FORMER PYE'S WAREHOUSE

LANCASTER

Lancashire

Archaeological Evaluation and Watching Brief Report

Oxford Archaeology North

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CONTENTS

SUMMARY

An evaluation was carried out by Oxford Archaeology North (OA North) in August 2002 on behalf of Totty Construction Group Plc and Persimmon Homes Ltd at the site of the former Pye's Warehouse, Damside Street, Lancaster (SD 4772 6200). The work took place in advance of the construction of a new housing development. Three evaluation trenches were excavated within the foot print of the original building, at the southern and eastern ends of the site. Following on from the evaluation a watching brief was maintained during the excavation of ground beams for the new development between 26th September and 11th October.

Excavation of the trenches revealed up to 1.5m of stratigraphy in which five phases were identified. Phase 1 was the earliest and comprised naturally accumulated riverine deposits. Phase 2 comprised a large number of tipped deposits which sloped from the western side of the site towards the eastern side. Many of the deposits contained rubble and mortar, and were interpreted as building debris; other layers contained unabraded pottery fragments and were interpreted as contemporary domestic waste. The layers dated from the early to mid-eighteenth century and were probably dumped intentionally over the soft alluvial deposits in order to build up and stabilise the ground at the river's edge. Two sandstone walls, probably dating to the eighteenth century, were identified in Phase 3. Phase 4 comprised demolition layers, some of which may have been laid down intentionally in order to stabilise the ground. In Phase 5 a sandstone surface was recorded in Trenches 1 and 2, in addition to more levelling layers. Phase 6 comprised levelling and destruction layers representing the demolition of the eighteenth/nineteenth century buildings prior to the remodelling of the town centre in 1938.

The watching brief confirmed the presence of tipped material over much of the site, with riverine deposits located in the southern end of the area investigated.

A small number of Roman and medieval pot sherds were recovered, but these were largely residual. Post-medieval pottery made up the bulk of the finds, with 167 fragments recovered; the sherds dated for the most part from the first half of the eighteenth century and were mostly domestic vessels. The quality and range of the wares reflect Lancaster's economic prosperity during the eighteenth century, which may be linked with the expansion of the Lancaster port facilities at that time.

While there is the potential for medieval or Roman deposits on the site, these will be at considerable depth. Unless changes in design are implemented which necessitate excavations to a greater depth, these deposits are unlikely to be significantly affected by the proposed development.

As a watching brief was maintained during the excavation for the insertion of the ground beams, it is considered that no further archaeological investigation is necessary during the course of the development.

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The evaluation was undertaken by Gunnar Hellström, Iain McIntyre, Tony Platt and Vix Hughes and the watching brief was undertaken by Andrew Bates. The clay tobacco pipes were examined by Gunnar Hellström, the animal bones by Andrew Bates, the palaeobotanic assessment was by Elizabeth Huckerby and the other finds categories by Ian Miller. Emma Carter produced the drawings, and the report was written by Vix Hughes, Ian Miller and Andrew Bates. The report was edited by Jamie Quartermaine and Carol Allen. The project was managed by Jamie Quartermaine.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Lancaster City Council granted Persimmon Homes Ltd planning permission for the demolition of the former Pye's Warehouse on Damside Street, Lancaster, in order to erect a residential development (SD 4772 6200). The development was subject to a planning condition that a programme of archaeological investigation be undertaken of the warehouse prior to demolition and that the site of the warehouse be subject to archaeological evaluation following the demolition of the warehouse buildings. This present stage of works follows earlier evaluations around the site (LUAU 1991 and 1992) and a fabric survey of the extant buildings (OA North 2002). The evaluation stage involved further trial trenching beneath the former warehouse building, following its demolition. This was designed to assess the archaeological and historical importance of the site and the impact of the proposed development. Following the evaluation Lancashire County Archaeological Service (LCAS) required that an archaeological watching brief be undertaken during the foundation excavations for the new development. Oxford Archaeology North (OA North) was commissioned to undertaken the evaluation and watching brief by Totty Construction Group Plc, who were the site contractors acting on behalf of Persimmon Homes. The evaluation was undertaken in August 2002 in accordance with a project design by Oxford Archaeology North (OA North), which was based on a verbal brief from LCAS; the watching brief was undertaken between 26th September and 11th October in accordance with a separate verbal brief from LCAS.

1.2 LOCATION AND TOPOGRAPHY

1.2.1 The warehouse is situated at the foot of Castle Hill, which is the site of a series of Roman forts which date from the first century AD onwards (Jones and Shotter 1988) (Fig 1). The River Lune, to the north, almost certainly flowed closer to the site of the forts than it does today, and it has been suggested that a harbour may have existed in this area, protected by the fourth century fort which was aligned parallel to the river (*ibid*).

1.2.2 The site lies at approximately 6.5m OD. The solid geology of Lancaster consists predominantly of Silesian grey-brown or reddened medium to coarse-grained sandstones of the Pendle Grit Formation, which is part of the Millstone Grit Group (British Geological Survey 1992). These sandstones are thickly bedded with thin siltstone partings, but with mixed sandstone/siltstone units near the top. The geology dates to the Upper Carboniferous era, which ended about 280 million years ago. The overlying drift geology deposits are somewhat mixed, and comprise predominantly fluvio-glacial sheet horizons of clayey sandy gravel and gravel.

1.3 HISTORY OF INVESTIGATION

1.3.1 A number of archaeological interventions have been carried out in the vicinity of Pye's Warehouse over the last thirty years. In the early/mid 1970s, the Roman bath house at the top of the slope behind the Pye's warehouse was excavated in an open area fashion, and the consolidated remains are still visible today (Jones and Shotter 1988) (Fig 2, A). In 1991 five trenches (T1-5) were excavated to the east of Damside Street (LUAU

1991). As the second phase of the project, a further four trenches (T6-8) were dug to the west of Damside, outside the footprint of the then extant Pye's warehouse (LUAU 1992) (Fig 2, B). Work has also been done more recently in 2000 on the banks of the Lune river, in advance of the new Millennium Bridge (LUAU 2000b) (Fig 2, C), and in the same year work was carried out on the site of the bus station (LUAU 2000a), which was renovated and redesigned (Fig 2, D). Ongoing excavations elsewhere in the city, at locations such as Church Street (Miller *et al* forthcoming) and the former Streamline Garage site on King Street (LUAU 2000c), have produced significant Roman finds which have helped to build up a picture of the archaeology of Lancaster.

1.3.2 The most recent work, undertaken in February 2002, consisted of an archaeological building survey of the Pye's warehouse (OA North 2002) (Fig 2, E). The survey comprised an outline analysis of the form, function, age and development of the warehouse, consistent with RCHME Level II standards. Unfortunately, it was not possible to gain safe access to the structure, and thus only the exterior was surveyed. The warehouse was Grade II Listed and comprised two nineteenth century wharf warehouses fronted onto the quayside, with twentieth century additions to the south and west.

2. BACKGROUND

2.1 PREHISTORIC

2.1.1 There is scarce prehistoric evidence for activity in and around Lancaster. Bronze Age burials found in the immediate vicinity of King Street constitute some of the best evidence for this period, but only reflect the funerary aspect and provide little information on settlement or other activities (Penney 1981). Earlier Neolithic to Bronze Age finds of flints from Vicarage Fields show possible transient occupation of the area, which would potentially have exploited coastal and riverine resources and / or have reflected agricultural activity (*ibid*).

2.2 ROMAN

2.2.1 The Roman occupation of Lancaster originated in the late first century AD, when the military made use of the strategic position commanding the lowest fording point of the River Lune. A Roman fort was constructed on the hilltop where the castle and Priory Church now stand. Traditionally, the origin of this fort has been accredited to the Governorship of Agricola *c*AD 79, but recent work (Shotter 1996) has suggested that an earlier date, associated with Cerialis during the early AD 70s, is more likely. Following programmes of refurbishment during *c*AD 100 and AD 160s (Jones and Shotter 1988), the site was completely remodelled and a new fort was constructed during the fourth century on a different alignment, parallel to the river.

2.2.2 Recent evidence has highlighted the importance of coastal transport for the Roman military throughout this period, and Lancaster may have been used for re-grouping troops during transport (Shotter 2001, 5). The association with the river was supported by the discovery upstream of a Roman altar stone (*RIB* 601), which indicated that a unit of sailors appeared to have been stationed at Lancaster (Dalziel and Whincop 1989, 4). The role of the fourth century fort is particularly tantalising, as it appears to be of a 'Saxon Shore' type, suggesting that it was designed as an integral part of the Irish Sea defences. As such, the use of the Lune as an important harbour would seem highly likely and it has been argued that the realignment of the late Roman fort '*may have been intended to protect harbour facilities and ships below*' (*op cit*, 6).

2.2.3 Trial excavations alongside Damside Street (LUAU 1991) have recovered Roman material along the old line of the Lune, comprising interleaved deposits of Roman occupation debris and river silts, perhaps indicating an extended river frontage at the base of Castle Hill. This suggests that *in situ* activity existed from the early Roman period, but subsequently the area became waterlogged, and perhaps subject to the tidal flow of the river. Sterile silts were clearly forming throughout the late Roman and early medieval periods, but by the twelfth century the area was settled, with the boundary of a burgage plot fronting Church Street being cut into the silts.

2.2.4 The principal development of the extramural settlement outside the forts took place along Church Street, with activity also identified in Penny Street and on the site of Lancaster Market (Drury forthcoming). The considerable Roman development of Church Street has been highlighted by the recent excavations on the site of the former Mitchells Brewery (Miller *et al* forthcoming). Present day Damside Street lies to the east of the Roman fort complex, below the bluff on which Church Street stands, and appears to be on the periphery of the Roman civilian settlement.

2.3 EARLY MEDIEVAL

2.3.1 Following the Roman occupation, little is known of Lancaster apart from isolated archaeological finds and place name evidence, although this gives some indication of the nature of the settlement. A church clearly existed within the fort area on Castle Hill by the ninth century (Newman 1996), and this formed the centre of a vill *(Chercaloncastre* or Church Lancaster) dependent on the manor of Halton by 1066 (Penney 1981, 13-4). In addition, another vill *(Loncastre)* existed, although its precise location has been disputed (White 1993, 11). There are suggestions that it was centred around Stonewell (Faull and Stinson 1986).

2.4 MEDIEVAL

2.4.1 Knowledge of later medieval development has been largely derived from documentary sources, the archaeological record for this period in Lancaster being limited. The centre of Lordship was moved to Lancaster soon after the Domesday survey (1086), Lancaster Castle being founded by 1094 (White 1993, 19). A borough was created in 1193 (*ibid,* 11-14) with Church Street, Market Street and Penny Street as its principal thoroughfares (*ibid,* 26-29). Church Street and Calkeld Lane, which are both located close to present day Damside Street, were clearly established by the thirteenth century (Penney 1981). Calkeld is a modern translation of the Old Norse words *kaldr* and *kelda,* meaning cold-well (Ekwall 1922), suggesting that this area was of some significance in the early medieval period (Penney 1981, 13).

2.4.2 The town corn mill, built by at least 1574 and demolished in 1769, was located opposite Calkeld Lane on a low-lying area of marshy wasteland known as the Green Ayre (Fig 4). The mill may in fact have been in existence by the twelfth century (Penny 1981, 19). The Green Ayre area was bounded by the Lune to the north, and by the mill leat and tail race to the south. The alignment of the leat probably echoes an earlier meander or course of the Lune. The course of the old mill race survives, indeed its northern extent, beyond Fleet Square (Figs 5 and 7), and was still open at the beginning of the nineteenth century.

2.4.3 The first reference to a bridge over the River Lune concerns the supply of wood for repairs in 1215 (*ibid*, 18). A stone structure was built during the fifteenth century and is depicted on John Speed's sketch map of the town in 1610 (Fig 3). The bridge was situated to the north of Lune Square and was eventually demolished during the nineteenth century. Bridge Lane, which led from China Lane, past the Carpenter's Arms (now the Three Mariners public house) and under Pye's warehouse to Lune Square, was presumably developed in association with the earliest bridge (Fig 7). This is uncertain, however, as there are no early references to the lane, which survives as a cobbled area to the south of the former Pye's warehouse. It has been assumed that the medieval bridge was constructed on the site of a Roman bridge, although there is no evidence for this.

2.4.4 There are records of a port at Lancaster during the medieval period, although there are no details concerning the position or nature of early wharfs (Penney 1981, 20). Both Docton's reconstructed map of 1684 (Docton 1957; Fig 4) and Mackreth's map of 1778 (Fig 5) show an unnatural bend in the river immediately upstream from the bridge; the course of the river may in part have been affected by the position of the bridge or perhaps have reflected the use of the area as a quay.

2.5 POST-MEDIEVAL

2.5.1 By the seventeenth century there are cartographic representations which add another dimension to the understanding of the layout and development of the town. Speed's map of 1610 and Docton's reconstructed map of 1684 indicate that the area to the south of present day Damside Street comprised burgage plots (Figs 3 and 4) associated with the properties erected along Church Street. The maps also indicate that the Green Ayre was undeveloped in this period, containing no buildings except for the mill. It is possible that there was industrial activity on the area during the medieval period, as the Lancaster Museum database refers to the Lune Foundry on, or close to, Cable Street (Price 1987).

2.5.2 It would seem that Lancaster passed through a period of stagnation during the sixteenth and seventeenth centuries, although the construction of Lawson's Wharf on the riverside at the eastern end of Cable Street in *c*1680 (Dalziel and Whincop 1989, 13) perhaps marks the beginnings of Lancaster's foreign trade during this period. During the late seventeenth and eighteenth centuries, there was a change in the fortunes of the town, marked by an increasing trade with the West Indies and Americas (Penney 1981, 29); the port took a significant share of this trade after Liverpool, Bristol and London. The end of the previous century had seen the beginnings of the growth of trade via the port, with the establishment of the first sugar refinery on the site now known as Sugar House Alley (*ibid*, 31).

2.5.3 The Port Commission funded and constructed St George's Quay in 1750, which could accommodate 300 ton vessels and was located downstream of the medieval bridge. Subsequently, as demand grew, the New Quay was built in 1768, further downstream again. The medieval bridge was superseded by Skerton Bridge in 1788, and the early bridge was partially demolished by Brockbanks shipbuilders on Green Ayre in 1802, and is shown as such on Binn's map (1821) (Fig 6). These improvements to the port reflect a considerable boost from trade with the West Indies, and Lancaster entered a period of unparalleled prosperity during which many fine buildings were erected (Penney 1981, 29).

2.5.4 As the town prospered there was an increase in population and a subsequent increase in property development, particularly in the area of Green Ayre and St George's Quay. The economic growth of Lancaster in the late seventeenth and early eighteenth centuries eventually led to the physical expansion of the town, and also to an increase in building density. By the time of Mackreth's map of 1778 (Fig 5), the Green Ayre had been developed for residential and industrial use and a series of new roads, such as Cable Street, Wood Street and Chapel Street, had been laid out. At this time Bridge Lane is shown as the main thoroughfare leading to the bridge, which was referred to from the thirteenth century onwards. Most of the redevelopment was accommodated by infilling previously open land, and the early property boundaries have largely survived. The original mid-nineteenth century warehouse, which lies at the core of the former Pye's feed mill, was built backing on to Bridge Lane (Fig 7), but by the late twentieth century the mill complex had expanded sufficiently to block off the lane.

2.5.5 During the 1930s many of the houses and industrial premises were demolished and the original bus station was erected.

3. METHODOLOGY

3.1 PROJECT DESIGN

3.1.1 A project design for an evaluation of the study area (*Appendix 1*) was submitted by Oxford Archaeology North (OA North) in accordance with a verbal brief from the Development Control Officer (DCO) of Lancashire County Archaeology Service (LCAS). Following formal acceptance of the project design by LCAS, OA North was commissioned by Totty Construction Group Plc, acting on behalf of Persimmon Homes Ltd, to undertake the work. In the event it was found that the northern part of the study area was severely disturbed by cellaring and contaminated with molasses, and so the trench that was planned to be excavated there was eventually excavated further to the south. In all other respects the project design was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists and with generally accepted best practice.

3.2 EVALUATION

3.2.1 Three evaluation trenches were excavated, two at the southern end of the site (Trench 2 and Area 3) and a long, extended trench (Trench 1) in the southern central part of the site (Fig 8 and 9). The trenches were excavated to a maximum depth of 2m from the surface, which required stepping in to conform with health and safety requirements. Trench 1 was excavated as a split level, three part trench; the upper part of the trench was 4m x 2m in size and was excavated to a depth of 1m, level with the groundworks. Adjacent to this, the trench was excavated from the base of the present groundworks; this was again 4m x 2m in size and was 1m in depth. The trench was then extended to the west, by 12m at the same width of 2m, and was excavated to a maximum depth of 1.75m. Trench 2 measured 4m x 4m and was 1m deep from the top. A 2m x 2m sondage, within the bottom of the trench, was then excavated to a depth of 1m, allowing a 1m wide step all around to satisfy health and safety requirements. Area 3 was 7m x 2m in extent and was located to the east of and between Trenshes 1 and 2.

3.2.2 In all trenches, the more recent surfaces were removed by a machine fitted with a toothless ditching bucket, and mechanical excavation was undertaken in level spits down to the level of the highest significant archaeological horizon, under archaeological supervision. At each stage of potential interest the machine was halted and an examination of the revealed deposits was made. Machining continued in each trench until the limit of 1m depth had been reached. The deposits revealed within the trench were recorded from the sections and finds were retrieved at every stage. On completion of the site works, the trenches were partially backfilled with spoil to prevent collapse, but were not otherwise reinstated.

3.2.3 Recording was by means of OA North's standard context recording system, with trench records and supporting registers and indices. A full photographic record in colour print and monochrome formats was made, with additional digital images collected as well. Section drawings and plans were made of relevant areas of the trenches at appropriate scales. The trenches were located using a Zeiss Elta total station, with the results superimposed in current and historic mapping within a CAD (AutoCAD 14) environment drawing.

3.3 WATCHING BRIEF

3.3.1 The watching brief recorded the location, extent, and character of any surviving archaeological features located during the ground works for the laying of the foundation ground beams. This comprised observation during the groundworks, the examination of any horizons exposed, and the accurate recording of all archaeological features, horizons and any artefacts found during the excavations. The trenches for the ground beams were excavated using a thirteen ton 360° tracked excavator, fitted with a 0.7m wide toothed bucket, down to the level of the first archaeological deposits. Any further excavation was completed by hand.

3.4 PALAEOENVIRONMENTAL ASSESSMENT

3.4.1 A single column sample, 0.78m in length, was taken through contexts ***649***, ***645***, and ***644***. These contexts were identified on site as natural riverine deposits. The column was sampled to assess whether it would provide information about the local environment prior to the eighteenth century. The column was subsampled in the laboratory and these subsamples were assessed as to their potential for palynological, waterlogged plant remains and diatom analysis.

3.4.2 Four samples were taken for palynological and diatom assessment at the following depths 0.02m, 0.28m, 0.56m and 0.78m from the top of the column. Four larger ones were taken for the assessment of waterlogged plant remains at depths of 0.01-0.02m, 0.26-0.30m, 0.54-0.58m and 0.76-0.78m.

3.4.3 ***Palynological Assessment:*** the samples for palynological assessment were prepared for pollen analysis using the standard techniques of KOH, acetolysis and hot HF acid treatment (Faegri and Iversen 1989). The residues were mounted in silicone oil and examined with an Olympus BH-2 microscope using x400 magnification routinely and x1000 for critical grains. Counting continued, where possible, until a sum of at least 50-100 pollen grains from land pollen types had been reached on two or more complete slides, to reduce the possible effects of differential dispersal under the coverslip (Brooks and Thomas 1967). Pollen identification was carried out using the standard keys of Faegri and Iversen (1989) and Moore *et al* (1991) and a limited reference collection held at OA North. As the samples were only being assessed, pollen grains not identified rapidly were recorded in either larger categories, for example, Tubuliflorae (Daisy-type) and Liguliflorae (Dandelion-type) or as undifferentiated grains. Cereal-type grains were defined using the criteria of Andersen (1979); indeterminate grains were recorded using groups based on those of Birks (1973). The data are presented as percentage values of the pollen sum, which includes all pollen types and bracken spores (*Appendix 5*). Charcoal particles greater than 5µ were recorded and are calculated as a percentage of the pollen sum plus charcoal.

3.4.4 ***Waterlogged Plants:*** the samples for waterlogged plant remains were wet sieved through a 250µ mesh. The residues were examined with a binocular microscope and all identifiable plant material was recorded as present or absent (*Appendix 5*).

3.4.5 A very small amount of each palynological sample was suspended in water and examined with a Olympus BH-2 microscope to record the presence or absence of diatoms.

3.5 ARCHIVE

3.5.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with current IFA and English Heritage guidelines

(English Heritage 1991). The paper and digital archive will be deposited in the Lancashire Record Office, Preston; it is proposed that the finds be accessioned to Lancaster Museum.

4. EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 A total of three trenches were excavated in the southern and central parts of the development area; it was originally intended to excavate a trench in the northern part of the site, but in the course of the initial ground exploration by the developer it was discovered that this area had been severely disturbed by extensive cellaring. Trench 1 was a long, narrow trench at two levels and was located in the southern central part of the site; it was subsequently expanded westwards. Trench 2 was located at the south end of the site and was a 4m square trench. In the place of the northern trench, an alternative trench, termed Area 3, was excavated in the south-eastern part of the development area. The results of the work are outlined below, although for brevity's sake the results are not discussed on an individual contextual basis, except where appropriate (Fig 8).

4.2 TRENCH 1

4.2.1 The eastern section of Trench 1 was machine-excavated and measured 4m in length by 2m in width; the maximum depth attained was 1m (Fig 9). The machining involved the removal of a number of post-medieval and modern layers, categorised as overburden. The removal of the overburden uncovered several linear features (two pipes and a wall) which were seen in plan, and effectively sub-divided the trench into two discrete sections (Plates 1 and 2). These features were recorded and their locations planned prior to being removed. Much of the material from Trench 1 was mechanically excavated, particularly in the central section where there were only tip layers and no structures. Context numbers were issued for a large number of individual layers, which for the most part made up the tip deposits; however, the overall stratigraphy was relatively simple.

4.2.2 ***Phase 1:*** the earliest deposits within the trench were a series of estuarine silts, seen at the western end of the trench for a length of 10m (Fig 9 and Plate 5)). These deposits, ***642–646,*** varied in texture, colour and organic content, indicating changing conditions of deposition associated with the River Lune; the boundaries between them were, correspondingly, quite diffuse. They were comparable with similar silts seen in previous excavations in 1991 (LUAU 1991), 1992 (LUAU 1992) and more recently in 2000 beneath the bus station (LUAU 2000a) and at the feet of the new millennium bridge (LUAU 2000b). The earliest of the exposed silts was ***642***, which was a pale grey, silty clay, over 0.1m thick and seen only in the deepest part of the trench, at *c*8.5-9m from the western end of the trench (Fig 10). Above this was ***643***, a mid grey silty clay, *c*0.1m thick and extending from 4m-10m from the western end. Layer ***644***, overlying this, was a dark grey clayey silt with frequent, black organic inclusions and preserved organic fragments, which was a maximum 0.3m thick. Overlying ***644*** was ***645***, a pale to mid grey silty clay, containing a small proportion of preserved organic material and plant remains and which was 0.25m thick. The latest of the riverine silts was ***646***, which was seen only at the western end of the trench, just below the exposed ground surface. Its maximum depth was 0.2m and the deposit was a mid-brown, silty sand containing a small proportion (*c*5%) of small sub-rounded stones. The sequence of deposits appears to indicate different depositional environments, the sediment size relating to the available energy of the river. The greater the energy available (*ie* the

faster the flow of the river) the greater the discharge transportable and the larger the size of sediment which can be carried. As the energy decreases, larger sediments are deposited until the finer fractions are also being deposited. Fine silts and clays are usually laid down in very calm waters with low energy, and on an estuarine river this would often be at the periphery of the flow, on the banks. The sandier deposit ***646*** may represent a surge or flood episode when the river reached a point of greater flow and was able to carry larger grained deposits further from the usual flow, depositing them when the waters receded.

4.2.3 ***Phase 2:*** overlying the silts were a large number of angled tip deposits (tiplines), formed by the dumping of material (Plates 3 and 4). These dumped layers sloped downwards from the western side to the eastern side of the site at an almost constant angle of 30° and extended over a distance of 13m in the central part of the trench, ***534***, ***587-631*** and ***647–655*** (Figs 9 and 10). The purpose of the dumping appears to have been to extend the area of stable ground along the edge of the river. The layers varied greatly in texture, consistency, and colour and the inclusions provide some indication of the origin of the dumped material. Layers containing a larger quantity of stones may have been demolition rubble or stone debris which was collected and dumped. The earliest layer in the sequence of tips was a layer of stony material, ***647***, which extended from 2m-11m from the western end of the trench. This initial layer, being stony in character, was probably laid to provide an initial stable surface for the carts which were transporting the material. Later layers of stony material, which may have derived from buildings or general debris mixed with possible soils, were ***595***, ***597***, ***598***, ***602***, ***626***, ***651***. Building demolition may also be represented by layers containing a proportion of mortar, ***592***, ***606***, ***601***, ***610***, ***613***, ***621***. Others appeared to have a small, but significant, proportion of pottery fragments and were probably collections of domestic debris, ***589***, ***599***, ***609***, ***615***, ***617***, ***620***, ***628***, ***629*** and ***649***. Domestic debris as well as industrial waste may also have accumulated elsewhere and then been dumped here. Layers with a higher organic content, which darkened and discoloured the material, include ***591***, ***594***, ***611***, ***618***, ***627***, and ***630***. A number of layers appeared to be more sterile and could reflect the need to bring natural material excavated from other locations, ***588***, ***590***, ***600***, ***607***, ***608***, ***612***, ***616***, ***619***. The remaining layers had no obvious origin, ***530***, ***534***, ***587***, ***593***, ***596***, ***603***, ***604***, ***605***, ***611***, ***614***, ***618***, ***622***, ***623***, ***624***, ***625***, ***631***, ***648***, ***650***, ***652***, ***653***, ***654*** and ***655***. The consistency of the angle of dumping suggests that the tipping took place over a relatively short time span, since leaving the area open for a lengthy period would almost certainly have meant that material settled and the slope would have become more gradual. Subsequent material would then have conformed to the newer slope angle.

4.2.3 ***Phase 3:*** after the land reclamation there would appear to be several further deposits laid down to stabilise the surface prior to building, which included ***522*** (Fig 9). In Trench 1 the first phase of building was represented by the presence of one surviving wall, ***532***, which was constructed of roughly-dressed, irregularly-coursed sandstone blocks with a rubble core, almost identical in nature to the walls seen during excavations beneath the bus station (LUAU 2000a), which dated to the eighteenth and nineteenth centuries. The wall was aligned approximately north/south, and was 3m-4m from the eastern end of the trench. It was linear in plan and survived to at least three courses. The foundation for the wall was not investigated due to health and safety considerations, but reliable comparisons to the walls found in the work done in 1992 (*ibid*) were available. Wall ***532*** was also identical in build and fabric to wall ***510***, investigated in Area 3.

4.2.4 ***Phase 4:*** post dating the lower part of the wall, ***532,*** were a number of deposits, all of which appeared to abut the wall rather than to be cut by it, ***524***, ***579-585***, ***525***, ***550-554***, ***559***, and ***564-567***. These deposits may have resulted from accumulated debris, or may have been dumped in cellars to dispose of material or to make up ground levels.

4.2.5 At the eastern end of the trench there appears to have been a small disturbance post-dating the infilling / makeup. An interface or cut, ***575***, was identified, but no obvious feature was seen during the machining of this end (Fig 9; west facing section). It may be that the disturbance continued to the east and was only partially within Trench 1. The cut was asymmetrical in profile, being possibly truncated by a later feature, and the sides were irregular while the base was relatively flat. It measured 1m in width and 0.4m in depth. The feature was filled by five distinct deposits, ***568-572***, which were all essentially silty clays of varying grey and brown hues, with a thin band of interlaced, red clay, ***571***. Fill ***570*** contained several medium sub-angular stones while the lower two fills, ***568*** and ***569***, both had charcoal inclusions. It is postulated that the feature may have been a small pit, used to dispose of debris or rubbish.

4.2.6 ***Phase 5:*** after these infilling deposits (Phase 4) there was a phase of levelling which appears to have been deliberate, and the uppermost deposit functioned as a bedding layer for a stone surface. The levelling layers included ***555–558*** and ***576–578***, and all were of a sandy nature but varied in colour from pinks to greys to yellowy browns. Several of the layers contained small proportions of mortar flecks and fragmented sandstone, and layer ***578*** contained approximately 1% charcoal flecks. The general character of the deposits suggests that they were associated with building activities. The layers were all deposited in a horizontal manner and were of even thicknesses (0.1m thick on average), with clear boundaries between them. The sandy texture of the deposits and their regular nature suggests that they were deliberately laid to form both levelling layers and a bedding layer for the surface ***542***, which was subsequently put down.

4.2.7 Truncating these levelling layers, and inserted prior to the surface ***542*** being laid, a pipe trench, ***526***, was cut (Fig 9); this was probably for drainage. The cut was linear in plan and was orientated east/west; it had regular edges, straight vertical sides and a flat base. The regular nature of the trench suggests that it was potentially hand dug using spades. A large bore ceramic pipe, ***528***, was laid within the trench, and the trench was then backfilled with several layers of compact, greyish brown gravely sand, ***527***. This fill contained an almost complete twentieth century glass bottle, which may have been rubbish thrown in by the workmen digging the pipe trench. Immediately overlying the pipe trench was surface ***542***; it is evident that the pipe was inserted prior to the flooring / surface being laid, but both activities were probably part of the same phase of construction activity. It should be noted that at some point the ceramic pipe went out of use and was filled with cement, which was probably pumped in.

4.2.8 The surface ***542*** appears to relate to the later use of the walls ***532*** and ***510***, since it abuts these walls at a later stage than the infilling (Fig 9). In Trench 1, surface ***542*** was composed of roughly hewn, yellow sandstone blocks, *c*0.22m in height and 0.15m in width. The sandstone blocks were set on their edges and were slightly inclined but formed a continuous surface which abutted the wall ***532*** on both its eastern and western sides. Layer ***500*** in Area 3 was a similar sandstone surface abutting wall ***510***; its stratigraphic relationship to wall ***510*** and its similarity to ***542*** suggest that it was almost certainly contemporary to ***542***. A thin dark band of material, ***656***, beneath the

sandstone surface may have resulted from occupation debris, post-dating the surface construction, subsequently infiltrating the surface and being deposited below.

4.2.9 Although the relationship was slightly unclear due to ground disturbances it appeared that there was a later phase of construction, represented by ***545***. This was in the north-east corner of Trench 1 where there was a distinct change in the surface. Below it, but post-dating the make up / infilling deposits ***550*** and ***553***, was a disturbance, ***547***, which was 1.0m in width and 0.4m in depth. It was filled by a dark brownish grey silty sand, ***546***, which contained 30% small stones and small proportions of mortar and charcoal flecks. It may have been a disturbance caused as the later ***545*** was being laid, or it may have occurred before and been infilled prior to the establishment of ***545***.

4.2.10 Structure ***545*** was only evident in the south facing section, at the extreme east end of Trench 1 (Fig 10), and consisted of two courses of large, yellowish sandstone blocks. The blocks were roughly hewn and rectangular in shape, measuring on average 0.3m by 0.2m. The structure may be the remains of a later phase of surfacing, or may be a partition wall. It is unlikely to be the remains of a structural wall as the foundations are not to the same depth as those of wall ***532*** or ***510***. If it does represent a wall then it would appear to be aligned east/west. If it is part of a surface then the surface would appear to extend northwards, as it did not extend into Trench 1 any further than the section.

4.2.11 ***Phase 6:*** overlying surface ***542*** and the possible wall / surface ***545*** were a series of more recent deposits, ***535–537***, ***538–540***, ***541*** and ***561–563*** (Figs 9 and 10). Layers ***561***, ***562*** and ***563*** represent more recent levelling and directly overlie surface ***542***. The earliest of these layers, ***563***, was truncated by a pipe trench ***574*** (Fig 9, west facing section). The pipe trench was linear and regular in plan, orientated approximately east/west. It had vertical sides and a flat base, with sharp breaks of slope, top and bottom. Within the cut ***574***, a cast iron pipe was laid on a bedding of thin sandstones and then backfilled with a mixed dark grey clayey silt deposit, ***573***. The remaining two levelling layers, ***562*** and ***561***, were then sequentially deposited over the top. It is possible that all three were quite closely timed and could reflect later construction and services installed within Pye's warehouse. Deposit ***535*** appears to have been a small localised disturbance, as does ***541***. Layers ***536*** and ***537*** again appear to have been make up or levelling deposits, possibly resulting from a demolition phase.

4.2.12 Along the entire length of the trench the upper-most surface was disturbed by the recent demolition activity and machining, and it was thus not possible to identify the more recent structures and deposits.

4.3 TRENCH 2

4.3.1 Trench 2 was machine-excavated and measured 4m in length by 4m in width; the maximum depth attained was 1m (Fig 11). At this point the base of the trench was cleaned and a sondage within the centre of the trench was hand excavated to a depth of 0.5m (Plate 6). The sondage was subsequently excavated deeper using a mechanical digger. The machining removed a number of post-medieval to modern layers.

4.3.2 ***Phase 3:*** the two earliest elements seen in Trench 2 were the wall ***510*** and deposit ***641***. The wall, ***510***, was seen in the upper part of the trench and may have continued to a greater depth, but this could not be established due to health and safety restrictions (Figs 11 and 12; Plate 8). The wall was constructed of roughly-dressed, irregularly-coursed sandstone blocks with a rubble core, and was almost identical to wall ***532*** seen

in Trench 1. It was linear in plan and survived to at least three courses. The wall was aligned approximately east/west, and was located at the northern end of the trench. No cut for a foundation trench was evident at this level and the deposits seen in the trench all post-dated the construction of the wall.

4.3.3 The other early deposit was seen in the sondage, in the east facing section (not shown on figures). Deposit ***641*** was a 0.5m thick layer of brownish grey silt, containing a large proportion of sub-rounded stones of medium size. Above this was a layer of black, possibly organic silt, ***639***, containing a significant proportion of small to medium stones. The layer varied in thickness from 0.1m to over 0.6m. This may indicate that it was dumped or tipped in from the western side, and would correspond to the direction of tip seen in Trench 1. The organic nature of the deposit may suggest that the material originally included plant matter or domestic waste, which may have been preserved by the waterlogged conditions.

4.3.4 ***Phase 4:*** overlying layer ***639***, and seen only in the east facing section, were two small/thin layers. Immediately overlying layer ***639*** was ***640***, which was 0.08m at its maximum thickness (Fig 11). It consisted of a pale-grey silt, containing a high proportion of mortar flecks and probably derived from building debris being dumped or spread in the vicinity. Above this was a layer, 0.4m thick, of mid-grey silt, ***638***. This had a very small proportion of mortar and charcoal flecks, as well as a low frequency of small stones. The layer probably represents a dumped deposit of make-up material.

4.3.5 Layer ***634*** was seen at the top of the sequence in the sondage and in plan at the base of the rest of Trench 2. It was a soft, pale-grey silt deposit, containing approximately 20% angular sandstone fragments, slate fragments and chunks of white mortar. The deposit was 0.6m thick and was almost certainly the result of building demolition, which was used as make-up material, although it is unclear whether the building could have been on the site or whether the material derives from an off-site source.

4.3.6 The overlying deposit ***633*** was seen both in the trench section and in plan (Figs 11 and 12). It was a 0.2m thick deposit of mid-grey clayey silt, containing a small proportion of fragmented sandstone, and appeared to have extended across most of the trench. Above it, towards the south, was deposit ***632***, a mid-brownish-red silty sand, containing 15% small sub-angular stones and towards the north it was truncated by cut ***663***.

4.3.7 Cut ***663*** was somewhat uncertain and may simply have been an interface between deposits. If it was indeed a cut feature then the majority of it was located east of the Trench 2 limits. Nevertheless, it was steeply sloped and two deposits post-dated it. Deposit ***661*** was a pale yellowish-grey sandy silt with a fragment of slate laid horizontally within it, and ***660*** was a mid to dark-grey silt with a small number of yellowish sandstone flecks. At this northern end of the trench, and above ***660,*** were two very mixed deposits, ***659*** and ***658***. Both were very disturbed and contained building debris; they appeared to represent recent rubble dumps, perhaps to act as make up.

4.3.8 At the southern end of the trench, deposit ***632*** was seen to be truncated by a later feature ***635***, which was only partially seen in plan as it extended south and east beyond the limits of Trench 2. The cut, ***635***, was triangular in plan, but probably square or rectangular in its entirety (Plate 7). The sides were regular, straight and steeply sloped, with a sharp break of slope changing to a concave base. The feature was filled with two distinct fills: ***637*** was the lower, mid-orangey-brown fill with ***636*** the upper, mid-orange fill. Both were silty sands and, surprisingly, contained only early finds from the

medieval and Roman periods. The stratigraphic relationship of this feature indicates its late date, since it truncated layers containing post-medieval finds, but the fine texture of the fills and the early finds, which must be residual, suggest that the fill material had been derived from areas which may have had surviving early deposits. It remains unclear whether the fill deposits originate from the immediate vicinity or from off-site.

4.3.9 The latest deposit within Trench 2 was ***662***, which appeared to be an area of disturbance. It was not associated with a clear cut, but rather was an area of soft ground which may have partially collapsed and then been deliberately infilled with rubbly material in a grey matrix. Although there was not a direct relationship at this point between Area 3 and Trench 2 due to the churned nature of the ground surface, it is likely that ***662*** was earlier than deposits ***513*** and ***508***, seen in Area 3.

4.4 AREA 3

4.4.1 This was an exposed section 7m in length and aligned approximately north/south on the eastern side of the site (Fig 8). It was located between Trenches 1 and 2 and was on the same level as the upper part of Trench 1. Although some extrapolation was required, it was possible to establish similar phases of activity within this section to those in Trenches 1 and 2.

4.4.2 ***Phase 3:*** the earliest activity seen in this trench was the construction of the sandstone wall, ***510***, which was built of roughly-dressed, irregularly-coursed sandstone blocks with a rubble core and was orientated approximately east/west (Fig 11; Plate 9). It was located 2.5m from the southern end of the section and was on the same alignment as the lower part of the wall seen at the northern end of Trench 2 (Plate 9). There was no sign of a cut for the construction of the wall at this level, and all the deposits seen within the section were either contemporary with the wall or post-date it. In this section the wall was seen to survive to a height of three courses and in the Trench 2 section a further six courses were seen (*Section 4.3.2*). The overall exposed height of wall ***510*** was 1.1m, which was observed to extend for a distance of at least 5m.

4.4.3 ***Phase 4:*** abutting the wall on the southern side was a soft, mid grey sand, ***509***, and overlying this was a dark-yellow gritty sand, ***508***. Both were approximately 0.1m thick and had relatively clear boundaries. The nature of the deposits suggested that they were relatively recent and could be demolition debris, either disposed of in the location of the demolition or used as make up material.

4.4.4 Overlying deposit ***508*** was a thin layer of mid-pinkish-brown sandy clay, ***513***, which was also seen as a thicker layer on the north side of, and abutting, wall ***510***. This deposit was compact and contained slate, small stones, clay lumps and what appeared to be black burnt flecks. The deposit was quite mixed and was probably a deliberate dump of material, perhaps used to infill an area. It was quite similar to ***524***, seen in Trench 1 and was also interpreted as a make up layer. If both were indeed the same deposit it would suggest that there was a period of major alterations in which the ground level was changed.

4.4.5 On the northern side of the wall ***510*** was a sequence of deposits which varied in colour, texture and inclusions. The lowest deposit was ***514***, a pale-grey sandy silt which may be the disturbed natural that was seen at the northern end of the section. Overlying this was ***512***, a thin band of reddish sandy silt containing mortar flecks; this was interpreted as a spread of demolished and then pulverised brick and building debris. Above this was ***505***, a thin band of dark-grey gritty silt material with traces of burnt material

within it. Above this was a firm mid-grey band, ***504***, a dark yellow loose, silty sand, ***515*** a compact, pale-grey gritty sand containing a small proportion of mortar flecks and ***516*** was a pale brown, gritty silt containing 15% small angular stones. The nature of these layers suggests that they were all dumped material from various sources, such as building demolition or accumulated debris, and were used either to infill an area or to make up ground levels.

4.4.6 Truncating layer ***516*** was a possible cut or depression, ***520***, which was shallow, asymmetrical, and gently sloped with gradual breaks of slope and a flat base. It was filled with a dark-grey silty clay containing 5-10% small sub-angular stones and about 1% brick fragments, again indicating building debris, ***509***.

4.4.7 On the southern side of the wall ***510***, and overlying deposit ***513*** was a different sequence of deposits. At the bottom was ***507***, a loose, black gritty layer containing a high concentration of what appeared to be burnt material. The deposit was very irregularly laid and had an uneven boundary with ***513*** below. Overlying ***507*** was ***521***, a blackish-brown make up layer at the extreme southern end of the section. Towards the central part was deposit ***506***, a loose, pale-grey sand which overlay ***521***, and was quite discontinuous and irregular and contained a significant proportion of mortar, indicating that it may have been building debris. Above ***506*** was layer ***518***, a dark-grey deposit containing stones and a small proportion of brick fragments. Layer ***503***, above ***518***, was a dark-grey sandy clay and ***502,*** at the top of the sequence, was a pale-brownish grey silty clay. All of these layers appeared to be either building debris or rubble and accumulated sediments dumped within the area to act as make up or levelling material. The layers were mostly distinct and the greatest thickness of any was 0.2m.

4.4.8 ***Phase 5***: above and sealing fill ***519*** and deposit ***502*** was a discontinuous layer of concrete / cement ***517***, which had possible been poured. The base of ***517*** was even, although the upper surface was more irregular. Layer ***501*** was a compact mid-grey silty clay and contained 20-30% sub-rounded stones, of medium size, and this appeared to be a very rough makeup layer. The latest traceable event at the top of the section was a surface, composed of yellow sandstone blocks which were similar in size and arrangement to those comprising ***542***, seen in Trench 1. The relationship with wall ***510*** was not secure, but, it appeared that the surface ***500*** was later than wall ***510***. In addition, the matrix surrounding the stones was dissimilar to that of ***542***, being a dark-blackish-grey, loose, gritty sand; however, it was difficult to tell if the matrix material post-dated the surface and had simply infiltrated the gaps between the stones. The difficulty arose since at this level the upper surface of the site had been considerably churned as a result of tracked excavators tracking across it.

5. WATCHING BRIEF RESULTS

5.1 INTRODUCTION

5.1.1 Between the end of the evaluation and the beginning of the watching brief, the ground surface within the area of the development had been reduced, leaving between 0.40m to 1.0m of overburden across the site, although some of this was made up of hardcore laid down to allow heavy machinery on site. The areas described during the watching brief were allocated watching brief (WB) numbers, and their locations are shown on Fig 13. The watching brief was undertaken during the groundworks for the newbuild ground beam foundations. This involved the excavation of a series of interconnecting trenches, and consequentially allowed the investigation of the whole area as a single excavation. The exception to this is WB 5, which was a discrete excavation in the south-west corner of the site, but was also the location of Trench 6 of the 1992 evaluation (LUAU 1992, S*ection 5.2.19*). The depth of overburden and depth of excavation for each area is given in *Appendix 4*. The northern third of the site had previously been heavily disturbed as a result of cellaring, destroying any archaeological deposits in that area, and as a consequence no watching brief was considered necessary here.

5.1.2 Although a ratio giving the degree of slope for the tipped deposits (S*ection 5.2.1*) is given in the descriptions below, it should be noted that these will be effected by the by the angle at which the trenches cut across the true direction of fall of these deposits. However, all of the descriptions relating to degree of slope come from trenches excavated on an east/west alignment; where the trench was excavated on a north-south orientation, the layers had the appearance of being horizontal.

5.2 WATCHING BRIEF RESULTS

5.2.1 ***Phase 1:*** three deposits located were identified as river silts associated with deposition of material by the River Lune, prior to land reclamation of this area, in WB1 and WB9. Layer ***730*** in WB9 was stratigraphically the earliest identified deposit, a mid-grey silt at least 0.25m thick. Above this was a 0.80m thick light-grey river silt, which was similar and probably the same material as layer ***725*** in WB1; however, no stratigraphically relationship was demonstrated. Above ***725*** was a deposit of light-grey river silt, ***724***, which was at least 1.95m thick, with occasional unworked wood inclusions. These deposits had an apparent slope of c25º towards the north-east.

5.2.2 ***Phase 2:*** Trench WB1 produced the most complete sequence of deposits relating to land reclamation in this area (Fig 14), which survives as a series of tip lines, of material deliberately deposited over the river silts. The earliest of this material, located directly above the river silts, ***724***, was a 0.80m thick deposit of dark-grey medium sand clay with less than one percent medium to small sub-rounded and charcoal flecks, ***723***. Above it was a 0.8m thick, light-orange-grey clay fine sand with lenses of mid-grey material within it, ***722***. This was overlain by a 1.04m thick deposit of dark-grey medium sandy clay with occasional sub-rounded and sub-angular sandstone inclusions and rare charcoal flecks, ***721***. Overlying this was a layer, ***720***, 0.55m thick, consisting of a light-orange-brown clayey coarse sand. Here the sequence was broken by a later cut for a culvert, ***719*** (S*ection 5.2.13*) (Fig 14; Plate 11).

5.2.3 Continuing the sequence of tipped material, was a 0.40m thick deposit of mid-dark-grey medium sandy clay, with occasional mid-orange-brown mottles, ***715***, and within

the layer were occasional medium sized sub-rounded sandstone. Above this was a light-orange coarse sandy clay with occasional flecks of mortar and small stone inclusions, ***714***, which was 0.32m thick. Layer ***713*** comprised a very dark-grey clay with occasional small light-brown-grey mottles of coarse sand, and was 0.59m thick (Plate 11). Above this was a layer of light coarse brown sand 0.14m thick, ***712***, and above that a much thicker deposit, 0.60m deep, of dark-grey coarse sandy clay, ***711***; included within it were occasional small to medium sized sub-angular stone inclusions, and rare small mortar fragments and flecks of charcoal. Deposit ***709***, the final layer in this sequence (Fig 14), comprised a very thick deposit (2.3m deep) of mid-brown-grey coarse sandy clay, which contained occasional small to medium sized sub-rounded sandstone, charcoal flecks, and slightly more frequently small mortar fragments. In Trench WB8, in the west facing section and the southern end, was a deposit of dark-brown-grey coarse sandy silt clay with occasional very light-grey flecks of mortar and small to medium sized sub-sounded sandstone inclusions, ***726***, which was at least 0.68m thick and was above ***709***.

5.2.4 This sequence of deposits represents material dumped rapidly over the area, which were observed to fall at a very steep angle, typically at an angle of 45^{o}.

5.2.5 Other earlier tipped material was located in Trench WB9, directly above river silts, ***729***. These comprised two deposits: a 0.50m thick layer of dark-blue-grey clay silt with occasional medium sized sub-rounded stone inclusions, ***728***. Above this was a layer, at least 0.38m thick, comprising a dark-grey, medium sandy silt clay with occasional medium sized sub-rounded stone inclusions, ***727***. Both layers were falling to the east at a an angle of c25^{o}, below 1.0m of overburden.

5.2.6 In Trenches WB10, WB13 and WB15, the lowest observed deposit was a layer of light-grey fine sand silt, with occasional small to medium sized sub-rounded stone inclusions and very light grey small mortar fragments, ***755***. Above this was a mid-grey fine sandy silt clay, with occasional medium sized sub-rounded and sub-angular sandstone inclusions and very small mortar fragments. Within this layer were lenses of mid grey brown silty fine sand, ***754***. Above 754 were a mid-orange-grey silt and medium to coarse sand, approximately 0.80m thick, ***737*** and also a very dark-grey silty clay with rare charcoal flecks and very small sub-rounded stone inclusions, at least 0.85m thick, ***738***. Finally above these were deposits, ***710*** and ***711***. The angle of the deposits in this northern part of the site has decreased to 26^{o} at Trench WB15.

5.2.7 A second group of earlier tipped material was noted in WB14, located in the western half of this area, although these were not directly related stratigraphically to the earlier material in WB1. The lowest deposit, ***745***, comprised a mid-grey silt with rare small, sub-rounded stone, at least 0.40m thick. Above this was a very dark-grey silt with rare very small stone inclusions, ***744***, which was 0.52m thick but decreased in thickness further down the slope. This was overlain by a mid-orange-brown coarse sand silt clay with occasional small sub-rounded stone inclusions, 0.80m thick, ***742***.

5.2.8 Above layer ***742*** was a mid0grey fine sand silt clay, with occasional small to medium sub-angular stone inclusions, ***741***. This layer had the appearance of having contained a high percentage of burnt material, but which had since been heavily leached. Above this and ***742*** were two deposits, including a dark-grey coarse sand clay with occasional small to medium sized sub-angular stone inclusions, ***743***, which was at least 0.50m thick, and located to the north of this area. Above layer ***743*** was overburden. The second deposit, ***740***, was a very dark-grey silt including a few fragments of roof slates, of a maximum size of 0.30m by 0.15m by 0.01m, and was at least 0.55m thick. Above

740 lay a mid-brown-grey fine sandy silt clay, ***739***, at least 0.42m thick. The degree of slope in the deposit of Trench WB14 varied from 45º to the west, and c25º to the east.

5.2.9 In WB17, above deposit ***739*** which was also noted here, was a dark-grey fine sand silt clay deposit, ***762***, and was 0.68m thick. Above this, also visible in WB16, was a light-brown-grey coarse sand silty clay with occasional small sub-rounded and sub-angular stone inclusions, ***761***, and was at least 0.70m thick. In WB16 a series of layers was visible above deposit ***761***. Directly above ***761*** was a deposit, at least 0.20m thick, of light-blue-grey fine sandy silt with lenses of dark-grey silty clay within it, ***760***. Above ***760*** was a layer of light-grey-brown fine sand silt, with very small, rare, very light grey mortar inclusions, ***758***, at least 0.25m thick. Continuing up the stratigraphic sequence, was a dark-grey coarse sandy silt clay, with lenses of mid-grey medium sandy clay with rare small sub-rounded and sub-angular stone inclusions and charcoal flecks, ***757***; both ***757*** and ***758*** are likely to be the same as layer ***754***, noted in WB15. Above ***757*** was a dark-grey coarse sand silty clay with occasional small to medium sized sub-angular stones, ***756***. In WB18 a very dark-grey fine sandy silt was observed, ***763***, at least 0.33m thick, which was above deposit ***761*** and below deposit ***758***. All of these deposits were observed falling to the east at an angle of c26º.

5.2.10 Layer ***757*** was also observed at the base of WB19, above which was a layer of dark grey coarse sandy silt, ***766***, that was at least 0.5m thick. This deposit had been truncated by a later foundation cut, ***770*** (S*ection 5.2.15*), on the opposite side of which was the same layer (recorded as ***765***). Above ***765*** was a dark-orange-brown coarse sandy clay, ***764***, that was 0.50m thick. Exposed in Trench WB19, WB6 and WB7 was a dark-grey silty coarse sand, ***764,*** at least 0.20m thick, and above this were layers ***701*** and **700**. Above ***701***, was layer ***700*** which consisted of a mid-grey fine sand silt with rare charcoal flecks and very small mortar fragments.

5.2.11 In WB6 and WB7 three further deposits were observed. The lower most layer was a dark-orange-brown coarse sandy clay with occasional small to medium sized sub-angular and sub-rounded stone inclusions, ***707***, and was at least 0.15m thick. Above this lay a lens of crushed sandstone and mortar 60mm thick, ***706***. Continuing upwards stratigraphically was a layer of mid grey silty fine sand 50mm thick, ***702***, located below layer ***700,*** described above (*Section 5.2.10*).

5.2.12 ***Phase 3:*** a total of four structures were located during the watching brief associated with this phase. A sandstone trench built foundation/wall, ***773***, was observed in WB1 and WB8, aligned north-east/south-west (Plate 10). In WB1 it was observed cutting a deposit of tipped material, ***711***, and its cut, ***774***, measured 1.80m in width and was 0.90m deep. The foundation/wall, ***773***, consisted of roughly squared, coursed, sandstone blocks of a maximum size of 0.60m by 0.50m by 0.20m, with a rubble core of angular sandstone fragments of a maximum size of 0.18m by 0.15m by 0.12m. It was bonded with a very light-grey, coarse sand, mortar and was at least 5.37m length, 0.60m wide and 1.38m high. The foundation cut had then been backfilled with a very dark-grey coarse sand silt with frequent, small, sub-rounded and sub-angular stone inclusions, ***772***.

5.2.13 Also in Trench WB1 was a culvert, ***718***, was located at the base of Section 20 (Fig 14); its cut measured 1.98m in width and 1.32m in depth. The culvert was of a sandstone construction with a single course of roughly squared stone making the sides, measuring 0.45m by 0.20m by 0.20m, a capping stone measuring 0.60m wide and 0.15m thick but of an unknown length. The void within the culvert measured 0.40m by 0.20m, partially

filled with a dark-grey coarse sandy silt, ***717***. The culvert was orientated in a north-east/south-west direction.

5.2.14 In Trench WB15 was revealed a sandstone, trench built, foundation, ***749,*** at its eastern end, which comprised roughly squared and roughly coursed sandstone blocks with a rubble core, aligned north-east/south-west. The construction cut measured 1.0m wide and at least 0.58m deep, ***751***, with backfill around the stone work comprising dark-grey coarse sand silty clay, with occasional medium sized sub-angular stone inclusions, ***750***.

5.2.15 Trench WB19 contained a north/south orientated sandstone foundation, ***771***, and its cut, ***770***, which was flush against the stone work, cutting layer ***764*** of Phase 2 (S*ection 5.2.10*). The foundation, ***771***, comprised roughly squared and roughly coursed sandstone blocks, of a maximum width of 0.40m and depth of 0.13m, but of unknown length. It was 0.62m in width, at least 0.66m in depth, but of an unknown length.

5.2.16 In WB20 two sandstone foundations were noted. Foundation ***775*** was orientated east/west and had been truncated by recent excavation, for 2.20m before turning to the south into the trench baulk; it was 0.60m wide and at least 0.85m deep. Foundation ***776*** was noted in the south-western corner of Trench WB20, and appeared to be orientated roughly north/south. Both were thought to be trench built comprising roughly squared and coursed sandstone blocks.

5.2.17 ***Modern disturbance:*** in Trench WB20 were two deposits, thought to represent disturbed tipped material of Phase 2, ***767*** and ***768,*** and which were to the north of the sandstone foundation, ***776*** (S*ection 5.2.16*). Layer ***768*** comprised a 0.2m deep dark-grey course sandy silt and deposit ***767*** formed an overlying deposit of mid-brown fine sandy clay, 0.40m thick.

5.2.19 A further deposit of river silts, ***769***, was noted in Trench WB5, in the south-west corner of the site; it was located directly below 0.75m of modern overburden, was at least 0.75m deep, and was a very dark-grey sandy silt with rare medium to small rounded stone. However, this is the position of Trench 6 of the 1992 evaluation of this area (LUAU 1992), and these were probably the backfilled river silts from this evaluation trench. The Trench 1 and 2 backfill of the 2002 evaluation were also noted as modern disturbance during the watching brief; Trench 1 was within watching brief Trench WB14 and Trench 2 was in WB10.

6. FINDS

6.1 QUANTIFICATION

6.1.1 In the course of the fieldwork 215 fragments of artefacts were recovered. The bulk of the assemblage comprised ceramic vessel fragments (167 sherds), and also included glass (11 fragments), animal bones (eight fragments), clay tobacco pipe (15 sherds), iron (two fragments), lead (three fragments), and ceramic building material (six fragments). Catalogues of the artefacts have been included in *Appendix 3* in context number order. All finds were treated in accordance with standard OA North practice.

6.2 POTTERY

6.2.1 Fragments of pottery, which included material of Roman, medieval and post-medieval date, dominated the finds assemblage. Analysis of the pottery was based solely on visual inspection of individual sherds, and has been described using the terminology developed by Orton *et al* (1993).

6.2.2 A total of nine sherds of Roman pottery was retrieved from the evaluation; three sherds from Trench 1 (***589*** and ***620***), and six sherds from Trench 2 (***633***, ***634*** and ***637***). The Roman pottery was clearly residual as all fragments were abraded and occurred in conjunction with post-medieval material, indicating that it had been redeposited during the eighteenth century development of the quay.

6.2.3 The medieval period was represented in the finds assemblage by four sherds of pottery. Typologically, the earliest fragments were those produced from pit fill ***636*** (Trench 2), which comprised a single, glazed body sherd of Partially Reduced Grey ware and a single, unglazed body sherd of an oxidised fabric (1019). The absence of diagnostic sherds, such as rim fragments, precluded the identification of vessel forms, although a broad thirteenth to fifteenth centuries date may be ascribed to these sherds. However, both sherds were small and abraded, and had clearly been redeposited. Two fragments of Late Medieval Fully Reduced ware were also produced from the evaluation; one fragment (1024) from layer ***639*** (Trench 2) and one fragment (1026) from layer ***615*** (Trench 1). Both fragments were quite abraded, suggesting that they had probably been redeposited, although the breaks in the pottery were not worn, indicating that they had not moved far from their original place of deposition. These fragments are likely to be the products of the kiln site at Silverdale/Arnside, which manufactured the characteristic local pottery in the sixteenth and seventeenth centuries, and occur widely in Lancaster, the Lune valley, and even Kendal (White 2000, 290).

6.2.4 In total, 154 sherds of post-medieval pottery were retrieved from the evaluation, of which 94 sherds (61% of the group) were derived from stratified contexts. In general terms, the stratified material was in good condition; it was neither abraded nor rolled, and included substantial parts of individual vessels, suggesting that it not been disturbed subsequent to deposition. A range of fabric types and vessel forms was represented, and several contexts yielded interesting and closely dated material.

6.2.5 A particularly informative group of 50 sherds (1054) was produced from tip layer ***629*** (Trench 1). Many of the sherds were large and unabraded, and there was some adjoining fragments, indicating that this material was likely to represent contemporary dumping. The group contained a range of wares, which included stoneware, tin-glazed

earthenware, Staffordshire slipware, trailed slipware, Metropolitan-type slipware, mottled ware, and dark-glazed earthenware. In broad terms, this group may be dated typologically to the eighteenth century although, significantly, the collection did not contain any fragments of creamware, which was widely produced by 1760 (Barker 1999).

6.2.6 A total of six vessels were represented by the 13 sherds of stoneware produced from tip layer ***629***, and included a white salt-glazed vessel of English origin. This fabric type was introduced *c*1720 (*ibid*), although its production in north-west England, focused at Prescot, was not established until the middle of the eighteenth century (Oswald *et al* 1981). The group also contained a sherd of brown salt-glazed stoneware and several fragments of imported stoneware, which probably originated from Germany.

6.2.7 The four fragments of tin-glazed earthenware, or delftware, retrieved from ***629*** represent a single shallow bowl/dish, which bears a cobalt blue decoration. This vessel may have been produced in Lancaster, as a delftware manufactory was established on Ford Quay by John Beakbane, William Charnley, and others, in 1745 (Archer 1997, 568). However, very little is known about this production centre, and hitherto there was no delftware definitely attributable to Lancaster. Prior to 1745, delftware is likely to have been imported from Liverpool, which was an established production centre by the early eighteenth century. Interestingly, the Lancaster pottery is believed to have been established by Liverpool merchants.

6.2.8 A total of six sherds of slipware were retrieved from tip layer ***629***, two of which may be attributed with confidence to Staffordshire producers. The only diagnostic sherd was a vessel handle, probably from a cup. This had a hard, buff-coloured fabric with a thick lead glaze, and traces of a dark-brown slip decoration. The group also contained three sherds of trailed slipware and a single sherd of Metropolitan-type slipware.

6.2.9 The English slipware industry was established in the late sixteenth century, and was focused initially in Somerset (Barker 1993). By the mid-seventeenth century, slipware production had spread over much of Britain, although during the late seventeenth/early eighteenth centuries, the Staffordshire products dominated the market. From the 1720s onwards, however, the Staffordshire potteries gradually withdrew from the production of slipware, and concentrated on fine wares for a more affluent clientele (*ibid*, 19).

6.2.10 The group also contained several fragments of mottled, or manganese speckled, ware; a buff-bodied earthenware covered with a streaked, mottled brown lead glaze. The forms present within the group included at least one dish with a roulette decorated rim. It is conceivable that the mottled ware was manufactured at Prescot, Merseyside, where such wares were produced from the early eighteenth century (Davey 1987).

6.2.11 The remainder of the group comprised dark-glazed earthenwares, predominantly storage jars. Some were undoubtedly produced at Burton-in-Lonsdale, which flourished throughout the eighteenth century, although the kitchenware forms are very difficult to distinguish from the products of the kilns recently identified at Bilsborrow (White 1998), thought to have been in production by the 1720s.

6.2.12 The range of pottery retrieved from ***629*** suggests a depositional date of *c*1740-60, and probably towards the upper limit of the range. A similar, but numerically smaller, group of pottery (1028) was produced from tip layer ***649*** (Trench 1). This included a single sherd of delftware, one sherd of trailed slipware, one sherd of Staffordshire slipware, and one sherd of lead-glazed stoneware. A mid-eighteenth century date may also be ascribed to this group, suggesting it to be broadly contemporary with ***629***.

6.2.13 Other tip layers within Trench 1 that produced datable artefacts included ***589***, ***599***, ***601***, ***602***, ***609***, ***615***, ***617***, ***620***, and ***628***. All contained material similar to that retrieved from tip layers ***629*** and ***649***, and suggested that all were broadly contemporary, and represented a single phase of development on the quay during the mid-eighteenth century.

6.2.14 A single sherd of Blackware (1016), a fabric type developed during the early eighteenth century, was retrieved from context ***633*** (Trench 2). Whilst this was a small sherd, it was not particularly abraded, and the breaks were not worn. It was not, however, a diagnostic sherd, precluding any comment on vessel form, although its shiny glaze suggest that it may be the product from south Lancashire, or have been imported coastwise via London. Similar material was produced from excavations in China Street, Lancaster, and have been ascribed a seventeenth century date (Penney 1980b, 15).

6.3 CLAY TOBACCO PIPES

6.3.1 In total, 15 sherds of clay tobacco pipe were retrieved from the evaluation, and included three bowls and 12 stem fragments. An eighteenth century date may be ascribed to those fragments retrieved from tip layers ***628*** and ***629*** (Trench 1), whilst a fragment of stem (1034) produced from layer ***602*** is possibly of a seventeenth century date. An eighteenth century date may also be ascribed to fragments produced from layer ***634*** and pit fill ***637*** (Trench 2).

6.3.2 None of the clay tobacco pipe fragments incorporated a makers stamp, and it is thus impossible to confirm their place of origin. The earliest pipemaker recorded in Lancaster is John Holland in 1732 (White 1975, 58), and during the eighteenth century Lancaster became important as a centre of production, reflecting its geographical position and established trade with America and the West Indies.

6.4 OTHER MATERIALS

6.4.1 ***Glass:*** a total of 11 fragments of bottle glass and a single fragment of window glass was retrieved from the evaluation. With the exception of a largely complete bullet stopper mineral water bottle (1031) of late nineteenth/early twentieth centuries date, the glass vessel fragments were not well preserved, often with highly iridescent and flaky weathering on all surfaces. Nevertheless, it was possible to ascribe a late seventeenth/eighteenth centuries date for fragments of dark-green wine bottles retrieved from layers ***522***, ***524***, ***599***, ***629*** (Trench 1), and pit fill ***636*** (Trench 2).

6.4.2 ***Ironwork:*** two fragments of iron (1040) were retrieved from the evaluation, both from ***633*** (Trench 2). The material was heavily corroded and was not easily recognisable as objects.

6.4.3 ***Lead:*** three fragments of lead (1041) were retrieved from the evaluation, all from unstratified contexts. The material for the most part was in fair condition, with the objects covered by a thin layer of white corrosion products. All fragments were window kame, and appeared to be milled rather than cast kame. Whilst difficult to date with accuracy, there is increasing evidence for the use of milled kame in the later medieval period (LUAU 2000d). The presence of lead kame provides some evidence of buildings in the vicinity during the early post-medieval period.

6.4.4 ***Animal bone:*** the assemblage incorporated a total of eight fragments of animal bone, and included cow, pig, and sheep/goat bones. These appeared to represent domestic refuse, with no evidence of waste material from specialist functions such as tanning or horn working.

6.4.5 ***Molluscs:*** small amounts of marine mollusc shell (1053) were recovered from layer ***601***. Only a single species was present, a common bivalve, which was consumed in great quantities during the eighteenth and nineteenth centuries, and thus their appearance in layer ***601*** is of no surprise.

6.4.6 ***Ceramic building material:*** the assemblage contained six small fragments of brick, retrieved from various contexts. These cannot be dated precisely and can add little to the interpretation of the site.

6.5 DISCUSSION

6.5.1 The artefact assemblage is of some interest, and particularly for the post-medieval pottery. The small groups of Roman and medieval pottery included small and abraded sherds, which were likely to have been transported accidentally to the site subsequent to their deposition elsewhere in the vicinity. The retrieval of unabraded fragments of Blackware (1016) from deposit ***633***, and Late Medieval Fully Reduced ware (1024) from layer ***639*** within Trench 2, however, hint at development of the riverside across the southern part of the site during the seventeenth century. Interestingly, the only other pottery retrieved from ***633*** was of Roman date.

6.5.2 The post-medieval pottery largely dates to the first half of the eighteenth century; the paucity of fragments with under-glaze painted decoration, which was extremely fashionable during the 1770s (Barker 1999), and transfer printing in under-glaze blue, common by *c*1810, was notable. The range of vessels forms indicated domestic use, with no evidence of any specialist function, and the assemblage as a whole appears to represent domestic refuse, dumped during the deposition of the tipping layers exposed within Trench 1. The quality and range of the wares reflects Lancaster's 'Golden Age' during the first half of the eighteenth century, and its rise in economic prosperity through its port status.

7. PALAEOENVIRONMENTAL RESULTS

7.1 PALYNOLOGIAL ASSESSMENT

7.1.1 The palynological assessment demonstrated the presence of pollen in the sediments and pollen preservation was such that full analysis of the sediments could be carried out if required.

7.1.2 ***Tree and Shrub:*** tree and shrub pollen were recorded at moderate values (36-44%) from all samples with alder (*Alnus*) and hazel-type (*Corylus avellana*) as the major taxa recorded.

7.1.3 ***Herb:*** herb pollen was recorded at values of 51-58%. Some cereal-type pollen was identified in all samples except that from 0.56m. The cereal-type pollen may be derived from cereals or from wild grasses with large grains such as *Glyceria*, which could be growing close to rivers (Andersen 1979). Hemp/hop (Cannabis/Humulus) was recorded in all samples except 0.02m. Pollen from a number of weed taxa was recorded including nettles (*Urtica*), ribwort plantain (*Plantago lanceolata*), dandelion-type (Liguliflorae) and daisy-type (Tubuliflorae). Heather (*Calluna*) pollen and *Sphagnum* moss spores suggest that some of the pollen may be derived from bog or heathland.

7.2 WATERLOGGED PLANT AND DIATOM ASSESSMENT

7.2.1 ***Waterlogged Plants:*** the assessment of waterlogged plant remains demonstrated that plant material was preserved in all contexts (***649***, ***645*** and ***644***) sampled. The upper and lower samples from 0-0.02m and 0.76-0.78m were richer in plant remains than those from 0.26-30m and 0.54-50.58m. All samples contained amorphous plant material and monocotyledon (indeterminate fragments from plants such as grasses, sedges and rushes) remains. The sample from 0.76-0.78m contained seeds from arable weeds eg black bindweed (*Fallopia convovulus*) and common chickweed (*Stellaria media*), grassland species eg fairy flax (*Linum catharticum*) and lesser stitchwort (*Stellaria graminea*). Seeds from elderberry (*Sambucus nigra*) were also identified. In the 0.02-0.04m samples plants from several types of plant communities that included wet ground were identified; these included sedge (*Carex*), rushes (*Juncus*), celery leaved buttercup (*Ranunculus sceleratus*) and crowfoots (*Ranunculus* Batrchium-type), ruderals (eg common nettles) and broader categories such as buttercups (*Ranunculus repens*). Elderberries (*Sambucus nigra*) and blackberries (*Rubus fruticosus*) were more common in the lower samples than in the upper samples.

7.2.2 ***Diatoms:*** Diatoms, small freshwater or marine algae with a silica valve, were noted in the pollen samples but no identifications were attempted. Diatoms can be used as climatic, marine and nutrient indicators.

7.3 CONCLUSIONS

7.3.1 The palaeoenvironmental assessment has demonstrated the preservation of pollen, waterlogged plant remains and diatoms in the column sample from contexts ***649***, ***645*** and ***644***. The waterlogged plant remains are more informative about the local environment than the pollen. The data from 0.02-0.04m, ***649,*** suggests a muddy or waterlogged environment and is shown in particular by the record of celery leaved

buttercup (*Ranunculus sceleratus*) and crowfoots (*Ranunculus* Batrchium-type). The arable weeds, ruderals, elderberries (*Sambucus nigra*) and blackberries (*Rubus fruticosus*) in samples 0.01-0.02m and 0.76-0.78m all suggest that the environment was away from the water's edge.

7.3.2 Any interpretation of palynological analysis from riverine silts should be cautious given the limited samples, and because of the estuarine conditions found on the River Lune, within the environs of the site. Although useful information can be obtained it must be remembered that pollen may be derived from many sources unlike that from lake or peat bog sediments (Moore *et al* 1991). The following are the three most important sources:

i) the air either from rain or wind

ii) water from the river catchment and the sea in the case of an estuary

iii) redeposition of older sediments from further up stream.

7.3.3 In general redistributed pollen or that transported for long distances by water is poorly preserved with many crumpled and poorly preserved grains. The pollen from this assessment, however, is moderately well preserved although some crumpled grains were recorded. The data would appear to suggest some secondary woodland of alder and hazel, some grassland, including possibly arable cultivation, and heath or bog communities in the general locale of the development site.

8. DISCUSSION AND CONCLUSIONS

8.1 DISCUSSION

8.1.1 The River Lune has played a crucial role in the development of Lancaster since Roman times, and the evaluation has provided a valuable opportunity to examine archaeologically the evolution of its waterfront in the area of the former Pye's Warehouse.

8.1.2 Evidence for the location and character of the putative Roman harbour is scarce, although the area of Pye's warehouse has been postulated as a probable '*centre of Roman harbour activities*' (LUAU 1991, 10). Evidence for this rests on the retrieval of Roman pottery from the site, at depths in excess of 5m, during the construction of the warehouse (*ibid*), and anecdotal evidence for a masonry structure exposed at depth during construction work in the 1930s, which was interpreted as the remains of a Roman wharf (D Shotter pers comm). More recently, the presence of an ancillary route from the eastern gate of the earlier forts veering northwards towards the area of Pye's warehouse has been suggested (Jones and Shotter 1988). Similarly the excavation by Sir Ian Richmond of Roman buildings in the then vicarage allotments during the 1950s, may be interpreted as extramural settlement extending from the north gate of the fort (White 1987), and hints at the existence of a road from the fort directly to the harbour.

8.1.3 The evaluation has not been able to confirm the presence of Roman structures, although a Roman presence in the vicinity was confirmed by the retrieval of residual Roman pottery, from post-medieval contexts. The site has, however, almost certainly suffered a significant amount of disturbance during its occupation, particularly during the twentieth century. It should be stressed, moreover, that excavation to depth was not undertaken during the course of the evaluation due to health and safety constraints, and because the underlying stratigraphy was not intended to be disturbed in the course of the development; consequently it has not been possible to establish if *in situ* Roman deposits survive below the excavated levels.

8.1.4 The exact course of the River Lune also requires consideration as it may have altered significantly, as rivers generally meander in their lower courses and the meanders usually migrate (Small 1989). In the case of the Lune, the meander bend near the Pye's site would have continued to erode the outer bank, and deposit on the inner bank. It is therefore possible that during the Roman period the river edge may have been nearer the centre of the present river channel, although the exact course of the river remains unclear. What is clear is that since the later medieval period, and especially in the post-medieval period, the course of the river has changed, partly due to man's activities.

8.1.5 The position of the medieval harbour is similarly elusive, although documentary evidence from 1297 refer to the town's small-scale maritime trade with Ireland, France, and along the coast (Dalziel and Whincop 1989, 1). The upper limit of navigation for large craft during this period is likely to have been the wooden bridge across the Lune, which crossed the river to the Skerton side at Cross Street (now Lune Street), and is thought to have been in place during the reign of King John (AD 1199-1216) (Irving 1987, 34). This bridge was replaced during the fifteenth century by a four-arched stone structure (Dalziel and Whincop 1989, 10), which is depicted as such on Stephen Mackreth's map of 1778 (Fig 5). The position of this structure, which presumably took the same site as the earlier bridge, was slightly downstream of Pye's warehouse. This suggests that large vessels were unable to use a wharf on the river by Pye's warehouse,

and will have had to moor further downstream, or unload in mid-river. Speed's map of 1610 (Fig 3) depicts several large sailing vessels on the river downstream of the bridge, but none upstream. This does not, however, preclude the passage of smaller vessels beyond the bridge, as exemplified by the position of Lawson's Wharf off Cable Street.

8.1.6 On the Lancaster side of the river, Bridge Lane would appear to have been the main route to the bridge. By the sixteenth century there is evidence for some structures along its route, and by the eighteenth century the area was almost entirely built up. It is uncertain, considering the evidence for land reclamation, what the area would have been like prior to Speeds map of 1610 (Fig 3). It is known that the Lune formed the northern limit of the town of Lancaster in the medieval period (White 2001, 40), but the relation of the town to the current course of the river is not known. The results gained from the evaluation suggest that the site was only minimally occupied and may still have been part of the river course, or possibly the river bank. Bridge Lane therefore may have been less of a structural road and more of a footpath across the sands, perhaps only intermittently accessible depending on the tidal height.

8.1.7 During the post-medieval period, coastwise transport expanded rapidly and in many coastal towns, such as Southampton, Poole, Bristol, Exeter, and London, medieval waterfronts were upgraded or expanded. Much of this reconstruction was undertaken in the sixteenth and seventeenth centuries, and continued into the eighteenth and nineteenth centuries (Crossley 1990). In Poole, for instance, the medieval timber quays and jetties were buried or removed by the development of the present quayside during the late seventeenth century (Milne 1981). The evaluation and watching brief has clearly demonstrated this process in Lancaster by the regular and consistent tiplines exposed in Trench 1 of the evaluation and over most of the area during the watching brief. These represent a specific and organised initiative to increase the area of land along the bank of the River Lune beneath Pye's warehouse. The finds are believed to be contemporaneous rather than residual and date this activity to *c*1740-60; this is likely to have taken place prior to, or concurrent with, the dealings of the Port Commission. This body was formed from an Act of Parliament that was granted in 1749, as a consequence of the increasing volume of trade entering the port. This increase in trade is represented in the finds assemblage, particularly the material retrieved from the tip layers in Trench 1. Indeed, the evaluation has provided a valuable opportunity to examine a significant, albeit small, group of early/mid-eighteenth century pottery, the analysis of which may inform a wider understanding of the pottery supply in Lancaster during a period of the town's economic prosperity. Stratified examples of eighteenth century pottery groups from Lancaster are limited to those excavated in China Street (Penney 1980b) and Church Street (Miller *et al* forthcoming).

8.1.8 The Rawlinson Papers from 1785 document the types of goods exported from the port of Lancaster at the end of the eighteenth century (Schofield 1946, 45). This source clearly indicates that a significant amount of pottery was exported via Lancaster, and that it was derived from local, or at least regional, suppliers. The local pottery manufacturers are not well understood, although there is some documentary evidence for their existence. In addition to the production centres at Burton-in-Lonsdale and Bilsborrow, kilns are thought to have existed at Newlands on the south-east outskirts of Lancaster (Penney 1980a), and at Scotforth (Niven 1982). The range of wares manufactured, and precise production dates for these potteries are unknown, although the Newlands site is thought to have ceased production by the mid-nineteenth century

(Penney 1980a, 42), whilst the Scotforth kilns appear to date from the early/mid-nineteenth century.

8.1.9 The medieval bridge was partly demolished by Brockbanks shipbuilders on Green Ayre in 1802, allowing access by ship to the area of Pye's warehouse. However, by this time the focus of trade had shifted further down the quay, as Ford Quay was extended in 1848, and again rebuilt in stone in 1892, and Glasson Dock opened in 1787.

9. IMPACT AND RECOMMENDATIONS

9.1 IMPACT

9.1.1 The evaluation and watching brief has demonstrated the survival of post-medieval archaeological remains in the form of tipped deposits, which were interpreted as land reclamation and hard standing for the subsequent development of the site. These deposits produced a significant group of early/mid-eighteenth century artefacts, which highlight the importance of the port during this period. These deposits will be severely affected by the proposed development.

9.1.2 Further information regarding the original course of the river, and its implications for the presence of Roman activity within the area, can only be gleaned from work which exposes deeper-lying alluvial and fluvial silts that have been shown to survive beneath the development area. Unless changes in design are implemented which necessitate excavations to a greater depth, these deposits are unlikely to be significantly affected by the proposed development.

9.2 RECOMMENDATIONS

9.2.1 A watching brief was maintained during the excavation for the insertion of the ground beams in order to maximise investigation of these deposits. No further archaeological investigation is considered necessary during the course of the development. No further palaeoenvironmental work is recommended.

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APPENDIX 1
PROJECT DESIGN

Oxford Archaeology North

August 2002

FORMER PYES WAREHOUSE, LANCASTER

ARCHAEOLOGICAL EVALUATION

Proposals

The following project design is offered in response to a request from Totty Construction Group Plc, for the implementation of an evaluation of the former Pye's Feed Mill, Lancaster.

1.1 INTRODUCTION

1.1 Lancaster City Council have granted Persimmon Homes Ltd planning permission for the demolition of the former Pye's Warehouse on Damside Street, Lancaster and the erection of a residential development. Planning permission was granted on the condition that the Persimmon Homes Ltd client undertook a programme of archaeological recording and investigation both prior to demolition and immediately following demolition of the warehouse buildings. This present stage of works follows on from a fabric survey of the extant buildings (OAN 2002) and from an earlier evaluation (LUAU 1992) which involved localised excavations adjacent to the mill. This evaluation stage of the programme would involve a further programme of trial trenching beneath the warehouse building, following its demolition, and is designed to assess the archaeological and historical importance of the site and the impact of the proposed development. The defined programme of works is at the request of Totty Construction Group Plc and is in accord with a verbal brief from the Lancashire County Archaeology Service (LCAS).

1.2 ***Archaeological Context:*** the warehouse is situated at the foot of Castle Hill, the site of a series of Roman forts which date from the first century AD onwards. The River Lune, to the north, almost certainly flowed closer to the site of the forts than it does today and it has been suggested that a harbour may have existed in this area, protected by the fourth century fort, which was aligned parallel to the river. Trial excavations alongside Damside Street (LUAU 1991) have also indicated Roman material along the old line of the Lune, perhaps indicating an extended river frontage at the base of Castle Hill.

1.3 The present warehouse structure overlies the course of the former Bridge Lane, a thoroughfare which led from China Lane to Lune Square and was associated with the bridge over the Lune which was referred to from the thirteenth century onward. By 1749 the river was subject to improvement and the quayside upgraded - such improvements seem to have given a considerable boost to trade with the West Indies and Lancaster entered a period of unparalleled prosperity during which many fine buildings were erected, including St George's Quay, the Custom House, and the warehouse buildings on the Quay.

1.4 A limited evaluation of the site was undertaken in 1992 (LUAU 1992), with trenches 6-8 to the south of the warehouse and trench 9 to the north. It was clear from the trial trenches that archaeology did survive on the site, although its full extent could not be ascertained from the excavations as it was not feasible to examine certain parts of the site. It appears that some parts of the site were not utilised or developed until relatively recently, for example the area to the east of the former Bridge Lane in Lune Square. Yet to the south of the warehouse there are earlier Roman and medieval archaeological deposits on the eastern side of the former Bridge Lane with possible water front activity and potential waterlogged deposits.

1.5 The area lies within an Area of Archaeological Potential and is regarded as being of archaeological interest due to the proximity of known Roman archaeology, and possible waterfront activity of this and subsequent periods. The location of any archaeological remains and the nature of the former topography of the area will add to the understanding of the changing course of the river Lune and how this has affected the use of the area.

1.6 ***Oxford Archaeology North (OA North):*** OA North has considerable experience of the recording of historic buildings together with evaluation and excavation of sites of all periods, having undertaken a great number of small and large scale projects during the past 20 years. Fieldwork has taken place within the planning process and construction programmes, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has undertaken numerous urban evaluations comparable to the proposed study.

1.7 OA North has the professional expertise and resource to undertake the project detailed below to a high level of quality and efficiency. OA North and all its members of staff operate subject to the Institute of Field Archaeologists (IFA) Code of Conduct. OA North is an IFA registered organisation, number 17.

2. OBJECTIVES

2.1 TRIAL TRENCHING

2.1.1 The evaluation is intended to establish the character and extent of archaeological deposits within the extent of the Pye's Warehouse. It will assess the artefactual assemblage and the environmental evidence within the site.

2.1.2 The results of the earlier evaluation (LUAU 1992) have demonstrated that there are intact deposits to a maximum depth of 4m from the surface; however, it is understood that the development will not extend deeper than 1m from the surface. It is therefore required by LCAS that the evaluation trenches extend to a depth of 2m below the surface to provide for any additional ground works in the course of the development. To undertake trenching to a depth of 2m will necessitate that the trenches are stepped in, in order to comply with health and safety requirements. If there is any requirement to excavate deeper than 2m then there will be a need for box shoring.

2.1.3 The excavations will primarily be by mechanical excavation excavating in shallow spits under archaeological supervision. Each spit will be subject to manual cleaning and the stratigraphy recorded.

2.1.4 ***Post-Excavation and Report Production:*** an evaluation report will be produced for the client which will assess the significance of the structures and stratigraphy in terms of the context of the site. A site archive will be produced to English Heritage MAP 2 guidelines (English Heritage 1991) and in accordance with the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990).

3. METHODS STATEMENT

3.1 EVALUATION

3.1.1 Three evaluation trenches will be excavated; one at the southern end of the site, one at the northern end of the site, and two adjacent trenches in the southern central part of the site. The trenches will be excavated to a maximum depth of 2m from the surface, which would require stepping in to conform with health and safety requirements. This would mean the excavation of a 4m x 4m trench from the top to enable a 2m x 2m excavation within the bottom of the trench. Where the trench is excavated from the base of the present groundworks there will be no requirement to step in and therefore the trench will be 4m x 2m in size. It is also proposed to excavate an adjacent trench to that from the base of the groundworks, and will be excavated down from the level of the present ground surface; this will be no deeper than 1m and will also be 4m x 2m in size. The dimensions may be altered to conform with local conditions or constraints, such as modern building foundations or services. If it proves necessary to excavate any deeper than 2m from the surface this will necessitate the use of box-shoring.

3.1.2 In all trenches, the modern surfaces will be removed by machine (fitted with a toothless ditching bucket) under archaeological supervision. The mechanical excavation will be undertaken in level spits (*c*150mm deep) down to the level of the highest significant archaeological horizon. Any features identified by the machining process, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels, depending on the subsoil conditions, and where appropriate sections will be studied and drawn.

3.1.3 Any investigation of intact archaeological deposits will normally be by half-sectioning, linear features will be subject to no more than a 25% sample, and extensive layers will, where possible, will be sampled by partial rather than complete removal. It is hoped that, in terms of the vertical stratigraphy, maximum information retrieval will be achieved through the examination of sections of cut features. All excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features which appear worthy of preservation *in situ*.

3.1.4 By virtue of the fact that the site is adjacent to the tidal section of the River Lune the excavation will potentially extend to depth where the trench will become waterlogged. While excavation is proceeding a pump will be in service to remove residual water from the trench bottom; however, if it proves that this is insufficient to control the inflow of water, then the maximum depth of the excavation will have to be limited. It is assumed the client will negotiate for the pumping of water into the public drain system.

3.2 FINDS

3.2.1 The deposits are likely to be waterlogged, and there will be waterlogged silts overlying the bedrock (LUAU 1992). As waterlogged silts, often anaerobic, are an excellent matrix for the preservation of organic material, this should be borne in mind if the current exploration continues into waterlogged deposits.

3.2.2 Depending upon the amount of organic material recovered two options for their recovery are available:

1. if finds are made at a level considered 'normal' for contemporary deposits within the city then a policy of total recovery would be pursued as per OAN standard procedure;
2. if unusually large amounts of finds are recovered, a sampling strategy will be developed in consultation with the LCAS.

3.2.3 The costs for analysis are defined as a contingency and will only be brought into play with an agreement from the client and LCAS. If significant and substantial remains are identified then they should be recorded and preserved *in situ* if possible.

3.2.4 Except for items subject to the Treasure Act, all artefacts found during the course of the project will remain the property of the landowner, who will be encouraged to donate them to Lancaster City Museum.

3.2.5 Any finds of human remains will be left *in situ*, and will only be removed in extremis and then under a home office burial licence, in compliance with the Disused Burial Grounds (Amendment) Act.

3.2.6 ***Environmental Sampling:*** environmental samples (bulk samples of 30 litres volume, to be sub-sampled at a later stage) will be collected from suitable deposits (i.e. the deposits are reasonably well dated and are from contexts the derivation of which can be understood with a degree of confidence). Where such deposits are encountered, an appropriate sampling strategy will be agreed with LCAS.

3.2.7 An assessment of any environmental samples will be undertaken by the in-house palaeoecological specialist, who will examine the potential for further analysis. The number of samples to be analysed is dependant upon the survival of organic deposits and hence the costs are defined per sample. The assessment will examine the potential for macrofossil, arthropod, palynological and general biological analysis and the samples will be submitted to the appropriate specialists subject to the results of the assessment.

3.2.8 Samples will also be collected for technological, pedological and chronological analysis as appropriate. If necessary, access to conservation advice and facilities can be made available. OA North maintains close relationships with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs artefact and palaeozoological specialists with considerable expertise in the investigation, excavation and finds management of sites of all periods and types, who are readily available for consultation.

3.3 RECORDING

3.3.1 All information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology of English Heritage, with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.

3.3.2 Results of all field investigations will be recorded on *pro forma* context sheets. The site archive will include both a photographic record and accurate large-scale plans and sections at an appropriate scale (1:50, 1:20 and 1:10). All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration. Plans and contexts will be linked within a digital single context planning system.

3.3.3 Archaeological planning will be undertaken using a data-logging total station and the data will be digitally incorporated into a CAD system during the evaluation. This process will generate scaled plans which will also be subject to manual enhancement. The drawings will be generated at an accuracy appropriate for 1:20 scale but can be output at any scale required. Section drawings will for the most part be generated manually, although a total station has proved to be a cost effective tool for drawing very long sections.

3.4 POST-EXCAVATION AND REPORT PRODUCTION

3.4.1 ***Archive:*** the results of Stage 3.2-3.3 will form the basis of a full archive to professional standards, in accordance with MAP 2 guidelines (English Heritage 1991) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a

properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct.

3.4.2 This archive can be provided in the English Heritage Centre for Archaeology format, both as a printed document and on computer disks as ASCii files (as appropriate). The complete archive, inclusive of paper archive and artefactual assemblage, will be deposited with the Lancaster City Museum Merseyside within six months of the completion of the fieldwork. A synthesis of the archive will also be available for deposition in the National Monuments Record.

3.4.3 ***Report:*** a report will be compiled outlining the results of the investigation for the use of the client and the SMR. This report will be a digital and paper copy, with drawings submitted as Autocad DXF, databases in Microsoft Access format and text in ASCii format. The data will be submitted in accordance with the Archaeology Data Service. The final report will include a copy of this project design, and indications of any agreed departure from that design. It will present, summarise, and interpret the results of the programme detailed above, and will include recommendations for any further mitigation works and details of the final deposition of the project archive.

3.4.4 ***Confidentiality:*** the final report is designed as a document for the specific use of the client, and should be treated as such; it is not suitable for publication as an academic report, or otherwise, without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project brief and project design, or for any other explicit purpose, can be fulfilled, but will require separate discussion and funding.

3.5 OTHER MATTERS

3.5.1 ***Health and Safety***: OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1999). A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties.

3.5.2 The excavation of the deep trenches will come under CDM regulations, and for this element the Totty Construction Group Plc will act as lead contractor and will be planning supervisor responsible for health and safety during the excavation.

3.5.3 There is a serious risk of contaminated soils as the cellars of the warehouse have been used to store animal fat rich molasses. It is understood that the contaminated soils will be removed from site by the time of the proposed evaluation, and in any case it is not proposed to work in areas where there have been contaminated soils.

3.5.4 It is understood that all services will have been removed from the site by the time of the start of the evaluation.

3.5.5 ***Reinstatement:*** deep trenches will be backfilled on completion of the trenching for health and safety reasons but otherwise there is no requirement for the reinstatement of the trenches.

3.5.6 ***Indemnity:*** OA North has professional indemnity to a value of £2,000,000, employer's liability cover to a value of £10,000,000 and public liability to a value of £15,000,000. Written details of insurance cover can be provided if required.

3.5.7 ***Working Hours:*** normal OA North working hours are between 9.00 am and 5.00 pm, Monday to Friday, though adjustments to hours may be made to maximise daylight working time in winter and to meet travel requirements. It is not normal practice for OA North staff to be asked to work weekends or bank holidays and should the client require such time to be worked during the course of a project a contract variation to cover additional costs will be necessary.

3.5.8 ***Monitoring:*** Monitoring of the project will be undertaken by the Lancashire County Archaeological Service (LCAS). Access to the site for monitoring purposes will be afforded to LCAS at all times.

3.5.9 ***Contingencies:*** in accordance with the Institute of Archaeologists guidance, contingency costs to cover variation from those circumstances that are predictable from the evaluation results are defined below. These provide for finds analysis and environmental assessment of significant waterlogged deposits with their associated finds and environmental deposits and is in addition to the basic level of assessment and analysis already incorporated within the main costs. As defined within the brief the proposal provides for a contingency for unforeseen circumstances, such as bad weather, the discovery

of dangerous deposits, significant complex stratigraphy and for dealing with unexpected services. The drawing upon contingencies will be subject to agreement with the client and LCAS.

4. WORK TIMETABLE

4.1 ***Trial Trenching***

A 5 day period is required to excavate, record and backfill the location trenches.

4.2 ***Post-Excavation and Report Production***

An evaluation report will be submitted within one month of the completion of the fieldwork, and interims will be submitted on completion of each stage of work.

4.3 LUAU can execute projects at very short notice once an agreement has been signed with the client.

4.4 The project will be under the management of **Jamie Quartermaine BA Surv dip MIFA** (OA North Senior Project Manager) to whom all correspondence should be addressed.

4.5 The project will be supervised in the field by a suitably qualified member of OA North's staff to be determined when the start date is known in order to take in account of OA North's already programmed commitments.

APPENDIX 2
SUMMARY CONTEXT LIST

Context Number	**Site Subdivision**	**Description**
500	Area 3	Sandstone Surface
501	Area 3	Layer
502	Area 3	Layer
503	Area 3	Layer
504	Area 3	Layer
505	Area 3	Layer
506	Area 3	Layer
507	Area 3	Layer
508	Area 3	Layer
509	Area 3	Layer
510	Area 3	East/west Sandstone Wall
511	Area 3	Layer
512	Area 3	Layer
513	Area 3	Layer
514	Area 3	Layer
515	Area 3	Layer
516	Area 3	Layer
517	Area 3	Layer
518	Area 3	Layer
519	Area 3	Fill of ***520***
520	Area 3	Cut / Interface
521	Area 3	Layer
522	Trench 1	Layer
523	Trench 1	Layer
524	Trench 1	Layer

525	Trench 1	Layer
526	Trench 1	Cut for Pipe Trench
527	Trench 1	Pipe Trench Backfill
528	Trench 1	Pipe Trench Backfill
529	Trench 1	Void
530	Trench 1	Layer
531	Trench 1	Void
532	Trench 1	North / South Sandstone Wall
533	Trench 1	Layer
534	Trench 1	Tip Layer
535	Trench 1	Layer
536	Trench 1	Layer
537	Trench 1	Layer
538	Trench 1	Layer (= ***561***)
539	Trench 1	Layer (= ***562***)
540	Trench 1	Layer (= ***563***)
541	Trench 1	Layer
542	Trench 1	Layer
543	Trench 1	Layer
544	Trench 1	Layer
545	Trench 1	Sandstone Wall / Surface
546	Trench 1	Fill of ***547***
547	Trench 1	Cut or Disturbance
548	Trench 1	Layer
549	Trench 1	Layer
550	Trench 1	Layer
551	Trench 1	Layer
552	Trench 1	Layer

553	Trench 1	Layer
554	Trench 1	Layer
555	Trench 1	Layer
556	Trench 1	Layer
557	Trench 1	Layer
558	Trench 1	Layer
559	Trench 1	Layer
560	Trench 1	Layer
561	Trench 1	Layer (= ***538***)
562	Trench 1	Layer (= ***539***)
563	Trench 1	Layer (= ***540***)
564	Trench 1	Layer
565	Trench 1	Layer
566	Trench 1	Layer
567	Trench 1	Layer
568	Trench 1	Fill of ***575***
569	Trench 1	Fill of ***575***
570	Trench 1	Fill of ***575***
571	Trench 1	Fill of ***575***
572	Trench 1	Fill of ***575***
573	Trench 1	Fill of Pipe Trench ***574***
574	Trench 1	Cut for Pipe Trench
575	Trench 1	Cut / Interface
576	Trench 1	Layer
577	Trench 1	Layer
578	Trench 1	Layer
579	Trench 1	Layer
580	Trench 1	Layer

581	Trench 1	Layer
582	Trench 1	Layer
583	Trench 1	Layer
584	Trench 1	Layer
585	Trench 1	Layer
586	Trench 1	Layer
587	Trench 1	Tip Layer
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589	Trench 1	Tip Layer
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623	Trench 1	Tip Layer
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627	Trench 1	Tip Layer
628	Trench 1	Tip Layer
629	Trench 1	Tip Layer
630	Trench 1	Tip Layer
631	Trench 1	Tip Layer
632	Trench 2	Layer – makeup
634	Trench 2	Layer
635	Trench 2	Cut for Pit
636	Trench 2	Fill of ***635***
637	Trench 2	Fill of ***635***

638	Trench 2	Layer
639	Trench 2	Layer
640	Trench 2	Layer
641	Trench 2	Layer
642	Trench 1	River Silts
643	Trench 1	River Silts
644	Trench 1	River Silts
645	Trench 1	River Silts
646	Trench 1	River Silts
647	Trench 1	Tip Layer
648	Trench 1	Tip Layer
649	Trench 1	Tip Layer
650	Trench 1	Tip Layer
651	Trench 1	Tip Layer
652	Trench 1	Tip Layer
653	Trench 1	Tip Layer
654	Trench 1	Tip Layer
655	Trench 1	Tip Layer
700	WB6, WB7 and WB19	Tip Layer
701	WB6, WB7 and WB19	Tip Layer
702	WB6 and WB7	Tip Layer
703	WB6, WB7 and WB19	= ***700***
704	WB6, WB7 and WB19	= ***700***
705	WB6, WB7 and WB19	= ***701***
706	WB7	Tip Layer
707	WB7	Tip Layer
708		Not Used
709	WB1	Tip Layer

710	WB1, WB10, WB13 and WB15	Tip Layer
711	WB1, WB10, WB13 and WB15	Tip Layer
712	WB1	Tip Layer
713	WB1	Tip Layer
714	WB1	Tip Layer
715	WB1	Tip Layer
716	WB1	Fill of ***718***
717	WB1	Fill of ***718*** (culvert)
718	WB1	Fill of ***718***
719	WB1	Construction Cut
720	WB1	Tip Layer
721	WB1	Tip Layer
722	WB1	Tip Layer
723	WB1	Tip Layer
724	WB1	River Silts
725	WB1	River Silts
726	WB8	Tip Layer
727	WB9	Tip Layer
728	WB9	Tip Layer
729	WB9	River Silts (= ***725***?)
730	WB9	River Silts
731	WB1, WB10, WB13 and WB15	= ***710***
732	WB1, WB10, WB13 and WB15	= ***711***
733	WB11	Recent Disturbance (Trench 2)
734	WB11	Recent Disturbance (Trench 2)
735	WB1, WB10, WB13 and WB15	= ***710***

736	WB1, WB10, WB13 and WB15	= ***711***
737	WB13 and WB15	Tip Layer
738	WB13	Tip Layer
739	WB14 and WB17	Tip Layer
740	WB14	Tip Layer
741	WB14	Tip Layer
742	WB14	Tip Layer
743	WB14	Tip Layer
744	WB14	Tip Layer
745	WB14	Tip Layer
746		Not Used
747	WB1, WB10, WB13 and WB15	= ***711***
748	WB13 and WB15	= ***737***
749	WB15	Fill of ***751*** (foundation)
750	WB15	Fill of ***751***
751	WB15	Construction Cut
752	WB1, WB10, WB13 and WB15	Same as ***710***
753	WB15	Modern Disturbance
754	WB15 and WB16	Tip Layer
755	WB15	Tip Layer
756	WB16	Tip Layer
757	WB16, WB18 and WB19	Tip Layer, same as ***754***
758	WB16, WB18 and WB19	Tip Layer, same as ***754***
759	WB16	Tip Layer
760	WB16	Tip Layer
761	WB16, WB17 and WB18	Tip Layer
762	WB14, WB16 and WB17	Tip Layer

763	WB16 and WB18	Tip Layer
764	WB19	Tip Layer
765	WB19	Tip Layer
766	WB19	Same as ***765***
767	WB20	Modern Disturbance
768	WB20	Modern Disturbance
769	WB5	Redeposited River Silts
770	WB19	Construction Cut
771	WB19	Fill of ***770*** (foundation)
772	WB1	Fill of ***774***
773	WB1	Fill of ***774*** (foundation)
774	WB1	Construction Cut
775	WB20	Foundation
776	WB20	Foundation

APPENDIX 3
SUMMARY FINDS LIST

Context	OR	Quantity	Material	Date Range
501	1000	2	Pottery	19th Century
513	1001	1	Pottery	Mid-18th Century
513	1048	1	Animal bone	Undated
516	1002	1	Pottery	19th Century
519	1003	1	Pottery	19th Century
522	1042	3	Glass vessel	17th - 18th Century
524	1043	1	Glass vessel	17th - 18th Century
524	1004	6	Pottery	18th - 19th Century
527	1031	1	Glass vessel	Late 19th - 20th Century
533	1049	2	Animal bone	Undated
552	1050	3	Animal bone	Undated
554	1005	1	Pottery	19th Century
554	1006	2	Brick	Undated
563	1007	1	Pottery	18th Century
568	1008	1	Pottery	19th Century
578	1009	1	Pottery	18th Century
589	1011	2	Pottery	2nd Century?
589	1010	1	Pottery	18th Century
599	1044	1	Glass vessel	17th Century
601	1053	3	Mollusc	Undated
601	1029	2	Pottery	17th-19th Century
602	1034	1	Clay tobacco pipe	17th Century
609	1030	3	Pottery	19th Century
615	1027	3	Pottery	18th Century
615	1026	1	Pottery	late 15th - 17th Centuries
617	1012	1	Pottery	18th Century
620	1014	3	Pottery	18th Century
620	1013	1	Pottery	3rd Century ?
628	1035	1	Clay tobacco pipe	18th Century

629	1045	3	Glass vessel	17th - 18th Century
629	1036	8	Clay tobacco pipe	18th Century
629	1054	50	Pottery	1740-60
633	1051	1	Animal bone	Undated
633	1040	2	Iron	Undated
633	1015	1	Brick	Undated
633	1032	3	Brick	Undated
633	1016	1	Pottery	17th Century
633	1017	2	Pottery	2nd Century ?
634	1018	3	Pottery	2nd - 3rd Centuries
634	1037	3	Clay tobacco pipe	18th Century
634	1046	1	Glass vessel	18th Century
636	1019	2	Pottery	13th - 14th Centuries
636	1020	4	Pottery	Early/mid 18th Century
636	1047	2	Glass vessel	17th - 18th Century
637	1021	1	Pottery	2nd Century
637	1022	3	Pottery	2nd - 3rd Centuries
637	1038	1	Clay tobacco pipe	18th Century
637	1023	2	Pottery	18th -19th Centuries
639	1039	1	Clay tobacco pipe	18th - 19th Centuries
639	1024	1	Pottery	Late 15th - 17th Centuries
639	1025	1	Pottery	19th Century
639	1052	1	Animal bone	Undated
649	1028	4	Pottery	Mid 18th Century
Unstrat	1041	3	Lead	17th - 19th Centuries
Unstrat	1033	60	Pottery	17th - 19th Centuries

APPENDIX 4
WATCHING BRIEF EXCAVATION DEPTHS

Watching Brief Number	Depth to Archaeology (Overburden)	Total Depth
WB1	1.8m	3.0m
WB2	Disturbed area to north	Disturbed area to north
WB3	Disturbed area to north	Disturbed area to north
WB4	Disturbed area to north	Disturbed area to north
WB5	Disturbed area (1996 evaluation trench)	1.5m
WB6	0.10m	0.90m
WB7	0.40m	0.75m
WB8	1.25m	2.20m
WB9	1.05m	1.80m
WB10	Minimum of 0.82m	0.82m
WB11	0.30m	0.58m
WB12	Disturbed area to north	Disturbed area to north
WB13	Disturbed area to north	Disturbed area to north
WB14	0.34m	1.12m
WB15	0.40m	1.02m
WB16	0.40m	1.40m
WB17	0.35m	1.05m
WB18	0.32m	9.02m
WB19	0.24m	0.88m
WB20	Minimum 0.85m	0.85m

APPENDIX 5
PALAEOBOTANICAL DATA

Table 1: showing percentage pollen data from the column sample through contexts ***649***, ***645***, and ***644***.

Depth m		**0.02**	**0.28**	**0.56**	**0.78**
Trees and Shrubs		41.1	37.5	43.5	43
Herbs		51.1	57.5	53	54.7
Bracken		7.7	5	3.5	3.5
Betula	Birch	13	9	6	7
Pinus	Pine	1			
Quercus	Oak	1	3	6	4
Alnus	Alder	13	10	6	16
Corylus avellana-type	Hazel	11	15	24	16
Ilex aquifolium	Holly	1			
Salix	Willow			2	
Sambucus	Elderberry		1		
Cannabis/*Humulus*	Hemp/Hops		4	1	2
Calluna	Ling heather	7	8	7	6
Gramineae	Grass	18	30	32	21
Cereal-type		3	4		1
Cyperaceae	Sedges	2	3	1	1
Plantago lanceolata	Ribwort plantain	2	3	5	4
Plantago sp	Plantain	1	1		
Filipendula	Meadowsweet				1
Rumex acetosa	Common sorel	1			2
Urtica	Nettles	2			1
Chenopodiaceae	Goosefoot family	1			
Caryophyllaceae	Stitchwort family	1			

Umbelliferae	Carrot family	1			
Liguliflorae	Dandelion type	3	3	2	5
Tubuliflorae	Daisy type	4	1	1	1
Ranunculus sp	Buttercup				2
Sinapsis-type	Mustard	1		1	1
Myosotis	Forget-me-not	1			
Centaurea nigra	Common knapweed	1			
Cruciferae	Cabbage family				1
Polygola	Milkwort				1
Pteridium aquilinum	Bracken	8	5	4	4
Unknowns		2	1		1
Sphagnum moss		7	5	4	
Bryophyte	Mosses				
Polypodium		2	3	3	1
Pteropsida	Undiff Ferns	8	9	6	4
Indeterminate grains		22	11	15	23
Charoal particles		55	67	60	61
Pollen sum		90	80	85	86

Table 2: Waterlogged plant remains from the column sample through contexts ***649***, ***645***, and ***644***.

+ = present in sample

Depth in m from top of column	**0.01-0.02**	**0.26-0.30**	**0.54-0.58**	**0.76-0.78**
Sample size in g	264	204	131	167
Amorphous plant material	+	+	+	+
Monocotyledon remains	+	+	+	+
Charcoal			+	+
Fly puparia			+	
Insect	+		+	
Molluscs		+	+	+
Wood fragments	+		+	+
Coal			+	+
Clinker		+		
Arable weeds				
Euphorbia helioscopia-sun spurge	+			
Fallopia convolvulus-black bindweed				+
Stellaria media- common chickweed				+
Polygonum lapathifolium-pale persicaria	+			+
Grassland				
Linum catharticum-fairy flax				+
Stellaria graminea-lesser stitchwort				+
Ruderals				
Lapsana communis-nipplewort				+
Prunella vulgaris-self heal				+
Urtica dioica- stingimg nettle	+			
Wet ground				
Carex trigynous- sedges		+		+
Lychnis flos-cuculi-ragged robin		+		
Juncus spp- rushes	+		+	+
Montia-blinks			+	
Potentilla palustris-type-marsh cinquefoil	+			
Ranunculus sceleratus- celery-leaved buttercup	+			
Ranunculus Batrachim-type-crowfoot	+	+		
Broad				
Potentilla spp-cinquefoils	+			
Ranunculus repens-type-buttercups	+			
Viola sp-violets	+			
Possible native food sources				
Sambucus nigra-elderberry	+			+
Rubus fruticosus- blackberry	+			

ILLUSTRATIONS

PLATES

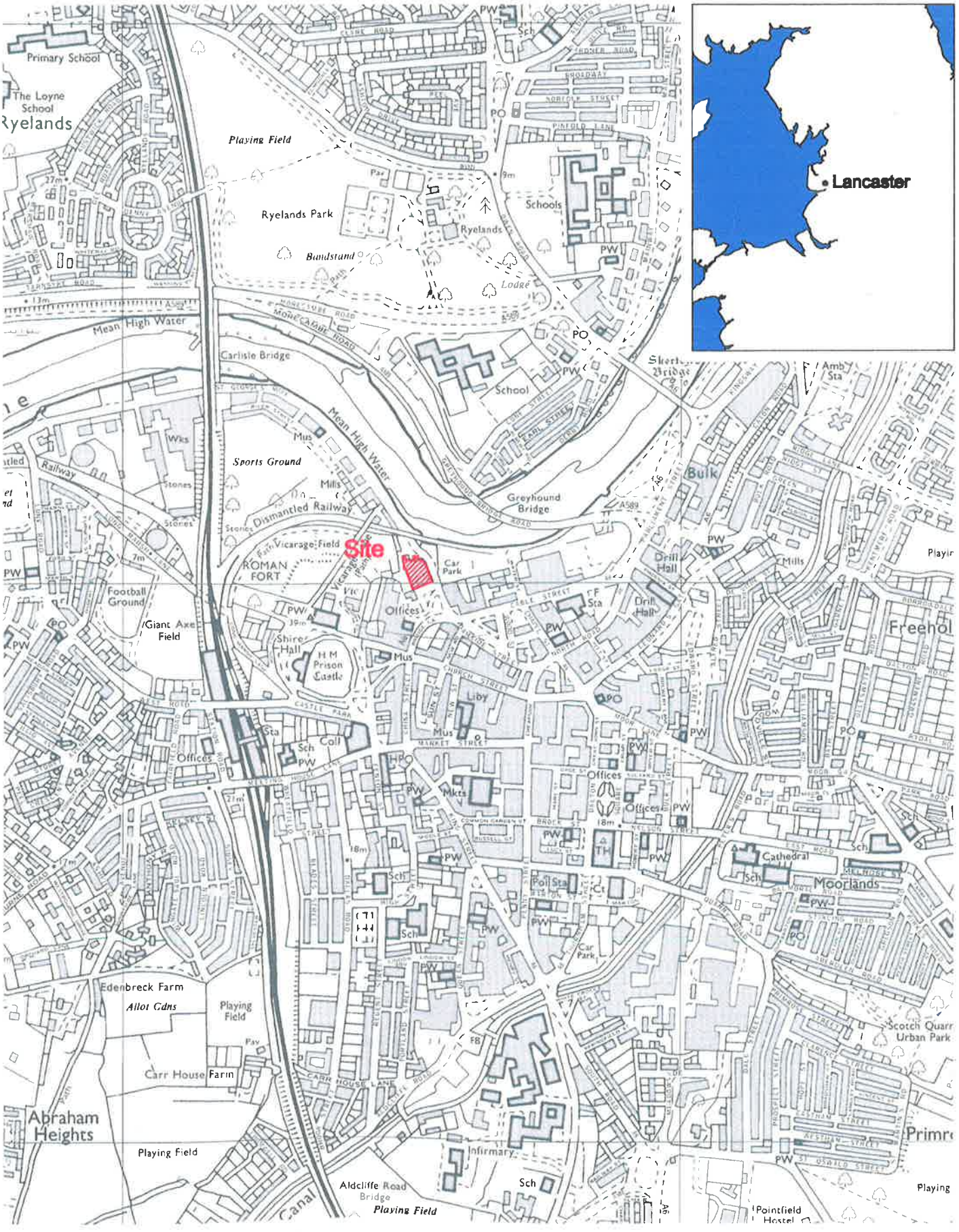


Figure 1: Site location map

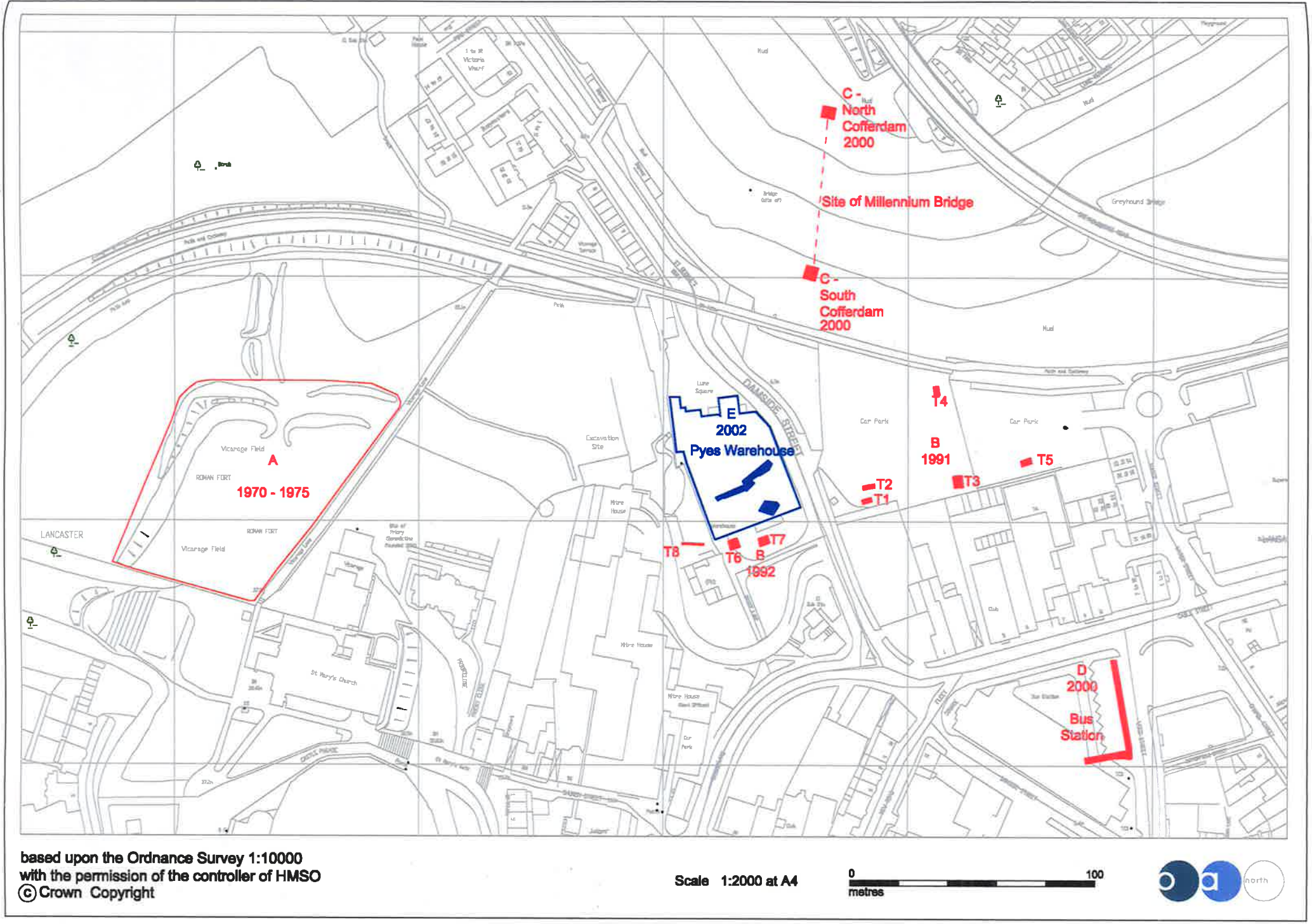


Figure 2 : Location of previous archaeological interventions

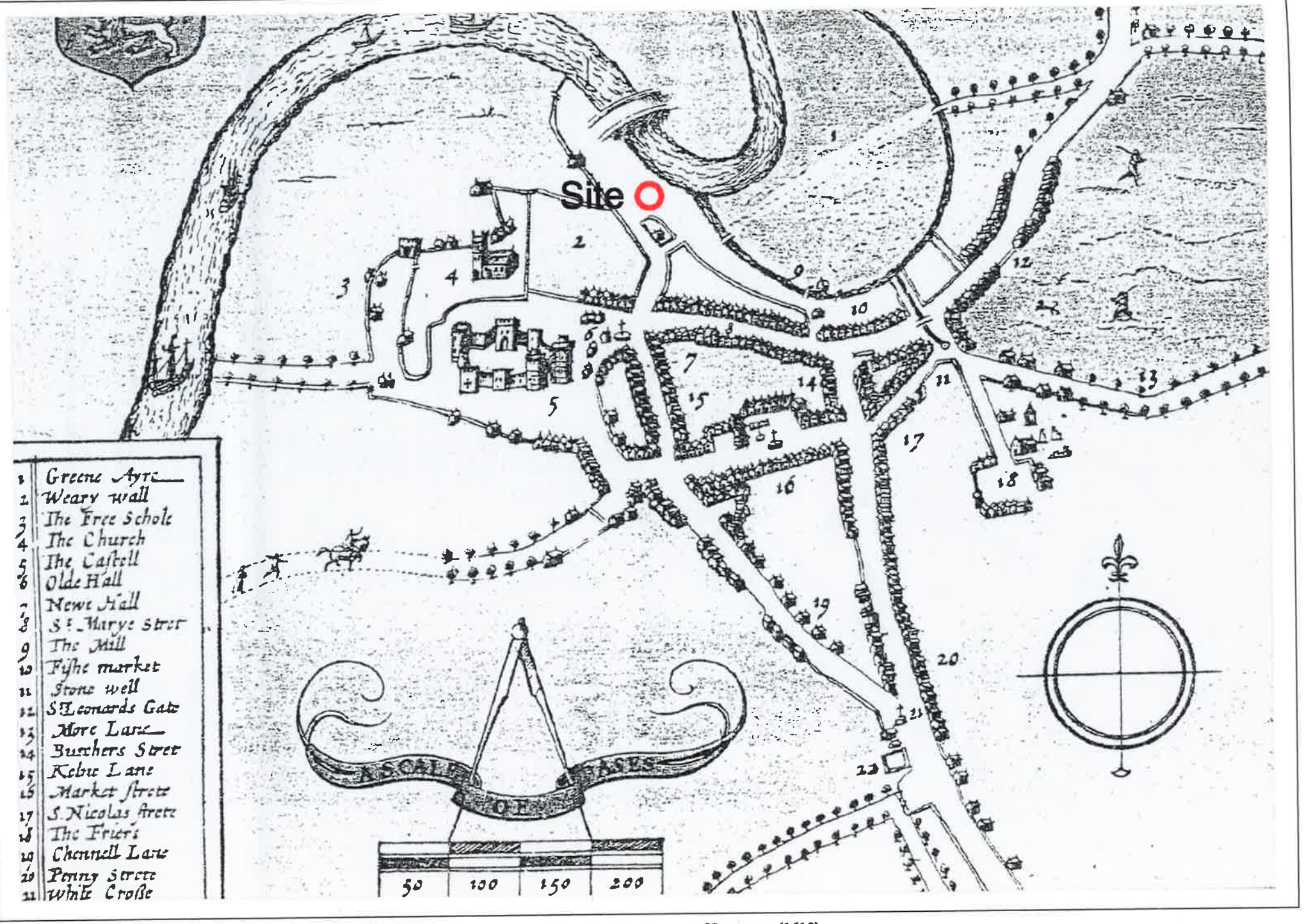


Figure 3 : Speed's map of Lancaster (1610)

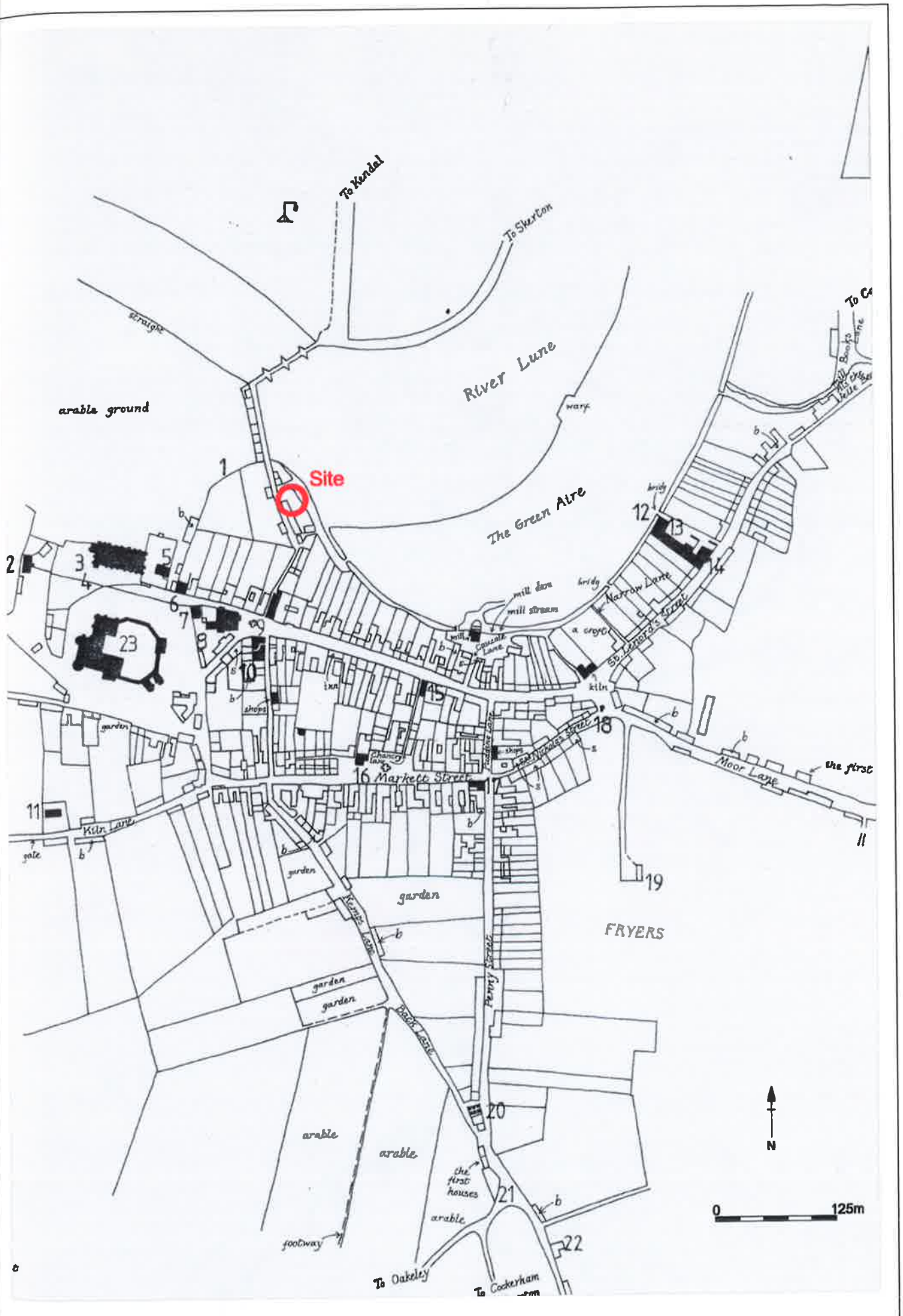


Figure 4 : Docton's map of Lancaster (1684)

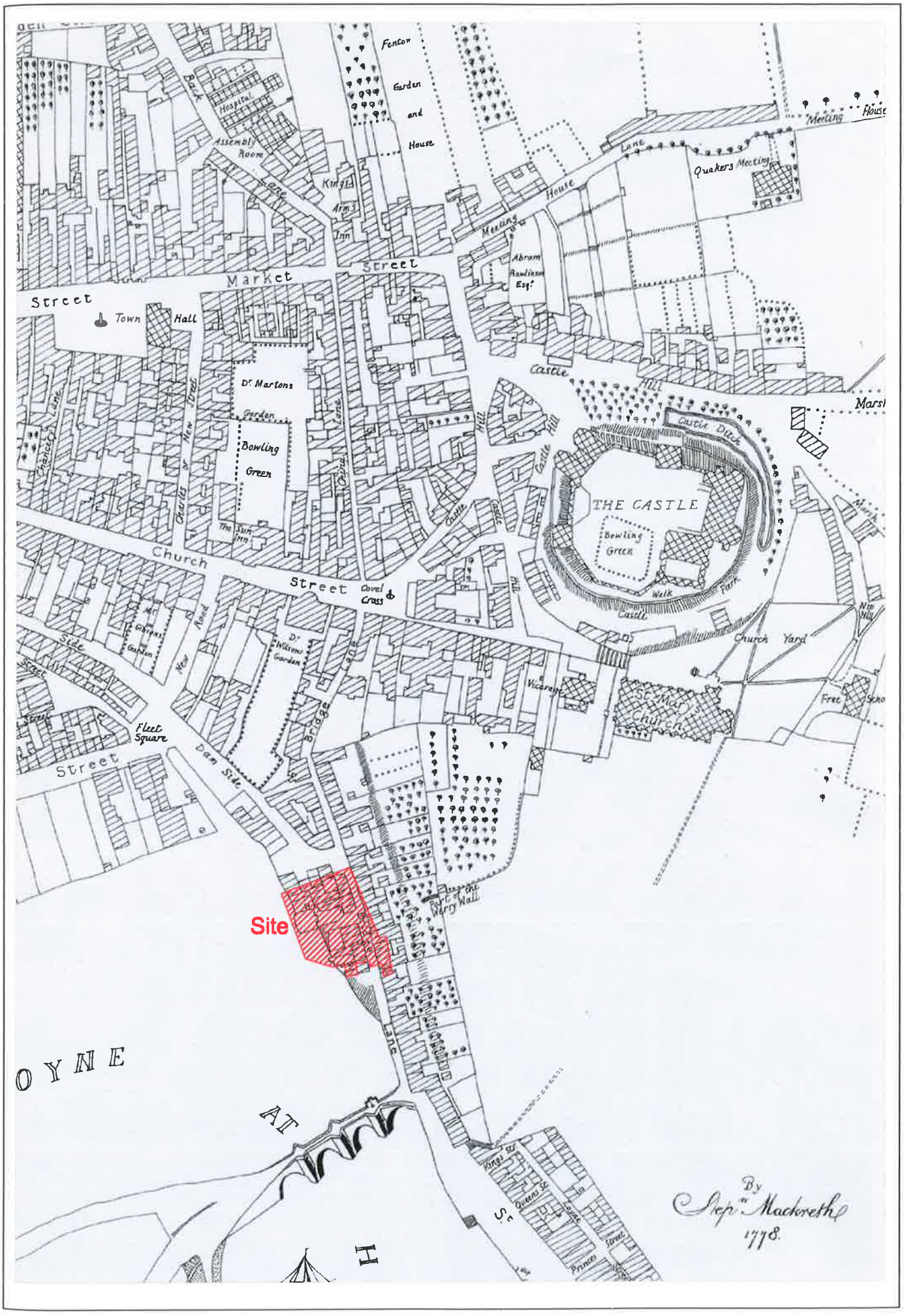


Figure 5: Mackreth's map of Lancaster (1778)

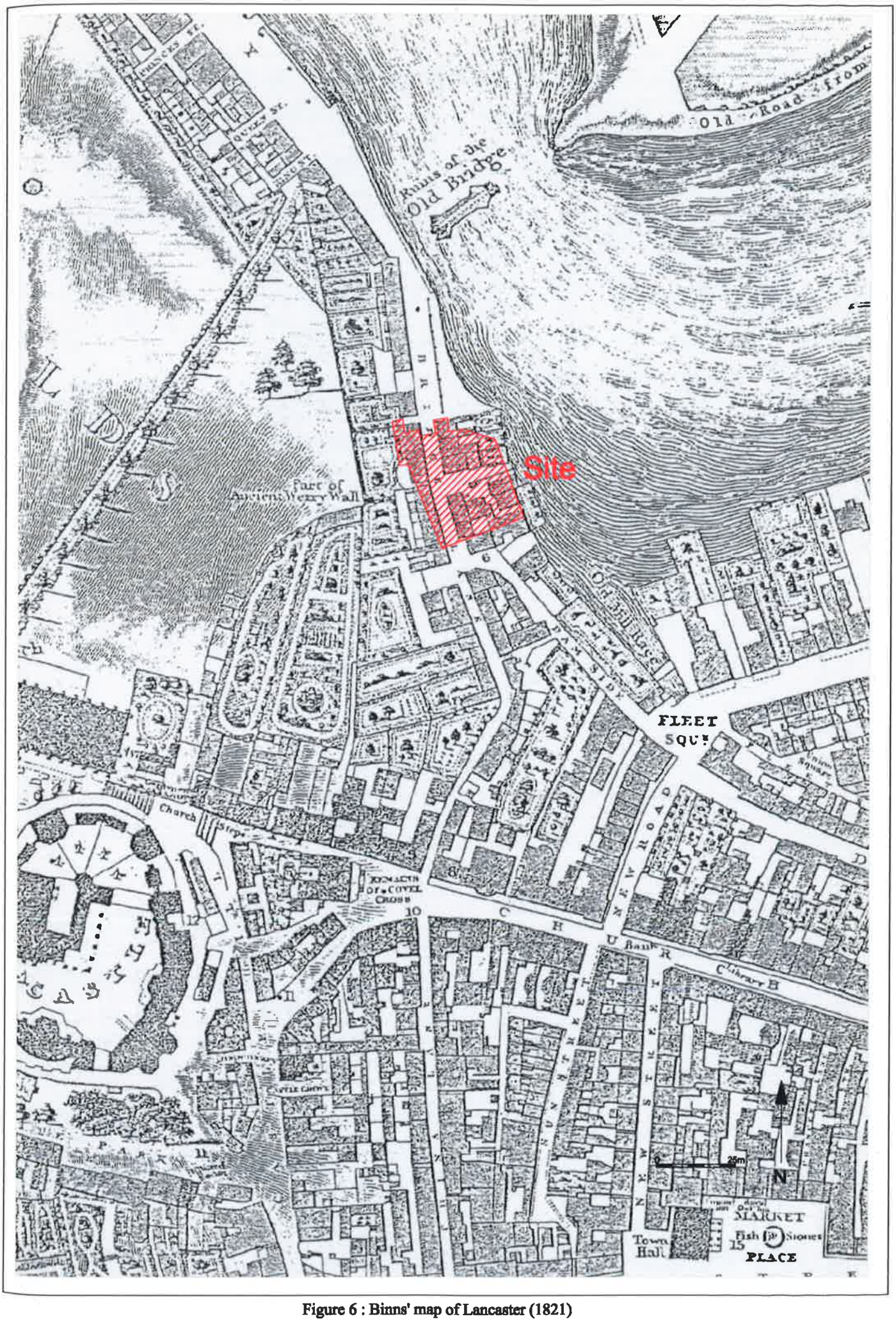
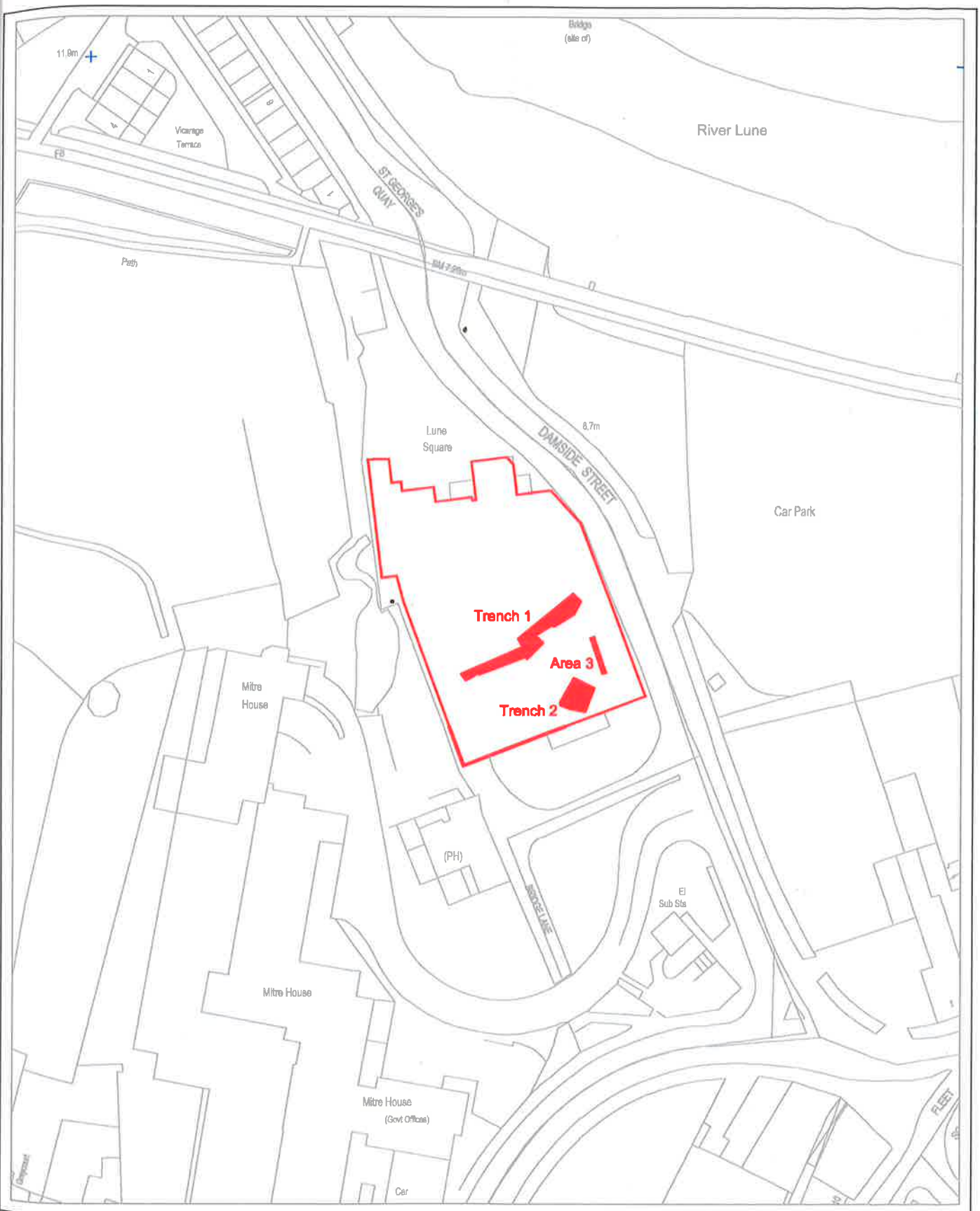


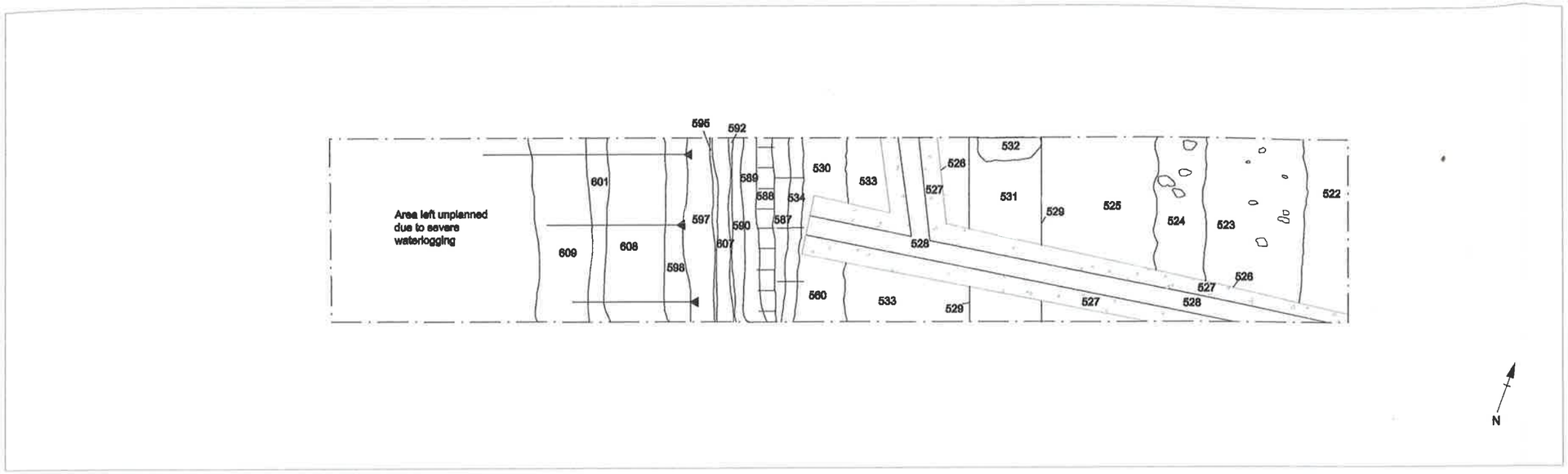
Figure 6 : Binns' map of Lancaster (1821)

Figure 7: Ordnance Survey 1st edition map of Lancaster (1849)

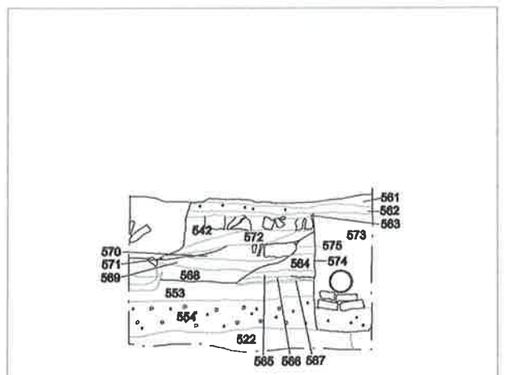


oa north Oxford Archaeology North Storey Institute Meeting House Lane Lancaster LA1 1TF Tel 01524 848666 Fax 01524 848606	PROJECT: Former Pyes Warehouse, Lancaster DRAWING No: 9 SCALE: 1:1000 at A4 TITLE: Plan of Warehouse and Trench Locations and Area of Watching Brief CLIENT Totty DRAWN BY: CEH DATE: September 2002	LOCATION: N	KEY: Warehouse Trench Locations SCALE: 0 25m

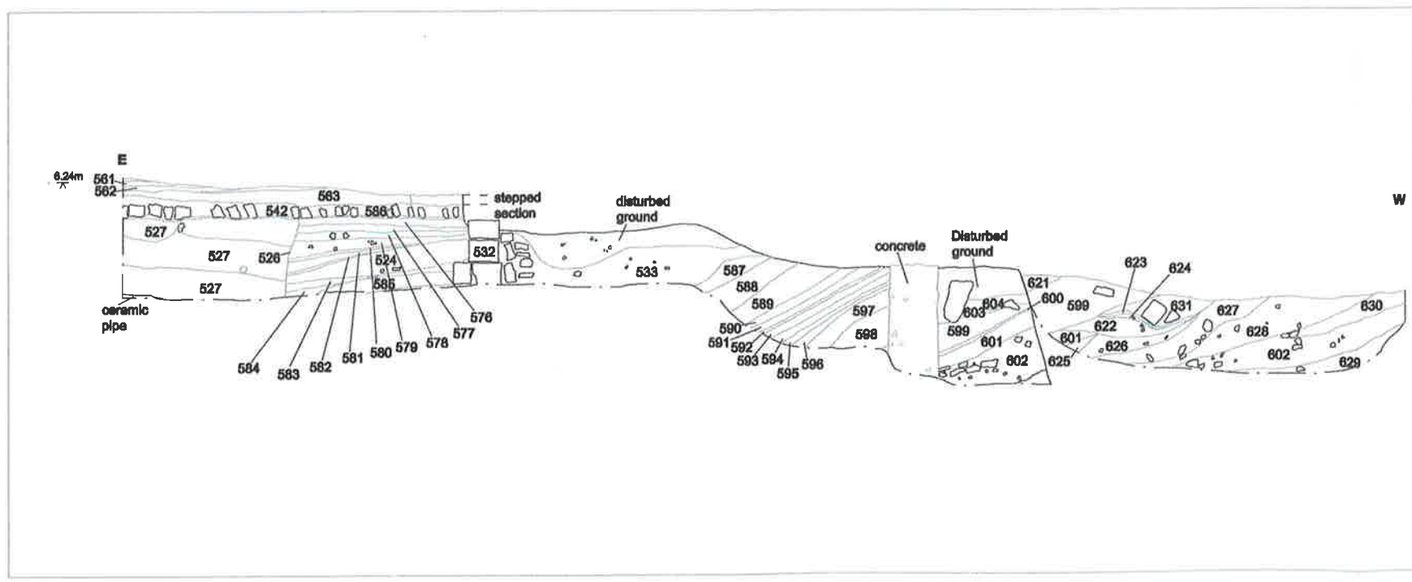
Figure 8: Plan of warehouse and trench locations



Plan of Features in Trench 1, East End



West-Facing Section at Eastern End of Trench 1



North-Facing Section at Eastern End of Trench 1

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PROJECT:

Former Pyes' Warehouse, Lancaster

DRAWING No: 9

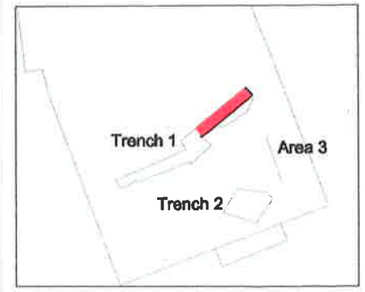
0 1m

Scale 1:50 at A3

DRAWN BY: CEH/EC

DATE: September 2002

LOCATION:



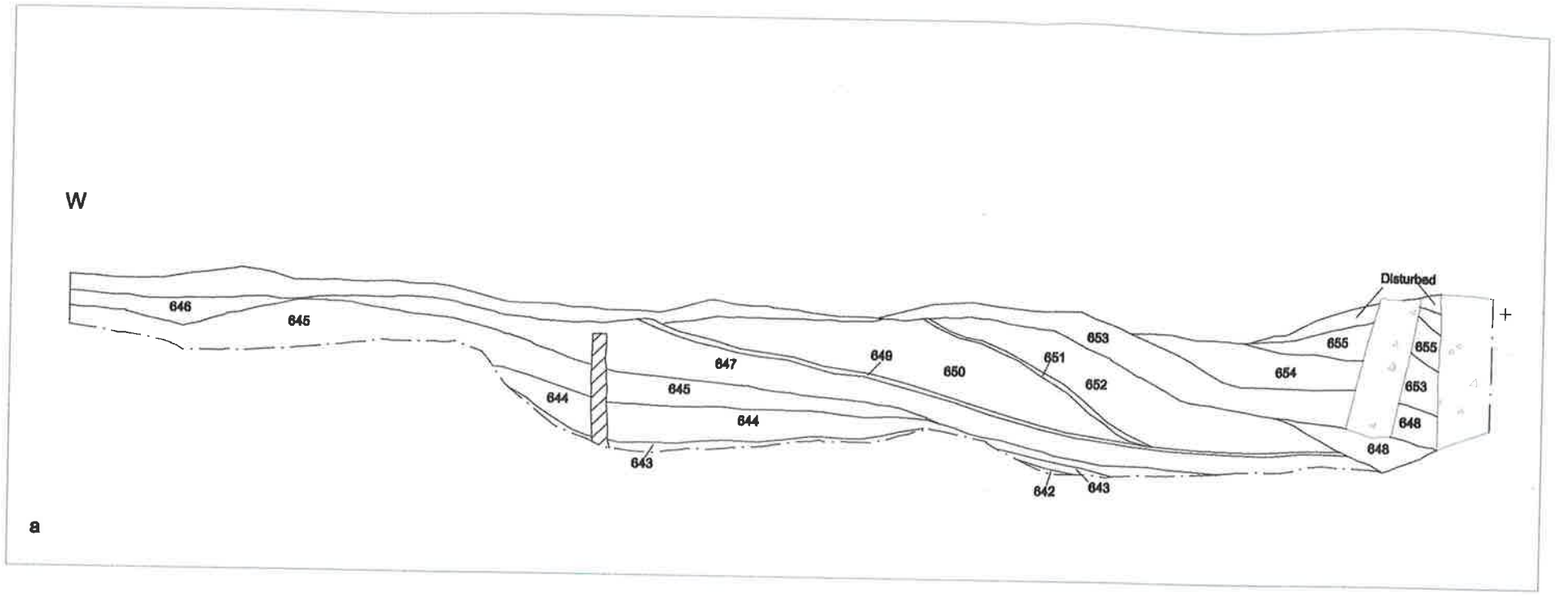
KEY

- Extent of excavation
- Context numbers 101
- Deposit
- Concrete

TITLE: Plan of Features in Trench 1, East End and North and West Facing Sections at Eastern End of Trench 1

COMMISSIONED BY: Totty Construction Group Plc

Figure 9: Plan of features in Trench 1, east end, and north and west facing sections at the eastern end of Trench 1



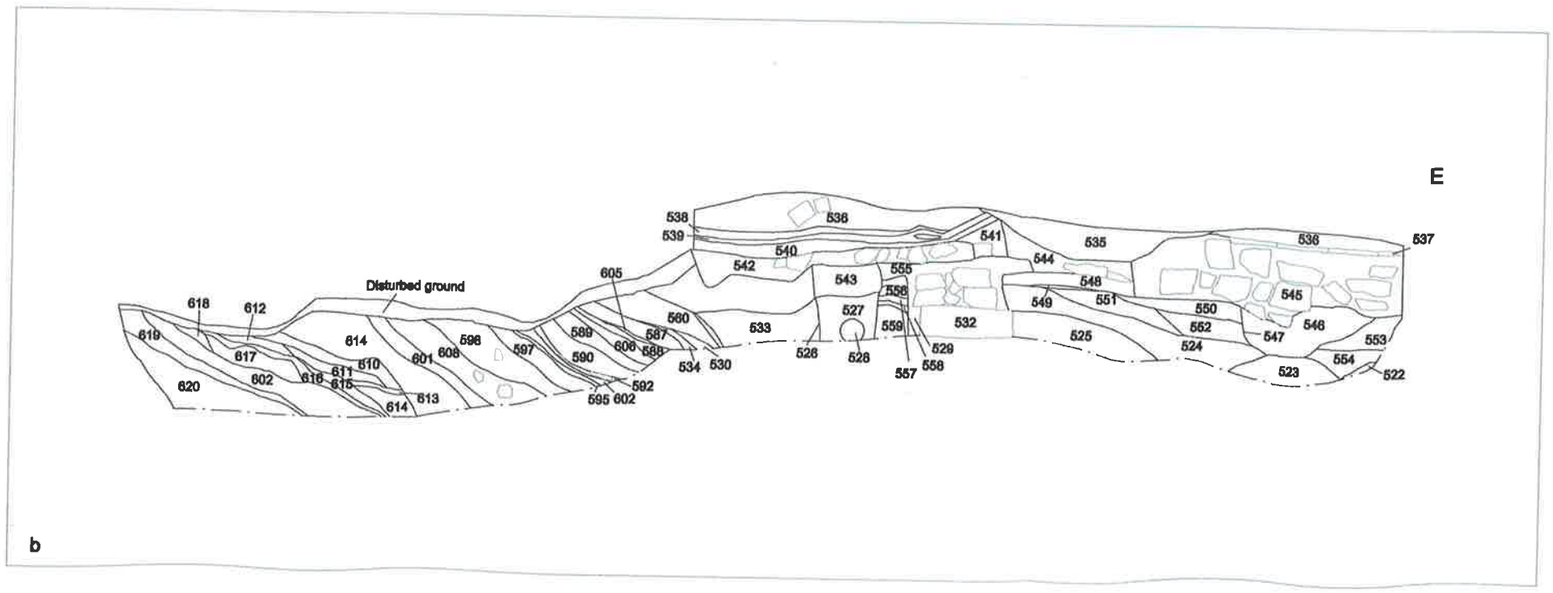


Figure 10 : South-facing section of Trench 1

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PROJECT:

Former Pyes' Warehouse, Lancaster

DRAWING No: 10

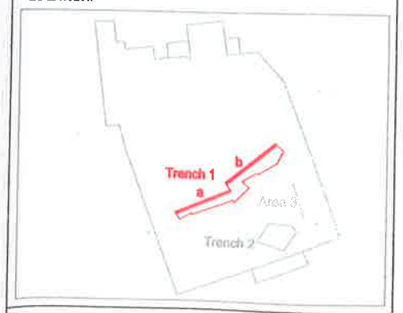
0 0.5m

Scale 1:20

DRAWN BY: CEH

DATE: September 2002

LOCATION:



KEY

Extant of excavation

Bottle

Context number 101

Concrete

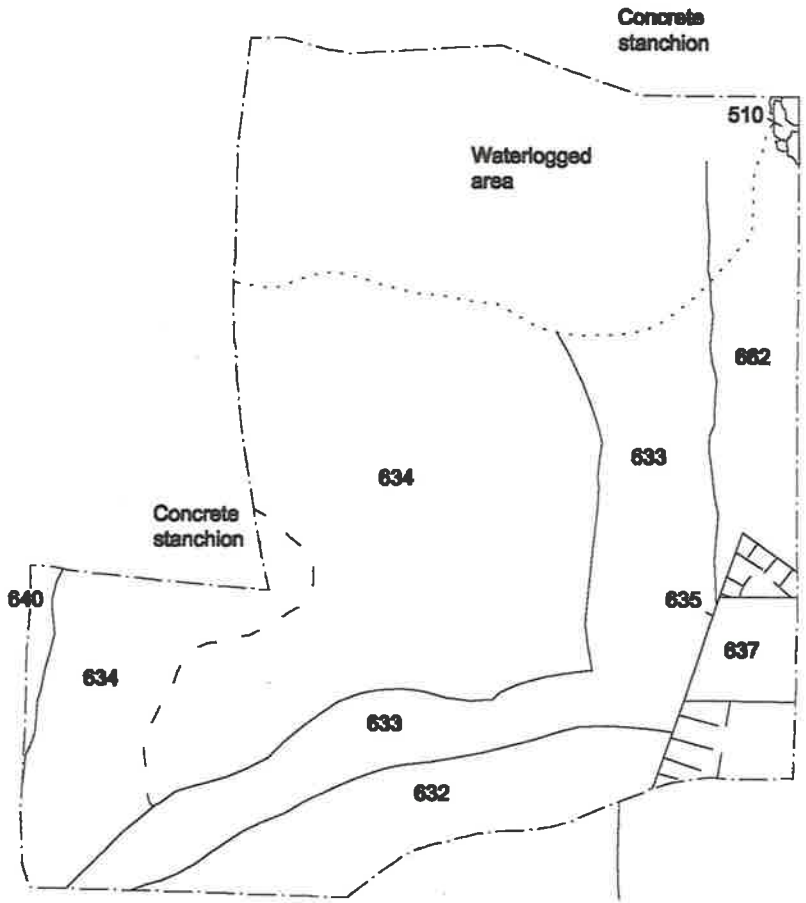
Unfaced stonework

TITLE:

South-facing Section of Trench 1

COMMISSIONED BY:

Totty



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PROJECT:

Former Pyes Warehouse
Lancaster

DRAWING No:

11

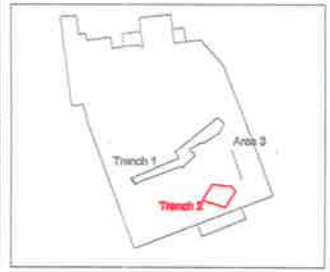
0 1m

Scale 1:50 at A4

DRAWN BY: CEHEC

DATE: September 2002

LOCATION:



KEY

Extent of excavation

Edge of water

Uncertain edge

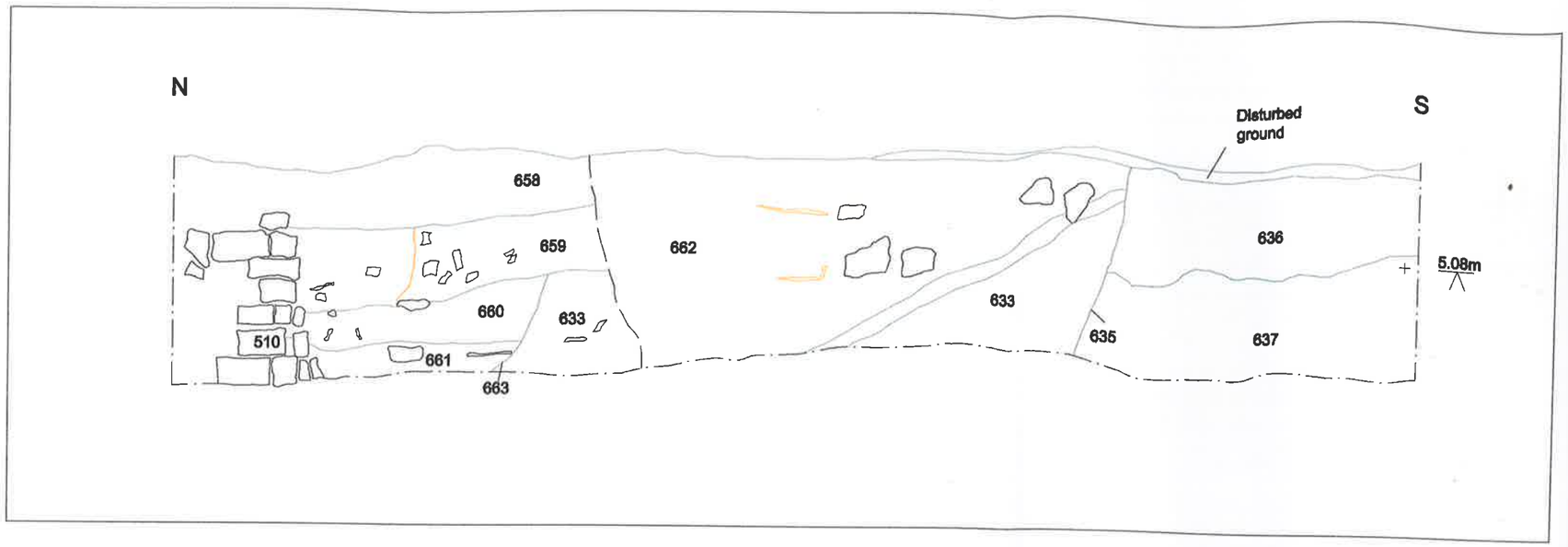
TITLE:

Plan of Features in Trench 2

COMMISSIONED BY:

Totty Construction Group Plc

Figure 11: Plan of features in Trench 2



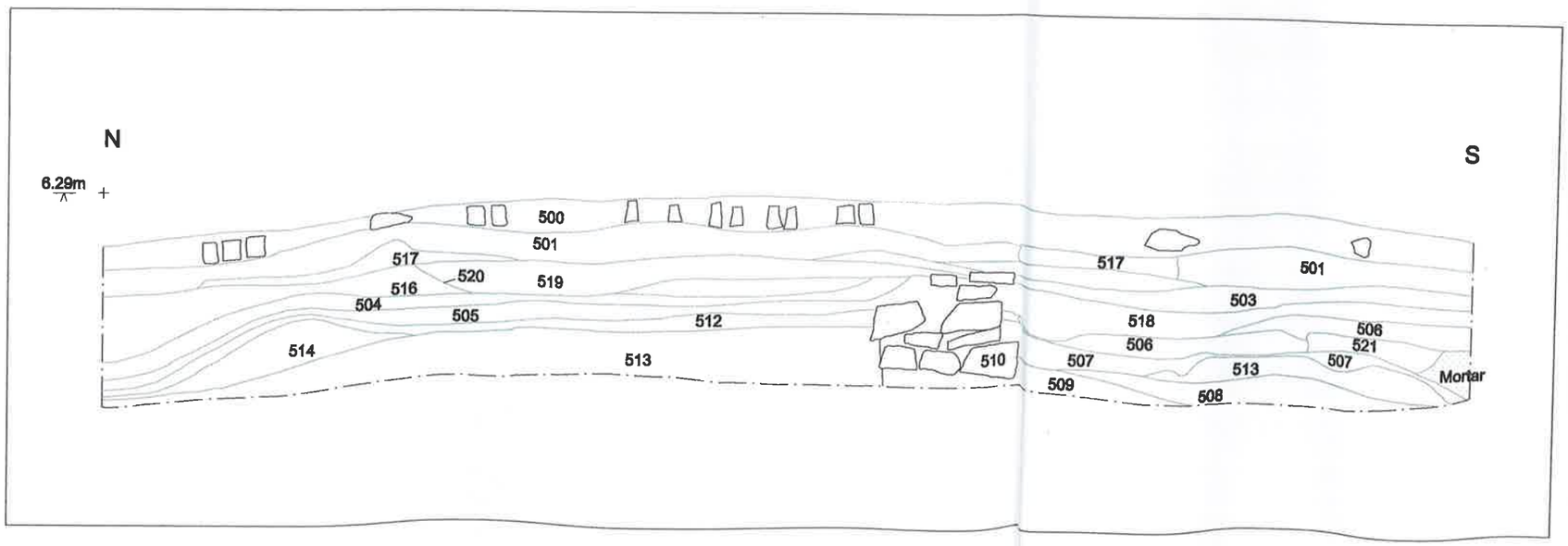


Figure 12: West-facing Section of Trench 2; and West-facing Section of Area 3

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LA1 1TF

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PROJECT:
Former Pyes' Warehouse, Lancaster

DRAWING No:
12

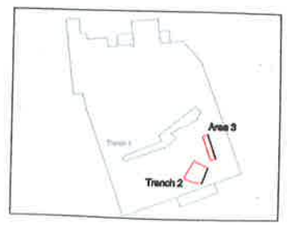
0 0.25m

Scale 1:10 at A3

DRAWN BY: CEH/EC

DATE: September 2002

LOCATION:

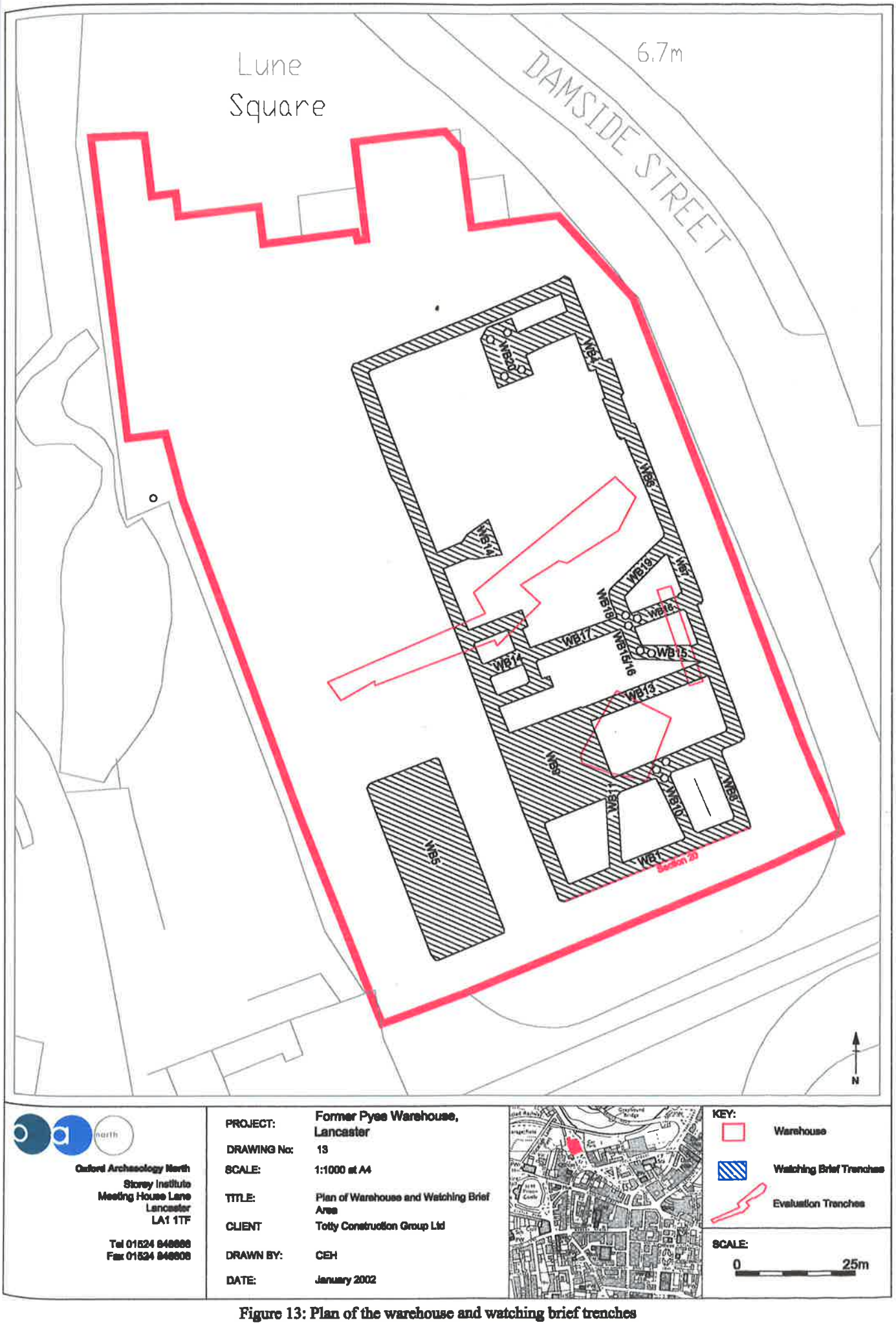


KEY

Extent of excavation
Mortar
Deposit
Fe
Context number 101

TITLE:
West-facing Section, Area 3; and West-facing Section, Trench 2

COMMISSIONED BY:
Totty Construction Group Plc



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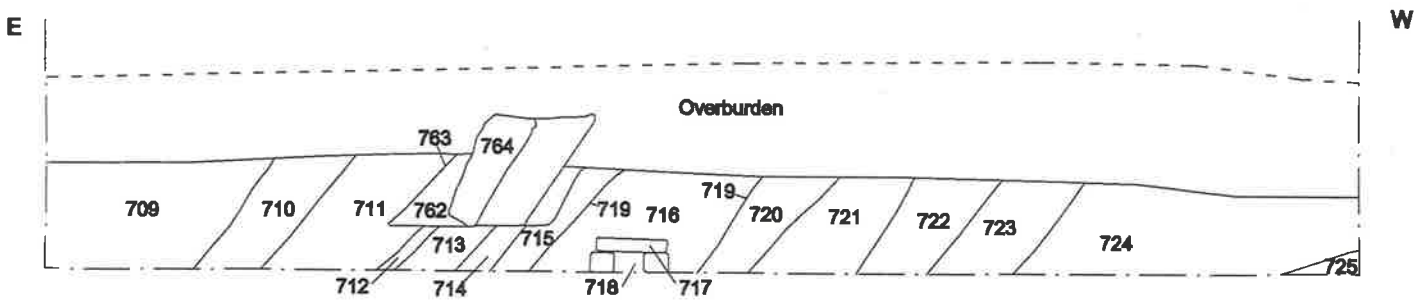
Tel 01524 848666
Fax 01524 848606

PROJECT:	Former Pyes Warehouse, Lancaster
DRAWING No:	13
SCALE:	1:1000 at A4
TITLE:	Plan of Warehouse and Watching Brief Area
CLIENT	Totty Construction Group Ltd
DRAWN BY:	CEH
DATE:	January 2002

KEY:
- Warehouse
- Watching Brief Trenches
- Evaluation Trenches

SCALE: 0 25m

Figure 13: Plan of the warehouse and watching brief trenches



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Lancaster
LA1 1TF

Tel 01524 848666
Fax 01524 848606

PROJECT:

Former Pyes Warehouse
Lancaster

DRAWING No:

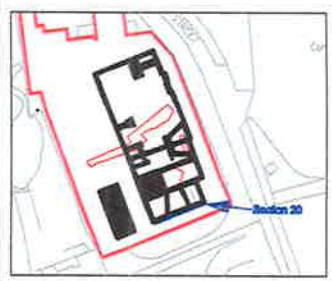
14

0 2m

DRAWN BY: EC / JQ

DATE: January 2002

LOCATION:



KEY

TITLE:

Watching Brief Section 20

COMMISSIONED BY:

Totty Construction Group Plc

Figure 14: North facing section (20) at the southern extent of the development

Plate 1: Plan view of the east end of Trench 1 from the east

Plate 2: Plan view of the east end of Trench 1 from the west

Plate 3: Trench 1, North facing tip lines, central section of East end of trench

Plate 4: Trench 1, South facing tip lines

Plate 5: Trench 1, Silt deposits in central section of trench

Plate 6: General view of Trench 2 looking south

Plate 7: Trench 2 Cut ***635***, looking north

Plate 8: Trench 2, Wall ***510*** looking east

Plate 9: Wall ***510***, exposed in the west facing section of Area 3

Plate 10: Foundation ***773*** cut into tipped material ***711*** and ***715*** associated with land reclamation

Plate 11: Culvert ***719***