownish grey (10YR 6/2) to very dark greyish brown (10YR 3/2) SILTY CLAY with abundant coarse sand. Sharp boundary	Sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH10	2.5	2.91	Soft wet black (10YR 2/1) highly organic odorous SILTY CLAY with fine sand component rare <5% 5mm rounded to subrounded black gravel <10% decayed plant matter	Organic Alluvium	Tidal deposits	40	
BH10	2.91	3	Poor recovery wet compact grey (10YR 5/1) medium SAND	Alluvium (clay and silt)	Tidal deposits		
BH10	3	3.7	Compact fine to medium SAND light brownish grey (10YR 6/2) with dark brown (10YR 5/2) mottling irregular and mixed to 3.45m bgl some horizontal banding from 3.45 -3.70m. Sharp boundary bgl	Sand	Tidal deposits		
BH10	3.7	3.77	Soft very dark grey (10Yr 3/1) mottled with light grey (10YR 7/1) organic clay SILT with ephemeral fine sands	Organic Alluvium	Tidal deposits		
BH10	3.77	4	Compact very pale brown (10YR 7/4) fine sand, mottled with black organic pockets 300mm in size throughout	Sand	Tidal deposits		
BH10	4	4.6	Compact grey brown (10YR 5/2) medium sand	Sand	Tidal deposits		
BH10	4.6	5	Compact dark grey brown (10YR 4/2) medium to coarse SAND with rare <5% black (10YR 2/1) organic flecks	Sand	Tidal deposits		
BH11	0	0.15	Tarmac, concrete fragments and asphalt	Tarmac	Make-up deposits		
BH11	0.15	1.2	Compact black ashy CLINKER with occasional 20% fine to medium subscapular to sub rounded brick and off-white mortar fragments becoming clayey from 1m. Made ground, demolition and levelling	Dump deposit	Make-up deposits	8	■ 14-16C
BH11	1.2	1.2	Light yellow brown coarse sand with frequent fine to medium red brick fragments, x1 large cobble, frequent fine to medium mortar fragments. Made ground, demolition and levelling	Dump deposit	Make-up deposits		
BH11	1.2	1.8	Firm brown (10YR5/4) gritty silty clay with occasional coarse to granular mortar flecks and CBM fragment (20%). Gradual boundary	Dump deposit	Make-up deposits		
BH11	1.8	2	Soft grey (10Yr 5/1) gritty silty clay with occasional fine 5mm mortar flecks 15%, rare 5% 5mm light red (2.5YR 6/6) sub rounded CBM fragments. Yard deposits?	Surface	Make-up deposits		
BH11	2	2.25	Void	Void			
BH11	2.25	2.36	Soft grey (10YR 6/1) fine to coarse sandy SILT with moderate 10% medium 10-30mm subangular to subrounded gravel. Wavy boundary	Sand and silt	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH11	2.36	2.37	Compact coarse SAND light grey (10YR 7/1)	Sand	Tidal deposits		
BH11	2.37	2.43	Compact grey (10YR5/1) silty fine to medium SAND. Sharp boundary	Sand	Tidal deposits		
BH11	2.43	2.48	Soft ephemerally sandy organic SILT dark brown (10YR 3/2). Sharp boundary	Organic Alluvium	Tidal deposits		
BH11	2.48	2.5	Soft wet grey (10YR 5/1) fine sandy SILT. Sharp Boundary	Sand and silt	Tidal deposits		
BH11	2.5	2.54	Soft dark brown (10YR 2/2) organic gritty silt with x1 300mm wood fragment. Sharp boundary	Organic Alluvium	Tidal deposits		
BH11	2.54	2.84	Compact light grey (10YR 7/1) slightly silty fine SAND	Sand and silt	Tidal deposits		
BH11	2.84	2.89	Loose dark grey 10YR4/1 fine silty SAND with rare flecks of organic remains	Sand and silt	Tidal deposits		
BH11	2.89	2.95	Compact light grey (10YR 7/1) slightly silty fine SAND	Sand and silt	Tidal deposits		
BH11	2.95	3	Loose grey (10YR 6/1) silty fine sand	Sand and silt	Tidal deposits		
BH11	3	3.15	Void	Void			
BH11	3.15	3.2	Soft very dark grey (10YR 3/1) silty fine SAND	Sand and silt	Tidal deposits		
BH11	3.2	3.25	Fairly well consolidated light brownish grey (10YR6/1) medium SAND	Sand	Tidal deposits		
BH11	3.25	3.52	Compact yellow (10YR 8/6) medium SAND mottled with grey bands of dark grey brown (10YR4/2) organic silt 3.44-45. Sharp boundary	Sand	Tidal deposits		
BH11	3.52	3.8	Compact grey (10YR6/1) medium SAND	Sand	Tidal deposits		
BH11	3.8	3.82	Decayed wood fragment, (Dark grey(10YR4/1). Sharp slanted boundary	Wood	Tidal deposits		
BH11	3.82	3.95	Loose grey (10YR 6/1) medium SAND with dark laminations. Irregular boundary	Laminated sand	Tidal deposits		
BH11	3.95	4	Loose medium SAND, pale brown (10YR 6/3) 40mm gravel clast, subangular	Sand	Tidal deposits		
BH11	4	5	Compact greenish grey (Gley 5/10Y) fine SAND with rare pockets of black fine sandy silt highly organic e.g. 4.14-4.17m bgl. Rare flecks of organic throughout	Sand	Tidal deposits		
BH12	0	0.1	Indurated light yellow grey coarse sand with small to medium gravel. Made ground, demolition and levelling	Sand and Gravel (made ground)	Make-up deposits	9	■ 20C

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH12	0.1	1.2	Compact black ashy CLINKER, silty with rare sharp modern glass fragments, rare fine subangular to subrounded gravels, rare flecks of white mortar 30% granular to medium red brick fragments rare 5% half bricks, rare oyster shell. Made ground, demolition and levelling	Dump deposit	Make-up deposits		
BH12	1.2	1.2	Light yellow brown coarse sand with frequent fine to medium red brick fragments, x1 large cobble, frequent fine to medium mortar fragments. Made ground, demolition and levelling	Dump deposit	Make-up deposits		
BH12	1.2	1.48	Soft light greenish blue sandy silt with occasional organics becoming sandier with depth	Dump deposit	Make-up deposits		
BH12	1.48	1.75	Soft dark brownish grey coarse sandy clay becoming sandier with depth	Dump deposit	Make-up deposits	10	■ L12-15C
BH12	1.75	1.88	Soft dark grey (2.5YR 4/1) fine slightly sandy silt with rare <1% coarse 60mm gravel subrounded, sandstone and mortar. Sharp boundary	Dump deposit	Make-up deposits	11	■ L12-16C
BH12	1.88	1.94	Loose light blue grey (Gley 2 7/1) slightly silty fine sand with light reddish-brown fine to medium CBM fragments <5% subangular 5-25mm. Sharp boundary	Dump deposit	Make-up deposits		
BH12	1.94	2	Soft light brownish grey (2.5YR 6/2) slightly silty SAND with rare fine (<10mm) subrounded pebbles, slightly organic	Dump deposit	Make-up deposits		
BH12	2	2.3	Void	Void			
BH12	2.3	2.52	Soft blue grey (GLEY 2 6/5B) SAND with rare decayed wood fragment at 2.46m bgl, moderate 30% fine, coarse subrounded gravel. Sharp boundary	Gravelly sand	Tidal deposits		
BH12	2.52	2.6	Soft blue grey (Gley 2 25/5B) silty, medium to coarse SAND	Sand	Tidal deposits		
BH12	2.6	2.8	Compact blue grey (GLEY2 5/5) slightly silty medium to coarse SAND. Sharp boundary	Sand	Tidal deposits		
BH12	2.8	2.9	Compact dark blueish grey (GLEY2 4/1) fine SAND, slightly organic x1 50m CBM fragment. Sharp boundary	Sand	Tidal deposits	12	■ L12-16C
BH12	2.9	3	Compact light blueish grey (GLEY 2 7/1) medium SAND	Sand	Tidal deposits		
BH12	3	3.2	Compact grey (2.5y 6/1) fine SAND with rare pockets (1 0mm) of organic black sand	Sand	Tidal deposits		
BH12	3.2	3.55	as below but with rare thin irregular laminations	Laminated sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH12	3.55	3.7	Loose light brownish grey (2.5YR 6/2) fine sand with laminations of silty clay (5mm), wavy sharp boundary	Laminated sand	Tidal deposits		
BH12	3.7	3.75	Soft very dark grey (2.5Y 3/1) organic silt with compact decayed plant remains throughout	Organic Alluvium	Tidal deposits		
BH12	3.75	3.8	Compact light grey (2.5Y7/1) fine to medium SAND with rare flecks of organics. Diffuse boundary	Sand	Tidal deposits		
BH12	3.8	3.85	Soft black (2.5Y 8/1) highly organic fine sandy SILT with moderate compressed veg. matter 10-40mm	999	Tidal deposits		
BH12	3.85	4	Compact dark greyish brown (2.5Y 4/1) slightly silty fine SAND, 1% rare 10mm flecks of decayed plant matter, slightly more organic at top	Sand and silt	Tidal deposits		
BH12	4	5	Compact grey (10YR 6/1) medium SAND mottled with rare black (10YR 2/1) flecks <1%	Sand	Tidal deposits		
BH14	0	1	Brick rubble and clinker	Rubble	Make-up deposits	13	■ 14-16C
BH14	1	1.46	Soft wet very dark grey brown (10YR 3/2) highly organic gritty SILT very pale brown (10YR8/2) mottling rare, x1 medium 40mm subrounded pebble, x1 70mm angular CBM frag. Sharp boundary	Organic Alluvium (mixed)	Occupation	14	■ L12-16C, B
BH14	1.46	1.55	Compact light grey fine silty SAND with 10mm laminations of dark grey organic silt, x1 20mm mortar fragment	Laminated sand	Tidal deposits		
BH14	1.55	1.8	Compact light grey (10Yr 7/1) fine SAND with rare 30mm pockets of dark brown (10YR3/3) organic SILT. Irregular boundary	Sand	Tidal deposits		
BH14	1.8	1.9	Loose wet brown (10YR 4/3) highly organic mixed silty fine SAND	Organic Alluvium	Tidal deposits	41	
BH14	1.9	2	Loose very pale brown (10YR7/3) fine sand	Sand	Tidal deposits		
BH14	2	2.1	Soft very dark grey brown (10YR 3/2) fine highly organic sandy SILT with abundant 30mm plant fragments reeds and twigs. Sharp boundary	Organic Alluvium	Tidal deposits	42	
BH14	2.1	2.4	Loose wet dark grey (10YR4/1) medium SAND with occasional organic flecks 15% throughout no bedding, sharp boundary	Sand	Tidal deposits		
BH14	2.4	2.47	Soft very dark brown (10YR2/2) highly organic SILT with abundant 30% decayed fine 5mm veg fragments	Organic Alluvium	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH14	2.47	2.75	Compact dark grey (10YR 4/1) medium SAND with yellow mottling from 1.68m	Sand	Tidal deposits		
BH14	2.75	2.78	Soft wet very dark brown slightly silty humic well-formed PEAT, irregular boundary	Organic Alluvium	Tidal deposits		
BH14	2.78	2.88	Soft dark yellowish brown silty medium SAND rare fine plant remains diffuse boundary	Sand and silt	Tidal deposits		
BH14	2.88	3	Loose wet light grey medium to coarse SAND	Sand	Tidal deposits		
BH15	0	0.15	Gravel and asphalt, Carpark surface	Sand and Gravel (made ground)	Make-up deposits		
BH15	0.15	0.35	Red brick and mortar fragments infilled with grey and black ashy clinker. Made ground, demolition, and levelling	Dump deposit	Make-up deposits		
BH15	0.35	1.2	black ashy slightly silty CLINKER with large concrete and brick fragments 150-200mm in size. Made ground, demolition, and levelling	Dump deposit	Make-up deposits		
BH15	1.2	1.4	Soft very dark grey (10YR 3/1) medium to coarse sandy SILT with frequent fine to medium subangular to subrounded gravel (20%, 10-30mm), occasional 15% fine to medium white sandy mortar fragments (10-40mm). Sharp boundary	Dump deposit	Make-up deposits		
BH15	1.4	1.6	Compact brown (10YR 4/3) silty fine, medium and coarse SAND with 20% fine to medium white to off grey mortar fragments. Sharp Boundary	Dump deposit	Make-up deposits		
BH15	1.6	1.7	Compact dark yellowish-brown coarse sandy granular to medium subangular to subrounded GRAVEL and mortar fragments. Sharp boundary	Dump deposit	Make-up deposits		
BH15	1.7	1.9	Firm yellowish brown (10YR 4/4) silty fine SAND. Sharp boundary. Bedding /footing	Dump deposit	Make-up deposits		
BH15	1.9	2	Loose coarse gravel /rubble subangular to subrounded, clast supported	Rubble	Make-up deposits		
BH15	2	2.34	Loose coarse gravelly 20-60mm subangular to subrounded GRAVEL, with rare granular gravels and coarse sand, clast supported light brownish grey (10YR6/2), sharp boundary	Rubble	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH15	2.34	2.55	well consolidated GRAVEL 10mm in size subangular to subrounded clast supported, interspersed with brown (10YR 4/4) silty medium sand. Sharp boundary	Sand and Gravel (made ground)	Make-up deposits		
BH15	2.55	3	Firm wet dark blueish grey (Gley 2 4/10B) slightly organic silty SAND becoming siltier with depth, rare <10mm flecks of decayed organic material	Sand and silt	Tidal deposits		
BH15	3	3.44	Soft wet silty fine SAND, very dark grey (10YR 3/1) mottled with 10-30mm patches of organic smelling black silty sand. Sharp boundary	Sand and silt	Tidal deposits		
BH15	3.44	3.74	Loose wet dark grey (10YR 4/1) slightly silty fine sand with lenses of granular gravel 3.60-3.64m bgl. Sharp boundary	Sand and silt	Tidal deposits		
BH15	3.74	3.92	Loose wet dark grey (10YR 4/1) slightly silty fine to medium SAND with rare 5mm subrounded gravels <1% dark grey silt laminations <1mm increasing with depth. Sharp boundary	Sand and silt	Tidal deposits		
BH15	3.92	4	Loose dark greyish brown (10YR 4/2) medium to coarse SAND	Sand	Tidal deposits		
BH15	4	4.33	Poorly recovered loose dark greyish brown (10YR 4/2) fine to medium SAND. Sharp boundary	Sand	Tidal deposits		
BH15	4.33	4.6	Soft black (10YR2/1) organic smelling medium to coarse SAND with moderate fine to large wood fragments 10-90mm in size, slightly degraded, mixed deposit. Sharp boundary	Organic Alluvium	Tidal deposits	43	
BH15	4.6	4.62	Soft black (10YR 2/1) highly organic silty fine SAND with 10% fine organic detritus, sharp boundary	Organic Alluvium	Tidal deposits		
BH15	4.62	4.74	Loose dark grey (10YR 4/1) silty fine to medium SAND with laminations of black (10YR 2/1) organic silty fine to medium sand with fine rare <5% degraded plant remains, laminations at 45 degrees downward angle. Sharp boundary	Laminated sand	Tidal deposits		
BH15	4.74	4.89	Loose grey (10YR 5/1) fine to medium silty SAND with bands 10mm thick of decayed plant matter. Irregular boundary	Laminated sand	Tidal deposits		
BH15	4.89	5	Mixed fine 10mm 'sandstone' gravel (20%), 10mm decayed wood material and black (10YR 2/1) and mottled grey (10YR 5/1) fine to coarse SANDS	Gravelly sand	Tidal deposits		

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Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH01	0	0.1		Tarmac	Make-up deposits		
BH01	0.1	1.2		Dump deposit	Make-up deposits		
BH01	1.20	1.48	Loose rubble	Rubble	Make-up deposits		
BH01	1.48	2.31	Compact dark greyish brown (2.5Y 4/2) silty clay with silty sand component. Occasional charcoal inclusions becoming moderate at 2.05-2.31m. Small limestone fragments at 1.48m and infrequent small CBM inclusions. Sharp boundary	Alluvium (mixed)	Make-up deposits		
BH01	2.31	2.70	Loose light olive brown (2.5Y 5/4) fine silty sand. Occasional charcoal inclusions	Sand	Tidal deposits		
BH01	2.70	2.97	Void	Void	Tidal deposits		
BH01	2.97	4.20	Loose light olive brown (2.5Y 5/4) fine silty sand with moderate clay component. Moderate charcoal inclusions. Wooden object at 3.2m	Sand	Tidal deposits	100	Wood
BH01	4.20	4.80	Void	Void	Tidal deposits		
BH01	4.80	5.70	Loose light olive brown (2.5Y 5/4) fine silty sand with occasional clay component. Occasional charcoal inclusions. Clear boundary	Sand	Tidal deposits		
BH01	5.70	6.50	Loose light olive brown (2.5Y 5/4) fine silty sand mottled with organic/humic possible peat/waterlogged material (Gley 2 2.5/10B) and occasional charcoal. Clear boundary	Laminated sand	Tidal deposits		
BH01	6.50	7.20	Loose light yellowish brown (2.5Y 6/3) coarse silty sand. Occasional charcoal inclusions	Sand	Tidal deposits		
BH01	7.20	8.28	Loose light yellowish brown (2.5Y 6/3) coarse silty sand. Frequent CBM and charcoal with large CBM pieces at 7.36-7.45m. Waterlogged material at 7.64m. Frequent limestone fragments between 8.06-8.28m. Contains some broken fragments of shell mixed in with CBM. Clear boundary	Sand (mixed)	Tidal deposits	101	■ L13-15C+
BH01	8.28	8.60	Compact light yellowish brown (2.5Y 6/3) coarse silty sand with silty clay component. Occasional charcoal inclusions and small fragments of marine shell	Sand	Tidal deposits		
BH01	8.60	9.50	Coarse compact silty sand with silty clay. Sediment supported. 6/3 2.5 Y light yellowish brown. Occasional charcoal inclusions and small fragments of marine shell. Capped at end of deposit with large angular flint stone 7cm. Sharp boundary	Laminated sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH01	9.50	9.66	Very compact dark bluish grey silty clay (Gley 2 3/10B) grey with light olive brown (2.5Y 5/4) mottling. Abundant rounded chalk inclusions; well sorted <10mm. Boulder Clay	Glacial Till	Glacial Till		
BH01	9.66	10.10	Void	Void	Glacial Till		
BH01	10.10	11.08	Very compact dark bluish grey silty clay (Gley 2 3/10B) with light olive brown (2.5Y 5/4) mottling. Abundant rounded chalk inclusions; moderately sorted 10-20mm. Boulder Clay	Glacial Till	Glacial Till		
BH01	11.08	11.06	Void	Glacial Till	Glacial Till		
BH01	11.60	13.10	Very compact dark bluish grey silty clay (Gley 2 3/10B) with light olive brown (2.5Y 5/4) mottling. Abundant rounded chalk inclusions; poorly sorted 10-50mm. Boulder Clay	Glacial Till	Glacial Till		
BH01	13.10	14.60	Very compact dark bluish grey silty clay (Gley 2 3/10B) with light olive brown (2.5Y 5/4) mottling. Abundant rounded chalk inclusions; poorly sorted 10-50mm. Boulder Clay	Glacial Till	Glacial Till		
BH02	0	0.1		Tarmac	Make-up deposits		
BH02	0.1	1.2		Dump deposit	Make-up deposits		
BH02	1.20	1.70	Void	Void	Make-up deposits		
BH02	1.70	1.92	Loose very dark greyish brown (2.5Y 3/2) coarse silty sand with abundant poorly sorted subangular to subrounded pebbles (5-50mm), limestone present. Clast supported in lower 0.2m of deposit. Occasional charcoal, coal and CBM inclusions	Dump deposit	Make-up deposits	200	■ L19-20C, G
BH02	1.92	2.01	Compact bluish black (Gley 2 2.5/10B) silty clay. Frequent waterlogged organic / humic material present, including wood. Infrequent glass fragments, large brick present from 1.9-2.05m. Clear boundary	Organic Alluvium	Tidal deposits		
BH02	2.01	2.70	Compact brown (7.5YR 4/2) fine silty clay with occasional organic bluish black (Gley 2 2.5/10B) mottling	Alluvium (clay and silt)	Tidal deposits		
BH02	2.70	3.26	Compact brown (7.5YR 4/2) fine silty clay. Moderate organic bluish black (Gley 2 2.5/10B) mottling. Moderate CBM fragments, occasional charcoal inclusions. Poorly sorted subangular pebbles (10-50mm)	Alluvium (clay and silt)	Tidal deposits	201	■ L19-20C
BH02	3.26	3.48	Void	Void	Tidal deposits		
BH02	3.48	3.80	Compact brown (7.5YR 4/2) fine silty clay. Moderate organic bluish black (Gley 2 2.5/10B) mottling. Moderate CBM fragments, occasional charcoal inclusions. Poorly sorted subangular to subrounded pebbles (10-50mm)	Alluvium (clay and silt)	Tidal deposits		
BH02	3.80	4.01	Compact bluish black (Gley 2 2.5/10B) organic silty clay	Alluvium (clay and silt)	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH02	4.01	4.20	Compact brown (7.5YR 4/2) fine silty clay. Moderate organic bluish black (Gley 2 2.5/10B) mottling. Moderate CBM fragments, occasional charcoal inclusions. Poorly sorted subangular to subrounded pebbles (10-50mm)	Alluvium (clay and silt)	Tidal deposits		
BH02	4.20	4.43	Void	Void	Tidal deposits		
BH02	4.43	5.20	Compact brown (7.5YR 4/2) fine silty clay. Moderate organic bluish black (Gley 2 2.5/10B) mottling. CBM fragments present at 4.95m. Occasional charcoal inclusions. Poorly sorted subangular to subrounded pebbles (10-50mm)	Alluvium (clay and silt)	Tidal deposits		
BH02	5.20	5.47	Compact bluish black (Gley 2 2.5/10B) organic silty clay	Alluvium (clay and silt)	Tidal deposits		
BH02	5.47	5.70	Compact brown (7.5YR 4/2) fine silty clay. Moderate organic bluish black (Gley 2 2.5/10B) mottling. Moderate CBM fragments, occasional charcoal inclusions. Poorly sorted subangular pebbles (10-50mm)	Alluvium (clay and silt)	Tidal deposits		
BH02	5.70	5.80	Compact brown (7.5YR 4/2) fine silty clay. Moderate organic bluish black (Gley 2 2.5/10B) mottling. Frequent CBM fragments, occasional charcoal inclusions. Poorly sorted subangular to subrounded pebbles (10-50mm). Sharp boundary	Alluvium (clay and silt)	Tidal deposits	202	■ L13-15C+
BH02	5.80	6.41	Compact brown (7.5YR 4/2) fine silty sand with bluish black (Gley 2 2.5/10B) mottling. Clear boundary	Sand	Tidal deposits		
BH02	6.41	6.52	Compact bluish black (Gley 2 2.5/10B) organic fine silty sand with clay component. Sharp boundary	Organic Alluvium	Tidal deposits		
BH02	6.52	6.70	Compact brown (7.5YR 4/2) fine silty sand with bluish black (Gley 2 2.5/10B) mottling	Alluvium (clay and silt)	Tidal deposits		
BH02	6.7	8	Void	Void	Tidal deposits		
BH02	8	8.5	Void	Void	Tidal deposits		
BH02	8.5	9.5	Void	Void			
BH02	9.50	11.00	Very compact dark bluish grey (Gley 2 3/10B) silty clay with light olive brown (2.5Y 5/4) mottling. Infrequent subangular to subrounded limestone/chalk pebbles and moderately frequent rounded chalk inclusions <10mm	Glacial Till	Glacial Till		
BH03	1.00	1.49	Void	Void			
BH03	0	0.11		Tarmac	Make-up deposits		
BH03	0.11	0.15		Dump deposit	Make-up deposits		
BH03	0.15	0.25		Surface	Make-up deposits		
BH03	0.25	1		Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH03	1	1.49		Void	Make-up deposits		
BH03	1.49	2.00	Loose light yellowish brown (2.5Y 6/3) coarse silty sand. Poorly sorted subangular to subrounded pebbles (10-30mm). Moderately frequent CBM fragments and mortar, occasional charcoal inclusions	Dump deposit	Make-up deposits	300	■ L12-15C
BH03	2.00	2.40	Void	Void	Make-up deposits		
BH03	2.40	2.58	Loose dark greyish brown (2.5Y 6/3 to 2.5Y 4/2) coarse silty sand. Poorly sorted subangular to subrounded pebbles 10-40mm. Infrequent large CBM fragments. Sharp boundary	Dump deposit	Make-up deposits	301	■ L13-15C+
BH03	2.58	2.67	Compact light yellowish brown (2.5Y 6/3) coarse silty sand with clay component. Moderately sorted subangular to subrounded pebbles 5-20mm. Moderately frequent CBM fragments and burnt stone. Sharp boundary	Dump deposit	Make-up deposits	302	■ NCD
BH03	2.67	2.96	Compact olive brown (2.5Y 5/4) silty sand. Moderately frequent subangular to subrounded small pebbles (<10mm) to upper part of deposit. Charcoal band (~40mm thick) at 2.8m and <15mm thick yellowish brown (10YR 5/6) laminations occurring beneath this. Rare small CBM and bone fragments. Clear boundary	Dump deposit	Make-up deposits	303	B
BH03	2.96	3.00	Compact very dark greyish brown (2.5Y 3/2) coarse silty sand. Moderately frequent subangular to subrounded small pebbles (5-10mm). Occasional marine shell. Frequent organic/humic peaty material	Organic Alluvium (mixed)	Occupation	304	S
BH03	3.00	3.08	Void	Void	Occupation		
BH03	3.08	3.29	Compact very dark greyish brown (2.5Y 3/2) silty sand. Frequent organic/humic peaty material. Occasional marine shell. Frequent CBM fragments at 3.25-3.29m with thin (<10mm thick) banding occurring between 3.19-3.21m. Clear boundary	Organic Alluvium (mixed)	Occupation	305	■ L12-15C, B
BH03	3.29	3.37	Loose light olive brown (2.5Y 5/4) fine silty sand with mid yellowish brown (10YR 4/4) banding. Clear boundary	Sand (mixed)	Occupation		
BH03	3.37	3.49	Loose light olive brown (2.5Y 5/4) silty sand with reddish brown (10YR 3/2) mottling, possibly burning. Abundant CBM fragments, rare charcoal. Sharp boundary	Dump deposit	Occupation	306	■ NCD
BH03	3.49	3.61	Compact olive brown (2.5Y 5/4) fine silty sand. Rare pottery sherds. Sharp boundary	Sand (mixed)	Occupation		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH03	3.61	3.70	Compact mid grey (Gley 2 5/5PB) fine silty sand with occasional clay component. Charcoal rich, very dark grey to black (Gley 2 2.5/10PB) burnt deposit with charcoal. Coarse silty sand banding at 3.61-3.62m and 3.64-3.66m. Occasional shale. Poorly sorted 2-20mm subangular pebbles and limestone. Clear boundary	Dump deposit	Occupation		
BH03	3.70	3.98	Loose olive brown (2.5Y 5/4) fine silty sand. Occasional charcoal inclusions and yellowish brown (10YR 5/6) banding. Gradual boundary	Sand	Occupation		
BH03	3.98	4.00	Compact olive brown (2.5Y 5/2) fine silty sand with occasional charcoal inclusions	Sand	Occupation		
BH03	4.00	4.10	Void	Void	Occupation		
BH03	4.10	4.21	Compact olive brown (2.5Y 5/2) fine silty sand with occasional charcoal inclusions. Occasional marine shell. Clear boundary	Sand	Occupation	308	S
BH03	4.21	4.44	Compact light olive brown (2.5Y 5/4) fine silty sand with rare charcoal. Clear boundary	Sand	Occupation		
BH03	4.44	4.63	Loose light olive brown (2.5Y 5/4) fine silty sand with yellowish brown (2.5Y 6/8) banding. Rare wood fragments. Burnt stone deposit at 4.44-4.52m. Poorly sorted 10-30mm subangular to subrounded pebbles with occasional marine shell. Sharp boundary	Dump deposit	Occupation		■ L12-15C, S, B
BH03	4.63	4.74	Clast supported limestone deposit with 10-70mm poorly sorted subangular to subrounded limestone fragments. Some olive brown (2.5Y 5/4) fine silty sand. Occasional marine shell, rare charcoal. Possible slag. Sharp boundary	Rubble	Occupation	310	■ L12-15C
BH03	4.74	4.91	Compact olive brown (2.5Y 5/2) fine silty sand with rare charcoal inclusions. Sharp boundary	Sand	Tidal deposits		
BH03	4.91	5.00	Compact mid grey (Gley 2 5/5PB) fine silty sand with clay component.	Sand	Tidal deposits		
BH04	0	0.14		Tarmac	Make-up deposits		
BH04	0.14	1		Dump deposit	Make-up deposits		
BH04	1.00	1.12	Void	Void	Make-up deposits		
BH04	1.12	1.26	Loose dark greyish brown (2.5Y 4/2) fine silty sand with yellowish brown (10YR 5/6) and mid grey (Gley 2 5/5PB) mottling. Clear boundary	Dump deposit	Make-up deposits		
BH04	1.26	1.42	Loose light olive brown (2.5Y 5/4) fine silty sand. Occasional CBM fragments, marine shell and charcoal. Rare burnt stone. Clear boundary	Dump deposit	Make-up deposits	400	■ L12-15C, S
BH04	1.42	1.49	Firm mid greyish brown (2.5Y 5/2) fine silty sand with clay component. Occasional charcoal inclusions and coal with a concentration between 1.46-1.49m. Sharp boundary	Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH04	1.49	1.95	Compact light olive brown (2.5Y 5/4) silty sand with clay component. Poorly sorted 10-40mm subangular to subrounded pebbles. Occasional marine shell fragments, CBM fragments and charcoal inclusions. Concentration of pebbles and marine shell at 1.8-1.95	Dump deposit	Make-up deposits	401	▲ L12-14C
BH04	1.95	2.09	Void	Void	Occupation		
BH04	2	2.09	Void	Void	Occupation		
BH04	2.09	2.23	Loose light olive brown (2.5Y 5/4) fine silty sand with occasional clay component. Occasional charcoal inclusions, infrequent CBM fragments. Clear boundary	Sand (mixed)	Occupation	402	■ L12-15C
BH04	2.23	2.46	Compact mid greyish brown (7.5YR 4/2) silty clay. Occasional charcoal and subangular to subrounded pebbles (<20mm). Thin (<10mm) dark yellowish brown (10YR 4/6) silty sand banding present. Gradual boundary	Alluvium (mixed)	Occupation		
BH04	2.46	2.61	Compact light olive brown (2.5Y 5/4) fine silty sand with occasional light yellowish brown (2.5Y 6/8) mottling. Clear boundary	Sand (mixed)	Occupation		
BH04	2.61	2.72	Very loose dark yellowish brown (10YR 4/6) silty sand with bands of fine light yellowish brown (2.5Y 6/8) silty sand. Rare charcoal inclusions and CBM fragments. Gradual boundary.	Dump deposit	Occupation		
BH04	2.72	3.00	Compact bluish grey (Gley 2 5/5PB) fine silty sand. Frequent charcoal and burnt marine shell. Frequent organic material between 2.83-2.89m, possibly burnt	Sand	Tidal deposits		
BH04	3.00	4.00	Compact bluish grey (Gley 2 5/5PB) fine silty sand. Occasional charcoal inclusions	Sand	Tidal deposits		
BH04	4.00	4.10	Void	Void	Tidal deposits		
BH04	4.10	4.60	Compact bluish grey (Gley 2 5/5PB) fine silty sand. Occasional charcoal inclusions	Sand	Tidal deposits		
BH04	4.60	5.00	Compact mid greyish brown (7.5YR 4/2) fine silty sand with occasional charcoal inclusions	Sand	Tidal deposits		
BH05	0	0.1		Tarmac	Make-up deposits		
BH05	0.1	0.3		Rubble	Make-up deposits		
BH05	0.3	0.5		Surface	Make-up deposits		
BH05	0.5	0.7		Sand and Gravel	Make-up deposits		
BH05	0.7	0.9		Rubble	Make-up deposits		
BH05	0.9	1		Sand and Gravel	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH05	1	1.15	Void	Void	Make-up deposits		
BH05	1.15	2.00	Compact light olive brown (2.5Y 5/4) fine silty sand with mid greyish brown (7.5YR 4/2) silty clay dark yellowish brown (10YR 4/6) fine silty sand mottling. Rare <10mm subangular to subrounded pebbles. Rare charcoal inclusions	Dump deposit	Make-up deposits		
BH05	2.00	2.09	Void	Void	Make-up deposits		
BH05	2.09	2.26	Compact light olive brown (2.5Y 5/4) fine silty sand with mid greyish brown (7.5YR 4/2) silty clay and dark yellowish brown (10YR 4/6) fine silty sand mottling. Rare (<20mm) subangular to subrounded pebbles. Rare charcoal. Gradual boundary	Dump deposit	Make-up deposits		
BH05	2.26	2.55	Very compact mid greyish brown (7.5YR 4/2) silty clay with dark yellowish brown (10YR 4/6) and mid olive yellow (2.5Y 6/8) fine silty sand mottling. Moderate charcoal inclusions. Sharp boundary	Dump deposit	Tidal deposits		
BH05	2.55	2.68	Compact light olive brown (2.5Y 5/4) fine silty sand with yellowish brown (10YR 5/6) mottling. Frequent dark yellowish brown (7.5YR 4/2) clay component. Rare charcoal. Gradual boundary	Sand (mixed)	Tidal deposits		
BH05	2.68	3.00	Compact light yellowish brown (2.5Y 6/4) fine silty sand with dark yellowish brown (7.5YR 4/2) mottling. Clear boundary	Sand	Tidal deposits		
BH05	3.00	3.05	Void	Void	Tidal deposits		
BH05	3.05	3.10	Loose olive brown (2.5Y 4/4) silty sand. Gradual boundary	Sand	Tidal deposits		
BH05	3.10	3.37	Loose light yellowish brown (2.5Y 6/4) fine silty sand with frequent mid greyish brown (7.5YR 4/2) silty clay mottling. Frequent charcoal inclusions and bluish staining. Gradual boundary	Sand	Tidal deposits		
BH05	3.37	3.48	Loose light olive brown (2.5Y 5/4) to light yellowish brown (10YR 5/6) silty sand. Sharp boundary	Sand	Tidal deposits		
BH05	3.48	3.52	Compact bluish black (Gley 2 2.5/10B) silty clay with organic peaty material containing wood, possibly waterlogged. Occasional charcoal inclusions. Sharp boundary	Sand	Tidal deposits		
BH05	3.52	3.59	Loose light olive brown (2.5Y 5/3) fine silty sand with rare charcoal inclusions. Clear boundary	Sand	Tidal deposits		
BH05	3.59	3.71	Loose light yellowish brown (2.5Y 6/4) fine silty sand with rare charcoal inclusions	Sand	Tidal deposits		
BH05	3.71	3.80	Loose light yellowish brown (2.5Y 6/4) fine silty sand with frequent light bluish grey (Gley 2 7/5B) mottling. Possible organic deposits at 3.71-3.75m. Sharp boundary	Sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH05	3.80	3.86	Compact bluish black (Gley 2 2.5/10B) silty clay with organic peaty material containing wood, possibly waterlogged. Occasional charcoal inclusions. Rare 10mm subangular to subrounded pebbles. Sharp boundary	Sand	Tidal deposits		
BH05	3.86	3.94	Compact light grey (Gley 2 7/5B) fine silty sand. Sharp boundary	Sand	Tidal deposits		
BH05	3.94	4.00	Compact brownish grey (7.5YR 5/1) fine silty sand. Sharp boundary	Sand	Tidal deposits		
BH05	4.00	4.46	Compact dark yellowish brown (7.5YR 4/2) fine silty sand. Rare shell inclusions. Clear boundary	Sand	Tidal deposits		
BH05	4.46	5.00	Mid grey (Gley 2 5/5PB) silty clay with silty sand component. Waterlogged / organic mottling with dense organic deposit at 4.95-5.00m containing marine shell fragments. Moderate charcoal inclusions	Sand	Tidal deposits	500	S
BH06	0	0.08		Tarmac	Make-up deposits		
BH06	0.08	0.15		Surface	Make-up deposits		
BH06	0.15	0.7		Dump deposit	Make-up deposits		
BH06	0.7	1.5		Dump deposit	Make-up deposits		
BH06	1.50	1.96	Loose light yellowish brown (2.5Y 6/4) coarse silty sand with frequent poorly sorted subangular to subrounded 10-50mm pebbles and limestone fragments. Largely clast supported, mainly limestone. Moderately frequent CBM fragments and occasional charcoal inclusions. Small band of clay between 1.64-1.71m. Sharp boundary	Dump deposit	Make-up deposits	600	■ L13-15C+, M
BH06	1.96	2.32	Compact olive brown (2.5Y 4/3) fine silty clay with very dark greyish brown (2.5Y 3/2) mottling. 3/2 2.5 Y very dark greyish brown. Frequent charcoal inclusions and CBM fragments. Occasional rounded pebbles (<40mm). Frequent broken marine shell. Sharp boundary	Dump deposit	Make-up deposits	601	■ L12-15C
BH06	2.32	2.68	Loose light yellowish brown (2.5Y 6/8) very fine silty sand with light olive brown (2.5Y 5/4) banding. Occasional charcoal inclusions. Clear boundary	Sand (mixed)	Occupation		
BH06	2.68	3.00	Compact mid grey (Gley 2 5/5PB) fine silty sand with clay component and dark yellowish brown (10YR 4/6) mottling	Sand (mixed)	Occupation		
BH06	3.00	3.35	Compact olive brown (2.5Y 4/3) fine silty clay with fine silty sand. Occasional charcoal inclusions. Poorly sorted subangular to subrounded pebbles (5-20mm). Frequent CBM fragments, abundant from 3.00-3.10m. Occasional broken marine shell. Small pieces of broken limestone. Clear boundary	Dump deposit	Occupation	602	■ L12-15C
BH06	3.35	3.54	Compact mid grey (Gley 2 5/5B) fine silty sand with clay component and dark yellowish brown (10YR 4/6) mottling. Gradual boundary	Laminated sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH06	3.54	4.16	Loose light yellowish brown (2.5Y 6/8) very fine silty sand with bands of light olive brown (2.5Y 5/4) and mid grey (Gley 2 5/5PB). Frequent charcoal inclusions. Clear boundary	Laminated sand	Tidal deposits		
BH06	4.16	4.50	Loose mid grey (Gley 2 5/5PB) silty sand mottled with light olive brown (2.5Y 5/4). Rare CBM fragments and charcoal inclusions	Sand	Tidal deposits		
BH06	4.50	6.00	Loose mid grey (Gley 2 5/5PB) fine silty sand mottled with light olive brown (2.5Y 5/4). Occasional clay banding. Rare CBM fragments. Occasional charcoal inclusions.	Sand	Tidal deposits		
BH06	6.00	6.30	Loose mid grey (Gley 2 5/5PB) fine silty sand mottled with light olive brown (2.5Y 5/4). Rare CBM fragments and charcoal inclusions. Clear boundary	Laminated sand	Tidal deposits		
BH06	6.30	7.36	Very humic waterlogged peaty deposit. Mid grey (Gley 2 5/5PB) with frequent dark grey to black (Gley 2 2.5/10G) possible peat banding. CBM fragments between 6.73-6.76m, rare animal bone at 6.51m and 6.85m. Occasional broken marine shell. Poorly sorted subangular to subrounded pebbles 5-50mm. Clear boundary	Laminated sand	Tidal deposits	603	S, B, cal AD 1300-1408
BH06	7.36	7.50	Loose mid grey (Gley 2 5/5PB) fine silty sand mottled with light olive brown (2.5Y 5/4). Rare CBM fragments and charcoal inclusions	Laminated sand	Tidal deposits		
BH06	7.50	7.75	Loose mid grey (Gley 2 5/5PB) fine silty sand mottled with light olive brown (2.5Y 5/4). Rare CBM fragments and charcoal inclusions. Organic material noted at 7.7m. Clear boundary	Laminated sand	Tidal deposits		
BH06	7.75	8.26	Loose mid greyish brown (2.5Y 5/1) very coarse silty sand. Banding of humic dark grey to black (Gley 2 (2.5/10B) organic material at 7.91-7.92m and 8.10-8.11m Occasional marine shell. Charcoal fragments noted at 7.76-7.8m. Poorly sorted subangular to subrounded stone (5-30mm) from 8.13-8.26m. Sharp boundary	Gravelly sand	Tidal deposits	604	▲ ■ M11-L12C, S, Corylus cal AD 1054-1266
BH06	8.26	9.00	Very compact dark grey (Gley 2 3/10B) silty clay with light olive brown (2.5Y 5/4) mottling. Moderately frequent rounded to subangular chalk inclusions (<10mm). Boulder Clay	Glacial Till	Glacial Till		
BH06	9.00	10.50	Very compact dark grey (Gley 2 3/10B) silty clay with light olive brown (2.5Y 5/4) mottling. Moderately frequent rounded to subangular chalk inclusions (<10mm). Boulder Clay	Glacial Till	Make-up deposits		
BH07	0	0.1		Tarmac	Make-up deposits		
BH07	0.1	1		Dump deposit	Make-up deposits		
BH07	1.00	1.37	Loose poorly sorted clast supported subangular to subrounded pebbles and cobbles (10-60mm). Some loose light olive brown (2.5Y 5/4) coarse silty sand. Occasional CBM fragments. Sharp boundary	Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH07	1.37	2.00	Compact light olive brown (2.5Y 5/4) fine silty sand mottled with mid greyish brown (7.5YR 4/2) silty clay. Occasional charcoal inclusions and CBM fragments. Marine shell fragments present at 1.55-1.65m and 1.80-1.89m. Poorly sorted subangular to subrounded pebbles (10-40mm)	Dump deposit	Make-up deposits	700	
BH07	2.00	2.15	Compact light olive brown (2.5Y 5/4) fine silty sand mottled with mid greyish brown (7.5YR 4/2) silty clay. Occasional charcoal inclusions and CBM fragments. Marine shell fragments present at 1.55-1.65m and 1.80-1.89m. Poorly sorted subangular to subrounded pebbles (10-40mm)	Dump deposit	Make-up deposits	701	■ L12-15C
BH07	2.15	2.83	Compact dark grey (Gley 2 3/10B) silty clay. Frequent organic and possible peaty material. Bands of charcoal at 2.15-2.16m, 2.34-2.35m and 2.58-2.59m. Occasional subangular to subrounded pebbles (10-20mm). Bands of humic peaty material at 2.28-2.30m, 2.53-2.56m and 2.76-2.83m containing wood fragments. Occasional animal bone with a concentration noted at 2.76-2.83m. Clear boundary	Organic Alluvium (mixed)	Occupation	702	▲ L12-14C, B, L
BH07	2.83	3.00	Compact mid grey (Gley 2 5/5PB) fine silty sand. Rare subangular to subrounded pebbles (<20mm)	Sand	Occupation		■ L12-15C, B
BH07	3.00	3.96	Compact mid grey (Gley 2 5/5PB) fine silty sand. Rare subangular to subrounded small pebbles (<10mm). Small possible peat material between 3.29-3.3m. Sharp boundary	Sand	Occupation		
BH07	3.96	4.00	Compact dark grey (Gley 2 3/10B) silty clay organic deposit.	Organic Alluvium (mixed)	Occupation		▲ ■ L12-E14C
BH07	4.00	4.08	Void	Void	Occupation		
BH07	4.08	4.66	Compact dark grey (Gley 2 3/10B) silty clay organic deposit. Peaty inclusions present throughout deposit with a band occurring at 4.46-4.50 containing wood fragments. Occasional charcoal inclusions and silty sand component. Sharp boundary	Organic Alluvium (mixed)	Occupation		
BH07	4.66	5.00	Compact dark greyish brown (2.5Y 4/2) fine silty sand. Occasional charcoal inclusions.	Laminated sand	Tidal deposits		
BH08	0	0.09		Tarmac	Make-up deposits		
BH08	0.09	1		Dump deposit	Make-up deposits		
BH08	1.00	1.10	Void	Void	Make-up deposits		
BH08	1.10	1.30	Very loose light olive brown (2.5Y 5/4) fine silty sand abundant poorly sorted subangular to subrounded pebbles (10-40mm). Largely clast supported. Sharp boundary	Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH08	1.30	1.55	Compact very mottled light olive brown (2.5Y 5/4) fine silty sand with dark greyish brown (7.5YR 4/2) clay component. Frequent mid yellowish brown (10YR 4/6) laminations. Occasional charcoal inclusions and shell fragments	Dump deposit	Make-up deposits		
BH08	1.55	1.60	Loose, clast supported poorly sorted deposit comprising subangular to subrounded pebbles, limestone fragments and CBM fragments with some light olive brown (2.5Y 5/4) fine silty sand. Sharp boundary	Dump deposit	Make-up deposits		
BH08	1.60	1.86	Compact light olive brown (2.5Y 5/4) fine silty sand with light yellowish brown (2.5Y 6/2) mottling. Occasional charcoal inclusions. Sharp boundary	Sand (mixed)	Occupation		
BH08	1.86	2.00	Black (2.5Y 2.5/1) fine silty sand very organic deposit. Waterlogged, possible peat. Occasional shell inclusions and bone fragments	Organic Alluvium (mixed)	Occupation		B
BH08	2.00	2.43	Black (2.5Y 2.5/1) fine silty sand very organic deposit. Waterlogged, possible peat. Occasional shell inclusions and bone fragments with concentrations of bone at 2.00-2.08m and oyster shell at 2.3-2.35m. Pot at 2.35m. Rare subangular to subrounded pebbles. Sharp boundary	Organic Alluvium (mixed)	Occupation	801	■ L12-15C, S, B
BH08	2.43	2.72	Mid grey (Gley 2 5/5PB) fine silty sand with clay component and occasional charcoal. Sharp boundary	Sand	Occupation		
BH08	2.72	2.77	Black (2.5Y 2.5/1) very organic waterlogged fine silty sand with clay component. Rare bone fragments. Clear boundary	Organic Alluvium (mixed)	Occupation	802	B
BH08	2.77	2.94	Mid grey (Gley 2 5/5PB) fine silty sand with clay component and occasional charcoal. Possible peaty material at 2.81-2.86m. Clear boundary	Sand	Occupation		
BH08	2.94	3.00	Black (2.5Y 2.5/1) very organic waterlogged fine silty sand with clay component.	Organic Alluvium (mixed)	Occupation		
BH08	3.00	3.15	Void	Void	Occupation		
BH08	3.15	3.23	Loose greyish brown (2.5Y 5/2) fine silty sand. Sharp boundary	Contamination	Occupation		
BH08	3.23	3.31	Compact dark greyish brown (2.5Y 4/2) silty clay with possible peat and occasional charcoal. Clear boundary.	Contamination	Occupation		
BH08	3.31	3.48	Loose greyish brown (2.5Y 5/2) fine silty sand. Sharp boundary	Sand	Occupation		
BH08	3.48	3.69	Black (2.5Y 2.5/1) very organic waterlogged fine silty sand with clay component. Occasional shell inclusions and rare limestone fragments. Sharp boundary	Organic Alluvium (mixed)	Occupation	803	▲ ■ L12-14C, S
BH08	3.69	4.00	Loose greyish brown (2.5Y 5/2) fine silty sand. Sharp boundary	Laminated sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH08	4.00	5.00	Loose greyish brown (2.5Y 5/2) fine silty sand. Leather fragment present at 4.55m	Laminated sand	Tidal deposits	804	L
BH09	0	0.1		Tarmac	Make-up deposits		
BH09	0.1	1		Dump deposit	Make-up deposits		
BH09	1.00	1.30	Void	Void	Make-up deposits		
BH09	1.30	1.62	Mottled dark to mid yellowish brown (2.5Y 4/2 to 2.5Y 5/4) coarse silty sand with moderate CBM fragments and poorly sorted subrounded to subangular pebbles and limestone fragments (10-50mm). Occasional charcoal inclusions. Clear boundary	Dump deposit	Make-up deposits		
BH09	1.62	1.90	Dark yellowish brown (2.5Y 5/4) coarse silty sand with moderately frequent subangular to subrounded pebbles (10-30mm). Occasional charcoal inclusions. Gradual boundary	Dump deposit	Make-up deposits		
BH09	1.90	2.00	Loose mid yellowish brown (2.5Y 5/4) silty sand	Sand (mixed)	Occupation		
BH09	2.00	2.20	Loose mid yellowish brown (2.5Y 5/4) silty sand. Possible drop down from 1.90-2.00m	Sand (mixed)	Occupation		
BH09	2.20	2.80	Compact dark greyish brown (2.5Y 4/2) mottled coarse silty sand with mid grey (Gley 2 5/5PB) clay patches and infrequent dark yellowish brown (10YR 4/6) banding. Frequent dark grey (Gley 2 3/10B) banded organic material and lenses of charcoal inclusions. Occasional marine shell fragments, particularly between 2.26-2.38m. Infrequent CBM fragments. Dark organic or charcoal lens at 2.51-2.52m with rare bone fragments and again at 2.69-2.70m	Organic Alluvium (mixed)	Occupation	900	▲ L12-14C, S
BH09	2.80	2.84	Compact mid grey (Gley 2 5/5PB) thin band of silty clay. Sharp boundary	Alluvium (clay and silt)	Occupation		
BH09	2.84	3.00	Loose mid grey (Gley 2 5/5PB) fine silty sand with occasional organic inclusions. Wood fragments noted at 2.92m. Sediment supported	Organic Alluvium (mixed)	Occupation	901	W
BH09	3.00	3.36	Compact mid grey (Gley 2 5/5PB) fine silty sand with frequent olive brown (2.5Y 4/3) mottling. Occasional charcoal inclusions. Clear boundary	Sand (mixed)	Occupation		
BH09	3.36	3.68	Compact mid grey (Gley 2 5/5PB) fine silty sand with pale grey (10YR 6/1) mottling. Bands of organic material occur at 3.42m and 3.60m with occasional bone fragments. Clear boundary	Sand	Occupation	902	B
BH09	3.68	3.96	Dark greyish brown (Gley 2 3/10B) humic and organic-rich fine silty sand with possible peaty material and occasional mid grey (Gley 2 5/5PB) mottling. Moderately frequent bone fragments and charcoal inclusions. Occasional wood fragments. Infrequent CBM fragments. Sharp boundary	Organic Alluvium (mixed)	Occupation	903	B

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH09	3.96	4.00	Mid grey (Gley 2 5/5PB) fine silty sand. Sharp boundary	Laminated sand	Tidal deposits		
BH09	4.00	4.15	Void	Void	Tidal deposits		
BH09	4.15	4.42	Mid grey (Gley 2 5/5PB) fine silty sand. Gradual boundary	Laminated sand	Tidal deposits		
BH09	4.42	5.00	Compact dark greyish brown (2.5Y 4/2) fine silty sand. Occasional charcoal inclusions	Laminated sand	Tidal deposits		
BH10	0	0.12		Tarmac	Make-up deposits		
BH10	0.12	1.08		Dump deposit	Make-up deposits		
BH10	1.08	1.22		Rubble	Make-up deposits		
BH10	1.22	1.5		Dump deposit	Make-up deposits		
BH10	1.50	1.77	Void	Void	Make-up deposits		
BH10	1.77	1.94	Loose dark greyish brown (2.5Y 4/2) coarse silty sand with moderate clay component. Abundant poorly sorted subangular to subrounded pebbles (10-40mm). Occasional small CBM fragments and charcoal inclusions. Sharp boundary	Dump deposit	Make-up deposits	1000	■ NCD
BH10	1.94	2.06	Loose yellowish brown (2.5Y 5/4) fine silty sand with occasional marine shell fragments. Sharp boundary	Dump deposit	Make-up deposits		
BH10	2.06	2.26	Loose dark greyish brown (2.5Y 4/2) coarse silty sand with moderate clay component. Moderately frequent subangular to subrounded pebbles. Occasional CBM fragments, charcoal inclusions and marine shell fragments. Sharp boundary	Dump deposit	Make-up deposits		
BH10	2.26	2.48	Compact yellowish brown (2.5Y 5/4) fine silty sand with lenses of organic material organic at 2.34-2.38m. Moderately frequent marine shells (cockles and mussels). Occasional subangular small pebbles (<5mm). Light yellowish brown (10YR 5/6) mottling. Occasional charcoal inclusions. Clear boundary	Sand (mixed)	Occupation	1001	S
BH10	2.48	3.00	Compact very dark yellowish brown (2.5Y 3/2) clayey silt with frequent waterlogged organic and humic material. Occasional poorly sorted subangular to subrounded pebbles (10-40mm). Occasional marine shell fragments and charcoal inclusions. Rare CBM and bone fragments.	Organic Alluvium (mixed)	Occupation	1002	B, S
BH10	3.00	3.48	Compact very dark yellowish brown (2.5Y 3/2) clayey silt with frequent waterlogged organic and humic material. Occasional poorly sorted subangular to subrounded pebbles (10-40mm). Occasional marine shell fragments and charcoal inclusions. Rare CBM and bone fragments.	Organic Alluvium (mixed)	Occupation	1003	B, S

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH10	3.48	4.50	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal inclusions. Frequent light yellowish brown (10YR 5/6) mottling	Laminated sand	Tidal deposits		
BH10	4.50	4.89	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal inclusions. Frequent light yellowish brown (10YR 5/6) mottling	Laminated sand	Tidal deposits		
BH10	4.89	6.00	Compact dark greyish brown (2.5Y 4/2) fine silty sand with frequent charcoal lenses and yellowish brown (2.5Y 5/4) mottling. Occasional marine shell fragments	Laminated sand	Tidal deposits		B, cal AD 1225-1298
BH10	6.00	6.90	Compact dark greyish brown (2.5Y 4/2) fine silty sand with frequent charcoal lenses and yellowish brown (2.5Y 5/4) mottling. Occasional marine shell fragments. Clear boundary	Laminated sand	Tidal deposits		
BH10	6.90	7.16	Loose very dark greyish brown (2.5Y 3/2) fine silty sand. Frequent charcoal inclusions. Rare CBM fragments. Occasional bone and marine shell fragments. Frequent humic and organic material. Clear boundary	Laminated sand	Tidal deposits	1004	■ NCD, S, B
BH10	7.16	7.50	Compact dark greyish brown (2.5Y 4/2) fine silty sand with frequent charcoal lenses and yellowish brown (2.5Y 5/4) mottling. Occasional marine shell fragments. Diffuse boundary	Laminated sand	Tidal deposits		
BH10	7.50	8.27	Compact dark greyish brown (2.5Y 4/2) fine silty sand with frequent charcoal lenses and yellowish brown (2.5Y 5/4) mottling. Occasional marine shell fragments. Diffuse boundary	Laminated sand	Tidal deposits	1005	S
BH10	8.27	9.00	Very loose dark greyish brown (2.5Y 4/2) coarse silty sand with rare yellowish brown (2.5Y 5/4) mottling. Frequent cockle shells, occasional fish bones and charcoal inclusions. Rare pottery sherds. Occasional poorly sorted subangular to subrounded pebbles (10-40mm)	Gravelly sand	Tidal deposits	1006	▲ Rom?, B, S
BH10	9.00	9.22	Very loose dark greyish brown (2.5Y 4/2) coarse silty sand with rare yellowish brown (2.5Y 5/4) mottling. Frequent poorly sorted subangular to subrounded pebbles (20-50mm) between 9.11-9.19m. Gradual boundary	Gravelly sand	Tidal deposits		
BH10	9.22	9.36	Compact dark greyish brown (2.5Y 4/2) fine silty sand with moderate clay component. Occasional poorly sorted subangular to subrounded pebbles (5-40mm). Sharp boundary	Gravelly sand	Tidal deposits		
BH10	9.36	9.41	Clast supported shale deposit. Sharp boundary	Gravelly sand	Tidal deposits		
BH10	9.41	10.50	Very compact dark grey (Gley 2 3/10B) silty clay with occasional yellowish brown (2.5Y 5/4) mottling. Moderately frequent rounded chalk inclusions (<10mm). Boulder Clay	Glacial Till	Glacial Till		
BH11	0	0.11		Tarmac	Make-up deposits		
BH11	0.11	0.26		Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH11	0.26	0.41		Surface	Make-up deposits		
BH11	0.41	1		Rubble	Make-up deposits		
BH11	1.00	1.30	Void	Void	Make-up deposits		
BH11	1.30	1.71	Loose dark yellowish brown (10YR 4/6) coarse silty sand. Occasional moderately sorted subangular to subrounded pebbles (10-20mm). Sharp boundary	Sand and Gravel	Make-up deposits		
BH11	1.71	1.94	Loose clast supported deposit with abundant poorly sorted subangular and subrounded pebbles and cobbles (10-80mm). Sharp boundary	Sand and Gravel	Make-up deposits		
BH11	1.94	2.46	Void	Void	Make-up deposits		
BH11	2	2.46		Void	Make-up deposits		
BH11	2.46	2.59	Loose yellowish brown (2.5Y 5/4) coarse silty sand. Occasional CBM fragments. Moderately sorted with occasional subangular to subrounded pebbles (10-20mm). Clear boundary	Dump deposit	Make-up deposits	1100	■ NCD
BH11	2.59	2.71	Compact olive brown (2.5Y 4/3) silty clay with frequent poorly sorted subangular to subrounded pebbles (10-40mm). Infrequent CBM fragments. Clear boundary	Dump deposit	Make-up deposits		
BH11	2.71	3.00	Compact yellowish brown (2.5Y 5/4) coarse silty sand with abundant poorly sorted subangular to subrounded pebbles and cobbles (10-70mm). Moderately frequent charcoal inclusions and lenses of charcoal between 2.86-2.88m. Occasional CBM fragments, particularly between 2.91-3.00m	Dump deposit	Make-up deposits	1101	■ L13-15C+
BH11	3.00	3.36	Void	Void	Make-up deposits		
BH11	3.36	3.46	Clast supported brick and CBM rubble	Rubble	Make-up deposits	1102	■ L13-15C+
BH11	3.46	3.89	Compact olive brown (2.5Y 4/3) silty clay with dark yellowish brown (10YR 4/6) mottling. Frequent CBM fragments, with bricks noted at 3.61-3.67m and 3.79-3.89m. Pipe stem present at 3.52m. Occasional charcoal inclusions and burnt CBM fragments. Small burnt deposit at 3.68-3.72m. Infrequent limestone fragments. Sharp boundary	Dump deposit	Make-up deposits	1103	■ L13-15C+, CP 1580+
BH11	3.89	4.00	Loose pale brown (10YR 8/4) coarse silty sand. Frequent CBM fragments, with brick present at 3.91-3.96m	Rubble	Make-up deposits	1104	■ L13-15C+
BH11	4.00	4.34	Loose pale brown (10YR 8/4) coarse silty sand. Frequent CBM fragments, particularly to base of deposit where brick fragments are present.	Dump deposit	Make-up deposits	1105	■ L13-15C+
BH11	4.34	5.00	Void	Rubble	Make-up deposits		
BH12	0	0.1		Tarmac	Make-up deposits		
BH12	0.1	0.25		Surface	Make-up deposits		
BH12	0.25	1		Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH12	1.00	1.20	Void	Void	Make-up deposits		
BH12	1.20	1.78	Compact light yellowish brown (2.5Y 6/8) fine silty sand with clay component and mid yellowish brown (10YR 5/6) mottling. Infrequent coal / clinker fragments, occasional charcoal inclusions. Poorly sorted occasional subangular to subrounded pebbles (10-30mm). Sharp boundary	Dump deposit	Make-up deposits		
BH12	1.78	2.00	Very loose dark yellowish brown (10YR 3/6) coarse silty sand with frequent poorly sorted subangular and subrounded pebbles (10-50mm). Occasional charcoal inclusions and possible heat affected pebbles / clay. Possible saltern deposit	Burnt deposit	Make-up deposits		
BH12	2.00	2.08	Void	Void	Make-up deposits		
BH12	2.08	2.44	Very loose dark yellowish brown (10YR 3/6) coarse silty sand with frequent poorly sorted subangular and subrounded pebbles (10-20mm). Occasional charcoal inclusions and possible heat affected pebbles / clay. Possible saltern deposit	Burnt deposit	Make-up deposits		
BH12	2.44	2.51	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal inclusions. Clear boundary	Burnt deposit	Make-up deposits		
BH12	2.51	2.58	Very loose dark yellowish brown (10YR 3/6) coarse silty sand with thin reddish-brown laminations (<5mm), possible burning or saltern deposits. Occasional charcoal inclusions. Sharp boundary	Burnt deposit	Make-up deposits		
BH12	2.58	2.92	Compact yellowish brown (2.5Y 5/4) fine silty sand with moderately frequent charcoal inclusions. Band of reddish brown (10YR 5/6) silty sand at 2.91-2.92m. Sharp boundary	Sand	Occupation		
BH12	2.92	3.00	Mid grey (Gley 2 5/5PB) fine silty sand	Sand	Occupation		
BH12	3.00	3.16	Loose mid grey (Gley 2 5/5PB) fine silty sand with reddish brown (10YR 5/6) mottling. Occasional wood fragments. Clear boundary	Sand	Occupation		
BH12	3.16	3.32	Loose mid grey (Gley 2 5/5PB) fine silty sand. Occasional charcoal inclusions. clear boundary.	Sand	Occupation		
BH12	3.32	3.45	Loose mid grey (Gley 2 5/5PB) fine silty sand with reddish brown (10YR 5/6) mottling. Clear boundary	Sand	Occupation		
BH12	3.45	3.49	Compact dark grey to black (Gley 2 2.5/10B) organic-rich and humic coarse silty sand with clay component, possibly waterlogged. Frequent bone fragments. Clear boundary	Organic Alluvium (mixed)	Occupation	1200	B
BH12	3.49	3.54	Compact mid grey (Gley 2 5/5PB) silty clay. Sharp boundary	Alluvium (clay and silt)	Occupation		
BH12	3.54	3.68	Loose mid grey (Gley 2 5/5PB) fine silty sand. Occasional poorly sorted subangular to subrounded pebbles (10-40mm). Clear boundary	Sand	Occupation		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH12	3.68	3.82	Loose mid grey (Gley 2 5/5PB) fine silty sand with mid greyish brown (7.5YR 5/1) mottling. Sharp boundary	Sand	Occupation		
BH12	3.82	4.00	Loose dark grey to black (Gley 2 2.5/10B) coarse silty sand with clay component and mid grey (Gley 2 5/5PB) mottling. Abundant organic and humic material possibly waterlogged. Frequent bone fragments. Infrequent large CBM fragments	Organic Alluvium (mixed)	Occupation	1201	▲■ L12-15C, B
BH12	4.00	4.30	Compact mid grey (Gley 2 5/5PB) silty sand with clay component. Occasional marine shell fragments. Infrequent wood and large bone fragments, particularly between 4.20-4.27m	Sand	Occupation		
BH12	4.30	4.43	Compact mid grey (Gley 2 5/5PB) silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal inclusions. Clear boundary	Sand	Occupation	1202	■ L12-15C, B, S
BH12	4.43	4.59	Loose mid grey (Gley 2 5/5PB) fine silty sand with frequent mid yellowish brown (10YR 5/6) mottling. Occasional charcoal inclusions. Sharp boundary	Sand	Occupation		
BH12	4.59	4.79	Loose dark grey to black (Gley 2 2.5/10B) coarse silty sand with clay component. Abundant organic and humic material possibly waterlogged. Clear boundary	Organic Alluvium (mixed)	Occupation	1203	B, S
BH12	4.79	5.00	Loose mid grey (Gley 2 5/5PB) fine silty sand with frequent mid yellowish brown (10YR 5/6) mottling. Occasional charcoal inclusions. Sharp boundary	Sand	Tidal deposits		■ L12-15C, S
BH13	0	0.13		Tarmac	Make-up deposits		
BH13	0.13	1.12		Dump deposit	Make-up deposits		
BH13	1	1.12	Void	Void	Make-up deposits		
BH13	1.12	1.50	Very loose dark brown (10YR 3/6) coarse silty sand with occasional charcoal inclusions and CBM fragments. Frequent burnt clay, possible saltern deposit. Copper piping fragment present at 1.12m. Frequent poorly sorted subangular and subrounded pebbles (5-50mm). Sharp boundary.	Burnt deposit	Make-up deposits	1300	■ NCD, Cua
BH13	1.50	1.62	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal inclusions and rare dark brown (10YR 3/6) mottling.	Sand (mixed)	Occupation		
BH13	1.62	1.73	Compact dark yellowish brown (2.5Y 4/3) silty clay 4/3 2.5 Y with mid grey (Gley 2 (5/5PB) mottling. Occasional charcoal inclusions. Sharp boundary	Alluvium (mixed)	Occupation		
BH13	1.73	2.00	Compact yellowish brown (2.5Y 5/4) fine silty sand. Occasional subangular to subrounded pebbles (<30mm) charcoal inclusions and CBM fragments	Sand (mixed)	Occupation		
BH13	2.00	2.50	Compact yellowish brown (2.5Y 5/4) fine silty sand. Clear boundary	Sand	Occupation		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH13	2.50	2.84	Loose dark yellowish brown (2.5Y 4/4) silty fine sand with mid grey (Gley 2 5/5PB) clay patches and frequent dark brown (10YR 3/6) mottling. Moderately frequent charcoal inclusions. Frequent marine shell fragments, particularly between 2.57-2.71m with whole cockle shell present at 2.71m. Infrequent large CBM fragments between 2.77-2.84m. Gradual boundary	Sand (mixed)	Occupation	1301	■ L12-15C, S, B
BH13	2.84	3.00	Compact mid grey (Gley 2 5/5PB) fine silty sand with clay component and dark grey (Gley 2 2.5/10B) mottling. Slightly humic with occasional organic flecks. Infrequent bone fragments, with large bone fragment present at 2.89-2.94m. Occasional subangular to subrounded pebbles (<20mm). Occasional charcoal inclusions	Sand	Occupation	1302	▲ L12-14, B
BH13	3.00	4.05	Void	Void	Occupation		
BH13	4.05	4.43	Compact black (10YR 2/1) fine silty sand with abundant organic and humic material. Waterlogged and peaty with abundant wood fragments. Occasional bone fragments with large bone noted at 4.25-4.28m. Occasional charcoal inclusions. Sharp boundary	Organic Alluvium (mixed)	Occupation	1303	■ NCD, L, B
BH13	4.43	4.56	Dark grey to black (Gley 2 2.5/10B) fine silty sand. Waterlogged with frequent wood remains. Clear boundary	Sand	Tidal deposits		
BH13	4.56	4.63	Compact mid grey (Gley 2 5/5PB) fine silty sand. Clear boundary	Sand	Tidal deposits		
BH13	4.63	4.75	Loose dark yellowish brown (2.5Y 4/4) fine silty sand with mid grey (Gley 2 5/5PB) clay patches and frequent yellowish brown (2.5Y 5/4) and dark brown (10YR 3/6) mottling. Rare subangular to subrounded pebbles (<20mm) and occasional charcoal inclusions. Clear boundary	Sand	Tidal deposits		
BH13	4.75	5.00	Compact mid grey (Gley 2 5/5PB) coarse silty sand. Sediment supported. Occasional CBM fragments, particularly between at 4.85-4.9m	Sand	Tidal deposits		
BH14	0	0.15		Tarmac	Make-up deposits		
BH14	0.15	0.6		Dump deposit	Make-up deposits		
BH14	0.6	0.72		Surface	Make-up deposits		
BH14	0.72	1		Dump deposit	Make-up deposits		
BH14	1.00	1.67	Loose very dark greyish brown (2.5Y 3/2) coarse silty sand containing abundant poorly sorted subangular to subrounded pebbles and limestone fragments (5-40mm). Clast supported in places. Frequent CBM fragments. Infrequent slag and occasional coal and charcoal inclusions. Sharp boundary	Dump deposit	Make-up deposits	1400	■ L12-15C
BH14	1.67	1.75	Loose yellowish brown (2.5Y 5/2) fine silty sand with darker yellowish brown (2.5Y 5/4) mottling. Frequent poorly sorted subangular to	Sand (mixed)	Occupation		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
			subrounded small pebbles (<10mm). Infrequent charcoal inclusions. Sharp boundary				
BH14	1.75	1.85	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal inclusions. Sharp boundary	Sand	Occupation		
BH14	1.85	1.92	Loose yellowish brown (2.5Y 5/2) fine silty sand with darker yellowish brown (2.5Y 5/4) mottling. Frequent poorly sorted subangular to subrounded small pebbles (5-10mm) and shell fragments. Infrequent charcoal inclusions. Sharp boundary	Sand (mixed)	Occupation		
BH14	1.92	2.00	Loose black (2.5Y 2.5/1) fine silty sand with frequent organic and humic material. Possibly waterlogged. Frequent cockle and mussel shells and charcoal inclusions	Organic Alluvium (mixed)	Occupation		S
BH14	2.00	2.55	Compact dark grey (2.5Y 3/2) fine silty sand with dark yellowish brown (10YR 4/6) mottling. Frequent limestone (<20mm) and marine shell fragments. Infrequent bone fragments. Occasional charcoal inclusions. Rare pottery sherds. Clear boundary	Dump deposit	Occupation	1402	▲ ■ L13-L15C, B, S
BH14	2.55	3.00	Dark grey (2.5Y 2.5/1) coarse silty sand containing abundant organic and humic material, possible waterlogged peaty deposits. Frequent marine shell fragments with oyster shell noted at 2.66m. Possible waterlogged wood fragment at 2.73m. Occasional charcoal inclusions. Infrequent poorly sorted subangular to subrounded pebbles (10-40mm)	Organic Alluvium (mixed)	Occupation	1403	▲ ■ L12-14C, L, S, Pb
BH14	3.00	3.10	Void	Void	Occupation		
BH14	3.10	3.43	Dark grey (2.5Y 2.5/1) coarse silty sand containing abundant organic and humic material, possible waterlogged peaty deposits. Frequent marine shell fragments. Occasional charcoal inclusions. Infrequent poorly sorted subangular to subrounded pebbles (10-40mm)	Organic Alluvium (mixed)	Occupation		
BH14	3.43	4.00	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal inclusions	Laminated sand	Tidal deposits		
BH14	4.00	5.00	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal inclusions	Laminated sand	Tidal deposits		
BH15	0	0.15		Tarmac	Make-up deposits		
BH15	0.15	0.4		Rubble	Make-up deposits		
BH15	0.4	0.6		Dump deposit	Make-up deposits		
BH15	0.6	0.72		Surface	Make-up deposits		
BH15	0.72	1.2		Dump deposit	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH15	1.20	1.75	Loose yellowish brown (2.5Y 5/4) coarse silty sand with dark brown (2.5Y 3/2) mottling. Frequent poorly sorted subangular to subrounded pebbles, cobbles and limestone fragments (10-60mm). Frequent CBM fragments and occasional charcoal inclusions. Sharp boundary	Dump deposit	Make-up deposits	1500	■ L12-15C
BH15	1.75	1.88	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal and subangular to subrounded small pebbles (<10mm). Sharp boundary	Sand	Occupation		
BH15	1.88	2.05	Compact mid grey (Gley 2 5/5PB) fine silty sand with clay component and infrequent thin dark yellowish brown (10YR 4/6) banding. Occasional charcoal inclusions	Sand	Occupation		
BH15	2.05	2.70	Compact black (2.5Y 2.5/1) coarse silty sand with abundant organic and humic material that appears peaty. Frequent marine shell and occasional bone fragments. Moderately frequent subangular to subrounded pebbles (10-30mm) and charcoal inclusions	Organic Alluvium (mixed)	Occupation	1501	S
BH15	2.70	2.90	Void	Void	Occupation		
BH15	2.90	3.22	Poorly sorted, clast supported subangular to subrounded pebbles (10-50mm) with frequent CBM fragments and occasional bone fragments. Likely contamination / drop down	Contamination	Occupation	1502	■ L12-15C, B
BH15	3.22	3.33	Compact black (2.5Y 2.5/1) coarse silty sand with abundant organic and humic material that appears peaty. Frequent marine shell and occasional bone fragments. Moderately frequent subangular to subrounded pebbles (10-30mm) and charcoal inclusions. Sharp boundary	Organic Alluvium (mixed)	Occupation		
BH15	3.33	4.20	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal and CBM fragments with frequent patches of organic material towards base of deposit	Laminated sand	Tidal deposits	1503	■ L12-15C
BH15	4.20	4.71	Void	Void	Tidal deposits		
BH15	4.71	5.70	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal and CBM fragments. Infrequent thin, patchy lenses of organic material, possibly waterlogged	Laminated sand	Tidal deposits		
BH15	5.70	6.26	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal and CBM fragments. Infrequent thin, patchy lenses of organic material, possibly waterlogged	Laminated sand	Tidal deposits		
BH15	6.26	7.00	Compact mid to dark grey (Gley 2 5/5PB) fine silty sand with dark grey to black (Gley 2 2.5/1) mottling / organic inclusions. Thin, feint planar laminations throughout. Clear boundary	Laminated sand	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH15	7.00	7.20	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal inclusions and CBM fragments. Infrequent patches of organic material, possibly waterlogged	Laminated sand	Tidal deposits		
BH15	7.20	8.70	Compact mid grey (Gley 2 5/5PB) fine silty sand with yellowish brown (2.5Y 5/4) mottling. Occasional charcoal inclusions and CBM fragments. Infrequent patches of organic material possibly waterlogged. Thin, faint planar laminations throughout, more apparent towards base of deposit	Laminated Sand	Tidal deposits		
BH15	8.70	9.94	Loose dark bluish grey (Gley 2 2.5/1) coarse silty sand with light yellowish brown (2.5Y 6/8) mottling. Infrequent marine shell, although frequent between 9.02-9.08m and 9.61-9.66m, occurring alongside shale fragments. Rare angular and subangular pebbles (10-20mm). Sharp boundary	Laminated Sand	Tidal deposits	1504	S, Corylus cal AD 993-1155
BH15	9.94	10.20	Very compact dark grey (Gley 2 3/10B) silty clay with yellowish brown (2.5Y 5/4) mottling. Moderately frequent rounded chalk inclusions (<10mm). Boulder Clay	Glacial Till	Glacial Till		
BH16	0	0.15		Tarmac	Make-up deposits		
BH16	0.15	0.21		Dump deposit	Make-up deposits		
BH16	0.21	0.81		Rubble	Make-up deposits		
BH16	0.81	1		Dump deposit	Make-up deposits		
BH16	1.00	1.63	Loose dark grey (2.5Y 3/2) coarse silty sand. Moderately frequent CBM fragments, particularly frequent between 1.10-1.17m. Frequent poorly sorted subangular to subrounded pebbles (10-30mm). Occasional limestone fragments (<40mm) and charcoal inclusions. Gradual boundary	Dump deposit	Make-up deposits	1600	■ NCD
BH16	1.63	2.00	Loose yellowish brown fine silty sand with dark yellowish brown (10YR 4/6) mottling. Frequent charcoal inclusions and infrequent poorly sorted subangular to subrounded pebbles (5-20mm)	Sand (mixed)	Occupation		
BH16	2.00	2.70	Compact yellowish brown (2.5Y 5/4) fine silty sand with light and dark yellowish brown (2.5Y 6/8, 10YR 4/6) mottling. Frequent mid grey (Gley 2 5/5PB) silty clay lenses. Occasional charcoal inclusions. Possible band of waterlogged peat / organic material at 2.42-2.43m. Clear boundary	Sand (mixed)	Occupation		
BH16	2.70	3.00	Loose dark grey (2.5Y 3/2) fine silty sand with light and dark yellowish brown (2.5Y 6/8, 10YR 4/6) mottling. Mottled 3/2 2.5 Y, 4/6 10 YR and 6/8 2.5 Y fine loose silty sand. Frequent poorly sorted subangular to subrounded pebbles and limestone fragments (10-30mm). Occasional charcoal inclusions. Possible organic inclusions at 2.72m and 2.90m	Gravelly sand	Occupation		
BH16	3.00	3.05	Void	Void	Tidal deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Findings/dating
BH16	3.05	3.45	Loose yellowish brown (2.5Y 5/4) fine silty sand with light and dark yellowish brown (2.5Y 6/8, 10YR 4/6) mottling. Moderately frequent subangular to subrounded pebbles (<10mm). Sharp boundary	Laminated sand	Tidal deposits		
BH16	3.45	3.47	Compact dark grey (2.5Y 2.5/1) organic and humic / peaty fine silty sand. Waterlogged. Sharp boundary.	Organic Alluvium	Tidal deposits		
BH16	3.47	4.00	Loose yellowish brown (2.5Y 5/4) fine silty sand with light and dark yellowish brown (2.5Y 6/8, 10YR 4/6) mottling. Occasional charcoal inclusions	Laminated sand	Tidal deposits		
BH16	4.00	4.08	Void	Void	Tidal deposits		
BH16	4.08	4.57	Loose yellowish brown (2.5Y 5/4) fine silty sand with light and dark yellowish brown (2.5Y 6/8, 10YR 4/6) mottling. Occasional charcoal inclusions. Infrequent marine shell fragments, with oyster shell present at 4.36m. Clear boundary	Laminated sand	Tidal deposits	1601	S
BH16	4.57	4.82	Compact mid grey (Gley 2.5/5PB) fine silty sand with frequent charcoal inclusions. Clear boundary	Organic Alluvium	Tidal deposits		
BH16	4.82	5.00	Compact dark yellowish brown (2.5Y 4/3) fine silty clay with occasional charcoal inclusions.	Sand	Tidal deposits		
BH17	0	0.13		Tarmac	Make-up deposits		
BH17	0.13	0.63		Dump deposit	Make-up deposits		
BH17	0.63	1		Rubble	Make-up deposits		CP 1580+
BH17	1.00	1.21	Void	Void	Make-up deposits		
BH17	1.21	2.00	Loose pale yellowish brown (10YR 8/4) coarse silty sand with frequent CBM fragments and burnt stone (30-50mm), clast supported in patches. Occasional charcoal inclusions	Rubble	Make-up deposits	1700	■ NCD
BH14	2.00	2.32	Void	Void	Make-up deposits		
BH17	2.32	2.51	Loose pale yellowish brown (10YR 8/4) coarse silty sand with frequent poorly sorted subrounded pebbles (<40mm). Sharp boundary	Rubble	Make-up deposits		
BH17	2.51	2.66	Loose pale yellowish brown (10YR 8/4) silty sand with abundant poorly sorted subrounded cobbles and pebbles (<80mm). Clast supported	Rubble	Make-up deposits		
BH17	2.66	2.74	Loose pale yellowish brown (10YR 8/4) coarse silty sand with frequent poorly sorted subrounded pebbles (<40mm). Thin lenses of charcoal at 2.73-2.74m. Sharp boundary	Rubble	Make-up deposits		
BH17	2.74	3.00	Loose pale yellowish brown (10YR 8/4) silty sand with abundant poorly sorted subrounded cobbles and pebbles (<80mm). Clast supported	Rubble	Make-up deposits		
BH17	3.00	3.24	Void	Void	Make-up deposits		

Bore	Top (m)	Base (m)	Description	Facies	Stratigraphy	Context	Finds/dating
BH17	3.24	3.82	Loose pale yellowish brown (10YR 8/4) silty sand with abundant poorly sorted subrounded cobbles and pebbles (<80mm). Clast supported. Infrequent marine shell fragments, cockle shell present	Rubble	Make-up deposits	1701	S
BH17	3.82	4.00	Loose pale yellowish brown (10YR 8/4) silty sand with abundant poorly sorted subrounded cobbles and pebbles (<80mm). Clast supported. Occasional charcoal inclusions	Rubble	Make-up deposits		
BH17	4.00	4.24	Void	Void	Tidal deposits		
BH17	4.24	4.47	Loose pale yellowish brown (10YR 8/4) coarse silty sand. Frequent poorly sorted subangular to subrounded pebbles (10-50mm). Sharp boundary	Sand (mixed)	Tidal deposits		
BH17	4.47	4.69	Compact dark grey (Gley 2 2.5/10B) fine sandy silt with abundant organic and humic material, possible peat deposit. Waterlogged. Clear boundary	Organic Alluvium	Tidal deposits		
BH17	4.69	4.73	Compact dark grey (2.5Y 3/2) fine sandy silt with frequent organic and humic material, particularly within dark grey lenses (Gley 2 2.5/10B). Moderately sorted. Occasional subrounded to subangular small pebbles (<15mm). Clear boundary	Sand	Tidal deposits		
BH17	4.73	4.81	Compact dark grey (Gley 2 2.5/10B) fine sandy silt with abundant organic and humic material, possibly peaty. Waterlogged. Clear boundary	Organic Alluvium	Tidal deposits		
BH17	4.81	4.86	Compact dark grey (2.5Y 3/2) fine sandy silt with frequent organic and humic material, particularly within dark grey lens (Gley 2 2.5/10B). Moderately sorted. Occasional subrounded to subangular small pebbles (<15mm). Clear boundary	Sand	Tidal deposits		
BH17	4.86	5.00	Compact yellowish brown (2.5Y 5/4) fine silty sand with occasional charcoal inclusions	Sand	Tidal deposits		

APPENDIX F CORE PHOTOGRAPHS



BH01, Chapel Street: 1.00-5.00m



BH02, Chapel Street: 1.00-8.00m



BH03, Chapel Street: 1.00-7.00m



BH04, Chapel Street: 1.00-5.00m



BH05, Chapel Street: 1.00-5.00m



BH06, Chapel Street: 1.00-5.00m



BH07, Chapel Street: 1.00-4.00m



BH08, Chapel Street: 1.00-4.00m



BH09, Chapel Street: 1.00-4.00m



BH10, Chapel Street: 1.00-5.00m



BH11, Chapel Street: 1.00-5.00m



BH12, Chapel Street: 1.00-5.00m



BH14, Chapel Street: 1.00-3.00m



BH15, Chapel Street: 1.00-5.00m



BH01, Common Staithe: 1.20-14.00m



BH02, Common Staithe: 1.20-11.20m



BH03, Common Staithe: 1.00-5.00m



BH04, Common Staithe: 1.00-5.00m



BH05, Common Staithe: 1.00-5.00m



BH06, Common Staithe: 1.50-10.50m



BH07, Common Staithe: 1.00-5.00m



BH08, Common Staithe: 1.00-5.00m



BH09, Common Staithe: 1.00-5.00m



BH10, Common Staithe: 1.50-9.00m



BH11, Common Staithe: 1.00-5.00m



BH12, Common Staithe: 1.00-5.00m



BH13, Common Staithe: 1.00-5.00m



BH14, Common Staithe: 1.00-5.00m



BH15, Common Staithe: 1.20-9.70m



BH16, Common Staithe: 1.00-5.00m



BH17, Common Staithe: 1.00-5.00m

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APPENDIX H OASIS REPORT FORM

Project Details

OASIS Number	oxfordar3-505186		
Project Name	Chapel Street Car Park and the Common Staithe, King's Lynn, Norfolk		
Start of Fieldwork	Chapel St Car Park:	End of Fieldwork	Chapel St Car Park:
	03/12/18		07/12/18
Previous Work	Common Staithe:		Common Staithe:
	12/07/21		15/07/21
Future Work	no		unknown

Project Reference Codes

Site Code	XNFKLH18 / XNFKLH19	Planning App. No.	na
HER Number	ENF145566 / ENF152187	Related Numbers	na

Prompt	Historic England Heritage Action Zone (HAZ)
Development Type	na
Place in Planning Process	Not known/Not recorded

Techniques used (tick all that apply)

- | | | |
|--|--|---|
| <input type="checkbox"/> Aerial Photography – interpretation | <input type="checkbox"/> Grab-sampling | <input type="checkbox"/> Remote Operated Vehicle Survey |
| <input type="checkbox"/> Aerial Photography - new | <input checked="" type="checkbox"/> Gravity-core | <input type="checkbox"/> Sample Trenches |
| <input type="checkbox"/> Annotated Sketch | <input type="checkbox"/> Laser Scanning | <input type="checkbox"/> Survey/Recording of Fabric/Structure |
| <input type="checkbox"/> Augering | <input type="checkbox"/> Measured Survey | <input type="checkbox"/> Targeted Trenches |
| <input type="checkbox"/> Dendrochronological Survey | <input type="checkbox"/> Metal Detectors | <input type="checkbox"/> Test Pits |
| <input type="checkbox"/> Documentary Search | <input type="checkbox"/> Phosphate Survey | <input type="checkbox"/> Topographic Survey |
| <input type="checkbox"/> Environmental Sampling | <input type="checkbox"/> Photogrammetric Survey | <input checked="" type="checkbox"/> Vibro-core |
| <input type="checkbox"/> Fieldwalking | <input type="checkbox"/> Photographic Survey | <input type="checkbox"/> Visual Inspection (Initial Site Visit) |
| <input type="checkbox"/> Geophysical Survey | <input type="checkbox"/> Rectified Photography | |

Monument	Period	Object	Period
	Choose an item.	Pottery	Roman (43 to 410)
		Pottery	Medieval (1066 to 1540)
		CBM	Medieval (1066 to 1540)
		CBM	Post Medieval (1540 to 1901)
		CBM	Modern (1901 to present)
		Clay tobacco pipe	Post Medieval (1540 to 1901)
		Glass	Post Medieval (1540 to 1901)
		Leather	Medieval (1066 to 1540)
		Quern	Medieval (1066 to 1540)

Project Location

County	Norfolk	Address (including Postcode) Chapel Street Car Park, King's Lynn, PE30 1LY Common Staithe, King's Lynn, PE30 1NQ
District	King's Lynn and West Norfolk	
Parish	King's Lynn	
HER office	Norfolk	
Size of Study Area	Common Staithe: 0.8ha Chapel Street: 0.25ha	
National Grid Ref	Chapel Street Car Park: TF 61788 20377 Common Staithe: TF 61550 20340	

Project Originators

Organisation	Oxford Archaeology (OA)
Project Brief Originator	na
Project Design Originator	Jason Stewart, OA
Project Manager	Nick Gilmour, OA
Project Supervisor	Tom Bruce and Ashley Pooley, OA

Project Archives

	Location	ID
Physical Archive (Finds)	Norwich Castle Museum	tbc
Digital Archive	Norwich Castle Museum	tbc
Paper Archive	Norwich Castle Museum	tbc

Physical Contents	Present?	Digital files associated with Finds	Paperwork associated with Finds
Animal Bones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ceramics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Environmental	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Glass	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Human Remains	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leather	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stratigraphic		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Survey		<input type="checkbox"/>	<input type="checkbox"/>
Textiles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked Bone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked Stone/Lithic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

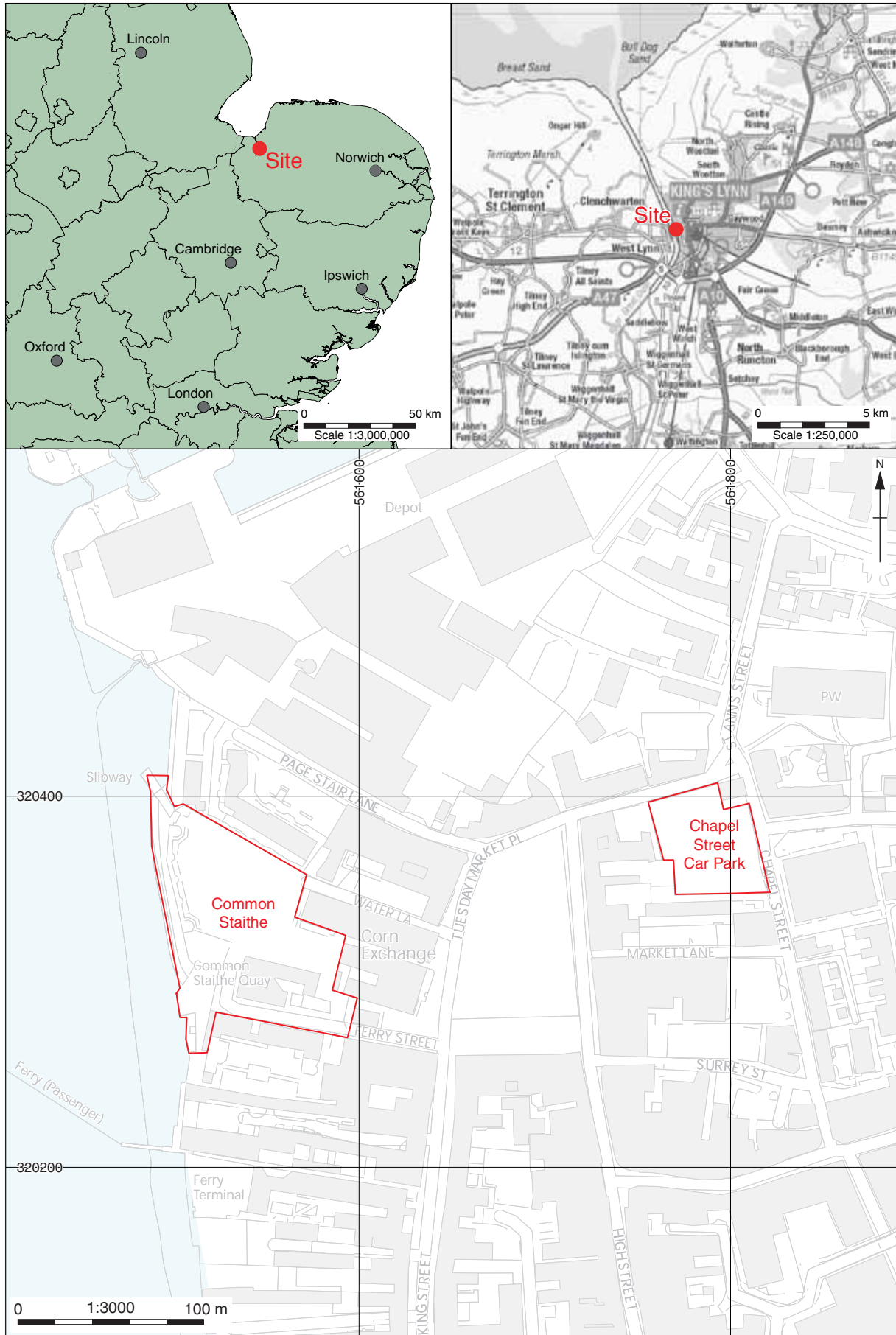
Digital Media

Database	<input checked="" type="checkbox"/>
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Geophysics	<input type="checkbox"/>
Images (Digital photos)	<input checked="" type="checkbox"/>
Illustrations (Figures/Plates)	<input checked="" type="checkbox"/>
Moving Image	<input type="checkbox"/>
Spreadsheets	<input type="checkbox"/>
Survey	<input checked="" type="checkbox"/>
Text	<input checked="" type="checkbox"/>
Virtual Reality	<input type="checkbox"/>

Paper Media

Aerial Photos	<input type="checkbox"/>
Context Sheets	<input checked="" type="checkbox"/>
Correspondence	<input checked="" type="checkbox"/>
Diary	<input type="checkbox"/>
Drawing	<input checked="" type="checkbox"/>
Manuscript	<input type="checkbox"/>
Map	<input type="checkbox"/>
Matrices	<input type="checkbox"/>
Microfiche	<input type="checkbox"/>
Miscellaneous	<input type="checkbox"/>
Research/Notes	<input type="checkbox"/>
Photos (negatives/prints/slides)	<input type="checkbox"/>
Plans	<input checked="" type="checkbox"/>
Report	<input checked="" type="checkbox"/>
Sections	<input checked="" type="checkbox"/>
Survey	<input type="checkbox"/>

Further Comments



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Figure 1: Site location. Scale 1: 3000 at A4

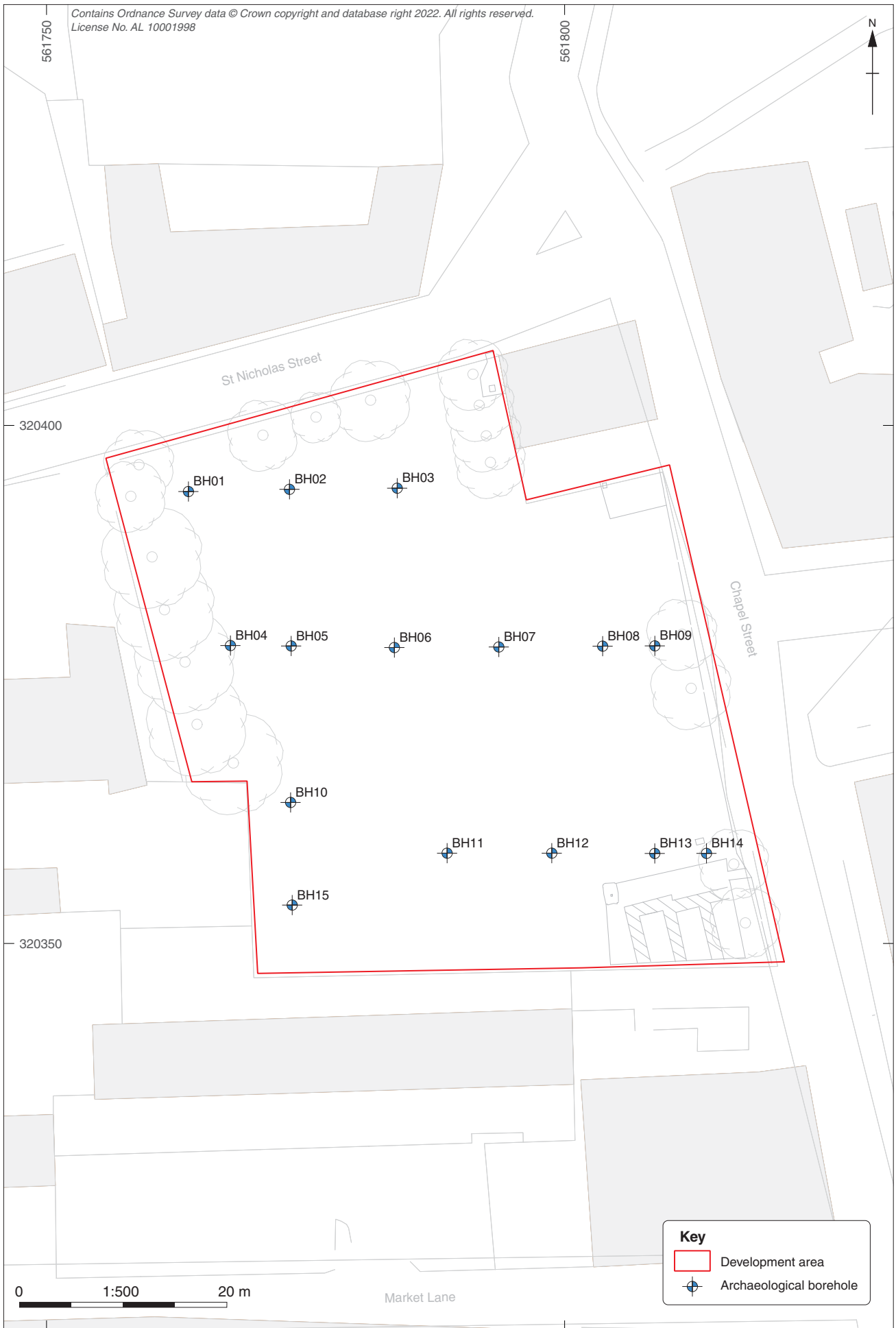


Figure 2: Borehole array with mapped services, Chapel Street Car Park. Scale 1:500 at A4

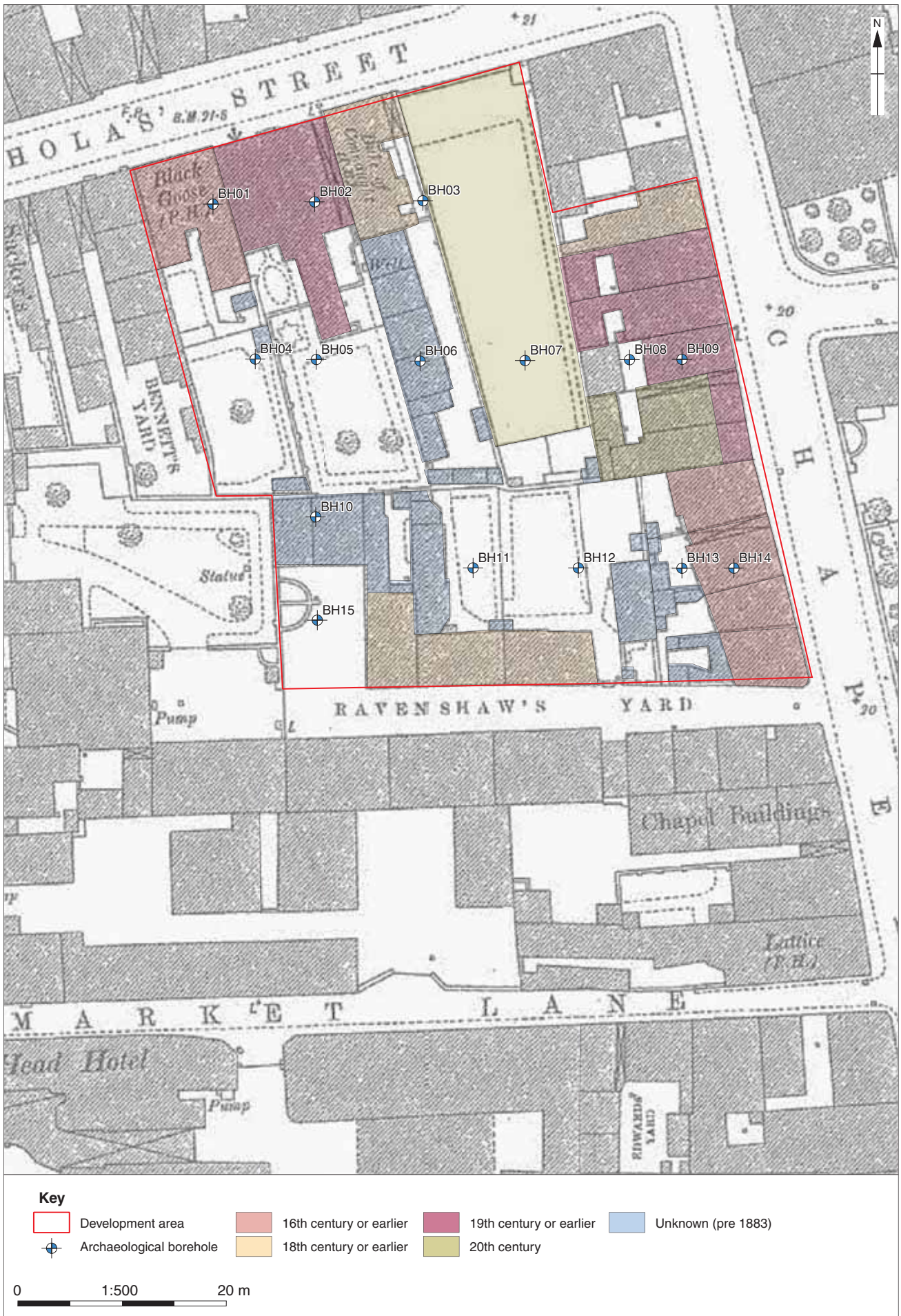


Figure 3: Borehole array with potential or known date of demolished buildings (Newsome 2018) and the 1883 Ordnance Survey 1:500 Town Plan (published 1886) Chapel Street Car Park. Scale 1:500 at A4

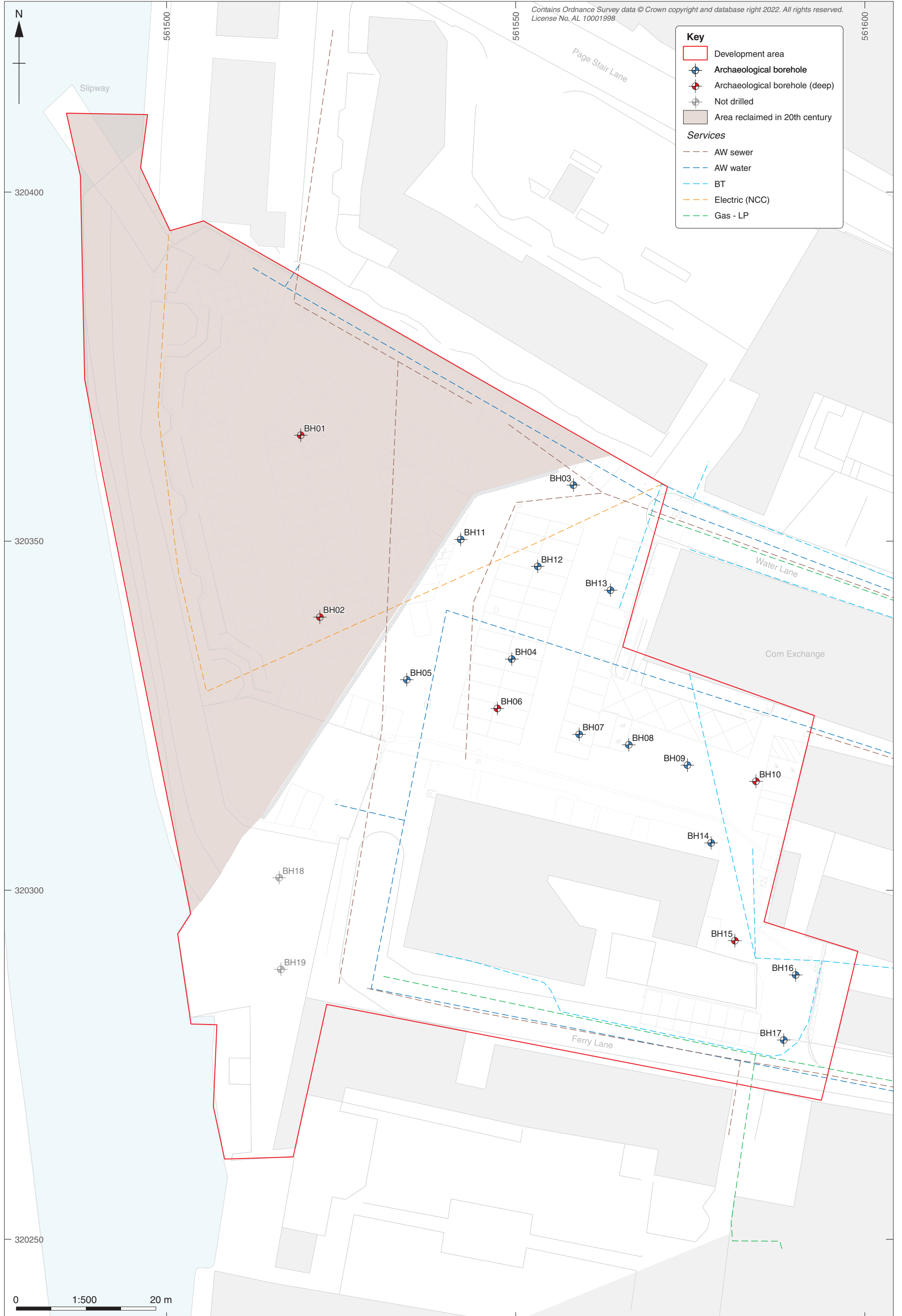
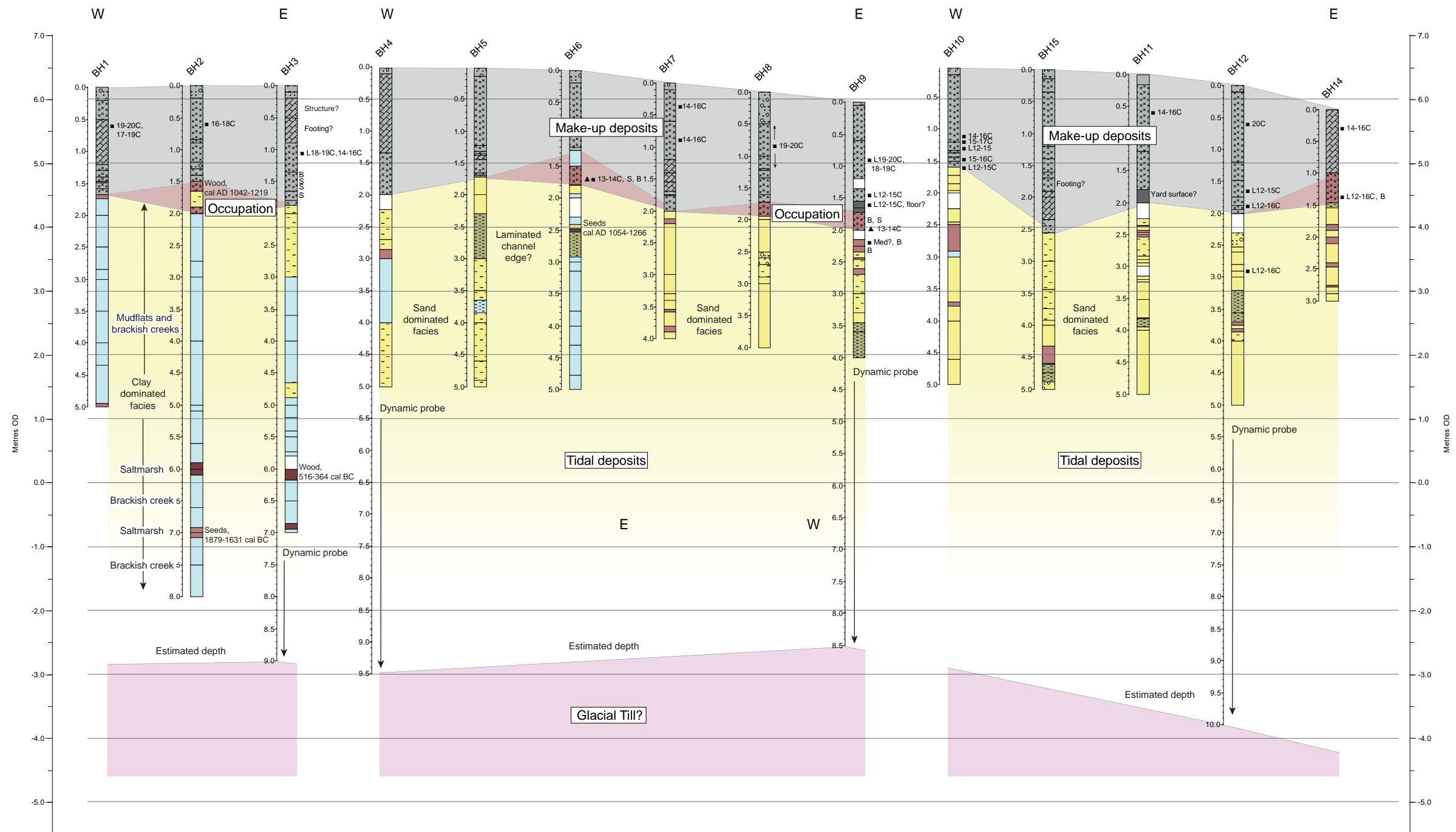


Figure 4: Borehole array with mapped services, Common Staithe. Scale 1:500 at A3

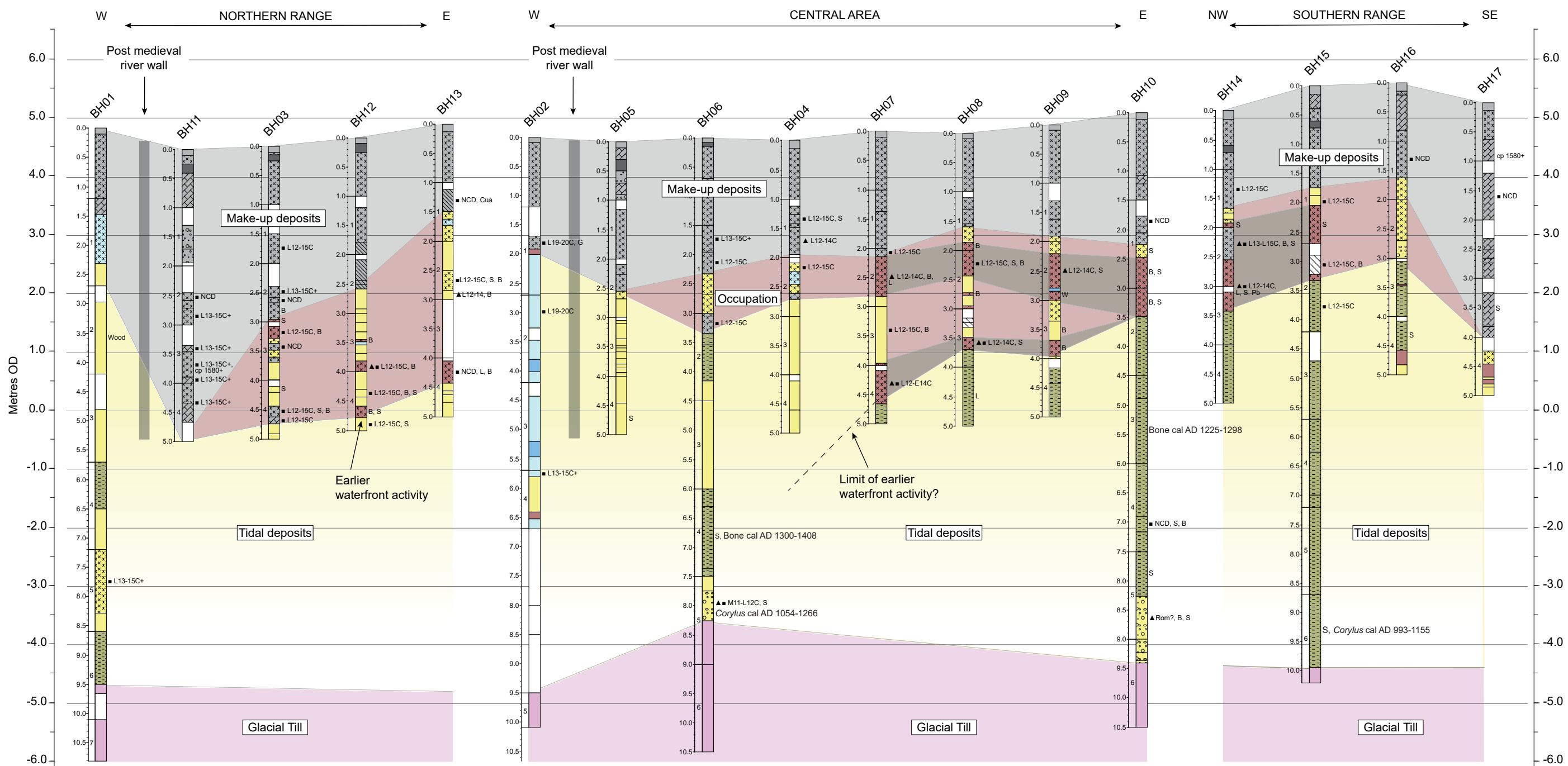


Figure 5: Borehole array with the 1883 Ordnance Survey plan, Common Staithe. Scale 1:500 at A3



Key			Finds		
Deposits					
	Core void		Alluvium (clay and silt)		Sand
	Core contamination		Alluvium (mixed)		Sand and silt
	Tarmac		Laminated alluvium		Sand (mixed)
	Dumped/make-up		Organic alluvium		Laminated
	Rubble		Organic alluvium (mixed)		Gravelly sand
	Burnt deposit		Peaty alluvium		Glacial Till
	Surface?				
	Gravel (dumped)				
Finds					
	Ceramic building material (CBM)		Pottery		Shell
	Bone		Wood		Lead

Figure 6: Litho-stratigraphic borehole profiles, Chapel Street



Deposits			Finds		
	Core void		Alluvium (clay and silt)		Ceramic building material (CBM)
	Core contamination		Alluvium (mixed)		Pottery
	Tarmac		Laminated alluvium		Shell
	Dumped/make-up		Organic alluvium		Bone
	Rubble		Organic alluvium (mixed)		Clay pipe
	Burnt deposit		Peaty alluvium		Wood
	Surface?		Sand		Copper alloy
	Gravel (dumped)		Sand and silt		Lead
			Sand (mixed)		Leather
			Laminated sand		Glass
			Gravelly sand		Not datable
			Glacial Till		

Figure 7: Litho-stratigraphic borehole profiles, Common Staithe



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