



# **ST GEORGE'S QUAY, LANCASTER, LANCASHIRE**

## **Archaeological Watching Brief**

**Oxford Archaeology North**



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Prepared by: David Tonks Chris Healey  
Position: Assistant Supervisor Project Officer  
Date: May 2006

Checked by: Stephen Rowland  
Position: Project Manager Signed.....  
Date: May 2006

Approved by: Alan Lupton  
Position: Operations Manager Signed.....  
Date: May 2006

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**Oxford Archaeology North**

Storey Institute  
Meeting House Lane  
Lancaster  
LA1 1TF  
t: (0044) 01524 848666  
f: (0044) 01524 848606

w: www.oxfordarch.co.uk  
e: info@oxfordarch.co.uk

**© Oxford Archaeological Unit Ltd (2006)**

Janus House  
Osney Mead  
Oxford  
OX2 0EA  
t: (0044) 01865 263800  
f: (0044) 01865 793496

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## SUMMARY

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As part of a feasibility study for the construction of a flood defence system for the city of Lancaster, the Environment Agency proposed to conduct a programme of geotechnical site investigation on St George's Quay, Lancaster (centred on SD 476 620) to provide further information for the development. Following submission of a project design, which was approved by Lancaster County Archaeology Service (LCAS), Oxford Archaeology North (OA North) were commissioned by the Environment Agency (EA) to undertake a watching brief during all groundworks on the historic quay.

The groundworks, designed to locate the position of nineteenth and twentieth century services, were carried out in two phases: Phase 1 between 30<sup>th</sup> June and 11<sup>th</sup> July 2005 and Phase 2 between 5<sup>th</sup> December 2005 and 3<sup>rd</sup> March 2006. Phase 1 involved the excavation of six exploratory Service Inspection Pits (SIPs) set out at intervals along St George's Quay and dug to a maximum safe depth of 1.2m. Phase 2 comprised the re-excavation and then expansion of these SIPs using an excavating machine. A programme of monitored boreholing was also undertaken during Phase 2 of the groundworks, which was followed by a visit to the Norwest Holst laboratory in Leeds to examine any closed cores when they were opened for analysis.

During Phase 1, cobbled surfaces were encountered at a shallow depth; although these surfaces had been disturbed by the insertion of later services, dating evidence from stratified layers beneath the cobbled surfaces suggests that they were of nineteenth century date. During Phase 2, in addition to those surfaces identified in Phase 1, two layers of cobbled surface, separated by levelling material, were encountered in SIP 502. Although no dating evidence was found associated with the lower surface, it is possible that it relates to the eighteenth century quayside. Much of the material encountered within the SIPs appeared to have been imported sediment placed behind the quay wall, but, because the majority was redeposited natural material and largely devoid of finds, it was not always possible within the confines of the SIP to determine whether unadulterated natural deposits had been reached.

These observations suggest that elements of both the nineteenth and possibly the eighteenth century quayside partially survive beneath the modern landscaping. In addition, a sherd of Northern gritty ware pottery, dating from the twelfth to mid-thirteenth century, was recovered during Phase 1. This is highly significant, given the paucity of medieval pottery found anywhere within the city, and especially important considering that no medieval pottery has previously been recovered from the site of the quayside. During the Phase 2 works a large timber, sawn at the base and with clear tool-marks, was found in an upright position approximately 2.5m below the modern ground surface in SIP 405/505. The rather ambiguous radiocarbon date suggested that it dated from between the early nineteenth and the twentieth centuries, although a late seventeenth to early eighteenth century date, pre-dating the construction of the quay, may in fact be more likely.

The position of the preserved cobbled surfaces, just below the modern ground surface, means that any future development on the site, even if of only shallow depth, would have a negative impact on these features. Any additional archaeological work

on the site has good potential for furthering an understanding of the development of the quayside and of the techniques and means of its construction.

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## ACKNOWLEDGEMENTS

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Oxford Archaeology North (OA North) would like to thank Mike Maddocks of the Environment Agency for co-ordinating, commissioning and funding the work, and to Phil Catherall, the Environment Agency Archaeologist, for his advice during the fieldwork. Thanks are also due to both James Barr and Mark Burton of Norwest Holst, and to Chris Pace and colleagues of Mowlem for their assistance on site. OA North are also grateful to Peter Iles of Lancashire County Council Archaeological Service (LCAS) for his attention to the project, and to Simon Keys and Chris Parks of Halcrow for their continued liaison and assistance with the site works.

Halcrow organised the Phase 1 and Phase 2 works. Norwest Holst were responsible for the excavation of the Phase 1 SIPs and the Phase 2 boreholes. Mowlem were responsible for the excavation of the Phase 2 SIPs.

The watching brief was undertaken by Andy Lane, Caroline Raynor, Stephen Rowland and David Tonks, who also wrote the report, together with Chris Healey. The drawings were compiled by Christina Clarke and Marie Rowland, and the finds were examined by Jo Dawson and Christine Howard-Davis, with the exception of the medieval pottery, which was identified by Ian Miller. The project was managed by Stephen Rowland, who also edited the report, together with Alan Lupton.



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## 1. INTRODUCTION

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### 1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 In exploring the logistics of installing a new flood defence system for Lancaster, Lancashire, the Environment Agency (EA) contracted Halcrow to conduct a programme of reconnaissance for old services along St George's Quay (centred on SD 476 620; Fig 1). St George's Quay is one of Lancaster's most significant post-medieval monuments and, accordingly, the Environment Agency Archaeologist requested that Oxford Archaeology North (OA North) submit a project design for a watching brief to be undertaken during groundworks on the quay. The project design (*Appendix 1*) was approved both by EA and Lancashire County Archaeological Service (LCAS), and OA North was subsequently commissioned to conduct the watching brief. An initial scheme of site investigation, undertaken between 30<sup>th</sup> June and 11<sup>th</sup> July 2005, involved the hand-excavation of five service inspection pits (SIPs) placed in order to locate a range of late nineteenth and twentieth century services down to a maximum safe depth of 1.2m (Fig 2). These SIPs, each measuring c 0.5m wide, were numbered 401 to 406, and were excavated across the grass verge on the north-east side of the road along the quay.
- 1.1.2 Following completion of Phase 1, a second phase of site investigation was undertaken between 5<sup>th</sup> December 2005 and 17<sup>th</sup> February 2006. This involved the use of a mechanical excavator to re-excavate, deepen and expand the width of the original SIPs through the footpath and verge. The Phase 2 SIPs were numbered 501 to 506, the last digit corresponding to that of the Phase 1 SIPs. On completion of SIPs 502, 504, 505 and 506, boreholes identified by the same numbers were drilled into each of these backfilled interventions. The granular materials removed from these cores were examined in the field by an OA North palaeoenvironmentalist, whilst the cohesive samples were examined in the Norwest Holst laboratory in Leeds, on 3rd March 2006. This report sets out the results of the archaeological watching brief and palaeoenvironmental monitoring in the form of a short document.

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## 2. METHODOLOGY

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### 2.1 PROJECT DESIGN

- 2.1.1 The project design (*Appendix 1*), approved by LCAS and EA, was adhered to in full and the work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists and generally accepted best practice.

### 2.2 WATCHING BRIEF

- 2.2.1 Close liaison was maintained between OA North staff and the site contractors during the watching brief. The groundworks were effected both manually and by mechanical excavator. The programme of field observation accurately recorded the location, extent, and character of any surviving archaeological features. This work comprised observation during the groundworks, the examination of any horizons exposed and the recovery, processing and storage of artefacts according to current standard practice based on guidelines set by the Institute of Field Archaeologists
- 2.2.2 The recording comprised a description and preliminary classification of features or structures revealed on OA North *pro-forma* sheets, and their accurate location in plan. In addition, a photographic record in colour slide and monochrome formats was compiled.

### 2.3 BOREHOLE MONITORING AND SEDIMENT DESCRIPTIONS

- 2.3.1 In addition to the field observations, an OA North environmental archaeologist liaised with the Norwest Holst soil specialist/field director in order to produce a record of the sediments from the four cores taken during the field investigations. This involved several visits to the site compound at St George's Quay, where descriptions were made of the granular bulk samples taken during the coring, and a visit to the Norwest Holst head offices in Leeds where descriptions were made of the sealed cohesive cores.

### 2.4 ARCHIVE

- 2.4.1 A full archive of the work undertaken has been produced to a professional standard in accordance with current English Heritage guidelines (English Heritage 1991). The archive will be deposited in the Lancashire County Record Office in Preston, and a copy of the report, along with an index to the archive, will be forwarded to the Lancashire Sites and Monuments Record.

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### 3. BACKGROUND

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#### 3.1 LOCATION AND TOPOGRAPHY

3.1.1 The site (centred on SD 476 620; Fig 1) occupies a section of the south-west bank of the River Lune. The majority of the works were excavated on an area of landscaped grass verge between the road of St George's Quay to the south-west and a pedestrian footpath to the north-east. The surrounding area is generally flat, being close to the Lune estuary, but it rises quite steeply to the south, towards Castle Hill. The area is one of continued urban regeneration with the redevelopment of warehouses and buildings previously associated with the quayside.

#### 3.2 GEOLOGY

3.2.1 The solid geology of Lancaster consists predominantly of Silesian (Upper Carboniferous) 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 drift geology has been mapped as glaciofluvial sheet deposits of clayey sands and gravels (*ibid*). However, the soils in the vicinity of the specific site are classified only as Urban by the Soil Survey (1983) and otherwise remain unclassified.

#### 3.3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.3.1 **Prehistoric period:** there is scant evidence for prehistoric activity in and around Lancaster and there are no known examples within the present development area. 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 activity and provide little information on settlement or other aspects of life (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.

3.3.2 **Roman period:** the Roman settlement at Lancaster originated in the late first century AD when the military made use of a commanding position overlooking a strategic crossing point of the river Lune (OA North 2003). Successive forts were situated on Castle Hill, to the south of the subject site, throughout the period of Roman rule in Britain (*ibid*). The latest, fourth century, fort seems to have been realigned parallel to the Lune, and the similarity in design to the Saxon Shore forts of southern Britain has led to the suggestion that it guarded a harbour and acted as a fleet supply base (Shotter 1993, 92-3; 1997).

- 3.3.3 It is, however, believed that in Roman times the river Lune ran somewhat to the south-east of its current course, and interleaved deposits of riverine silt and occupation debris of Roman date at the base of Castle Hill are thought to represent the remains of an extended river frontage (OA North 2003). It is also held that a Roman bridge over the Lune was located at a point along the bank now occupied by St George's Quay.
- 3.3.4 **Medieval and post-medieval period:** there is no documentary or physical evidence for medieval occupation of what would have been a very damp and marshy area around the site of St George's Quay. By the ninth century a church clearly existed within the former fort area on Castle Hill (Newman 1996), which by 1086 formed the centre of a vill, *Chercaloncastre* (or Church Lancaster) dependent on the manor of Halton (Penney 1981, 13-4). There are records of a port at Lancaster during the medieval period, although there are no details concerning the position or nature of early wharves (Penney 1981, 20).
- 3.3.5 Both Docton's reconstructed map of 1684 (Docton 1957) and Mackreth's map of 1778 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. The quay itself was built and paved some time during the 1750s, paid for by funds raised by the Lancaster Port Commission (Dalziel 2001), a body brought into being by an Act of Parliament in 1749 (*ibid*). By 1759 it is reported that ships of up to 300 tons were berthing at the quay which was then "200 yards" in length (*ibid*). During the eighteenth century, development of wharves and warehouses associated with the quayside was preceded by consolidation of the waterfront area through the dumping of large amounts of material, including a high proportion of re-deposited refuse (OA North 2003).
- 3.3.6 In 1764, Richard Gillow's new Palladian-style Custom House was completed for the Port Commission. This survives today as the Maritime Museum and the commissioners continued their development of the area, building in 1768 a New Quay downstream of St George's Quay to accommodate larger and deeper-draughted ships as demand grew (Dalziel 2001). The medieval bridge was superseded by the Skerton Bridge in 1788, and the early bridge was partly demolished by Brockbanks shipbuilders on Green Ayre in 1802. 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). This economic growth was accompanied by population growth and subsequent property development, particularly in the areas of Green Ayre and St George's Quay itself (*ibid*).
- 3.3.7 This period of relative wealth lasted until the early nineteenth century (Ellis 1998a and 1998b) when the number of trans-Atlantic voyages in and out of Lancaster rapidly declined, and the profitability of trade with the Caribbean plantations on which Lancaster was so reliant was eclipsed by the North and South American plantations. The Lune Shipbuilding Company, formed in 1863, only constructed six vessels before being wound up in 1870, due to Lancaster's disadvantages as a location (White 1988), compared to

neighbouring Barrow, which enjoyed close ties with the adjacent Backbarrow Ironworks.

- 3.3.8 In the latter half of the twentieth century, after the quay had fallen into disuse, the associated buildings were largely redeveloped or converted for domestic use and parts of the area were newly landscaped as recently as the present century (P Iles, *pers com*).

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## 4. RESULTS

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### 4.1 INTRODUCTION

- 4.1.1 In total, six service inspection pits (SIPs) were opened during each phase of the watching brief (Fig 2). The SIPs were numbered from 401 to 406 in Phase 1, and from 501 to 506 in Phase 2, with the last digit of each Phase 2 SIP corresponding to the last digit of the Phase 1 SIPs. The SIPs were excavated in order to determine the presence of modern services, in particular, the depth and location of two cast-iron water service pipes. The SIPs were mostly aligned approximately north-east/south-west with the exception of SIP 401/501, which was aligned almost north/south, and most were opened in two separate sections; the north-eastern half was opened through what is currently a concrete path while a south-western section was excavated under the present landscaped grass verge. All Phase 1 SIPs were hand-excavated, whilst those of Phase 2 were excavated using a combination of manual and mechanical means.
- 4.1.2 During Phase 1, contexts within SIPs from which stratified finds were recovered were allocated three-digit numbers, the first digit of which referred to the SIP number; thus contexts in SIP 401 were allocated context numbers starting from **100**, those in SIP 402 from **200**, etc. In Phase 2, contexts were allocated four-digit numbers, with again, the first digit of the sequence relating to the SIP number.

### 4.2 SERVICE INSPECTION PITS

- 4.2.1 **SIP 401; SIP 501:** this trench was aligned north/south and measured 6.4m x 0.36m x 1m deep during the Phase 1 groundworks, and was not re-excavated during Phase 2. The excavated material beneath the grass verge comprised entirely made ground. Several service ducts were observed, but no archaeological horizons or deposits were encountered. The stratigraphy comprised a 0.2m thick layer of turf and mid-brownish-grey sandy clay topsoil over a 0.25m thick white crushed stone and concrete levelling layer. This lay directly over a 0.55m thick layer of imported, crushed white stone in a brown sandy clay matrix.
- 4.2.2 The stratigraphy beneath the pathway was seen to comprise a 0.2m thick layer of topsoil over a 0.7m thick layer of imported crushed stone backfill, which in turn overlay a 0.4m thick layer of mid- to light brownish-grey crushed concrete and stone. This sealed a layer of dark grey stony material. No archaeological horizons or deposits were encountered.
- 4.2.3 **SIP 402; SIP 502:** SIP 402 was excavated across the verge and measured 3.8m x 0.5m x 0.9m deep. The north-eastward extension of this trench into the pathway resulted in dimensions during Phase 2 of 6.8m x 1.5m x 2.5m deep (max). The stratigraphy at the south-western end of the trench beneath the grass verge comprised a layer of dark brown/black sandy clay, up to 0.53m

thick and containing modern inclusions, which represented imported topsoil (**200/2000**). At the south-western end of the SIP, this topsoil sealed a cobbled surface (**2001**; Figs 3 and 4; Plate 1), bounded to the south-west by an alignment of kerbstones (**203**; Plate 2). Abutting the south-western side of kerbstones **203** was a setting of larger rectangular cobbles, **204**, arranged in two rows, themselves bounded to the south-west by an area of concrete, **205**, that extended beneath the current quayside road. Cobbled surface **2001** extended c. 1.8m to the north-east, before being truncated by modern disturbance related to the installation and decommissioning of a series of service ducts within mixed dark brown sandy clay deposit **206**. Context **206** was up to 0.8m thick and contained a number of redeposited cobbles, as well as a single sherd of mid-nineteenth to early twentieth century pottery (*Appendix 3*). The cobbles of **2001** were set into a 20mm thick layer of tarry asphalt, below which was encountered a 0.22m thick layer of very mixed, dark brown sandy-clay with some gravel (**2002**) and containing white earthenware and slip-decorated redware, both dating to the nineteenth century or later (*Appendix 4*).

- 4.2.4 At a depth of 0.75m below the existing ground surface and sealed by **2002**, a further well-laid cobbled surface (**2003**) was observed extending from the south-western end of SIP 502 for a distance of c. 1.8m, where it had been disturbed by the same service pipe as that which had truncated surface **2001**, above (Fig 5; Plate 3). Surface **2003** had a marked camber of 0.15m from the north-east to south-west, although the central portion had been truncated by disturbance. The cobbles of **2003** were embedded in the upper surface of **2004**, a loose, light brown sand with some silt and gravel inclusions which was excavated to a depth of 2m. The same material was identified as context **208** in SIP 402 during Phase 1 of the groundworks, and was observed to have fine laminations, as might be expected of river silt. This material appeared to continue to the south-west, beneath the unexcavated areas of kerb **203** and cobbles **204**. Several service ducts were observed to a depth of 0.8m from the current ground surface, but no further significant archaeological horizons or deposits were encountered.
- 4.2.5 The Phase 2 extension across the pathway measured 2.5m in length by 1.3m deep. The entire stratigraphy beneath the pathway comprised off-white crushed stone, which was removed to reveal the sought water pipe within the base of the intervention.
- 4.2.6 **SIP 403; SIP 503**: SIP 403 measured 3.8m x 0.5m x 0.9m deep (max) while SIP 503 measured 5m x 1.5m x 3.7m deep (max). The stratigraphy beneath the grass verge comprised a 0.6m thick layer of dark brown sandy clay topsoil (**300/3000**) with cobble inclusions overlying a thin layer of asphalt (**301/3003**). This sealed a cobbled surface (**3001**; Plate 4), which extended across the entire area of SIPs 403 and 503 beneath the verge. The cobbles were embedded in a very mixed, redeposited, brown, stony gravelly sandy-clay (**303/3002**) from which salt-glazed service pipe fragments (not retained), brown-glazed red earthenware, stoneware and white earthenware, all dating to the nineteenth century or later, were recovered (*Appendix 3*). Context **303/3002** had been deposited above yellowish-orange silty clay **304**, which itself appeared to be made ground. At a depth of 2m, two parallel wooden

planks, laid laterally 0.45m apart and supported by a transverse strut, were encountered embedded in dark silver-grey silt (**3004**). This was the shoring and trench for the old water-pipe, which was encountered at a depth of 3.7m beneath the modern ground surface. The water pipe was located at the far south-western end of SIP 503, and was only contacted by digging at an oblique angle beneath the quayside road. It was not, therefore, possible to determine any relationship between this early service and cobbled surface **3001** within the SIP.

- 4.2.7 During Phase 2, SIP 503 was extended to the north-east beneath the pathway. Machine excavation of an area 2.5m north-east/south-west by 0.95m deep revealed a ceramic water pipe at the base of the SIP, sealed by a backfill deposit of loose, dark brown rubble-rich sandy clay with occasional cobbles. A further excavation was undertaken through the pathway 1-2m to the east of SIP 503, encountering the same water pipe at a depth of 1.3m, sealed beneath the same backfill deposit. Excavation of the north-east end of the extension of SIP 503 was curtailed at this depth. No archaeological horizons or deposits were encountered, although finds of unstratified pottery were retained and identified as being of nineteenth century date or later (*Section 4.4*). Whilst several service ducts were observed, no further archaeological horizons or deposits were encountered.
- 4.2.8 **SIP 404; SIP 504:** SIP 404 measured 3.2m x 0.6m x 1.1m deep (max) across the verge, with a further 2.05m x 0.6m x 1.1m deep extension across the footpath. SIP 504 was excavated across both the footpath and the verge and measured 5.7m x 1.5m x 3.7m deep (max). The stratigraphy beneath the verge comprised a 0.6m thick layer of loose, dark brownish-grey sandy clay topsoil (**400/4000**) with occasional inclusions of redeposited cobbles. This lay directly over a thin layer of asphalt (**401**) which sealed a cobble surface (**403/4001**) extending for 2.12m to the north-east (Plate 5), whereupon it was truncated by the installation of a modern service. Although it was not possible to be certain, the cobbles appeared to continue beneath the north-eastern edge of the modern road surface. The cobbles were simply embedded in loose, very mixed, dark grey sandy clay with some clinker and ashy material (**404/4002**), which became increasingly thick to the east. Finds of nineteenth century white-glazed pottery were recovered from this layer which, at a depth of 0.85m, overlay a mid- to light brown, very sandy clay with some cobbles and sub-rounded stones (**405/4003**); this extended beyond the limit of excavation and was interpreted as natural geology. As with SIP 502, hand-excavation continued at an oblique angle beneath the current road, and encountered the sought water pipe 3.7m below the ground surface. During Phase 1, a single rimsherd from a large Northern gritty ware globular jar dating from the twelfth- to mid-thirteenth century was retrieved from the spoil heap.
- 4.2.9 The stratigraphy beneath the pathway entirely comprised a backfill deposit of dark brown sandy clay with rubble and cobble inclusions. The water pipe was located at a depth of 1.15m, whereupon the excavation was curtailed. No archaeological horizons or deposits were encountered,
- 4.2.10 **SIP 405; SIP 505:** SIP 405 measured 3.2m x 0.7m x 1.3m deep (max) across the verge and was extended by 2m across the pathway. SIP 505 measured



5.5m x 1.5m across both the verge, where it was 2.8m deep (max), and the footpath, where it was only 1.2m deep. The stratigraphy beneath the verge comprised 0.3m of imported dark grey sandy clay topsoil (5005) over 0.05m of asphalt (5006), which sealed a layer of poorly laid, previously disturbed cobbles (5007) at the western end of the SIP. These cobbles were likely to have been re-instated, as a concrete service duct was located directly underneath their position and they would have had to have been removed for it to have been installed. Beneath the cobbles was a loose, light brown sandy clay backfill layer (5008), in which several modern services were encountered at various depths, to a maximum of 1.3m. Beneath the services was a loose, mid-brown sandy gravelly stony clay with some cobbles and occasional boulders (5009). This was interpreted as redeposited natural; however, an upright wooden post was encountered at a depth of 2.05m beneath the modern footpath surface. The timber measured 0.72m in height and was 0.34m in diameter at its base. The fact that the post was found in an upright position would suggest that it had been intentionally set as opposed to having been redeposited (Section 4.4.4). Although the SIP was excavated to the base of the timber, in order to aid its recovery, the very limited width of the SIP at this point, restricted to the north and west by the presence of two modern services, meant that it was not possible to determine if there was any change in the surrounding substrate to suggest whether 5009 was *in situ* natural material, or had been redeposited.

4.2.11 The stratigraphy beneath the pathway (Fig 6; Plate 7) comprised a 0.1m thick layer of concrete (501/5000), over 0.05m of asphalt (502/5001). This sealed a cobble surface (Plate 6) in a mid-grey sandy clay matrix (503/5002) which extended across the entirety of the exposed area beneath the footpath. This surface directly overlay a very mixed sandy clay deposit (504/5003) with some gravel and angular stones from which a single sherd of nineteenth or twentieth century, self-glazed stoneware was recovered. There were two sandstone blocks observed at the north-east end of the section (Fig 5), but they were not structural or *in situ*. To the north-east of the SIP, context 504/5003 sealed a layer of black gravelly sandy silt (505/5004), up to 0.4m thick, which contained slag and hand-made brick, as well as stoneware and porcelain dating to the nineteenth or twentieth centuries (Appendices 3 and 4). Deposit 505/5004 sealed yellow brown, slightly greenish, silty clay with large pebbles (506), the lowest deposit encountered within the SIP, from which a single sherd of brown-glazed red earthenware, attributable to the late seventeenth century or later, and a brick fragment were also recovered. The entire sequence was truncated to the west by a modern service, which had been backfilled with 500, a mixed dark brown silty clay. A small quantity of unstratified pottery, mostly dating to the nineteenth century or later, was also recovered from the spoil heap.

4.2.12 **SIP 406; SIP 506:** SIP 406 measured 3.9m x 0.6m x 1.2m deep (max) across the verge, while SIP 506 measured 5.8m x 1.5m x 3.5m deep (max) across both the verge and the footpath. The stratigraphy beneath the verge comprised a 0.3m thick layer of topsoil overlying a thin tarmac surface and associated levelling layer. Within the central area of the trench, this sealed a layer of cobbles that had been laid within a bedding layer of very dark brown sandy silt and fine gravel with a combined thickness of 0.2m. This sealed a probable

levelling layer of pink sand, 0.05m thick, which had been laid above a 0.3m thick deposit of grey/brown gravelly clay with charcoal inclusions. This sealed a very thin band, 20mm thick, of black gritty material containing spheroidal slag, akin to hammerscale, which itself had been deposited above the basal deposit within the SIP, which comprised very fine laminated yellow sand, that dipped down to the west and was similar to that observed within the base of SIP 402. The entire sequence had been truncated to the west by the cut for a modern service and, less severely, to the east, by a pair of grey plastic pipes.

4.2.13 The stratigraphy beneath the pathway comprised a 0.1m thick layer of concrete over a 0.05m thick layer of asphalt, itself over a ragged surface of reinstated cobbles, **6000**. These lay over a 1.05m thick layer of very mixed, mid-brown stony sandy clay backfill relating to the installation of a gas pipe at a depth of 1m and electric cables at a depth of 1.5m. No significant archaeological horizons were encountered.

### 4.3 FINDS FROM PHASE 1

4.3.1 In total, 32 artefacts were recovered during Phase 1 of the watching brief, the majority of which were fragments of pottery. The remainder comprised ceramic building material, glass, slag, copper alloy and leather. The categories of finds found in the different contexts are summarised in Table 1, below, and all finds from Phase 1 are catalogued in *Appendix 3*.

	Pottery (medieval)	Pottery (post-medieval)	Ceramic building material	Glass	Slag	Copper alloy and leather	Totals
Unstratified (SIPs 404, 405, and 406)	1	11	2	3		1	19
Make-up layer <b>206</b>		1					1
Re-deposited natural <b>209</b>		3					3
Layer <b>304</b>		3		1			4
Cobbled surface and levelling layer <b>403</b>		1					1
Reinstated nineteenth century road surface <b>503</b>		1					1
Levelling layer <b>505</b>		1			1		2
Re-deposited river silt <b>506</b>		1	1				2
<b>Totals</b>	<b>1</b>	<b>22</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>32</b>

Table 1: Categories of finds by context

4.3.2 By far the most significant of the artefacts was a fragment of Northern gritty ware, dated to the twelfth to mid-thirteenth century. Although it was recovered from unstratified deposits, it was a fairly large rim fragment, with little sign of abrasion. Its significance lies not only in the small quantity of medieval pottery known from Lancaster as a whole but, more specifically, in the total lack of medieval pottery so far recovered from the quay area.

4.3.3 The post-medieval assemblage is very small, and the more closely-dateable artefacts within it appear to date from the mid-nineteenth century onwards. The fragments do not merit further comment.

4.3.4 It is recommended that the fragment of Northern gritty ware is deposited with Lancaster Museum, and that the post-medieval assemblage is discarded.

#### 4.4 FINDS FROM PHASE 2

4.4.1 A small group of artefacts comprising a total of 48 objects was recovered during Phase 2 of the project. In addition, a large piece of water-worn timber was also recovered.

4.4.2 The majority (46) of the objects recovered were from domestic pottery vessels of nineteenth century or later date, with the earliest probably dating from the early part of that century. The vessels represented include a limited range of fine tablewares, mainly saucers, and kitchenwares, including a large redware bowl. All are relatively small fragments, but with occasional unidentified concretions; their distribution is tabulated in Table 2 below. All finds from Phase 2 are catalogued in *Appendix 4*.

Context	2002	3002	4002	5003	5004	Unstrat	Totals
Tablewares		3		3	2		8
Kitchenwares	6	9	5	5	4	9	38
Building material					1		1
Industrial debris						1	1
<b>Totals</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>8</b>	<b>7</b>	<b>10</b>	<b>48</b>

Table 2: distribution of Phase 2 finds by context

4.4.3 A single brick and a single fragment of metal-working slag were recovered, and while neither can be dated with any precision the brick is probably of eighteenth or nineteenth century date.

4.4.4 A large fragment of timber resembling a post and damaged on its top end was recovered from the structure of the quay in SIP 505 (Plate 8). The wedge-shaped fragment as recovered measured 0.51m in length, with a wide base measuring 0.26m x 0.2m and a smoothed and rounded top end measuring 0.13m x 0.13m. The base had clearly been sawn, but a number of flattened areas just above the base clearly demonstrated tool-marks, possibly to remove unwanted spurs (Plate 9). The origin of the timber, from the crown of a tree, meant that the tree-rings were too distorted for accurate dendrochronological dating. Radiocarbon assay suggested that the timber was most likely early nineteenth to early twentieth century in date (*Section 4.6*), but given the difficulties of accurately dating post-medieval timbers in this manner, an earlier date cannot be discounted.

- 4.4.5 The positioning of the timber suggests that it was found *in situ*, although its exact relationship with the quay is uncertain. The greater degree of weathering to the upper part of the timber would indicate that, unlike the well-preserved and presumably buried base, this had been exposed to erosion. The smoothness of the top of the timber would suggest that water had been the primary weathering agent. While its function remains uncertain, the timber may have been a mooring post, as there is a slight 'neck' just below the top of the timber, which may have been caused by the attachment of a rope. A less convincing alternative, given the degree of weathering to the upper part of the timber, is that the post may have supported part of a quay-side structure, with the observed damage occurring during demolition.
- 4.4.6 In conclusion it can be stated that the finds from Phase 2 of the works add little to the understanding and interpretation of the site, and do not warrant further analysis.

#### **4.5 BOREHOLE/SEDIMENT DESCRIPTIONS**

- 4.5.1 In total, four boreholes (BH), numbered BH502, BH504, BH505 and BH506 after the Phase 2 SIPs into which they were sunk, were excavated during the investigations at St George's Quay and the descriptions of each are given in *Appendix 5*.
- 4.5.2 The boreholes varied in depth from 5.3m to 9.4m below the existing ground surface, and much of the sediment within the cores consisted of river silts, sands and gravel, with occasional natural cobbles. The uppermost deposits within each of BH504, BH505, and BH506 comprised gravelly clay with occasional bricks and sandstone, which has been interpreted as made ground. In part, this made ground is likely to represent the redeposited upcast of the recent SIPs. A certain degree of variability between the maximum SIP depth and that of made ground recorded on the borehole logs can be expected, given that basal depth of the SIPs was not level; the deepest excavations tended to be in areas occupied by deep services and would not, therefore, have been subjected to boreholing. This would explain the absence of made-ground within the BH502 records and the shallow depth of made ground within BH 504 relative to the maximum depth of SIP504. However, this does not explain the depth of made ground within BH505 (at 3.7m as opposed to 2.5m maximum depth within SIP505) and BH506 (at 5m against 3.5m maximum depth within SIP506). It is possible, therefore, that the eighteenth century ground surface at the south-western end of the quay was lower than that at the north-eastern end and that more material had to be deposited in this area to level-up the ground.
- 4.5.3 BH504 also contained up to 3m of silty clay, beginning at a depth of 3.2m, with occasional degraded plant remains which proved to be the only material suitable for extraction as U100-type windowless core samples. The remainder of the sediments, being fairly loose, were extracted as bulk/bucket samples and described in the site compound. No sediments offering any potential for palaeoenvironmental preservation were recovered.

- 4.5.4 The two U100 cores taken through the silty clay in BH504 were opened and described at the Norwest Holst laboratory in Leeds; a number of sub-samples were taken from the cores for any potential palaeoenvironmental investigation. However, given that the two cores represent less than 1m of the natural sediments from a total depth of 9.4m, and that there appeared to be no material suitable for radiocarbon dating, it is likely that the represented data would be of limited use.
- 4.5.5 The remains of cobble surfaces were discovered in and adjacent to BH502 and BH504; these were generally fairly near the modern ground surface and were recorded during the watching brief as **2003** and **4001** respectively (*Sections 4.2.4 and 4.2.10*). Otherwise, no significant archaeological remains were recorded in the boreholes.

#### 4.6 CARBON-14 DATING OF TIMBER REMAINS

- 4.6.1 Material from the timber 'post' (waterlogged *Quercus*) recovered from SIP 505 was sent to Kiel for Accelerated Mass Spectroscopy (AMS) analysis in order to establish a date range for its deposition.
- 4.6.2 The <sup>14</sup>C concentration of the sample fell within the plateau caused in part by fossil fuel burning (Suess effect) and it was only possible to provide a wide date range of 1680 – 1955 AD. It is very unlikely that the sample is older than 1680 AD but it is more unlikely that the sample dates from the second half of the twentieth century. The results of the radiocarbon dating area given in Table 3, below.

Range	cal AD	Probability
One Sigma Range (Probability 68.3%)	1687 - 1707	12.3%
	1719 - 1730	6.1%
	1810 - 1821	6.8%
	1827 - 1884	36.2%
	1913 - 1923	6.8%
Two Sigma Range (Probability 95.4%)	1680 - 1738	29.6%
	1805 - 1904	53.4%
	1905 - 1934	12.4%

Table 3: Results of the Radiocarbon Determinations from St George's Quay

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## 5. DISCUSSION

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### 5.1 CONCLUSION

- 5.1.1 The results of the watching brief indicated that, although truncated in places through the introduction of later services, a number of elements of the pre-twentieth century quayside remain preserved beneath the existing tarmac footpath and verge of the modern quayside. This suggests that there is good potential for the preservation of similar and other associated features in other areas of the quayside. The vagaries of preservation and truncation are demonstrated by SIP 402/502, where, during Phase 1 only displaced cobbles were observed whilst in the expanded Phase 2 SIP, two surfaces had survived.
- 5.1.2 Cobbled surfaces **2001**, **303/3001**, **403/4001**, **503/5002** and **600**, exposed during the watching brief in SIPs 502, 403/503, 504, 405/505 and 406 respectively, provide good evidence that much of the pre-twentieth century quayside surface has survived beneath the present landscaping of the area. The majority of the more closely-dated stratified pottery from beneath these cobbled surfaces belongs to the nineteenth century, rather than to the eighteenth century, when the quay was built, and there was no artefactual evidence to suggest that the surfaces date to the twentieth century. As such, these cobbled surfaces are highly likely to be of nineteenth century date; none are likely to relate to the original mid-eighteenth century quay structure.
- 5.1.3 For practical reasons, the eighteenth century quayside is highly unlikely not to have been surfaced. However, the only evidence for an earlier surface, **2003**, was observed in SIP 502. This underlay the nineteenth century surface, **2001**, and was embedded directly into sandy clay **2004**, interpreted as a natural deposit. Unlike the other surfaces, **2003** had a marked camber of 0.15m from north-east to south-west suggesting that it was the southern edge of a road, probably dipping down to a roadside drain. Despite intense scrutiny during its removal, no finds were recovered from within or beneath surface **2003** to enable a more secure dating of the surface. If surface **2003** is indeed a remnant of the eighteenth century quayside, it would appear to be a unique survival within the investigated area to the north and east of the quayside road. Although its absence within any of the other SIPs may suggest that the surface was truncated during the installation of nineteenth century services, its cobbles redeposited amid backfills, it seems more likely that the original cobbled surface represented by **2003** may have been reused in the construction of those surfaces dating to the nineteenth century.
- 5.1.4 In a number of instances it was possible to determine that those deposits encountered within the SIPs beneath the cobbled surfaces were made-ground; indeed, the results of the boreholing would suggest that this material, particularly towards the south-western end of the quay, was up to 5m deep. In several instances, discrete dumps of refuse would appear to have been used, for example layer **505/5004**. The source of the redeposited refuse would appear to be variable, and included material that was both domestic and

industrial in origin. The absence of any closely-datable seventeenth or eighteenth century artefacts (the significance of the medieval pottery is discussed below, *Section 5.1.7*) would suggest that this material was collected from what were then recently-colonised riverfront areas. Furthermore, given that the quay surface may have been relaid on several occasions between the eighteenth century and the final nineteenth century event recorded within the majority of SIPs, the deposition of waste material for levelling purposes may also relate to a number of different events in different parts of the quayside.

- 5.1.5 In the majority of cases, however, the nature of the substrate material identified within the SIPs and boreholes, combined with the paucity of finds, would suggest that redeposited natural material was used for filling in the quayside, including riverine sands and gravels. The redeposition of natural alluvial material within the structure of the quay made it very hard to determine the depth at which the boundary between the unadulterated and redeposited natural material occurred, as clearly demonstrated by deposit **5009**, surrounding the waterlogged timber recovered from SIP 505. In this instance, albeit within the cramped confines of the base of the SIP, it was not possible to determine any real difference between the material in which the post had been sunk, and that which had presumably been deposited above it as part of the eighteenth century quay infill. When the borehole data from BH505 is considered, it would appear that deposits interpreted as made-ground extend around 1m below the base of the timber. Whilst it might seem that the timber was redeposited within this made ground during the infilling of the quayside, it is highly unlikely that the timber would have remained upright, had this been the case. Instead, it is plausible that, because the granular substrate prevented the extraction of a continuous core within the borehole, it was impossible to determine the boundary between unadulterated natural alluvium, and the redeposition of the same material immediately above.
- 5.1.6 Although the timber post was dated by radiocarbon assay to, most probably, the early nineteenth to early twentieth centuries, the problems associated with Suess effect (relating to a change in the ratio of atmospheric carbon isotopes caused by the wide use of fossil fuels within the last few centuries), combined with the fact that the timber was waterlogged and thus potentially contaminated with radioactive material deriving from the local nuclear powerstation at Heysham, means that an accurate date cannot be easily attributed. The upright position of the timber very much suggests that it was found *in situ* and yet, there is no way that a nineteenth century timber could have been weathered in such a manner if it was sealed behind the quay wall. Moreover, if the radiocarbon results are taken at face value (*Table 3*), there would appear to be no chance that the tree from which the timber derives was felled at a time contemporary with the construction of the mid-eighteenth century quay. However, there is an almost 30% chance that the timber pre-dates the construction of the quay. If the earlier date range of 1680 - 1738 is considered, then it is possible that the timber represents a mooring post or fender that became incorporated within the structure of the quay. As such, the timber provides a useful clue to the level of the natural ground prior to the construction of the quay. Given that there is a low possibility that the timber dates to the mid-eighteenth century, if it were to form a structural element,

temporary or otherwise, of the earlier quay, then it must have been reused from another source.

- 5.1.7 The presence of a fragment of Northern gritty ware, whilst from an unstratified deposit, is especially significant to the archaeology of Lancaster given the paucity of medieval pot recovered from the city (*Section 4.3.2*). Its importance is enhanced when considered that no medieval pottery whatsoever has before been recovered from the area of the quay. The large and unabraded condition of this potsherd suggests that it was not much-disturbed since its deposition. Whilst the nearest documented medieval activity is Lancaster Castle, founded in 1094, the usage of the river front and the course of the River Lune during the medieval period is not known. Although the presence of a single unabraded sherd certainly hints at medieval activity on or around the site, it is more likely that the sherd was secondarily redeposited when rubbish and other material was used for infilling the quay and consolidating the area during the eighteenth century.

## 5.2 IMPACT

- 5.2.1 Any proposed development of the quayside, even of a relatively unintrusive nature, will undoubtedly impact on an area of archaeological potential. At present, very little is known about the construction of St George's Quay, nor, indeed, of the nature of activity in the area immediately preceding its construction. It is likely that any further archaeological work in the area would help better our understanding of these issues.



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## 7. ILLUSTRATIONS

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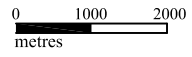


Figure 1: Location Map

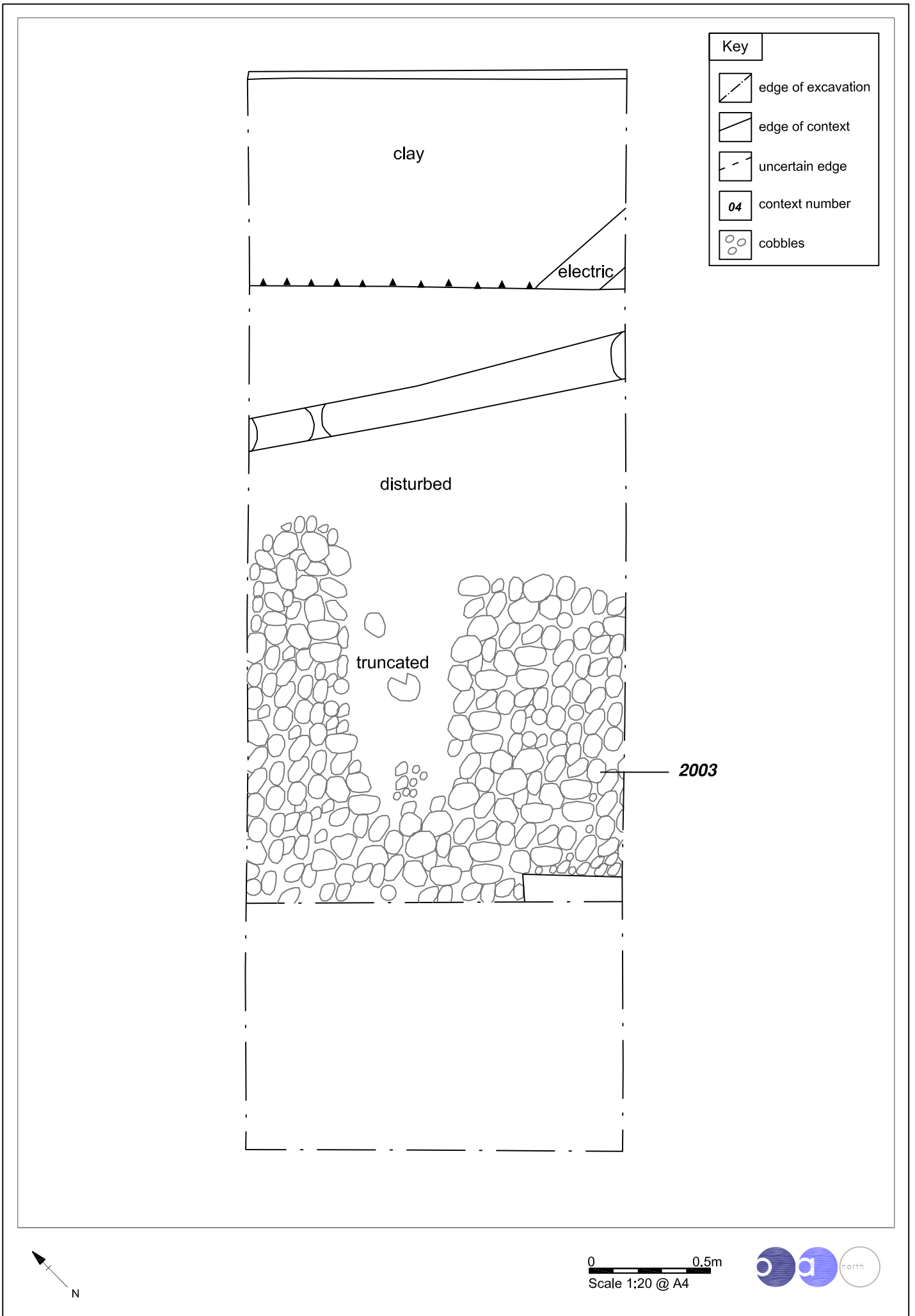


Figure 5: Plan of earlier cobbles (2003) in SIP 502

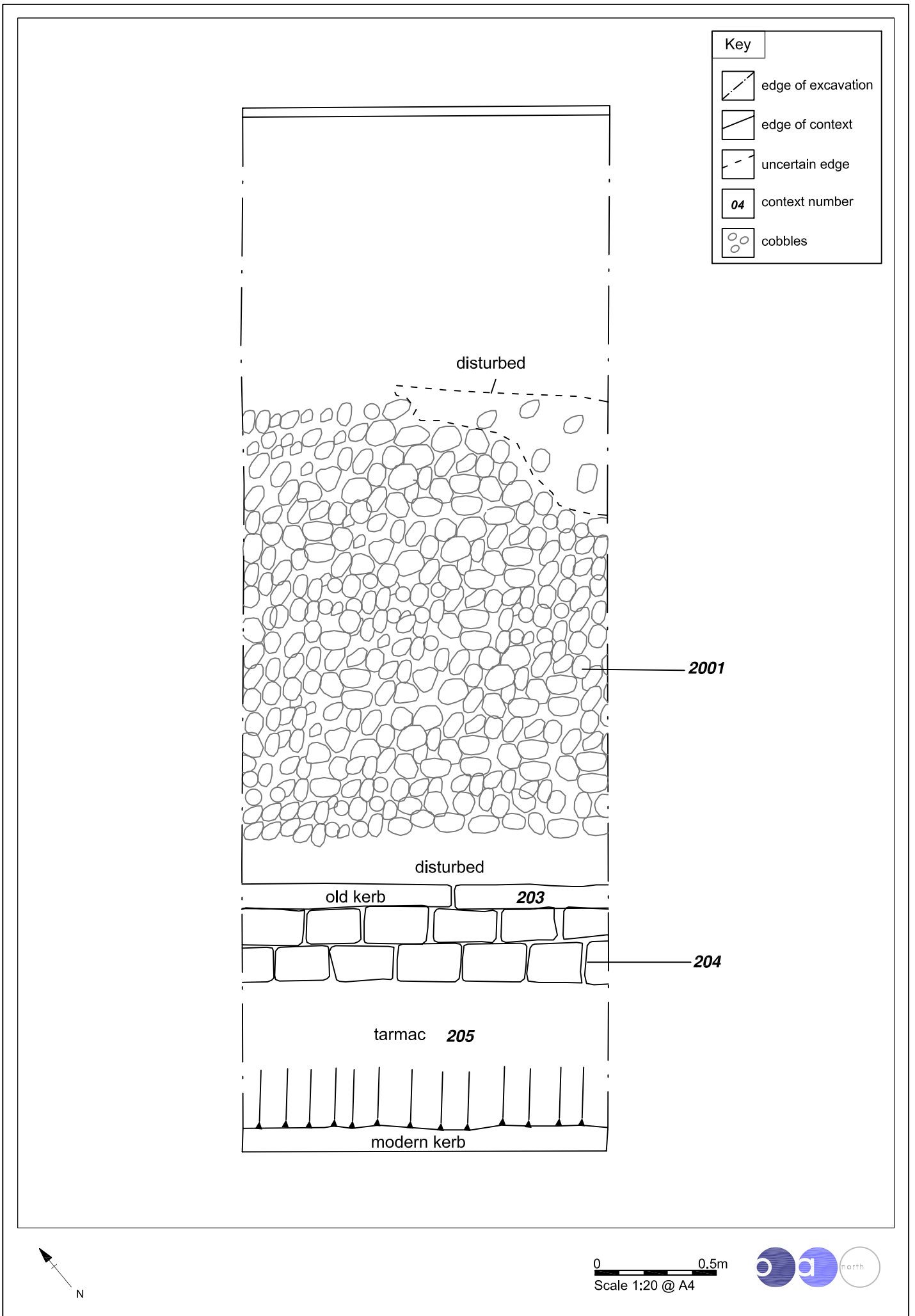


Figure 4: Plan of nineteenth century cobbles (2001) and kerb-side in SIP 502



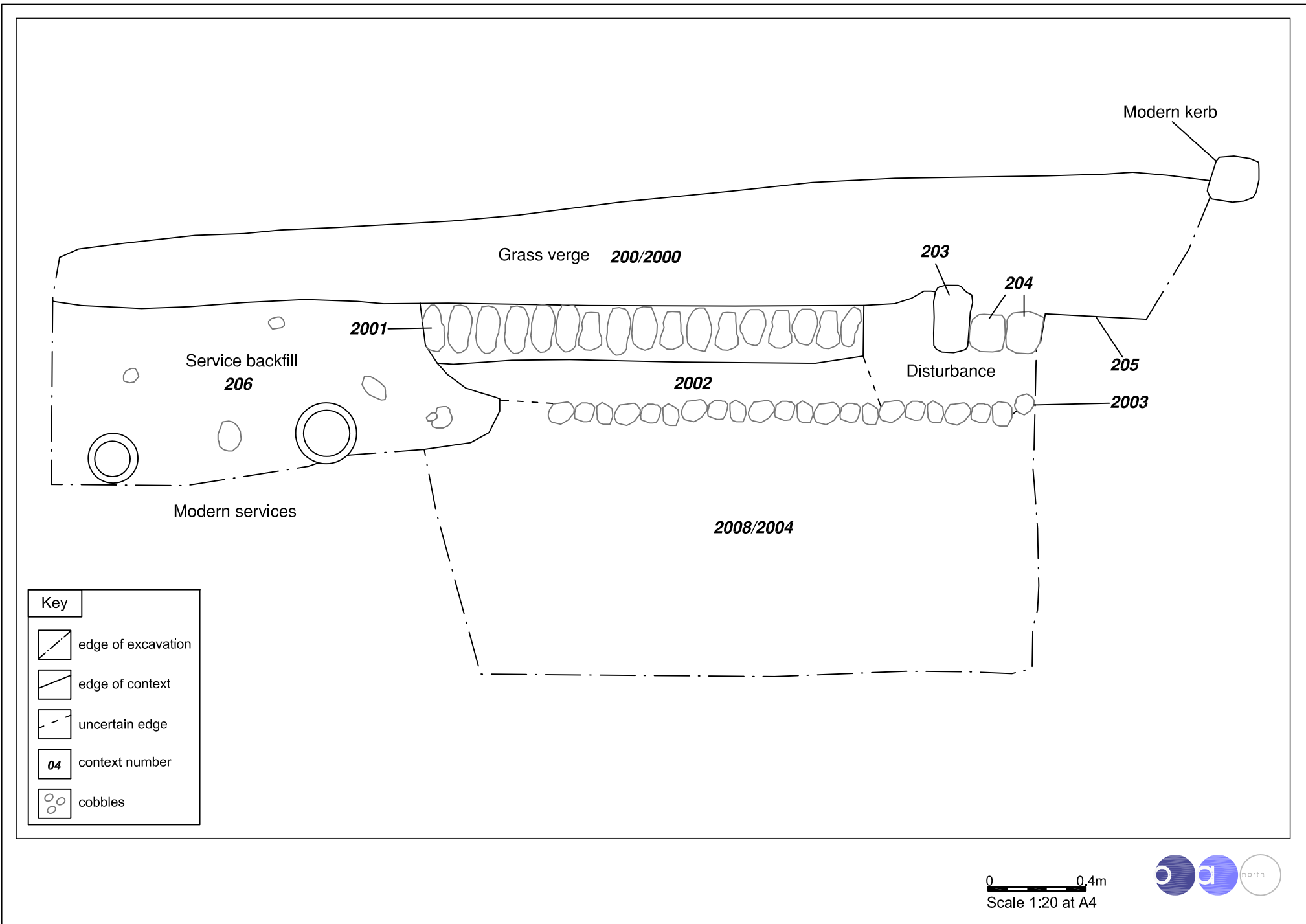


Figure 3: Composite north-west-facing section of SIP 402/502

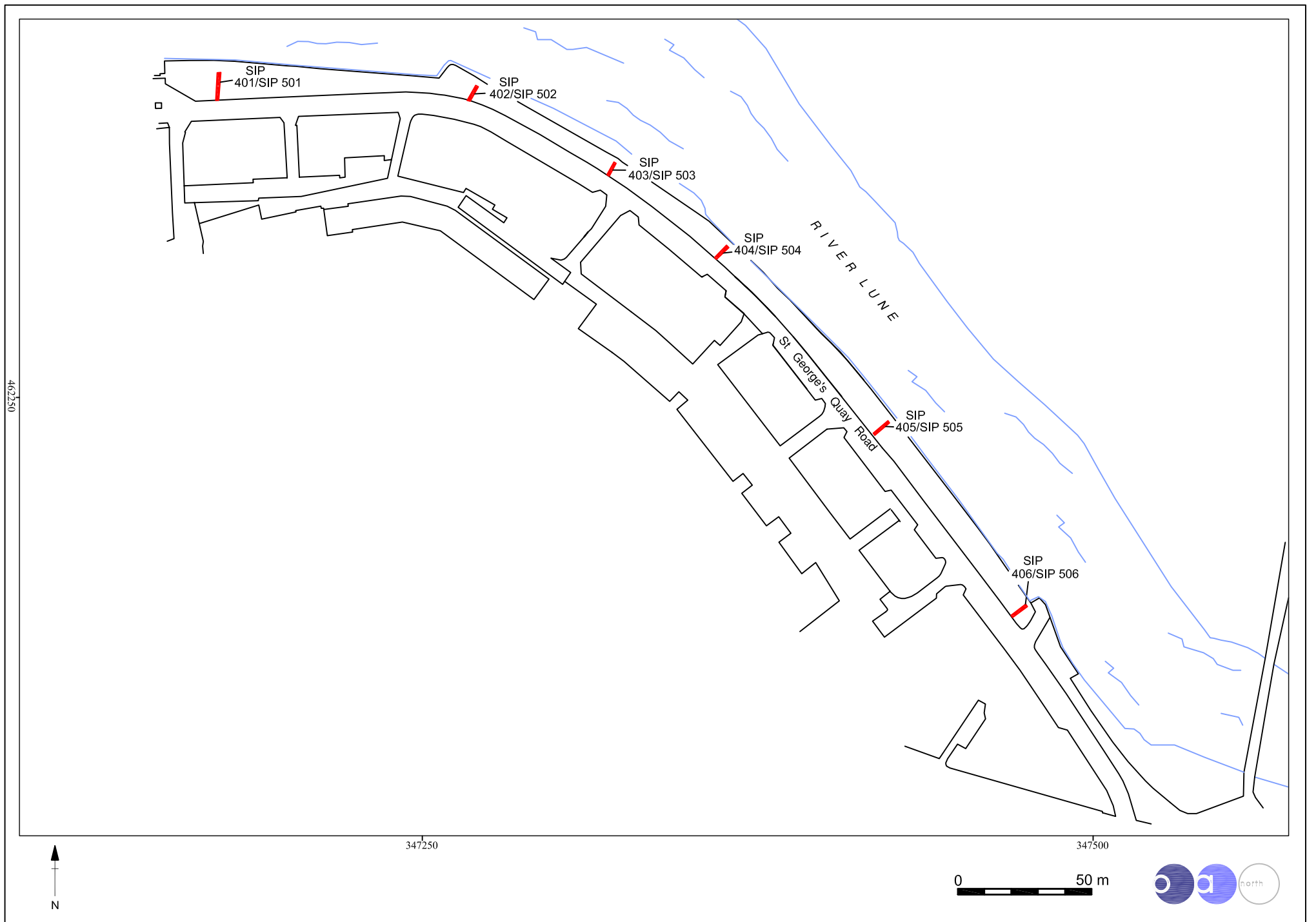




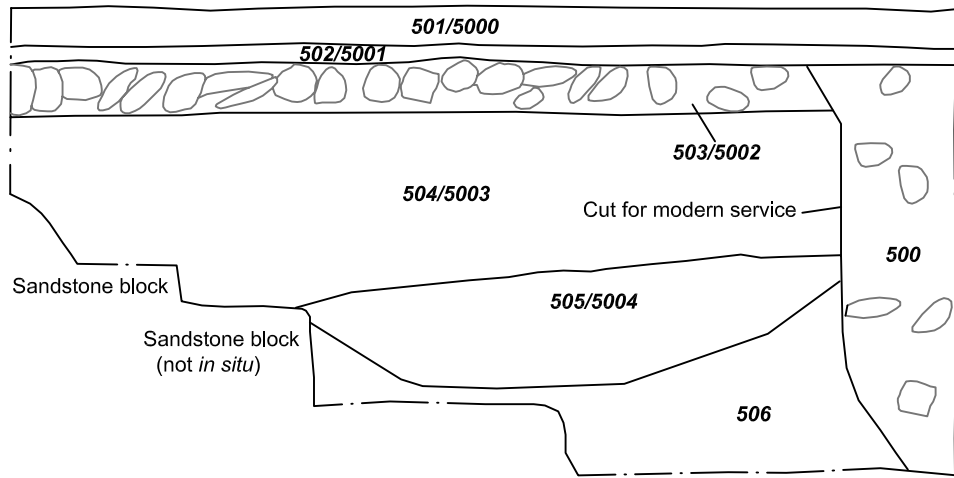


Figure 2: Service inspection-pit location plan

Key	
	edge of excavation
	edge of context
	context number
	cobbles




0  0.5m  
Scale 1:20 @ A4



Figure 6: Composite north-west-facing section through pathway in SIP 405/505





Plate 1: Cobble surface *2001* in SIP 502, facing south-west



Plate 2: Kerb *203* and square cobbles *204* in SIP 402 and 502, facing south-east



Plate 3: Earlier cobble surface *2003* in SIP 502, facing north-east



Plate 4: Cobble surface *3001* in SIP 503, facing south-west





Plate 5: Cobble surface *4001* in SIP 504, facing south-west



Plate 6: Cobble surface *5002* in SIP505, facing north-east





Plate 7: North-west-facing section, SIP505



Plate 8: The timber recovered from SIP 505

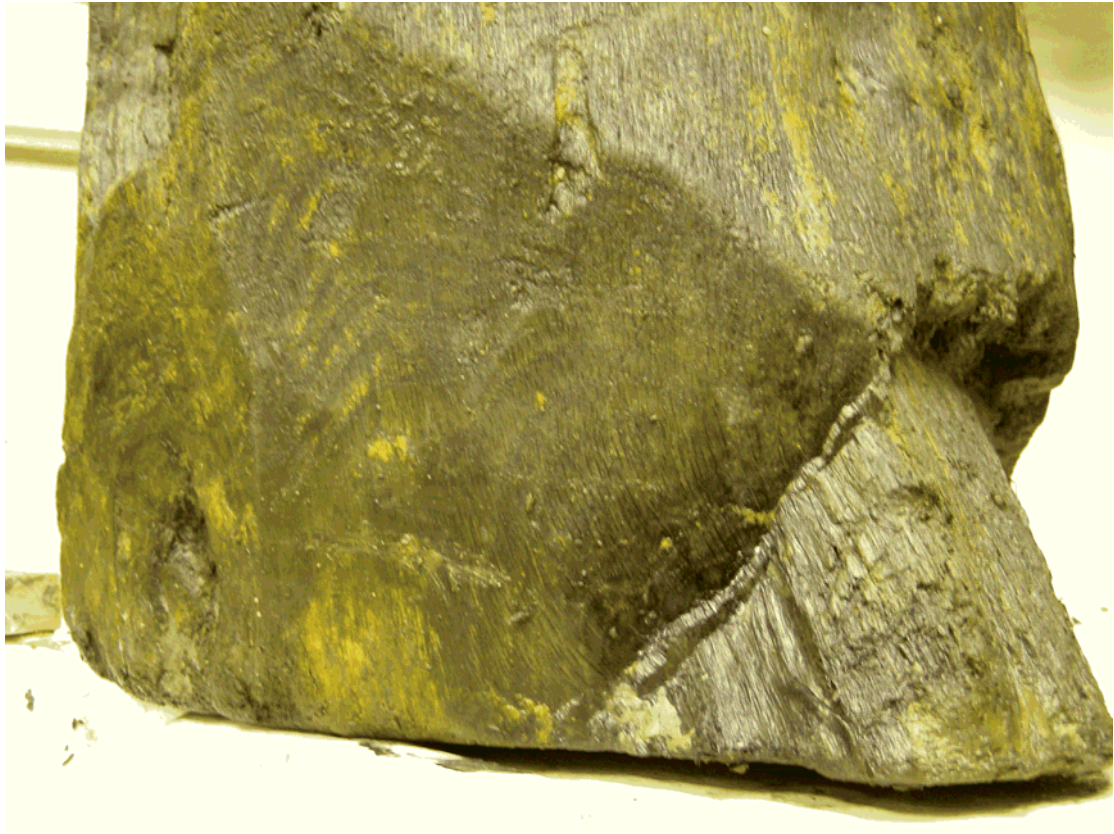


Plate 9: Detail of tooling around the base of the timber recovered from SIP 505

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## APPENDIX 1: PROJECT DESIGN

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**June 2005**

**Oxford  
Archaeology  
North**

### **LAND AT ST GEORGE'S QUAY, LANCASTER**

### **ARCHAEOLOGICAL WATCHING BRIEF DRAFT PROJECT DESIGN**

***Proposals***

The following project design is offered in response to a request from The Environment Agency for a watching brief during test pitting and other groundworks at St George's Quay, Lancaster.

## 1. INTRODUCTION

### 1.1 BACKGROUND

1.1.1 The Environment Agency has requested that Oxford Archaeology North (OA North) provide a project design and costs for a watching brief to be undertaken during test-pitting and associated ground works by Halcrow (the Client) at St George's Quay, Lancaster. The Client intends to conduct a programme of reconnaissance for old services in the area, including ground penetrating radar (GPR), boreholing and test-pitting, excavated by hand.

1.1.2 The site is centred at NGR SD 476 620 and lies on the south-east bank of the River Lune. It is thought that in Roman times the course of the river ran somewhat to the south-east of its current position, and interleaved deposits of riverine silt and occupation debris of Roman date are thought to represent the remains of riverside settlement. It is also thought that a Roman bridge over the Lune was located at some point along St George's Quay. There is thought to have been little in the way of medieval occupation of what would have been a very damp and marshy area, and it is not until the post-medieval period that development of the area occurs. During the eighteenth century, development of wharves and warehouses, several of which survive, was preceded by consolidation of the area through the dumping of large amounts of material, including a high proportion of redeposited refuse.

### 1.2 OXFORD ARCHAEOLOGY NORTH

1.2.1 Oxford Archaeology North (OA North) has considerable experience of undertaking watching briefs of all periods, having conducted a great number of small and large scale projects during the past 25 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.

1.2.2 OA North is an Institute of Field Archaeologists (IFA) **registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

## 2. OBJECTIVES

2.1 The following programme has been designed in accordance with the Lancashire County Archaeology Service document entitled *General Conditions for Appropriate Archaeological Contractors in Lancashire*.

2.2 **Watching Brief:** an archaeological watching brief will be maintained during test-pitting and other ground-disturbing works (with the exception of any boreholing) on St George's Quay. The watching brief will be undertaken in order to determine the presence, date, quality and state of preservation of previously unknown archaeology.

2.3 **Report and Archive:** a report will be produced for the Client within eight weeks of completion of the fieldwork. The report will aim to summarise the results of the watching brief within the context of existing knowledge about the site and its surroundings. These results will provide the basis for any recommendations for further work, should this prove appropriate. A site archive will be produced to English Heritage guidelines (MAP 2) and in accordance with the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990).

## 3. WORK PROGRAMME

3.1 In line with the objectives and stages of the archaeological works stated above, the following work programme is submitted:

3.2 **Watching Brief:** to be maintained during any ground disturbing activities such as test-pitting, but not boreholing.

3.3 **Report and Archive:** production of a suitably illustrated report and properly ordered archive.

## 4. METHODOLOGY

### 4.1 WATCHING BRIEF

- 4.1.1 A programme of field observation will accurately and systematically examine and record the location, extent, and character of any surviving archaeological features, horizons and/or deposits revealed during the course of ground disturbance, along with any artefacts, identified during observation.
- 4.1.2 During this phase of work, recording will comprise a full description and preliminary classification of features or materials revealed, and their accurate location (either on plan and/or section, and as grid co-ordinates where appropriate). Features will be planned accurately at appropriate scales and annotated on to a large-scale plan. A photographic record of archaeological features and general working shots, utilising monochrome print and colour slide will be undertaken simultaneously.
- 4.1.3 A plan will be produced of the areas of groundworks showing the location and extent of the ground disturbance and one or more measured sections will be produced, regardless of the presence of archaeology.
- 4.1.4 Putative archaeological features and/or deposits identified during groundworks, 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. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).
- 4.1.5 It is assumed that OA North will have the authority to stop the works for a sufficient time period to enable the recording of important deposits. It may also be necessary to call in additional archaeological support if a find of particular importance is identified or a high density of archaeology is discovered, but this would only be called into effect in agreement with the Client and LCAS and will require a variation to costing.
- 4.1.6 **Human Remains:** any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. LCAS and the local Coroner will be informed immediately. If removal is essential, the exhumation of any funerary remains will require the provision of a Home Office license, under section 25 of the Burial Act of 1857. An application will be made by OA North for the study area on discovery of any such remains and the removal will be carried out with due care and sensitivity under the environmental health regulations, and if appropriate, in compliance with the Disused Burial Grounds (Amendment) Act, 1981.
- 4.1.7 **Recording:** all information identified in the course of the watching brief works will be recorded stratigraphically, with sufficient pictorial record (plans, sections and both black and white and colour photographs or contact prints) to identify and illustrate individual features as well as the nature of the demolition work. Primary records will be available for inspection at all times.
- 4.1.8 Results of the field investigation will be recorded using a paper system, adapted from that used by the English Heritage Centre for Archaeology. The 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). Levels will be tied into the Ordnance Datum. 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.
- 4.1.9 **Treatment of finds:** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.



- 4.1.10 **Treasure:** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.
- 4.1.11 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.
- 4.1.12 **Contingency plan:** in the event of significant archaeological features or human remains being encountered during the watching brief, discussions will take place with the Planning Archaeologist, as to the extent of further works to be carried out, and in agreement with the Client. All further works would be subject to a variation to this project design.

## 5. REPORT

- 5.1 The results of the data gathered in *Section 4.1* above, will be collated and submitted in report format, illustrated with the relevant photographs and drawings. Where appropriate, the report will attempt to relate any findings to the known history and archaeology of the site, and to its local setting.
- 5.2 One bound and one unbound copy of the report will be submitted to the Client, and one bound copy and another in digital format will be submitted to LCAS and to the Lancashire Sites and Monuments Record together with an archive CD-ROM. Any subsequent work arising from this survey will be subject to separate consideration in liaison with LCAS and the Client.
- 5.3 The final report will include a copy of this project design, the relevant LCAS brief, 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 details of the final deposition of the project archive.
- 5.3 A brief summary of the fieldwork will be prepared and submitted to the Council for British Archaeology North West *Archaeology North West* within 12 months of the completion of the project.

## 6. ARCHIVE

- 6.1 The results of the photographic survey and watching brief will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. It will include summary processing and analysis of any features and finds recovered during fieldwork, in accordance with UKIC guidelines. 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, and arrangement to this effect will be made with the museum curator prior to the commencement of the project.
- 6.2 All finds will be treated in accordance with OA North standard practice, which follows current IFA guidelines and will be deposited, along with a copy of the report and of the original site records, with Lancaster City Museum.

## 7. HEALTH AND SAFETY

- 7.1 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 (1997). A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties.

- 7.2 The client would be asked to determine the nature of any utility services to the properties and site prior to any fieldwork being carried out.
- 7.3 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.

## 8. CONFIDENTIALITY

- 8.1 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.
- 8.2 Any proposed variations to the project design will be agreed with LCAS in co-ordination with the Client. OA North will arrange a preliminary meeting, if required, and LCAS will be informed of the commencement of the project in writing.

## 9. WORK PROGRAMME

- 9.1 The following programme is proposed:
- 9.2 **Watching Brief:** the duration of the watching brief will be dependent upon the progress of the contractor.
- 9.3 **Archive/Report:** the report and archive will be produced following the completion of all the fieldwork. The final report will be submitted within eight weeks of completion of the fieldwork and the archive deposited within six months. If desired, an interim statement could be produced within ten days of completion of the fieldwork.

## 10. STAFFING

- 10.1 The project will be managed by **Stephen Rowland** (Project Manager) to whom all correspondence should be addressed.
- 10.2 The watching brief will be undertaken by an OA North supervisor, suitably experienced in fieldwork techniques. Present timetabling constraints preclude detailing at this stage exactly who will be undertaking this element of the project.

The archaeological work will be monitored by LCAS, which will be arranged accordingly.

## APPENDIX 2: TABLE OF CONTEXTS

Context No.	SIP No	Form	Description
200	402	Layer	0.2m layer dark brown sandy silt imported topsoil.
201	402	Surface	0.6m concrete surface/pad.
202	402	Layer	0.3m soft, dark brown sandy silt levelling layer
203	402	Masonry	Kerbstone associated with cobble surface <b>204</b>
204	402	Surface	Cobble surface
205	402	Layer	Concrete layer
206	402	Layer	Make-up layer comprising 0.4m friable sand silt clay with inclusions of cobbles.
207	402	Layer	Make-up layer comprising loose, yellow fine sand.
208	402	Layer	Light brown/caramel laminated river silt natural.
209	402	Layer	Yellow-brown redeposited river silt natural associated with the installation of a Victorian foul water main service pipe.
210	402	Fill	Friable, black clinker backfill for kerbstone <b>203</b> .
300	403	Layer	Soft, loose mid-brown sandy clay imported topsoil.
301	403	Surface	Black asphalt former road surface.
302	403	Layer	Dark, loose clinkery levelling layer for surface <b>301</b> .
303	403	Surface	Loose, brown gritty gravelly-sand with cobble layer embedded. Probable old road surface.
304	403	Layer	Yellowy-orange silty clay. Possibly redeposited natural comprising a levelling layer for cobbled surface <b>303</b> .
400	404	Layer	Soft brown sand silt clay imported topsoil.
401	404	Surface	Compact black asphalt surface of old road.
402	404	Layer	Loose, grey gravelly sand levelling layer for surface <b>401</b> .
403	404	Surface	Compact, grey cobbled surface with associated charcoal-rich sandy clay levelling layer.
404	404	Layer	Very dark grey/black loose charcoal and clinker dump of levelling material for surface <b>403</b> .
405	404	Layer	Yellowy brown gravelly, silty clay. Most probably redeposited natural.
406	404	Fill	Deliberate backfill of service trench cut [ <b>407</b> ].
407	404	Cut	Linear cut forming a flat-bottomed "v"-shape in profile. Interpreted as a probable nineteenth century cut for a service trench.
500	405	Fill	Soft, mixed dark brown sandy clay comprising the deliberate backfill of service trench cut [ <b>507</b> ]
501	405	Surface	Modern concrete path surface.
502	405	Layer	Hard black asphalt comprising an earlier road or path surface.
503	405	Surface	Dark grey to black gritty silt with cobbles embedded. Probable re-instated nineteenth century cobble road surface/quayside.
504	405	Layer	Compacted yellow-brown clay silt with pebbles and ceramic building material fragments comprising a levelling layer for cobble surface <b>503</b> .
505	405	Layer	Dark grey/black loose gritty gravelly sandy silt comprising a levelling layer.
506	405	Layer	Soft, yellow-brown slightly greenish silt with inclusions of large pebbles. This is interpreted as redeposited river silt.
507	405	Cut	Linear cut for probable nineteenth century service trench.
600	406	Surface	Cobbled Surface
2000	502	Layer	Loose, dark brown/black sandy clay imported topsoil with inclusions of modern detritus and litter.
2001	502	Surface	Cobble surface set in a 0.01-0.02m thick layer of tarry asphalt with a kerbstone and associated stone sets. Probably nineteenth century roadside (Fig 4).
2002	502	Layer	Loose, dark brown mixed sandy clay with some gravel

Context No.	SIP No	Form	Description
			interpreted as a levelling layer for cobble surface <b>2001</b> .
<b>2003</b>	502	Surface	Cobble surface encountered 0.75m below ground surface. Embedded directly into natural, there is a pronounced north/south camber of 0.15m in the exposed area (Fig 5).
<b>2004</b>	502	Layer	Loose, light brown sandy clay with some silt and gravel. Natural river deposits.
<b>3000</b>	503	Layer	Loose, dark brown sandy clay imported topsoil.
<b>3001</b>	503	Surface	Probable nineteenth century cobble surface.
<b>3002</b>	503	Fill	Redeposited mid-brown stony sandy gravelly clay being the backfill after the laying of the water service pipe.
<b>3003</b>	503	Surface	Modern tarmac layer sealing the cobbles <b>3001</b> .
<b>3004</b>	503	Layer	Redeposited dark silver-grey river silt disturbed by the excavation of the water-service pipe trench.
<b>4000</b>	504	Layer	Loose, dark brown sandy clay imported topsoil.
<b>4001</b>	504	Surface	Nineteenth century cobbled surface.
<b>4002</b>	504	Layer	Loose, dark grey sandy clay with some clinker comprising a levelling layer for cobbles <b>4001</b> .
<b>4003</b>	504	Natural	Soft-ish, mid- to light brown/grey sandy clay natural with occasional cobbles and sub-rounded stone.
<b>5000</b>	505	Layer	0.1m layer of modern concrete pathway.
<b>5001</b>	505	Layer	0.05m thick layer of modern asphalt.
<b>5002</b>	505	Surface	Nineteenth century cobbled surface in sandy clay matrix.
<b>5003</b>	505	Layer	Mid-brown very mixed sandy clay with some gravel representing made ground and a levelling layer for cobble surface <b>5002</b> .
<b>5004</b>	505	Lens	Lens of loose, dark grey/black clinkery material within layer <b>5003</b> containing some bricks and brick fragments.
<b>5005</b>	505	Layer	Loose, dark-grey sandy clay imported topsoil.
<b>5006</b>	505	Layer	Modern thin layer of tarmac sealing reinstated cobbled surface <b>500</b> .
<b>5007</b>	505	Layer	Poorly reinstated cobbled surface. Disturbed by the laying of electric service ducts.
<b>5008</b>	505	Layer	Loose light-brown sandy clay with occasional cobbles being the backfill following the laying of service ducts.
<b>5009</b>	505	Layer	Compact but loose-ish gravelly clay with cobbles and occasional boulder. A wooden post was encountered at 2.05m below ground surface. This is probably redeposited natural.

SIPs = Service Inspection Pits

## APPENDIX 3: FINDS CATALOGUE FROM PHASE 1

SIP = Service Investigation Pit; Cxt = Context, OR = Object Record; U/S = Unstratified; Q = Quantity

SIP	Cxt	OR	Q	Material	Description	Date range
402	206	1000	1	Ceramic	White earthenware basin or serving dish fragment, close to rim, with blue transfer-printed pattern ('Asiatic Pheasants' or similar design)	Mid-nineteenth - early twentieth century
402	209	1001	3	Ceramic	Refitting rim-to-base fragments from white earthenware mug with enameled multi-colour transfer-printed border of pink roses with green leaves	Early twentieth century
403	304	1002	1	Ceramic	Brown-glazed red earthenware jar (?) base	Late seventeenth - early twentieth century
403	304	1002	1	Ceramic	Olive-green-glazed greyish stoneware fragment	Late eighteenth - twentieth century
403	304	1002	1	Ceramic	White earthenware basin (?) base with factory-produced blue slip coating on interior and relief-moulding on exterior	Late nineteenth - early twentieth century
403	304	1003	1	Glass	Very light purple furniture foot cup or similar item	Nineteenth - early twentieth century
404	U/S	1004	1	Ceramic	Rim fragment from Northern gritty ware large globular jar with everted rim, orange fabric with reduced grey core	Twelfth - mid-thirteenth century
404	U/S	1005	1	Ceramic	Brown-glazed red earthenware over-fired or burnt fragment (vesicular glaze)	Late seventeenth - early twentieth century
404	U/S	1006	1	Ceramic	Cream-coloured-glazed white earthenware tile fragment	Late nineteenth - twentieth century
404	U/S	1006	1	Ceramic	High-fired red fireclay (?) building material fragment, re-used, with dark grey mortar on surfaces and breaks	Nineteenth - twentieth century
404A	U/S	1007	1	Glass	Colourless vessel fragment, possibly cylindrical jug or vase, with vertical triangular cross-sectioned ribs	Nineteenth - twentieth century
404	403	1008	1	Ceramic	Blue painted white earthenware hollow-ware vessel fragment	Nineteenth - twentieth century
405	U/S	1009	1	Ceramic	Black-glazed red earthenware crock rim	Late seventeenth - early twentieth century
405	U/S	1009	1	Ceramic	Self-glazed buff-coloured stoneware cylindrical vessel fragment	Nineteenth - twentieth century
405	U/S	1010	2	Glass	White opaque flat fragments: one rim, one body with enamelled transfer-printed text '[Registe]red Trad[e Mark]... / ...EA./', with a motif of a flag below	Late nineteenth - twentieth century
405A	U/S	1011	3	Ceramic	Refitting pearlware jug (?) base fragments	Late eighteenth - nineteenth century

SIP	Cxt	OR	Q	Material	Description	Date range
405A	<i>U/S</i>	1011	1	Ceramic	White earthenware plate rim with 'Asiatic Pheasants' transfer-printed pattern	Mid-nineteenth - early twentieth century
405A	<i>U/S</i>	1011	1	Ceramic	White earthenware rim fragment	Late eighteenth - twentieth century
405A	<i>U/S</i>	1011	1	Ceramic	White earthenware saucer (?) rim fragment with dark green transfer-printed pattern	Nineteenth - early twentieth century
405	<b>503</b>	1012	1	Ceramic	Self-glazed buff-coloured stoneware hollow-ware vessel fragment	Nineteenth - twentieth century
405	<b>505</b>	1013	1	Ceramic	White ironstone cup base fragment	Late nineteenth - twentieth century
405	<b>505</b>	1014	1	Slag	Lump	Not closely dateable
405	<b>506</b>	1015	1	Ceramic	Brown-glazed agate ware coarseware base	Late seventeenth - early twentieth century
405	<b>506</b>	1016	1	Ceramic	Red earthenware brick fragment	Not closely dateable
406	<i>U/S</i>	1017	1	Ceramic	White earthenware bowl footrim, burnt	Nineteenth - early twentieth century
406	<i>U/S</i>	1017	1	Ceramic	Red earthenware flower pot (?) rim	Late seventeenth - twentieth century
406	<i>U/S</i>	1018	1	Copper alloy and leather	Bent fragment from gasket?	Nineteenth - early twentieth century?

## APPENDIX 4: FINDS CATALOGUE FROM PHASE 2

Context	OR no	Material	Category	Qty	Description	Date
2002	4	Ceramic	vessel	4	White earthenware	Nineteenth century or later
2002	4	Ceramic	vessel	2	Fragments late slip-decorated redware.	Nineteenth century or later
3002	2	Ceramic	vessel	6	Large redware bowl with internal white slip, unglazed, but splashes of black glaze on external walls.	Nineteenth century ?
3002	2	Ceramic	vessel	3	Fragments of late porcelain/bone china	Nineteenth century or later
3002	2	Ceramic	vessel	3	White underglaze transfer-printed earthenware and industrial slipware.	Nineteenth century or later
4002	7	Ceramic	vessel	3	White earthenware	Nineteenth century or later
4002	7	Ceramic	vessel	2	Fragments cream-bodied kitchen wares	Nineteenth century or later
5003	8	Ceramic	vessel	1	White earthenware	Nineteenth century or later
5003	8	Ceramic	vessel	3	Fragments creamware	Late eighteenth or early nineteenth century
5003	8	Ceramic	vessel	3	Fragments of late porcelain/bone china	Nineteenth century or later
5003	8	Ceramic	vessel	1	Fragment late industrial slipware.	Nineteenth century or later
5004	1	Ceramic	building material	1	Longitudinal striations suggest that this complete brick was extruded, but the lack of a frog suggests that it is hand-made.	Eighteenth or earlier nineteenth century?
5004	3	Ceramic	vessel	1	Fragments of late porcelain/bone china	Nineteenth century or later
5004	3	Ceramic	vessel	1	Fragment of late stoneware.	Nineteenth century or later
5004	3	Ceramic	vessel	1	Fragment of hand-painted white earthenware.	Nineteenth century or later
5004	6	Ceramic	vessel	2	White underglaze transfer-printed earthenware and industrial slipware.	Late eighteenth century or later
5004	6	Ceramic	vessel	1	Fragments of late porcelain/bone china	Nineteenth century or later
US	5	Ceramic	vessel	6	Fragments white earthenware - mortar on surfaces.	Nineteenth century or later
US	5	Ceramic	vessel	1	Fragment garden ware, slight waster	Nineteenth

<b>Context</b>	<b>OR no</b>	<b>Material</b>	<b>Category</b>	<b>Qty</b>	<b>Description</b>	<b>Date</b>
						century or later
US	5	Ceramic	vessel	2	Fragments self-glazed redware.	Nineteenth century or later
US	9	Industrial debris	slag	1		Not dated
				48		



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**APPENDIX 5: BOREHOLE/SEDIMENT DESCRIPTIONS**


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<b>Core No</b>	<b>Depth 1 m</b>	<b>Depth 2 m</b>	<b>Description</b>
<b>BH502</b>	2.00	3.30	Silt with sand and gravel and occ sub-rounded sandstone cobbles
	3.30	5.20	Sandstone gravel with occ angular sandstone cobbles
	5.20	6.50	Silt with sand and gravel and occ rounded sandstone cobbles
	6.50	6.90	Sandy and gravelly silt
	6.90	9.10	Sandy/silty rounded sandstone gravel with occ sub-rounded sandstone cobbles
<b>BH504</b>	2.00	3.20	Sandy gravelly clay with occ cobbles, brick, and sandstone (made ground)
	3.20	6.00	Sandy silty clay with fine gravel and occ degraded organic matter
	6.00	7.20	Soft silty clay
	7.20	9.40	Silty sandy coarse rounded gravel with occ sandstone cobbles
<b>BH505</b>	0.00	3.70	Sandy gravelly clay (made ground)
	3.70	5.60	Sandy gravelly silt
	5.60	6.70	Course angular sandstone gravel
<b>BH506</b>	0.00	5.00	Sandy gravelly clay (made ground)
	5.00	5.30	Coarse sand and angular sandstone gravel