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**Former Pilot Cinema,
John Kennedy Road,
King's Lynn, Norfolk**

Archaeological Monitoring



**Prepared for:
Wellington Construction Ltd**

Planning Ref: 13/00205/FM

HER: ENF134304

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Clay tobacco pipe.

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District:	King's Lynn and West Norfolk
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Planning Ref.:	13/00205/FM
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Summary

An archaeological watching brief was conducted for Wellington Construction Ltd during groundworks associated with the construction of new housing at the site of the former Pilot Cinema, John Kennedy Road in King's Lynn, Norfolk.

Observation of the piling of foundations for the new housing, and of the installation of a large and deep sewer pipe revealed a cross-section through the southern bank of the Fisher Fleet (infilled and invisible on the modern surface), the stratigraphy of deposits dumped to raise the ground level within the plot, a glimpse of a possibly late medieval structure and information pertaining to the 17th/18th-century glassworks on this site.

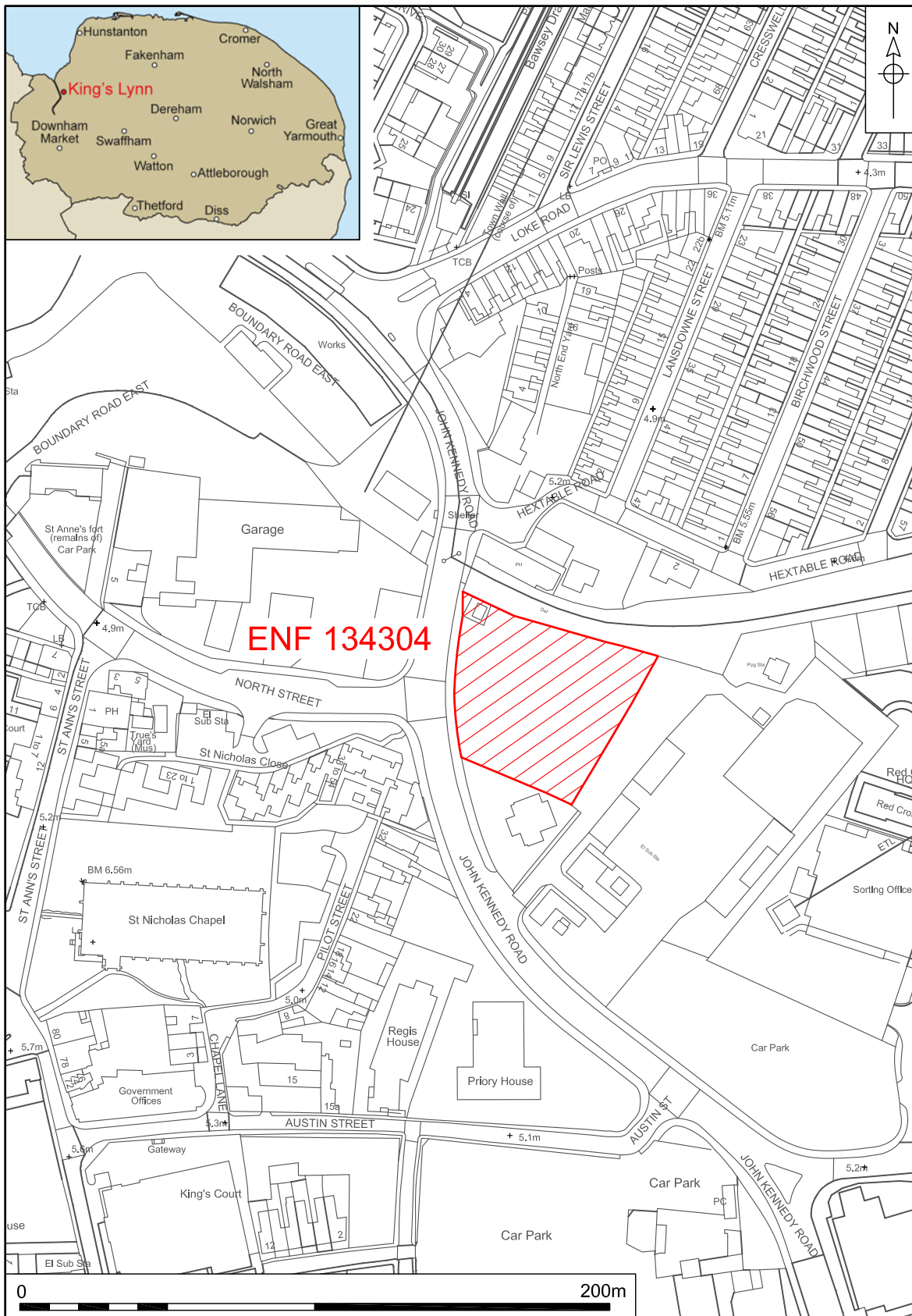
The Fisher Fleet produced a layer full of mid-17th-century rubbish, including clay tobacco pipes and glass crucible fragments which suggest that waste from the glass furnace was being dumped here at that period. The sealing layers were of relatively clean clay, suggesting no further rubbish dumping took place and that this clay was deposited by slow flowing water. This may be due to a major flood event in 1671, and possibly also in 1669/70, which necessitated furnace waste being dumped over the plot to raise the ground level after that date. The retaining wall of the southern bank of the Fisher Fleet was found; this wall may also have been constructed to control flooding, and appears to predate the rubbish-rich layer across the plot and.

Within the plot itself, no structural evidence for the glass furnace was found, but a large pit full of glass waste and a layer of furnace waste covering almost the whole observed area provide conclusive evidence of the presence of the glass manufacturing. Earlier evidence was present in the form of late medieval pottery, a late medieval brick wall and a layer of well-sorted medieval demolition rubble, used (like the later layer of furnace waste) to raise the ground level.

Late 16th-century mapping shows occupation in this area and the mapping from the mid to late 17th century depicts a 'glass house' here.

1.0 INTRODUCTION

As the result of the findings of an archaeological evaluation by trial trenching on the site, a watching brief took place on groundworks associated with the construction of new housing, including piling, foundations and service trenches on the site of the former Pilot Cinema, John Kennedy Road, King's Lynn in Norfolk (Fig. 1).



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Figure 1. Site location. Scale 1:2000

This work was undertaken to fulfil planning requirements set by the Borough Council of King's Lynn and West Norfolk (13/00205/FM) and requirements set by the Norfolk Historic Environment Service. The work was conducted in accordance with a Project Design and Method Statement prepared by NPS Archaeology (01-04-15-2-1126). This work was commissioned and funded by Wellington Construction Ltd.

This programme of work was designed to assist in defining the character and extent of any archaeological remains within the proposed redevelopment area, following the guidelines set out in *National Planning Policy Framework* (Department for Communities and Local Government 2012). The results will enable decisions to be made by the Local Planning Authority about the treatment of any archaeological remains found.

The site archive is currently held by NPS Archaeology and on completion of the project will be deposited with Norfolk Museums Service (NMAS), following the relevant policies on archiving standards.

2.0 GEOLOGY AND TOPOGRAPHY

The superficial geology of the site is clay and silt Tidal Flat Deposits which in turn overlie the Kimmeridge Clay Formation mudstone bedrock (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>).

The site is located at an elevation of approximately 5.80m OD on its east side and slopes gently down towards the west to an elevation of approximately 5.00m OD.

The site was bounded to the north by the line of the former Fisher Fleet (Gaywood River) - built over by the King's Lynn Dock Railway - with The Retreat public house and Victorian and modern housing beyond. To the south and west the site is bounded by the modern John Kennedy Road and its junction with North Street. West. South of the road junction is a mixture of industrial units, modern housing and dock facilities, all interspersed with medieval and post-medieval buildings. To the east of the site is a substantial electricity sub-station.

3.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The following information is derived from the evaluation report (Whitmore 2014, 4-8) and is based on information from the Norfolk Historic Environment Record (NHER):

King's Lynn (formerly Bishop's Lynn) was founded in 1095 around St Margaret's Church on the land between the Millfleet and the Purfleet. The town expanded in the mid 12th century as the land between the Purfleet to the south and the Fisher Fleet to the north was granted by Bishop Herbert de Losinga for settlement in 1146-1150. The site is located at the northern end of this 'Newland', immediately to the south of the Fisher Fleet, which formed the northern boundary of the medieval town of King's Lynn. To the east of the town the fleet is known as the Gaywood River and flows westwards from its source in Derby Fen, north-west of the village of Gayton to join with the River Great Ouse. The fleet remained an open, if increasingly canalised, waterway until the 19th when the King's Lynn Dock Railway (NHER13592) was constructed over part of its course, including the stretch of the fleet immediately north of the site.

Approximately 100m to the south-west of the site is St Nicholas Chapel (NHER5549), the largest surviving parochial church in England, which was founded in 1146 as part of Bishop De Losinga's establishment of the new settlement north of the Purfleet. A main north to south road, Dowhill Street (now known as Pilot Street and cut short by modern housing at its

northern end) ran to the east of the churchyard and northwards to Doucehill Bridge, the medieval crossing point over the Fisher Fleet. Doucehill Bridge would have been located just to the north-east of the corner of the site. Foundations of the bridge were identified during road works in the late 19th century (NHER40068).

North of St Nicholas Chapel Dowshill Street intersected with Drewes Lane (now known as North Street) and the site is located opposite this junction. The modern road layout has changed with John Kennedy Road now cutting across the line of Dowshill Street. Documentary research has identified a number of trades that were taking place along Dowshill Street during the later medieval period, including smiths, tanners, fullers and fishmongers (Clark and Carter 1977, 425). Several buildings of late 15th-century or 16th-century date still survive in the vicinity of St Nicholas Chapel. It is possible that similar buildings fronting onto Dowshill Street did at one time occupy the western frontage of the former Pilot Cinema site although, on Hollar's map of c.1660, which is the earliest known surveyed plan of King's Lynn (Higgins 2005) there is only one building shown, in the north east corner of the plot.

Away from the Dowshill Street frontage, on Hollar's map of 1660 a glassworks is marked as occupying the site. The glassworks is also present on Henry Bell's *Groundplat of King's Lynn*, dated 1680, which was produced as an updated copy of Hollar's map. Documentary sources indicate that the glassworks comprised a building to the rear of the plot and another building (shop?) on the Dowshill Street frontage. This latter building later became an alehouse (Higgins 2005). The glassworks was originally operated by Israel Harrison, from 1693 by a London glassmaker, Francis Jackson and in the 1720s by James Taverner. By 1742 the land was owned by Thomas Allen and was no longer in use for glassmaking.

According to Henry Harrod when discussing Bell's map 'The Glass House, which was not built much before the middle of the 17th century, and on the failure of the experiment stood empty for some years, and was taken possession of by a Presbyterian congregation shortly after the Restoration, which gave the building some notoriety' (Harrod 1870). This is contradicted by Higgins, in his biography of Henry Bell (Higgins 2005) who states that the glass house that became a Presbyterian meeting house was not the one on the Pilot Cinema site but another, shown on Rastrick's map of 1725, located just north of the Purfleet. The absence of the Dowshill Street glassworks on Rastrick's map may indicate that it had gone out of use by 1725.

The inset plan of King's Lynn on Faden's map of Norfolk shows buildings on the site and John Wood's King's Lynn map of 1830 shows buildings with gardens on the Pilot Street frontage and behind is a rectangular building which is likely to be the former glassworks building. The 1st Edition Ordnance Survey mapping also shows the rectangular building

The Pilot Cinema was constructed on the site in 1938 and closed in 1983. From 1983 the cinema building was used as a roller skating rink and subsequently a garden centre before being refurbished as Zoot's Nightclub in 1999. The nightclub closed in 2008. A number of photographs of the interior of the nightclub were taken as part of an 'Urban Exploration' in September 2012, the results of which can be accessed at <http://www.28dayslater.co.uk/forums/leisure-sites/75469-zoots-night-club-kings-lynn-september-2012-a.html>.

A search of the Norfolk Historic Environment Record (NHER) produced 289 records within 500m of the site, of which only the closest and most relevant records have been detailed below.

Immediately to the west of the site is Pilot Street (formerly Doweshill Street) and North Street (formerly Drewes Lane). Numerous Listed and historic buildings, centred around St Nicholas Chapel (NHER5549) and including late medieval, post-medieval and Victorian buildings on Pilot Street (NHER1111), Chapel Lane (NHER12004), Austin Street (NHER39588), North Street (NHER24426) and St Ann's Street (NHER12597, 39851, 22264, 24829).

To the east of St Nicholas Chapel building works in 1977 revealed skeletons overlying substantial medieval structural remains (NHER12649). The skeletons are thought to have been related to the extension of the graveyard of St Nicholas Chapel and the structural remains a continuation of the medieval buildings fronting onto the former northwards line of Pilot Street towards the Doucehill Bridge crossing of the Fisher Fleet.

South of St Nicholas Chapel and approximately 150m south-west of the current site, at the junction of Austin Street and Chapel Lane, archaeological evaluation trenching in advance of

the construction of the Freebridge Housing Association offices revealed evidence for a 14th-century building (NHER5530).

West of the proposed development area was the site of a post-medieval windmill, shown on Rastrick's map of 1725 and on Henry Bell's 1695 'The West Prospect of Lynn Regis', where it is labelled as the Starch Mill (NHER16378). Adjacent to the windmill the remains of a probable 14th-century arch were uncovered in the 19th century (NHER39850). West of the windmill was St Ann's Fort (NHER5486), constructed in 1570 as part of the towns defences and located at the confluence of the Fisher Fleet and River Great Ouse. Only fragments of the fort now survive.

North of the Fisher Fleet and of the line of the dock railway, archaeological evaluation and watching brief monitoring in advance of the construction of new housing revealed evidence for medieval and post-medieval buildings, occupation and the infilling of the northern edge of the Fisher Fleet (NHER49124).

East of the proposed development area historic mapping indicates that the land was primarily open ground until the later 18th or 19th century. Any archaeological evidence from the land immediately to the east of the site has probably been damaged by the construction of a substantial electricity substation. It appears that the construction of the sub station and attendant buildings has been cut into the existing ground surface and thus at least some truncation of any archaeological remains that were present will have occurred.

On the site of the former dairy depot on Austin Street, archaeological evaluation in 2009 revealed evidence for early medieval flooding overlain by dumping of silts and building waste. (NHER53200).

The archaeological evaluation undertaken in January 2014 (Whitmore 2014) took the form of four 4mx4m trenches. The trenching produced evidence of the former Fisher Fleet (which appeared to have been infilled in the mid to late 16th century), a post-medieval wall, early post-medieval pits, a large pit full of glass production waste and extensive layers of glass production waste. Walls and surfaces survived above these deposits and related to the 18th-19th-century landuse.

4.0 METHODOLOGY

The objective of this watching brief was to record surviving archaeological deposits within the development area.

The Brief required that all groundworks, including the piling, be monitored by an experienced archaeologist (Fig. 2).

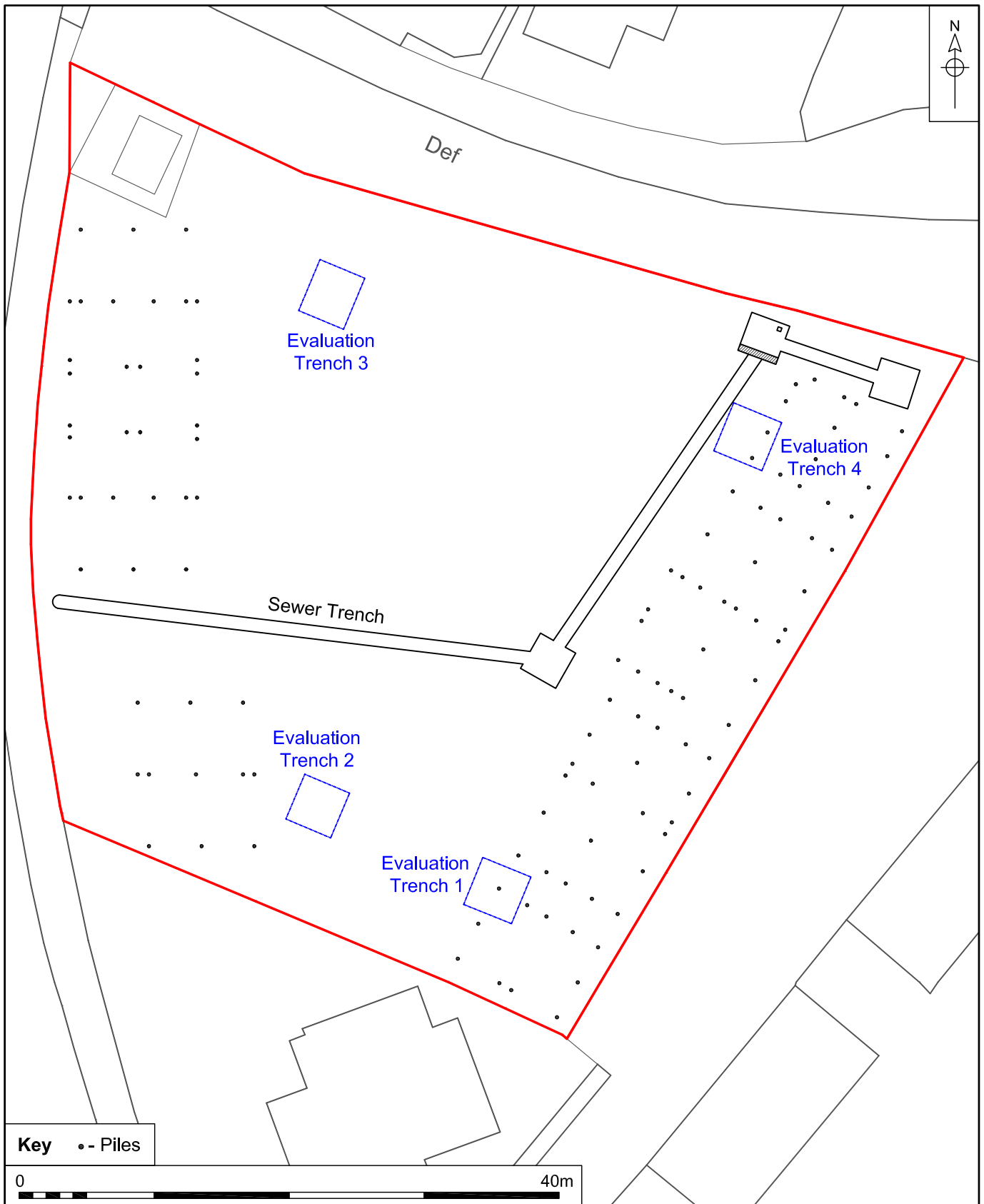
Machine excavation was carried out with a hydraulic 360° excavator equipped with a toothless ditching bucket.

Spoil, exposed surfaces and features were scanned with a metal-detector. All metal-detected and hand-collected finds other than those which were obviously modern, were retained for inspection.

Due to health and safety considerations and problems of access, environmental samples were not taken.

Archaeological features and deposits were recorded using NPS Archaeology pro forma. Plans and sections were recorded at appropriate scales. Digital photographs were taken of all relevant features and deposits and monochrome 35mm film employed where considered appropriate.

Site conditions were variable.



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Figure 2. Site plan, showing the location of the evaluation trenches, sewer trench and piles.
Scale 1:400

5.0 RESULTS

Areas for the blocks of residential accommodation were stripped and reduced to formation level without NPS Archaeology being present. Ken Hamilton of Norfolk Historic Environment Service did visit the site during this period.

The results of the archaeological monitoring of the piling and drain trench are presented below under separate headings.

5.1 Piling

(Figure 3)

The piling began on 27 May 2014 and was completed on 5 June 2014. The piles were between 13.00m and 18.75m deep (below ground level).

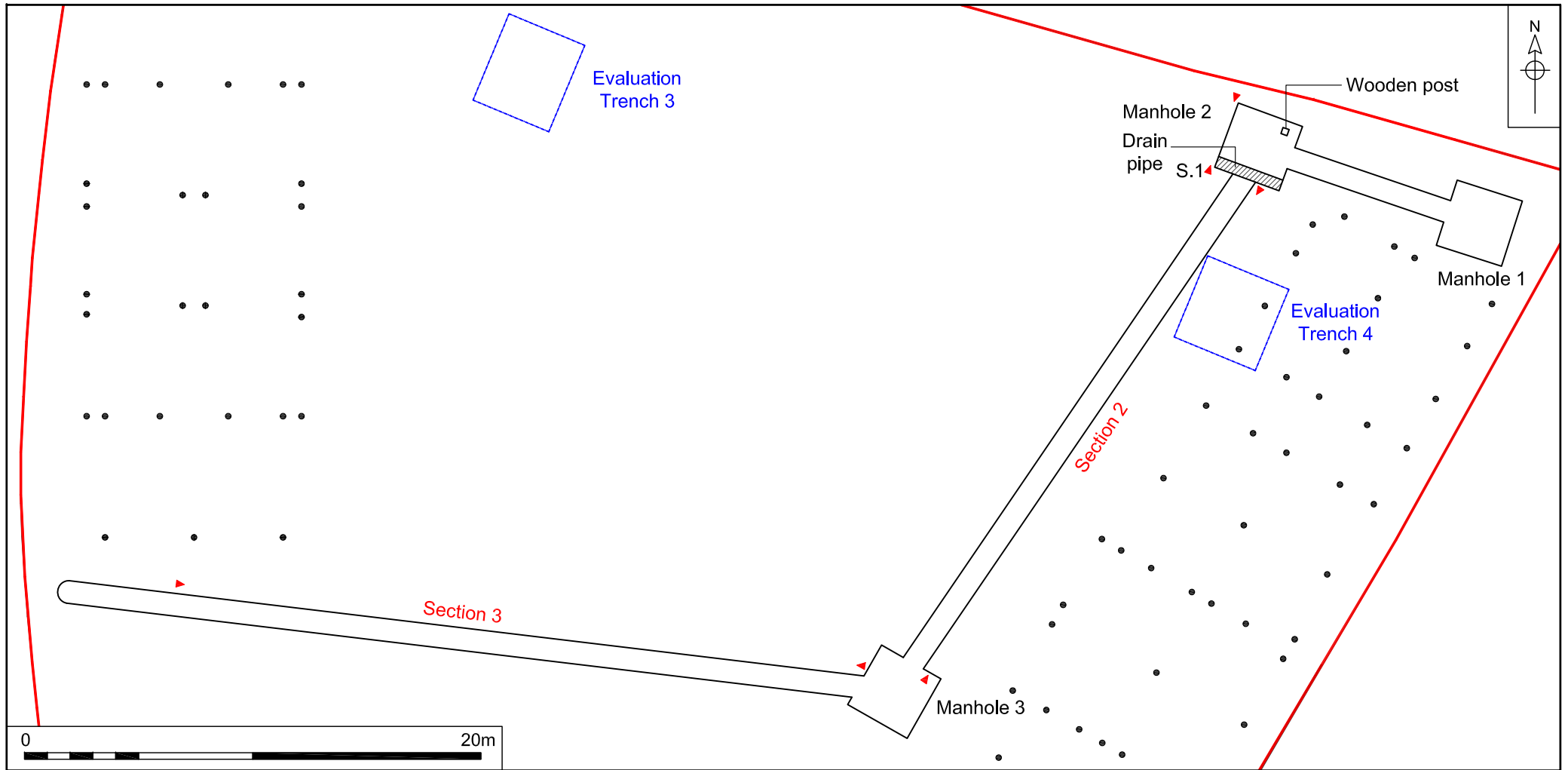


Plate 1. Piling in the northwestern corner of the site

Very limited information was obtained about the detail of the underlying stratigraphy and no obstructions were encountered (thus no necessity for machine excavation to clear them).

The underlying grey clay and silt Tidal Flat Deposits were encountered at each of the pile locations with peat and yellow sand also visible in some. The piles located in the southwest corner of the development site produced significant amounts of ash and burnt material.

Unstratified finds from the piling soil arisings included late medieval and 19th-century pottery, glass crucible fragments and 17th-century clay tobacco pipe bowls.



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Figure 3. Plan of sewer trench. Scale 1:250

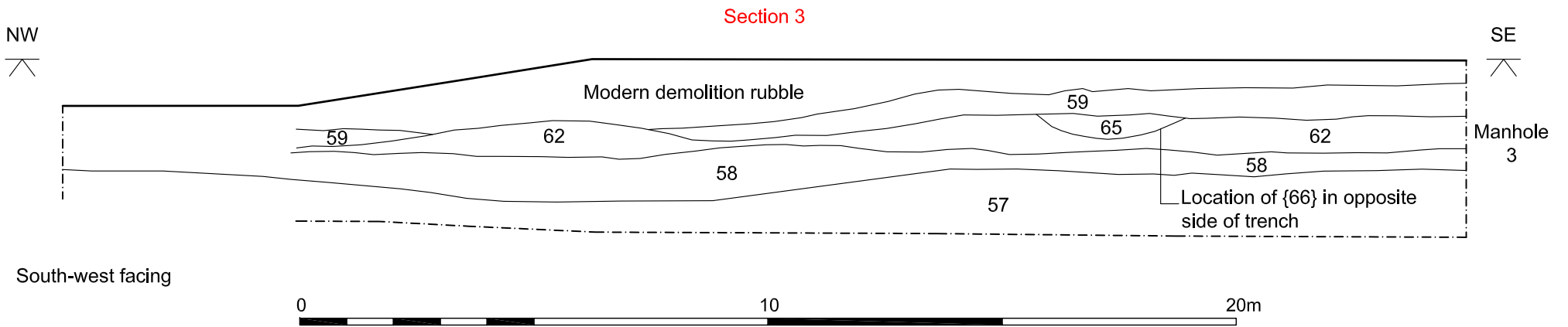
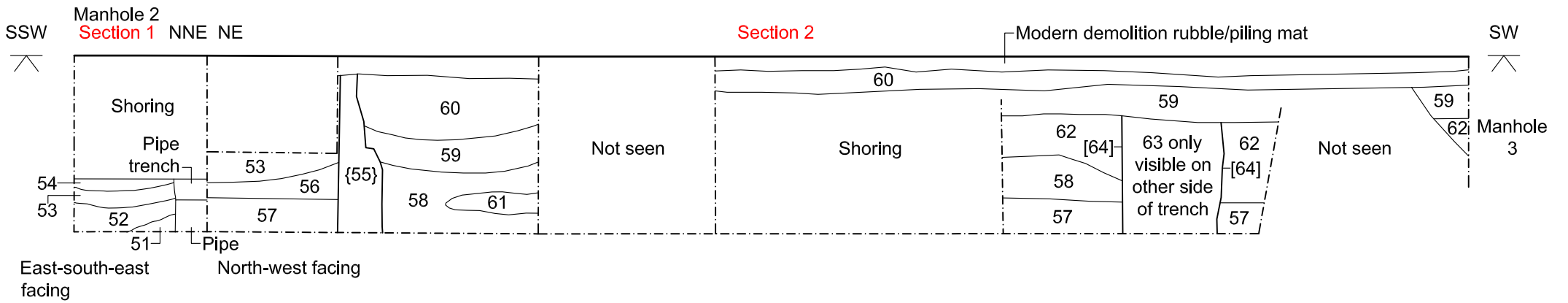


Figure 4. Sections 1 - 3. Scale 1:125

5.2 Drain Trench

(Figures 4 and 5)

Monitoring of the drain trench began on 29 September 2014 and continued until the trench was finished on 22 October 2014.

The drain trench measured 1m wide and was c.4m deep. Three manholes constructed in square holes 3m wide and 3m long were excavated along its route (Fig 3).

5.2.1 Manhole 1

The easternmost manhole (Manhole 1) and the short length of trench running westwards to Manhole 2 was not observed due to shoring boxes being in place.

5.2.2 Manhole 2

Manhole 2 was inspected when the shoring box was in place, however the lowest 1.2m of deposits were visible (Figs 3 and 4 section 1, Plate 2).

Deposits were slightly truncated by a large modern drain pipe encased in concrete.



Plate 2. Manhole 2 facing northwest

The lowest deposit (51) was a mid creamy grey sandy gravel containing occasional fragments of mortar, brick and tile (ceramic building material (CBM)) and appeared to slope down to the northeast.

Above (51) was layer (52), a black clay with sparse flint gravel and coal fragments. Like (51) this layer sloped downwards to the northeast, and perhaps sloped up again at the northeast end; it also appeared to get thicker towards the northeast.

Layer (53) was above (52) and was 0.4m thick; it too sloped upwards to the northeast and southwest. It was a dark brown silty clay containing frequent wood fragments and occasional mortar and CBM fragments. Artefacts collected from this layer included a sherd of 17th-/19th-century pottery, post-medieval roof tile and ceramic glass crucible fragments and early to mid 17th-century clay tobacco pipe bowls, suggesting a mid 17th-century date for this deposit.

Above that was layer (54) a relatively clean layer of black clay devoid of artefacts. The upper 3m was obscured by the shoring box.

A large wooden post was visible in the northeastern corner of the manhole excavation.

Manhole 2 appears to have been located within the former course of the Fisher Fleet. The Fisher Fleet was the northernmost of three 'fleets' which together with the Purfleet and the Millfleet to the south ran into the River Ouse through the town. The location of Fisher Fleet disappeared in the 19th century when the dock railway was laid along its infilled course.

Apart from layer (51), all of the deposits encountered in Manhole 2 were typical of deposits laid down in slow moving water.



Plate 3. Wall {55} facing east

5.2.3 Trench between Manhole 2 and Manhole 3

A large wall {55} was present towards the northeastern end of this trench (Figs 3 and 4 section 1, Plate 3) and was probably a revetting wall for the southern bank of the Fisher Fleet.

The wall appeared to comprise two phases of build. The earlier (lower) part was 1.0m wide and bonded with white chalky mortar. The upper part was c.0.4m wide and bonded with a sandy cream mortar. The bricks were post-medieval in date and of variable sizes and origin, suggesting that they may have been reused.

The stratigraphy to the northeast of that wall (i.e. within the Fisher Fleet) was partially obscured by shoring, but the bottom 2.0m was visible, comprising the natural mudflat deposit grey clay (57) at the bottom, with pale brown silt (56) above that and deposit (53), seen in Manhole 2, above that.

Deposits (57) and perhaps (56) are the natural pre-urban mudflat deposits and predate wall {55} by a considerable amount of time.

The stratigraphy observed in the rest of the trench southwestwards, between Manholes 2 and 3 consisted of grey clay (57) at the base with cream silt layer (58) above that.

Layer (58) may represent the early deposition of dredging deposits seen elsewhere in King's Lynn, for example layer [2] at the Boal Quay Excavations in 2012 (Hickling 2012, 18), which was 'a pale brown silt with rare pieces of ceramic building material, mortar and marine shell fragments and had a thick 'custard-like' consistency which would shake visibly when walked across' and was dated as post 1540 and pre 1645. The author encountered a similar deposit during a watching brief on piling work at Norfolk Street in King's Lynn (Hickling 2010, 5). Here two layers were encountered, the lowest being a dark grey clay with peat dating to the late 17th century, with a layer of mid brown clay 2-3m deep containing 19th- to 20th-century brick and plaster. Although this layer was later than that found at the present development and at Boal Quay, it was similar in make-up and may have derived from the same source and the same process i.e. spoil from dredging the Fleets and harbour. Here the layer petered out to the southwest i.e. away from the former Fisher Fleet.

Above layer (58) was layer (61)/(62), a deposit up to 1.8m thick of well sorted medieval demolition rubble of pale cream mortar fragments, brick and pegtile fragments. The absence of whole bricks and tiles suggests that this material had been sorted for reusable masonry and the remainder dumped here to assist in raising the level of the land. Layer (61)/(62) may have originated from the demolition of former monastery buildings after the dissolution in the late 1530s as it was exclusively medieval in date.

Cut through layer (58) was pit [64] (Fig 4 section 2, Plate 4), which was 2.3m wide and in excess of 2.7m deep with vertical sides. Its fill (63) was composed entirely of glass slag and waste and clinker. This feature was therefore backfilled with waste generated by the post-medieval glassworks known to be on this site.



Plate 4. Pit [64] facing west

Above layer (61)/(62) was layer (59) which was up to 0.8m deep and spread over virtually the whole area observed. It was composed of black ash and charcoal/fuel slag with glass waste, pottery dating from the late medieval to the 19th century and late 17th-century clay tobacco pipe fragments. This layer could well be waste generated by the glass furnace which has then been spread over the site in order to raise the ground level.

Above layer (59) was layer (60), a layer of 19th/20th-century rubble up to 0.55m thick, perhaps dating to either the building or the demolition of the 20th-century cinema. Above this was a layer of more recent demolition and levelling material.

5.2.4 The trench after Manhole 3

The same stratigraphic sequence of (57) below (58) below (62) below (59) described for the trench between Manholes 2 and 3 but as it got closer to the road (which was at a lower level than the ground level within the site) deposits (56), (62) and (59) became thinner and intermittent.

Between layers (62) and (59) was a shallow hollow or scrape (65) (Fig. 4 section 3) which was 3.1m wide and 0.5m deep was full of black fuel ash and red clinker. This deposit must have been one of the earliest deposits of furnace waste.

Close to (65), within layer (62) on the southern side of the trench was a stretch of brick wall {66} (Plate 5). This was aligned northwest to southeast and was formed of a double thickness of bricks laid in stretcher bond in a soft cream mortar. The bricks were uniform in size, late medieval in date and showed no evidence of reuse. Together with some of the pottery found on site, this wall suggests late medieval occupation here.



Plate 5. Wall {66} facing southwest (the concrete to the right is a foundation of the former cinema)

6.0 THE ARCHAEOLOGICAL MATERIAL

Finds were processed and recorded by count and weight, and information entered onto an Excel spreadsheet. Each material type has been considered separately and is presented below organised by material.

A list of finds in context number order can be found in Appendix 2a.

6.1 Pottery

by Sue Anderson

6.1.1 Introduction

Seven sherds of pottery weighing 245g were collected from three contexts (Appendix 3). Table 1 shows the quantification by fabric; a summary catalogue by context is included as Appendix 3.

Description	Fabric	No	Wt (g)	Eve	MNV
Late medieval and transitional	LMT	1	13	0.06	1
Surrey whiteware transitional 'Tudor Green'	SWWT	1	6		1
Cistercian-type ware	CTW	1	35		1

Description	Fabric	No	Wt (g)	Eve	MNV
Unprovenanced glazed	UPG	1	86		1
Midlands blackware	MIDB	1	30		1
<i>Total late/post-medieval</i>		5	170	0.06	5
Pearlware	PEW	1	41		1
Late post-medieval unglazed earthenware	LPME	1	34	0.15	1
<i>Total modern</i>		2	75	0.15	2
Total		7	245	0.21	7

Table 1. Pottery quantification by fabric

6.1.2 Methodology

Quantification was carried out using sherd count, weight and estimated vessel equivalent (eve). The minimum number of vessels (MNV) within each context was also recorded, but cross-fitting was not attempted unless particularly distinctive vessels were observed in more than one context. A full quantification by fabric, context and feature is available in the archive. All fabric codes were assigned from the author's post-Roman fabric series, which includes East Anglian and Midlands fabrics, as well as imported wares. Regional wares were identified based on Jennings (1981). Form terminology follows MPRG (1998). Recording uses a system of letters for fabric codes together with number codes for ease of sorting in database format. The results were input directly onto an Access database.

6.1.3 Pottery by period

6.1.3.1 Late medieval and post-medieval

The majority of sherds in this assemblage were late medieval in date. Two sherds were from ash/charcoal layer (59) and showed signs of burning. They comprised a rimsherd of a late medieval and transitional ware pipkin or jar and a brown-glazed Cistercian-type ware mug base. A late medieval Surrey whiteware carinated sherd, copper green glazed on both surfaces, was probably from a 'Tudor Green' loped cup or dish, but was unstratified. Also unstratified was a large body sherd from a ?jug with well-applied thick copper green glaze inside and out. This was in a fine sandy pale orange fabric and had applied decoration in the form of ring-and-dot stamps joined by narrow raised lines. Ring-and-dot stamps are a particular feature of Kingston-type Surrey whitewares, although they are known on other types of medieval pottery. The internal glaze would be unusual in this type of pottery, however, so the sherd is recorded as unprovenanced. There is a possibility that it could be a continental import.

6.1.3.2 Modern

A base sherd of a pearlware cup, with a footring base and decoration in the form of blue Willow Pattern transfer printing was an unstratified find (10). A plantpot rim was recovered from deposit (59).

6.1.4 Pottery by context

A summary of the stratified pottery by feature is provided in Table 2.

Context	Identifier	Fabric	Spotdate
10	U/S finds	UPG, SWWT, PEW	U/S
53	Layer	MIDB	17th-19th c.

Context	Identifier	Fabric	Spotdate
59	Layer	LMT, CTW, LPME	L.14th/15th c. or 18th-20th c.

Table 2. Pottery types present by feature

Only one sherd came from layer (53) but it suggests a post-medieval date, as does the CBM from this context. The burnt pottery from layer (59) was of late medieval date, whilst the fragment of plantpot was unburnt and may suggest that the burnt material was redeposited at a later date.

6.1.5 Discussion

Pottery in this small assemblage ranges in date from the late 14th to 19th century, although the majority clusters in the late medieval period. A broad range of types is present, with all identifiable fabrics coming from pottery production centres some distance from the town. This is as would be expected in a flourishing port of the period. Although it is unusual that no local wares are present, this is probably due to the small size of the assemblage.

6.2 Ceramic Building Material

by Sue Anderson

Eighteen pieces (19,212kg) of ceramic building material (CBM) were recovered from four contexts (Appendix 4). The assemblage was quantified (count and weight) by fabric and form and recorded in an Access database. Fabrics were identified on the basis of macroscopic appearance and main inclusions. The width, length and thickness of bricks and floor tiles were measured, but roof tile thicknesses were only measured when another dimension was available. Forms were identified from work in Norwich (Drury 1993), based on measurements; other form terminology follows Brunskill's glossary (1990).

Table 3 shows the quantification by type and form. A full catalogue by context is available in the archive.

Type	Form	Code	No	Wt (g)
Roofing	Plain roof tile (med)	RTM	3	593
	Plain roof tile (pmed)	RTP	2	110
	Pantile?	PAN?	1	4
Walling	Early brick	EB	2	974
	Early brick?	EB?	3	6099
	Late brick?	LB?	7	11432
Total			18	19212

Table 3. CBM by type and form

Five fragments of plain roof tiles were recovered. These were in two fabric groups, the estuarine clays most frequently employed during the medieval period (three pieces from layer (62)), and the yellow-firing gault clays which seem to be mainly of post-medieval date (two pieces from layer (53)). It was possible to obtain dimensions for one medieval roof tile, which measured 151mm wide and 15mm thick. This is within the range found in previous assemblages from the town.

One small flake of pantile, in a fine sandy fabric with clay pellets, was found in layer (53), suggesting a 17th-century or later date for this fill.

Twelve fragments or complete bricks were recovered, all in fine silty fabrics with ferrous or argillaceous inclusions typical of estuarine clays. Elsewhere in Norfolk, estuarine clay bricks were in use from the 13th to the 15th centuries. However, the fully oxidised fine red or orange fragments in this assemblage are likely to be slightly later.

Two fragments from (62) showed typical features of early bricks (sunken margins, warping, poor control over firing, straw impressions), whilst other fragments from this context were fully oxidised and probably later. The mortar on one piece of early brick from (62) was white with coal/charcoal inclusions, a type more frequently seen in the post-medieval period, suggesting re-use of the fragment.

Fragments from wall [66] had coarse sandy buff-coloured mortar on one or more surfaces. They were in red and orange estuarine fabrics with some straw impressions and may be of late medieval date.

Brick samples from wall [55] were covered in mortar and their identification is less certain, but at least one had a sunken margin. Three bricks were complete (230 x 121 x 53mm; 218 x 110 x 55mm; 205 x 95 x 50mm), and one was complete in two dimensions (127 x 62mm). This variability in size suggests that more than one batch of bricks was used in the wall, and it is likely that they were reused to build this wall in the post-medieval period. At least one had medium sandy mortar underneath white mortar with carbonised inclusions.

6.3 Glassworking Waste

by Sue Anderson

6.3.1 Introduction

Fifteen fragments (2,740kg) of glassworking waste were collected from five contexts (Appendix 5).

6.3.2 Methodology

Fragments were quantified by context, type and colour, and measured as appropriate, with the results recorded in an Access database. Terminology follows Paynter and Dungworth (2011), and Wilmott (2012).

6.3.3 The assemblage

Table 4 provides a quantification by material. A full catalogue by context is included in Appendix 5.

Material	No.	Wt(g)
Glass	6	519
Glass/ferrous?	1	454
Ceramic	8	1767
Total	15	2740

Table 4. Glassworking waste by material

Eight fragments of ceramic 'pots' or crucibles were collected from clay layer (53), pit fill (63) and as unstratified finds (10). They were in fine stoneware-like fabrics reduced to dark grey or oxidised to cream/pink/buff. The surfaces were covered with thin layers of greenish or white glass with streaks of brown or blueish glass particularly common externally. The pieces varied in thickness from 25mm to

40mm, and one large segment from (63) had an estimated diameter of c. 560mm. They are comparable with examples collected during previous work at the site (Anderson 2014) and may have been used in wood-fired furnaces (Paynter and Dungworth 2011, 18 and fig 29).

Most of the glass waste was recovered from pit fill (63) and comprised two trail fragments in pale green glass, a lump of green trails welded together, an irregular lump of blue-green altered glass with large bubble holes, and a large vesicular lump of green glass with an irregular melted surface. A piece of lightweight purple-grey vesicular material from deposit (65) was probably a piece of clinker.

A fragment of green glass with an iridescent brown surface was found in ash/charcoal layer (59). It is a piece of a bottle seal showing part of a coat of arms and is likely to be of 18th-century date (Plate 6).



Plate 6. Bottle seal from layer (59)

6.3.4 Discussion

Glassworking is known to have been established in King's Lynn by the late 17th century (Mehlman 1983, 68) and a glasshouse (possibly for vessel manufacture) is shown on a town map of 1680 (Brain 2002). Glassmaker, Issac Harrison, is recorded as working in 1649/50 (Brain 2002), although he may have been making bottles. This material is comparable with the glass waste recovered from previous work at the site, for which a mid 17th-century or later date has been suggested (Anderson 2014).

6.4 Clay Tobacco Pipe

by Rebecca Sillwood

Eighteen pieces of clay tobacco pipe weighing 225g were collected from three contexts during this watching brief. The majority of these fragments consisted of bowls of varying completeness and date and there were three fragments of undecorated undiagnostic stems.

Some of the earliest pieces recovered from the site were from layer (53), which was associated with the Fisher Fleet. These bowls include the smaller types dating from the early to mid 17th century, similar to examples illustrated by Atkin (1985, 126, fig. 2, nos. 3-5). Later 17th-century bowls (having a slightly larger capacity) were present within layer (59). The unstratified material (10) includes both earlier and later 17th-century types, but is clearly mixed.

None of the clay pipes examples collected from this site are marked or decorated, and there are no pipes that appear to be later than the 17th century.

6.5 Finds Conclusions

The finds from this watching brief at John Kennedy Road are similar in character to those recovered from the evaluation on the same site, and include medieval pottery and building material, but more significantly evidence for the glassworking industry on the site.

The evidence for this industry is clear, with crucible fragments and trails of molten glass present in most layers seen on the site. Bricks from two walls were also recorded; one possibly of late medieval date [(66)] and one of post-medieval date [(55)] and associated with the Fisher Fleet.

7.0 CONCLUSIONS

This project took place in two phases and each gave contrasting results.

The first phase comprised monitoring piling in the areas of the residential accommodation blocks. The piling revealed a small number of artefacts of late medieval to 19th-century and only broad indications of the underlying stratigraphy could be ascertained.

The second phase of this project, was monitoring the laying of a large sewer pipe through the centre of the site. This produced a cross-section through the south bank of the former Fisher Fleet and a view of the stratigraphical development of this plot.

The exposed section revealed the southern bank of the Fisher Fleet, its post-medieval retaining wall and a series of layers deposited to raise the ground level of the plot. These deposits consisted of dredged silt, well-sorted medieval demolition rubble and the rakings-out of the glass furnace. A series of deposits within the Fisher Fleet indicated that they had been laid down by slow moving water and the dumping of domestic rubbish and glass furnace waste in the mid 17th century. The layers above the rubbish-rich layer were of relatively clean clay suggesting no more dumping and slow moving water. Subsequently, glass making waste was dumping within the plot in an effort to raise the level of the land. The reason for this change in waste disposal practises may have been due to major floods from

storm surges in 1671 and possibly 1669/70 (Bullen Consultants 2005, 13) making a rise in ground level desirable. Upper layers, perhaps associated with the infilling of the Fisher Fleet and land reclamation in the 19th century were obscured.

A probable late medieval brick wall {66} was found above the dredged silt but below the medieval demolition rubble. This together with late medieval pottery found across the site suggests late medieval occupation. However this interpretation is at variance with the evaluation results where four times as many sherds of pottery of medieval date as opposed to late medieval were recovered (Whitmore 2014, 34). It does, however suggest medieval occupation and the earliest map (NRO BL 71) dating to c.1588 shows the Fisher Fleet bridge and housing on either side of the Fisher Fleet, although the map is not clear enough to be certain that there was housing within the present development site.

It seems that the post-medieval Fisher Fleet was not recognised during the evaluation (Whitmore 2014) but based on eth watching brief evidence it is possible that Trench 4 may have found the wider and unrevetted southern edge of it.

The earliest reasonably accurate map of King's Lynn shows the modern development site as being a defined plot from at least 1660 (Wenceslaus Hollar's map of c.1660), located next to the crossing of the Fisher Fleet by John Kennedy Road. It contains what was labelled 'The Glass House' which in this instance must mean a glass furnace. This glass furnace was probably working from before 1650 when it was run by Israel Harrison, through to the mid 18th century when (in 1742) it was described as 'late a glass house formerly Jackson's' (Higgins 2005, 50). Evidence for glass manufacture was present over much of the site with a layer of waste from the furnace spread over the whole area in an effort to raise the ground level. Glass slag, waste glass and fragments of glass crucibles were common finds. A large pit was encountered within the sewer pipe trench which was filled exclusively with waste glass, slag and crucible fragments.

The results from the earlier trial trench evaluation and the present watching brief have given us glimpses of the archaeological resource which lies beneath the surface in this part of King's Lynn i.e. medieval settlement, a 17th- to 18th-century glass furnace and the (now vanished) Fisher Fleet.

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This report was illustrated by David Dobson and edited by Jayne Bown. It was revised by Jayne Bown following comments received by Ken Hamilton.

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<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Appendix 1a: Context Summary

Context	Category	Cut Type	Fill Of	Description	Period
10	U/S Finds			U/S finds from piling	
51	Deposit			Gravel from the Fisher Fleet	
52	Deposit			Black clay from the Fisher Fleet	
53	Deposit			Brown silty clay from the Fisher Fleet	Early 17 th c.
54	Deposit			Black clay from the Fisher Fleet	
55	Masonry			Fisher Fleet wall	PM
56	Deposit			Pale brown/cream silt	
57	Deposit			Bluey grey silty clay	
58	Deposit			Mid brown clay	
59	Deposit			Black ash/charcoal	16 th -19 th c.
60	Deposit				
61	Deposit			Loose CBM	Medieval
62	Deposit			Loose CBM	Medieval
63	Deposit		64	Glass slag	Post-medieval
64	Cut	Pit		Pit	
65	Deposit			Black fuel ash and red slag	Post-medieval
66	Masonry			Wall	Late medieval

Appendix 1b: Feature Summary

Period	Category	Total
Unknown	Watercourse	1
Late medieval	Wall	1
Post-medieval	Wall	1
	Pit	1

Appendix 2a: Finds by Context

Context	Material	Qty	Wt	Period	Notes
10	Ceramic	6	1,031g	Post-medieval	Crucible fragments
10	Clay Pipe	5	70g	Post-medieval	Bowls
10	Pottery	2	92g	Med./Post-Med.	Late 14th-15th century
10	Pottery	1	41g	Modern	19th century
53	Ceramic	1	140g	Post-medieval	Crucible fragment
53	Ceramic Building Material	3	115g	Post-medieval	Roof tile fragments
53	Clay Pipe	5	48g	Post-medieval	Bowls and stems
53	Pottery	1	30g	Post-medieval	17th-19th century
55	Ceramic Building Material	1	1,874g	Medieval	Brick fragment
55	Ceramic Building Material	3	7,066g	Post-medieval	Complete bricks
62	Ceramic Building Material	5	3,466g	Medieval	Brick fragments
62	Ceramic Building Material	3	593g	Medieval	Roof tile fragments
59	Clay Pipe	8	107g	Post-medieval	Bowls and stems
59	Glass	1	7g	Post-medieval	Part of roundel with ?heraldic device from glass bottle
59	Pottery	1	34g	Modern	18th-20th century
59	Pottery	2	48g	Med./Post-Med.	Late 14th-16th century
63	Ceramic	1	596g	Post-medieval	Crucible fragment
63	Glass	5	512g	Post-medieval	Molten and other glassworking fragments
65	Glass/Ferrous	1	454g	Post-medieval	Clinker
66	Ceramic Building Material	3	6,099g	Medieval	Complete brick and fragments

Appendix 2b: Finds Summary

Period	Material	Total
Medieval	Ceramic Building Material	12
Med./Post-Med.	Pottery	4
Post-medieval	Ceramic	8
	Ceramic Building Material	6
	Clay Tobacco Pipe	18
	Glass	6
	Glass/Ferrous	1
	Pottery	1
Modern	Pottery	2

Appendix 3: Pottery Catalogue

Context	Fabric	Form	Rim	No	Wt/g	MNV	Fabric date range
10	SWWT			1	6	1	L.14th-15th c.
10	UPG			1	86	1	LMed?
10	PEW	cup		1	41	1	19th c.
53	MIDB			1	30	1	17th-19th c.
59	LMT	pipkin?	thickened everted	1	13	1	L.14th-16th c.
59	CTW			1	35	1	L.14th-15th c.
59	LPME	plantpot	beaded	1	34	1	18th-20th c.

Appendix 4: CBM Catalogue

Ctxt	Fabric	Form	No	Wt/g	Abr	Length	Width	Height	Mortar	Comments	Date
53	wmg	RTP	2	110							pmed
53	fscp	PAN?	1	4						flake	pmed
55	est?	LB?	1	1321			127	62	covered in white msca	broken at 85mm of length, thick mortar all over, sunken margins?	pmed?
55	est?	LB?	1	2417		218	110	55	covered in cream ms	pinkish, sunken margins, poss early?	pmed?
55	est?	LB?	1	1874		205	95	50	covered in cream ms/msca		lmed?
55	est?	LB?	1	3328		230	121	53	covered in white msca	grey clay on one stretcher? Pointing 10-15mm thick, poss tapered?	pmed?
62	est	EB	1	760				53	thin ms	some straw on base	med
62	est	EB	1	214				45	msca on top and break	hole in base, prob burnt-out organic inclusion?	med
62	est?	LB?	1	773			123	50	ms patches	red brick, rough surfaces	lmed?
62	fsfe	LB?	1	145				49		red brick, rough surfaces	lmed?
62	fsg	LB?	1	1574	++		134	67	ms patches	poss earlier?	lmed?
62	est	RTM	2	352						yellow with grey core	med
62	est	RTM	1	241			151	15		yellow with grey core	med
66	est	EB?	1	1810			128	52	ms buff	dark red with lighter core	lmed?
66	est	EB?	1	1388			129	53	cs on base	orange, some straw impressions	lmed?
66	est	EB?	1	2901		258	125	50	cs buff on base	dark red, some straw impressions, pointing 10-18mm	lmed?

Appendix 5: Glassworking Catalogue

Ctxt	Material	Type	Colour	No	Wt(g)	Notes	Date
10	ceramic	crucible	cream-pink	1	156	31mm thick, greenish glass int, green/brown ext	
10	ceramic	crucible	grey	2	174	20mm and 24mm thick, olive green glass int, green/brown ext	
10	ceramic	crucible	grey	2	265	28mm and 33mm thick, white glass int, green/brown glass ext	
10	ceramic	crucible	cream-grey	1	436	40mm thick, v hard stoneware-type fabric with calc inclusions, thin pale green glass int, white glass ext	
53	ceramic	crucible	grey	1	140	26mm thick, int green (mostly lost), ext green/brown glass	
59	glass	bottle	green	1	7	iridescent brownish surface - fragment of seal with partial coat of arms	18th c.
63	glass	altered glass/clinker	green	1	285	irregular lump, vesicular	
63	glass	trail	pale green	2	15	tapering drawn frags, 110mm long and 70+mm long	
63	glass	trail	green	1	67	lump composed of drawn rods	
63	glass	altered glass	blue-green	1	145	irregular lump with air holes	
63	ceramic	crucible	cream	1	596	25mm thick, c.560mm diam (7%), pale greenish glass int and ext	
65	glass/ferrous?	clinker	purple-grey	1	454	large, lightweight frag, poss overfired ceramic rather than glass, highly vesicular	

Appendix 6: OASIS Report Summary

OASIS DATA COLLECTION FORM: England

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OASIS ID: norfolka1-193419

Project details

Project name	Former Pilot Cinema, John Kennedy Road
Short description of the project	<p>An archaeological watching brief was conducted for Wellington Construction Ltd during groundworks associated with the construction of new housing at the site of the former Pilot Cinema, John Kennedy Road in King's Lynn, Norfolk.</p> <p>Observation of the piling of foundations for the new housing and the installation of a deep sewer pipe revealed a cross section through the southern bank of the infilled Fisher Fleet, the stratigraphy of deposits dumped to raise the ground level, a glimpse of a possibly late medieval structure and evidence of the 17th/18th-century glassworks on this site. The Fisher Fleet produced a layer of mid-17th-century rubbish, including glass crucible fragments from the glass furnace. The sealing layers were of relatively clean clay, suggesting that these layers were deposited by slow flowing water, perhaps during a major flood in 1671 and possibly also in 1669/70. The retaining wall of the southern bank of the Fisher Fleet was found; this wall may also have been constructed to control flooding and appears to predate the rubbish-rich layer across the plot. No structural evidence for the glass furnace was found, but a large pit full of glass waste and a layer of furnace waste covering almost the whole observed area provide conclusive evidence of the presence of glass manufacturing. Earlier evidence took the form of late medieval pottery, a late medieval brick wall and a layer of well-sorted medieval demolition rubble, used (like the later layer of furnace waste) to raise the ground level. Late 16th-century mapping shows occupation here and maps from the mid to late 17th century depict a 'glass house'.</p>
Project dates	Start: 22-05-2014 End: 22-10-2014
Previous/future work	Yes / No
Any associated project reference codes	ENF134304 - HER event no.
Type of project	Recording project
Site status	None
Current Land use	Other 3 - Built over
Monument type	WATERCOURSE Uncertain
Monument type	WALL Medieval
Monument type	WALL Post Medieval
Monument type	PIT Post Medieval

Significant Finds	BRICK Medieval
Significant Finds	TILE Medieval
Significant Finds	BRICK Post Medieval
Significant Finds	TILE Post Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	GLASS Post Medieval
Significant Finds	CLAY TOBACCO PIPE Post Medieval
Investigation type	"Watching Brief"
Prompt	National Planning Policy Framework - NPPF

Project location

Country	England
Site location	NORFOLK KINGS LYNN AND WEST NORFOLK KINGS LYNN John Kennedy Road
Study area	3000.00 Square metres
Site coordinates	TF 6197 2052 52.7575951448 0.400488202629 52 45 27 N 000 24 01 E Point

Project creators

Name of Organisation	NPS Archaeology
Project brief originator	Norfolk Historic Environment Service
Project design originator	NPS Archaeology
Project director/manager	Steve Hickling
Project supervisor	NPS Archaeology

Project archives

Physical Archive recipient	Norfolk Museums Service
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Digital Archive recipient	NPS Archaeology
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Digital Media available	"Images raster / digital photography","Images vector","Spreadsheets","Text"
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