

December 2010

**LIVERPOOL CANAL LINK,
PIER HEAD,
LIVERPOOL**

**POST-EXCAVATION ANALYSIS
PROJECT DESIGN**



Proposals

The following project design pertains to post-excavation analysis following archaeological excavations at The Liverpool Canal Link, Pier Head, Liverpool. It is submitted on behalf of Balfour Beatty and British Waterways.

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SUMMARY

Between March 2006 and June 2008, Oxford Archaeology North carried out excavation work across the Pier Head area of Liverpool (centred on NGR SJ 340 900). The work was undertaken on behalf of Balfour Beatty Civil Engineering Ltd for British Waterways in advance of the cutting of a new Canal Link, creating 1.4 miles of new navigable waterway along the banks of the river Mersey. The development area forms a significant part of the Pier Head in front of the Port of Liverpool Building, Cunard Building and Liver Building, known collectively as the Three Graces. The site lies within the Maritime Mercantile City of Liverpool World Heritage Site and is also classed as a conservation zone area. It includes the site of eighteenth-century sea walls, Manchester Dock, Chester Basin, George's Baths and George's Dock Basin. The site was excavated in nine trenches of various sizes across areas LCL4–7, with the divisions being based upon the sections designed by ARUP and British Waterways. Order of excavation was determined by the areas to be prioritised by Balfour Beatty Civil Engineering Ltd during the course of the bulk excavation and construction work.

Excavation revealed details of each of the major monuments as well as additional structures which did not feature on maps, and had not been previously documented. The excavations revealed a series of sea walls, and also temporary reclamation walls, which provided long- and short-term sea defences, at various stages of reclamation. The walls created as temporary works or retaining walls served to help the land-reclamation process as it moved north from Mann Island, effectively creating the modern Pier Head that we see today. The dock and sea walls varied in their construction style. The sea walls were built using yellow sandstone and a simple repetitive bond without mortar, while the construction of each dock was clearly a more complex exercise, with more associated structures and features, as well as alterations and additions to the structure over the course of its life. The Manchester Dock and Chester Basin both survived in excellent condition, less than 1m below the modern ground surface, while the foundations of warehouses were also uncovered, along with evidence for early quaysides.

The investigation generated large amounts of stratigraphical and structural data, and substantial assemblages of finds. This report assesses the potential of the archive and presents an updated project design for its analysis and publication. It is apparent that the data obtained as a result of the Canal Link Excavation have a considerable potential to address a number of regional and national research aims, unique to the work undertaken in Liverpool. There is a need to disseminate these important results to both academic and general audiences, and proposals for publication are proposed.

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1. INTRODUCTION

1.1 CONTRACT BACKGROUND

1.1.1 Balfour Beatty Civil Engineering Ltd are constructing the central section of the Liverpool Canal Link (NGR SJ 340 900) on behalf of British Waterways, and Oxford Archaeology North (OA North) was commissioned to undertake a series of watching briefs and large-scale excavation across the Pier Head area between March 2006 and June 2008 (Fig 1). An archaeological evaluation had been undertaken by OA North in 2006, and the five trenches excavated indicated the survival of archaeological material across the whole area (OA North 2006a). Following the completion of the fieldwork, a post-excavation assessment has been carried out, to define the costs of completing a programme of analysis and publication. This programme, its methodology and costs are set out in this project design.

1.2 HISTORICAL BACKGROUND

1.2.1 **Introduction:** Pier Head lies to the west of the Port of Liverpool Building, Cunard Building and the Liver Building, which are collectively known as the Three Graces. The site sits squarely within the Liverpool Maritime Mercantile City World Heritage Site (Fig 1) and is also part of a designated Conservation Area. Pier Head was reclaimed from the river during the eighteenth century, and was the site of significant dock development, including the establishment of Manchester Dock, Chester Basin, George's Dock and George's Dock Basin (Ritchie-Noakes 1984, 27). The excavation of the reclamation deposits have provided an opportunity to study the way in which this monumental feat was achieved, as well as the material culture of those living and working beside the Mersey from the mid-eighteenth century to the present day. The route of the cut for the new Canal traverses the plaza area of Pier Head. The site is bounded to the west by the river Mersey and modern sea walls, and to the east by Canada Boulevard.

1.2.2 **Pier Head:** the reclaimed land at Pier Head dates from the construction of George's Dock, which commenced in 1762 and was completed in 1771. Reclamation must have begun in advance of this, advancing north and west from Mann Island, following the construction of Dry Dock in the 1740s (*op cit*, 21; Fig 2). Corresponding to the opening of George's Dock was the construction of George's Dock Passage, George's Dock Basin and George's Ferry Basin (*op cit*, 27).

1.2.3 The precursor of Manchester Dock was a tidal basin, shown on Charles Eyes' map of 1785. It was developed into a proper dock, and a double-gated lock was added in 1816 (Jarvis 1996). Between 1785 and 1795, Chester Basin was constructed, just to the north-west of Manchester Basin (Fig 3). Both facilities were used by the Mersey Flats and Lighters, and neither was designed to accommodate international trade from the transatlantic fleet.

1.2.4 In 1900, George's Dock was drained, and the construction of the Three Graces began shortly afterwards, starting with the Port of Liverpool Building, which housed the Mersey Docks and Harbour Board Offices (Fig 4; Jarvis 1996). This was soon followed by the

iconic Liver Building, and finally the Cunard Building. Manchester Dock and Chester Basin were affected by changes in the preferred modes of transport, from canals to railways and then roads, which ultimately made both redundant. They were closed in the late 1920s and infilled *c* 1936. The backfilling of the docks coincided with the excavation of the Mersey Road Tunnels, and both were filled using the pink crushed sandstone tunnel risings (Jarvis 1996).

- 1.2.5 Since at least the mid-nineteenth century, Pier Head has served as a point of embarkation and arrival for passenger vessels. The most frequent of these have been ferries crossing the Mersey, but Pier Head has also been a terminal for ferries to the Isle of Man and Ireland, and the point of emigration for millions of Europeans on their way to the New World (Jarvis 1996).
- 1.2.6 During the 1960s, the area west of the Three Graces was occupied by a bus station, until the 1980s, when it was remodelled and landscaped into a large open plaza; the Mersey Ferry Terminal was constructed in the late 1980s (Sharples 2006, 276). The public plaza and ferry terminal have remained *in situ* since.
- 1.2.7 **Excavations at Pier Head:** there have been no previous large-scale archaeological excavations at Pier Head, aside from the 2006 evaluation undertaken by OA North (OA North 2006a), in conjunction with British Waterways and Galliford Try, and the initial excavation work beneath the floating roadway at the northern end of the site.

2 ORIGINAL AIMS AND OBJECTIVES

2.1 AIMS

2.1.1 The primary aims of the archaeological work were to establish the presence of archaeological remains and document their extent and diversity within the area affected by the construction of the Canal Link (OA North 2006b). Areas of potentially significant archaeology were highlighted and subject to mitigation. For those areas of the Canal Link already investigated during the evaluation, the aims were to trace the extent of the features and deposits identified, and place them in the context of the wider historical environment of Liverpool's waterfront.

2.1.2 Furnished with this information, academic aims were formulated and these formed the basis of the Project Design (*ibid*) for the programme of mitigating works at the Canal Link site. The aims were:

- to establish the presence or absence of archaeological remains within the identified area;
- to determine the extent, condition, nature, character, quality and date of any archaeological remains present;
- to establish any ecofactual and environmental potential of archaeological deposits and features;
- to provide a mitigative record of the archaeological deposits and structural remains, particularly the dock walls and sea walls, in anticipation of their disturbance by the proposed construction works.

2.2 OBJECTIVES

2.2.1 In order to meet the aims stated above, the following objectives were devised:

- to determine the thickness, depth and depositional history of any significant archaeological and environmental structures and deposits;
- to provide a mitigative record (photographed, drawn, surveyed and textual) of the archaeological deposits and structural remains, particularly the dock walls and sea walls, prior to their disturbance by the construction works;
- to characterise the nature of the main stratigraphic units encountered in terms of their physical composition (stone, gravel, organic materials *etc*) and their archaeological formation (primary deposits, secondary deposits *etc*);
- to assess the overall presence and survival of structural remains relating to the main periods of activity revealed and the potential for the recovery of additional structural information given the nature of the deposits encountered (*eg* the extent of later disturbance *etc*);
- to determine the broad phasing of the site to appreciate its development within its

historical context;

- to assess the overall presence and survival of the main kinds of artefactual evidence (including pottery, brick, tile, stone, glass, metal, bone, small finds, industrial residues *etc*), its condition and potential, given the nature of the deposits encountered;
- to assess the overall presence and survival of the main kinds of ecofactual and environmental evidence (including animal bone, human bone, plant remains, pollen, peat, charcoal, molluscs, soils, *etc*), its condition and potential, given the nature of the deposits encountered;
- to appraise the relative value of the main stratigraphic units revealed, in terms of their importance for preservation and conservation;
- to provide sufficient research in order to place any findings in context;
- to produce a report and archive in accordance with English Heritage guidelines (1991a);
- to create an ordered archive of the work to be housed in a public repository.

3 SUMMARY RESULTS OF THE ARCHAEOLOGICAL INVESTIGATIONS

3.1 EVALUATION, WATCHING BRIEF AND EXCAVATION

- 3.1.1 **Evaluation:** five evaluation trenches were excavated in 2006 (OA North 2006a), distributed across Pier Head, and directed at the identification of possibly extant features, such as Chester Basin, Manchester Dock and George's Dock Passage, identified from historical mapping. The excavations demonstrated that these structures were well preserved, and in some cases survived less than 1m below the modern ground level. The remains of dockside warehouses were also revealed. Excavations in the north and central parts of the site were hampered by a substantial reinforced concrete slab, which may have acted as a foundation for more recent landscaping, and limited the depth of the trenches to c 1.8m.
- 3.1.2 **Watching Brief and Excavation:** in February 2007, work began in Trench 408 in area LCL6 (Fig 5). A substantial yellow sandstone sea wall was encountered, both sides of which were excavated to formation level (Plate 1). This wall, orientated north/south, will have been constructed in tandem with the land reclamation necessary to create George's Dock, and therefore dates from the second half of the eighteenth century. Deposits on the east side of this sea wall comprised sand, silts and quarry waste, while to the west there were grey river silts, and a substantial layer of burnt material and charred timber.
- 3.1.3 In March 2007, Trenches 409, 409x and 410 were opened. Trenches 409 and 409x were located in LCL5–7 (Figs 5 and 6) and excavated under a watching brief, to a depth of 6m; the trenches terminated at the junction with the Twin City Culvert (Fig 6). A component of George's Dock Basin was revealed at the northern end of Trench 409/409x, and later brick features associated with the drainage of the city via the infilled George's Dock, including the Liver Culvert, an outfall running from the city into the river, built with a concrete base and a double-vaulted roof, in machine-made red brick bonded with standard portland cement. This structure was actually far larger than anticipated from the schematic engineering plans, and measured over 4m in diameter. It bisected the Canal on an east/west orientation (Fig 5). Although blocked at its eastern terminus, within the city, the western end was open, so that the culvert filled up at high tide.
- 3.1.4 Trench 410 lay within LCL4 (Fig 7), measuring 47 x 23m, and 5.8m deep. At its southern end, the north wall of Manchester Dock was revealed, orientated east/west (Plate 2) along with associated surfaces and warehouse remains. Two further walls were uncovered: the Old Quayside wall (a forerunner of the Manchester Basin) (Fig 6), and a further section of the mid-eighteenth-century sea wall, orientated north/south, and keyed into the western end of the Old Quayside wall (Plate 3). The wall of Manchester Dock was constructed from pink sandstone, and showed signs of repair and alteration, while the two earlier walls were constructed in yellow sandstone ashlar.
- 3.1.5 Backfill deposits were identified around these structures. In several locations, tip lines were discernible, showing that the land had been reclaimed from south to north along the

edge of the river. There were also isolated layers, containing pottery and clay pipe kiln dumps, suggesting that the reclamation sites provided a useful means of disposing of industrial waste from local industries. These deposits were sealed by a series of surfaces, contemporary in use, but varied in material and preservation. Principally, they comprised three different types of cobbles, and surfaces composed of machine-made and hand-made brick. There were also later concrete/tarmac surfaces associated with the museum car park.

- 3.1.6 Trench 411 was opened at the southern end of LCL5, opposite the Port of Liverpool Building (Fig 6). It measured 10.6 x 7m, with a maximum depth of 0.5m. The key features within this trench were the remains of a small, twin-roomed, warehouse, consisting of pink sandstone foundations underlying a series of poorly constructed walls in hand-made brick (Plate 4). A spread of loose cobbles was exposed on the north side of the structure. It is likely that the warehouse was contemporary with the construction, and early use, of the Chester Basin.
- 3.1.7 Trench 412 lay at the northern end of LCL5 (Fig 6), opposite the Port of Liverpool Building, and directly north of Trench 411. This trench was excavated to a maximum depth of 5.8m. The earliest structure identified was a substantial yellow sandstone wall, constructed entirely from recycled masonry (Plate 5). The material varied in finish, but included relief-moulded Lancashire roses, parts of a Corinthian capital, window lintels, and voussoirs, clearly coming from the demolition of a building of some pretension. This temporary wall would have retained and supported the reclaimed land as it settled, and would have provided a platform from which to start the next phase of reclamation. Both sides of the wall were surrounded by made-ground deposits, consisting of quarry waste and sand.
- 3.1.8 To the north of the wall were two later culverts. The earlier was likely to be George's Sluice, which was contemporary with George's Dock. The sluice bisected LCL5 on an east/west orientation, and was only visible at the formation level of the Canal. The limited view available showed that it was constructed of brick and concrete, and that the construction cut was revetted in timber.
- 3.1.9 At the far western edge of the trench, a section of George's Baths was identified (Fig 6). The scope for excavation was limited by the position of the remains close to the margin of the formation cut. It was, however, apparent that a substantial proportion of the subterranean level of the bath house remained extant. Key features were the substantial brick walls, at c 0.7m thick, and the lining of ceramic tiles.
- 3.1.10 Further investigations, undertaken in connection with the public realm works on the west side of the proposed canal, revealed a substantial, vertical, brick-lined shaft at what would have been the north-western corner of George's Baths. These are first recorded on Swire's map of 1823, which indicates that the bath house would have had at least two such structures, which served to pump water from the river and acted as small reservoirs for replenishing the bathing water. Confined space and tidal water restricted access to this structure, and also the opportunity to investigate it further. The second, companion shaft was not exposed during the Canal works, but presumably survives in the south-west part of LCL5.

- 3.1.11 Trench 413 (Fig 6) lay at the northern end of LCL4, near Trench 404, which was excavated during the evaluation in 2006. Initially, several surfaces were encountered, which varied both in type and arrangement. That portion of the Chester Basin lying within the formation cut for the Canal was fully exposed, as part of the main, bulk excavation, and proved to have survived in excellent condition since the basin went out of use in the 1930s (Jarvis 1996). It had been backfilled using a mixture of clay and a type of tar material. The construction of its wall was similar to that of Manchester Dock, in pink sandstone ashlar. As well as the dock wall itself, there was a square, vertical shaft acting as a sluice on the east side of the dock.
- 3.1.12 A second part of this trench was opened, on the northern side of the basin, adjacent to the entrance to the site of the new Museum of Liverpool Life (Fig 6). There, the Chester Basin survived in good condition, despite truncation in several places from the installation of modern services, and the curved outline of the projecting corner in this dock was revealed. The material used to backfill the basin was the same as that encountered elsewhere (*Section 3.1.11*), but, despite hydrocarbon contamination, it was sterile. There was no obvious or surviving dock furniture, and the reclamation deposits to the east and north of the dock wall had been more significantly disturbed than elsewhere. This can be attributed to the construction of the car-park gatehouse. There was a marked difference in the deposits observed, by comparison with those on the adjacent site of the new museum, in that there, dense dumps of pottery waste were identified.
- 3.1.13 Trench 414 was opened in the northern half of LCL6 (Fig 5), and measured 30 x 18.5m, and a maximum 5.8m deep. Two large yellow sandstone walls were revealed, one a continuation of the sea wall identified in Trench 408 (*Section 3.1.2*), and a temporary retaining wall, orientated east/west (Plate 6). This wall was similar in construction to the wall identified in Trench 412 (*Section 3.1.7*), although it did not contain any obviously recycled sandstone blocks. In some places, distinct tip lines were observed in the reclamation deposits, which represent discrete occasions when material was dumped.
- 3.1.14 Trench 415 was effectively the southern terminus of Trench 409/409x, and was located on the south side of the Twin City Culvert, within its original construction cut (Fig 6). The trench measured *c* 8 x 6m, and a maximum 3.8m deep. The rectangular culvert was orientated north-east/south-west, with two separate parallel chambers, and was still live at the time of the excavation. North of the culvert was a further section of the mid-eighteenth-century sea wall, constructed of yellow sandstone ashlar. The wall had been truncated significantly by the construction cut for the culvert and, given the narrowness of the trench, was only visible in profile in the south-facing section. The culvert and sea wall were surrounded by a series of deposits, including crushed pink and yellow sandstone, river sand, and a layer of crushed grey slate. There was no clear evidence of the sea wall in the north-facing section of the trench.
- 3.1.15 Trench 416 was located in LCL7, and measured 59 x 25m, and a maximum of 5m deep (Fig 5). The trench contained a number of modern features, including a brick-built, circular, subterranean chamber. A second such chamber was uncovered in Trench 407, during the evaluation (OA North 2006a). There was also a substantial, concrete subway, with ceramic tile facing, clearly built during the 1960s. Removal of these revealed a

substantial section of the mid-eighteenth-century sea wall which, despite truncation by the subway, survived in good condition to *c* 1.7m above the formation level for the canal basin (Plate 7). The wall was orientated north/south along the centre of LCL7 before turning to the west and continuing outside the limit of excavation. This western return had been truncated by the construction of the Liver Culvert, previously identified in Trench 409/409x (*Section 3.1.3*), which bisected LCL7 on an east/west orientation.

- 3.1.16 Trench 416x occupied the northern end of LCL7, north of Trench 416 (Fig 5), and was excavated at a late stage in the development, until an alternative access from Canada Boulevard could be put in place. Three substantial north/south-orientated pink and yellow sandstone walls were identified. The size, orientation, and position of these all suggest that they were buttress walls, constructed to support the eastern return of the sea wall at the entrance to George's Dock Basin (Plate 8). The second phase of excavation, including the removal of the haul road, revealed the buttress walls to their full extent, and an additional buttress was also uncovered. The sea wall itself did not appear to have survived. A section of George's Dock Basin wall was also revealed, but this pink sandstone structure was only present at the formation level for the Canal. The relationships in this area were difficult to discern, given the truncation of all the eighteenth-century structures by later work.
- 3.1.17 Trenches 417–421 were a series of test pits excavated on the north side of the floating roadway, which itself lay north of LCL8, to determine the presence of archaeological material, prior to the commencement of works. Two dock walls were identified.
- 3.1.18 Trench 422 lay in LCL5, north of Trench 412 (Fig 6), and was excavated to expose the Twin City Culvert on the west side of the canal. The trench measured 12 x 4m, and was excavated to a maximum depth of 5.6m. A small section of a late sea wall was revealed approximately 1m above formation level. It was orientated north/south on the west side of the excavations. Its construction was similar to previously recorded sea walls, although the yellow sandstone ashlar was smaller, with more rounded edges than elsewhere at Pier Head. Only a limited section of it survived, following truncation by the construction cut for the Twin City Culvert. Reclamation deposits were present on both sides of the wall, while late nineteenth-century backfill covered it.
- 3.1.19 Trench 423 was excavated as part of the public realm work along the edge of Canada Boulevard, west of the Port of Liverpool Building (Fig 6). The north/south-orientated trench revealed a further section of the mid-eighteenth-century, yellow sandstone sea wall. Only the upper two courses of the wall were exposed, while the remainder appeared to have survived below the formation level of the public realm works. The wall was constructed of large yellow sandstone ashlar blocks, and was in good condition. At the margin of each block on the upper course, where it met its neighbour, there was a small diamond-shaped niche, which would have contained a locking stone, shaped to fit.
- 3.1.20 Trench 424 was excavated as part of the cut beneath the walls of the floating roadway (Fig 5). Additional excavation on the south side of the floating roadway revealed the remnants of a very substantial dock wall, orientated east/west, and cut by the construction of the northern culvert for the Canal. It is likely that this structure represents the neck or passage of George's Dock Basin.

4 MATERIAL ASSESSED

4.1 INTRODUCTION

4.1.1 The entire paper and material archive was examined for the purposes of this assessment. Quantifications are incorporated within the individual assessments. The method of assessment used varied with the class of information examined, although in each case it was undertaken in accordance with guidance provided by English Heritage in *Management of Archaeological Projects, 2nd edition* (English Heritage 1991a). All classes of finds were examined in full, with observations supplemented by the records generated during the course of the fieldwork and maintained within the project archive. Quantifications are incorporated within the individual assessments.

4.2 AIMS AND OBJECTIVES

4.2.1 The aim of the assessment was to evaluate all classes of data from the investigations, in order to formulate a project design for a programme of further analysis appropriate to the potential demonstrated by the site archive. A statement of the significance of the results from each element of the archive is given below. These statements are based on the assessment work undertaken, related to the original academic themes defined in *Section 2*. The quantification and assessments represent an amalgamation of the total body of work carried out in the period 2006–8.

4.2.2 The objectives of this assessment correspond to Appendix 4 of *Management of Archaeological Projects, 2nd edition* (English Heritage 1991a). They are:

- to assess the quantity, provenance and condition of all classes of material: stratigraphical, artefactual and environmental;
- to comment on the range and variety of that material;
- to assess the potential of the material to address questions raised in the course of the project;
- to formulate any further questions arising from the assessment of the material.

4.2.3 This assessment will present:

- a factual summary, characterising the quantity and perceived quality of the data contained within the site archive;
- a statement of the academic potential of the data;
- recommendations for the storage and curation of the data.

4.3 STRATIGRAPHIC DATA

4.3.1 **Quantification:** the paper archive represents a percentage of the overall data gathered during the course of the excavation. A total of 751 contexts were recorded (Table 1), ranging from massive stone walls to lenses of back fill (see *Section 3*).

Category	Quantity
Context records	751
Black and white photographs	972
Colour slides	900
Digital photographs	1909
Laser scans	20
Individual CAD survey files	27

Table 1: Documentary archive

4.3.2 **Assessment:** the context record has allowed broad phasing to be established for the whole area of the site and has confirmed the identification of areas where earlier remains have been truncated by later development. Six main phases of activity have been identified in the course of this post-excavation assessment.

Phase 1 Early Post-Medieval Reclamation and Construction	Post-1750
Phase 2 Dock and associated dock structures	c 1771
Phase 3 Manchester Basin and Chester Basin	1785–95
Phase 4 Construction of Manchester Dock Gates	1810–15
Phase 5 George's Baths	1828
Phase 6 Pier Head plaza and dock closure	1900 onward

4.3.3 **Potential:** the phasing at this stage is provisional and will be able to be refined with more detailed stratigraphical analysis, coupled with information derived from the analysis of the finds, particularly key groups, such as the pottery and clay pipes.

4.4 PHOTOGRAPHIC AND DIGITAL DATA

4.4.1 **Photographic data:** in all, there are 3781 images, made up from 27 complete black and white films, and 25 colour slide films (Table 1). There are also approximately 1900 digital photographs. The photographs cover each of the main areas of work.

4.4.2 **Survey and Plan Data:** the digital data include all the records of survey undertaken using the EDM/Total Station and GPS, and the digital photographic archive (Table 1). The digitised drawings exist in four formats: the initial drawing, which is regarded as part of the paper archive (see Table 1); the raster image produced by scanning the drawing; the stand-alone digitised version of the original hand drawing; and the digitised data incorporated into the master site drawing.

4.4.3 **Assessment:** the photographs and digital data are an invaluable aid in all aspects of post-

excavation analysis. They provide a general and detailed pictorial record of the site throughout all phases of its excavation.

4.4.4 **Potential:** the photographs and digital data will be able to add valuable analytical and illustrative material to the final report and publication.

4.5 THE FINDS EVIDENCE: INTRODUCTION

4.5.1 The overall artefactual assemblage was of substantial size and was very varied in composition (Table 2), although it was dominated by pottery. An assessment of each class of artefact and ecofact is provided in the following sections. To establish the true potential of the assemblage, the same external and internal specialists were consulted as for the much larger assemblages recovered from the excavations at Chavasse Park and Environs (LUAU 2001; OA North 2010a).

Category	Number of Pieces
Post-medieval pottery	1640
Clay tobacco pipe	896
Glass	1149
Metalwork	153
Shell	291
Animal bone	144

Table 2: Finds assemblage by category

4.6 POST-MEDIEVAL POTTERY

4.6.1 **Methodology:** in total, 1640 fragments of pottery were recovered by the excavations. The detailed assessment carried out on the pottery assemblage from Chavasse Park and Environs (LUAU 2001; OA North 2010a) meant that the level of investigation necessary to arrive at a professional judgement of the value of the material from this section of the Canal was substantially reduced. The material was inspected during its recovery, and following its processing.

4.6.2 **Assessment:** there was a range of types of pottery. On the basis of what is already known from the assemblage from Chavasse Park and Mann Island (OA North 2010a; 2010b), these include kiln wasters, tin-glazed earthenware, biscuit wares, dark-glazed earthenware, mottled wares, slipware, salt-glazed stonewares and other stonewares, as well as transfer-printed earthenware. The forms of vessels will also vary and will include, but not be limited to, jugs, cups, bowls, plates, small jars, storage jars, sugar moulds, bottles and tiles. The pottery offers a way to obtain insights into the relative status of, for example, items manufactured for export.

4.6.3 **Potential:** this is a moderately sized group of excavated pottery and, taken in conjunction with the considerably larger group recovered from the excavations at Chavasse Park and Environs, in 2001–7 (OA North 2010a), it is of national significance. Pottery assemblages

in general have the potential to shed light on a number of aspects of the site and its archaeology, including, for example, the formation processes of the deposits, the use of the pottery, the function of different types of vessel, the status of the occupants of the different parts of the site, and the chronology of the development. Conversely, analysis of the stratigraphy and associated finds helps to refine the chronology and typology of the pottery, and aids an understanding of the nature of any biases within the surviving artefact assemblage.

4.6.4 This assemblage is particularly strong in its potential for detailed analysis of eighteenth- and early nineteenth-century groups. Study of the fabric, form, parallels, traded wares and imports, within stratigraphic context, will serve to illustrate Liverpool's trading connections in the post-medieval period and illuminate aspects of trade, economy and settlement in Liverpool through to the mid-twentieth century.

4.7 CLAY TOBACCO PIPE

4.7.1 **Quantification:** the excavations produced a total of 896 fragments of clay tobacco pipe (Table 2), almost all from stratified archaeological deposits. They range in date from the early seventeenth century to the early twentieth century, thus covering nearly the entire range of pipe use in Liverpool.

4.7.2 **Assessment:** the majority of the material is in a fresh and unabraded condition, and many of the contexts produced large fragments, indicating little disturbance since deposition. Clay tobacco pipes had a very short lifespan and no recyclable value once broken. They were also subject to rapid stylistic evolution and many were marked or decorated. These characteristics combine to make pipes one of the most sensitive and accurate means of dating archaeological deposits (Higgins 2008).

4.7.3 **Potential:** the pipe evidence will be of prime importance in helping to establish a tightly dated sequence for the archaeology of the site. Analysis will also establish an overview of the pipes produced and used in Liverpool. The assemblage has the potential to distinguish local and regional styles and their development across three centuries on Merseyside. In addition, specific styles of pipe were manufactured for export markets in the principal ports, such as London and Bristol, and also Liverpool, and these may be recognisable within the assemblage (*ibid*).

4.8 METALWORK

4.8.1 **Methodology:** a rapid visual scan of all the metalwork assemblage has been carried out, and the type of metal identified for each piece. In all, 153 objects were recovered and recorded, the majority being ferrous, with copper alloy forming the second largest group (Table 3).

Type	Number of pieces
Copper and alloys	25
Iron	126
Lead	2

Table 3: Metalwork by type

- 4.8.2 **Copper and alloys:** some 25 fragments of copper alloy were recovered, mostly from stratified contexts. The assemblage includes off-cuts and featureless fragments of sheet, strip, or drawn wire and piping, along with a small number of copper nails and fittings.
- 4.8.3 **Iron:** in all, 126 items of iron or steel were recovered. Most of the objects are in relatively good condition, recognisable, and from stratified contexts. They include structural ironwork, such as nails, alongside a proportion of featureless fragments.
- 4.8.4 **Lead:** both pieces were in good condition, with little sign of corrosion. The overall amount of lead is surprisingly small, probably a reflection of its recyclable value.
- 4.8.5 **Potential:** any household items may offer insights into the aspirations and economic circumstances of the inhabitants of the area, while items of mass manufacture may indicate the extent and nature of trade and industry.
- 4.9 **GLASS**
- 4.9.1 **Methodology:** assessment was based on the rapid visual inspection of available fragments. Data were recorded in a standardised format. In all, 1149 fragments of glass were recovered, the majority of the material dating from the eighteenth to twentieth centuries.
- 4.9.2 **Assessment:** the earlier eighteenth-century material is of great interest and significance to the site interpretation. Much of the eighteenth-century glass comprises dark-green wine bottles and other square or rectangular bottles. The later material has less value archaeologically, as it is not associated with the reclamation processes at Pier Head.
- 4.9.3 **Potential:** the principal contribution of the assemblage will be to assist in refining dating, allowing on occasion a greater precision than that afforded by the pottery.
- 4.10 **SHELLS**
- 4.10.1 **Quantification:** in total, 291 marine mollusc shells were recorded.
- 4.10.2 **Assessment:** these are likely to comprise mostly native oyster shells (*O edulis*), as food debris, rather than inhabitants of the dock or the pre-modification river Mersey, as muddy harbours and tidal pools are not a favoured habitat for this species (Liverpool City Council 2005, 100).

4.10.3 **Potential:** the relatively large size of the assemblage, and the wide range of contexts from which it was derived, provide scope for further analysis.

4.11 ANIMAL BONE

4.11.1 **Quantification:** a limited number of late post-medieval to early modern animal bone has been recovered from the excavation, totalling 144 separate pieces.

4.11.2 **Assessment:** species present include both domestic and wild mammals and birds. The material is in a good state of preservation, generally of a robust nature, frequently with little erosion of the surface of the bone, although often fragmented. The butchery marks upon the bone are typical of the period. All of the bone is likely to be derived from domestic refuse, or commensal animals.

4.11.3 **Potential:** the assemblage is small and has no further interpretative value beyond noting they're presence. No further work is recommended.

5 CURATION AND CONSERVATION

5.1 RECIPIENT MUSEUM

- 5.1.1 National Museums Liverpool is a group of eight museums in Liverpool, including the Merseyside Maritime Museum and the Museum of Liverpool Life. The main museum has been nominated as having the capacity to co-ordinate the deposition of the finds and the paper and electronic archive. Paper and digital copies of issued reports will be deposited with the Liverpool Record Office.

Site Code: LC07.

National Museums Liverpool, William Brown Street, Liverpool, L3 8EN. Contact: Liz Stewart. Tel 0151 207 0001 (switchboard).

Liverpool Record Office, Central Library, William Brown Street, Liverpool, L3 8EW. Tel 0151 233 5817.

5.2 CONSERVATION

- 5.2.1 The finds will require marking before being formally accessioned.

5.3 STORAGE

- 5.3.1 The complete project archive, which will include written records, plans, black and white and colour photographs, digital plans and photographs, artefacts, ecofacts and sieved residues, will be prepared following the guidelines set out in *Environmental standards for the permanent storage of excavated material from archaeological sites* (UKIC 1984, Conservation Guidelines 3) and *Guidelines for the preparation of excavation archives for long-term storage* (Walker 1990), prior to deposition.
- 5.3.2 The digital data will be temporarily stored on the server at OA North, which is backed up on a daily basis. For long-term storage of the digital data, CDs will be used, the content including the reports, plans, scanned images and digital photographs. Each CD will be fully indexed and accompanied by the relevant metadata for provenance. The digital record should ideally be duplicated as a paper record for long-term archiving, including comprehensive printouts of photographs and survey plots, labelled and summarised.
- 5.3.3 All dry and stable finds will be packed according to the Museum's specifications, in either acid-free cardboard boxes, or in airtight plastic boxes for unstable material. Each box will have a list of its contents and will in general contain only one type of material, such as pottery or glass.

5.4 PACKAGING

- 5.4.1 The assemblage is currently well-packaged and will require no further packaging. Box lists

derived from the site database have been compiled and will be updated when the identification of objects is complete. The paper records will be presented in either ring binders or in acid-free storage, fully indexed, and with the contents labelled.

5.5 **DISCARD POLICY**

5.5.1 A Discard Policy will be prepared, in consultation with the recipient museum, National Museums Liverpool. Material of no discernible long-term archaeological potential will be discarded, with the Museum's agreement.

5.6 **DISSEMINATION**

5.6.1 In accordance with the project *Brief* (Wardell Armstrong 2005), and following consultation with the client and the Merseyside Archaeologist, a suitable text will be prepared to publish the results from the excavation.

6 STATEMENT OF POTENTIAL

6.1 SUMMARY OF PRINCIPAL POTENTIAL

- 6.1.1 Despite disturbance and truncation caused by several twentieth-century constructions across the area of the Pier Head, the archaeological investigation of the Canal has demonstrated the survival of a large proportion of Liverpool's early historical waterfront, including a series of yellow sandstone sea defences and early docks, with their associated warehouses. Between these walls were clearly defined deposits of material which represent phases of land reclamation from the second half of the eighteenth century onwards. Between them, the assemblage of archaeological artefacts recovered in the course of the excavations, and the features identified and recorded, can significantly enhance an understanding of the development and reclamation of Pier Head.
- 6.1.2 The information recovered from Pier Head complements the data from work carried out on Mann Island as part of the LCL1–4 Canal Link by BAM Nuttall (OA North 2010c), the mixed use development by Countryside Neptune, directly adjacent (OA North 2010b), and works on the LCD1–7 Canal Link by Pierse Ltd (OA North 2011). Further links can be made to the excavation work carried out by Merseyside Archaeological Services on behalf of Pihl/Galliford Try directly to the west of the Canal Link, on the site of the new Museum of Liverpool (MAS 2008). Categories of material recovered from the global excavation programme include ceramics, glass, clay pipe, butchered animal bone, leather, timber, ferrous and non-ferrous metal, coins and tokens, and worked stone.

6.2 NATIONAL POTENTIAL

- 6.2.1 The Pier Head Canal Link investigations have provided an opportunity for the archaeological study of an important section of Liverpool's historical waterfront. Extensive remains of the post-medieval waterside fabric were uncovered, including a variety of dock facilities, warehouses and temporary works walls, which give a unique insight into the process of land reclamation that helped to shape the modern waterfront. These structures and their associated assemblages of finds have significant potential to contribute to knowledge in local, regional and national contexts. Some of the findings have helped and will help to elucidate previously unknown aspects of the development of the World Heritage Site, making them internationally significant. Evidence uncovered relating to riverside commerce and industry, as well as the remains of the production of goods for trade, has significant potential to contribute to an understanding of Liverpool's rise as a city trading on a global scale, and the contribution made by Liverpool to Britain's development into an economic and imperial power during the post-medieval period.
- 6.2.2 Similarly, when studied in conjunction with the material excavated from adjacent sites in Liverpool, the large and varied artefactual assemblage has excellent potential. It can be used to examine spatial and temporal distributions of goods produced, personal items, wholesale and retail/consumer issues, and regional and global trade. The artefactual assemblage from the North West is one of the smallest in the country, but the material from

these recent excavations in Liverpool has added to it substantially, and will add greatly to an understanding of Liverpool's hinterland (Newman and McNeil 2007a, 155).

6.3 INTERNATIONAL RESEARCH PRIORITIES

6.3.1 The Maritime Mercantile City of Liverpool is of international importance, as a World Heritage Site. In 2005, there were 830 recognised World Heritage Sites across the globe, of which only 26 are in the UK, including Stonehenge, the Tower of London, and Hadrian's Wall, all designated as having universal value. This status is a genuine reflection of the archaeological significance of a monument or landscape. Of the seven World Heritage Sites which are historical ports, two (Maritime Greenwich and Liverpool's Maritime Mercantile City) are in Britain, reflecting its importance as a seafaring nation. No international or even national research strategy has been formulated to address the development of ports, but the archaeological works at Liverpool provide the opportunity to advance studies in this field.

6.3.2 The guidelines for the implementation of the World Heritage Convention (UNESCO 2005) (which governs the management of World Heritage Sites) include the following requirements, all of which may be addressed and implemented by the analytical study, publication and presentation of the Pier Head material:

- to provide up-dated information about the World Heritage properties to record the changing circumstances and state of conservation of the properties (Point 201);
- to enhance capacity-building and research (Point 211);
- to raise the general public's awareness, understanding and appreciation of the need to preserve cultural and natural heritage (Point 211);
- to enhance the function of World Heritage in the life of the community (Point 211);
- to increase the participation of local and national populations in the protection and presentation of heritage (Point 211);
- States Parties are encouraged to raise awareness of the need to preserve World Heritage. In particular, they should ensure that World Heritage status is adequately marked and promoted on-site (Point 217);
- the World Heritage Committee encourages and supports the development of educational materials, activities and programmes (Point 219).

6.4 NATIONAL RESEARCH PRIORITIES

6.4.1 In 1991, the English Heritage document, *Exploring Our Past*, included a strategy for dealing with the problems and opportunities which would be encountered during the following decade (English Heritage 1991b). Many of the ideas first raised in this document were developed further in a draft *Research Agenda*, which outlined a series of research priorities (English Heritage 1997). The most recent English Heritage Research Strategy documents are *Exploring our Past Implementation Plan* (2003) and *Discovering the Past, Shaping the Future* (2005), although these are, in effect, strategies for English Heritage itself. Although the draft *Research Agenda* is no longer considered current, the following

research objectives remain pertinent, and are of direct relevance to this project.

6.4.2 **Processes of Change (PC): PC8: the Industrial Revolution (c AD 1700–1850):** work on this period of change should ‘include studies of the buildings and physical context of engineering, manufacturing and transport, the distribution and retail, water and sewage, interiors of and services to working class housing and the relationship between the traditional and new industries’ (English Heritage 1997, 45).

6.4.3 **Themes (T) - (T2) Urbanism:** ‘the quantity and quality of data derived from [urban contexts] merits greater attention on a thematic basis. There is a growing ability, especially given computer-based systems, to exploit the research potential of the data gathered to explore considerably more complex models of urbanisation. The opportunities for intra-site spatial analysis of settlements have developed massively and we would now wish to see the development of thematic and synthetic projects, designed to maximise the research potential of these resources to explore major archaeological research questions. The use of multivariate analysis, to explore spatial and temporal change in butchery, local environment, craft and industrial residues, building form and decoration, functional attributes of pottery and glass, *etc.*, are likely to be particularly important for testing theories relating to social action, economy, politics, ethnicity *etc.* It is an urgent priority that we start to draw upon data now collected, to review current knowledge and develop more complex theories of the past, if we are to create meaningful research agendas which are to inform the management of urban resources in coming years’ (English Heritage 1997, 52). The large body of structural evidence, the artefactual assemblages and environmental data from this, and other projects in Liverpool provide a significant opportunity to address these issues.

6.4.4 **Themes (T) - (T7) Patterns of craftsmanship and industry:** suggested ways in which understanding of this subject might be advanced include ‘projects to examine aspects of craftsmanship and manufacture deduced from a study of the finished object’ and ‘exploration of ancient carpentry, timber technology, woodland management’ (*op cit*, 54). The clay products recovered from the excavations, such as ceramic vessels and clay tobacco pipes, as well as the evidence for stone- and wood-working techniques and monumental building methods, can all provide rich evidence for this subject area.

6.4.5 These research questions are only a limited selection of the potential which the material archive affords us. It is generally rare that such a large and in this case interconnecting area of a modern city centre is excavated as part of a rationalised and well thought-out archaeological investigation.

6.5 REGIONAL RESEARCH PRIORITIES

6.5.1 *The North West Regional Archaeological Research Framework* (NWRARF) has produced a regional resource assessment (Brennand 2006), and a research agenda and strategy (Brennand 2007) for the post-medieval and industrial to modern periods. These documents consider the known evidence for each period within the region, identify *lacunae* in knowledge, and define important avenues for further research. Elements of the research agenda relevant to this project are summarised below, including verbatim quotation of

specific research initiatives that can be addressed by the Liverpool data, with specific relation to the material gathered during the Liverpool Canal Link investigations. This series of investigations may be regarded as unique, in view of the large area of waterfront covered, and with the attention paid to studying and recording the evolution of dock engineering at a time when Liverpool led the world in this field.

6.5.2 **Post-medieval Period:** the post-medieval archaeology of the North West is distinct and different from England south and east of the Pennines, its material culture being driven by processes, including industrialisation, which are founded upon, and symptomatic of, the environmental and socio-economic conditions. Research on the region's material culture is under-represented, partly because our knowledge of the consumption and production of material goods is lacking. An improved understanding of 'regional ceramic production and consumption is of central importance in the construction of the research frameworks for the whole period' (Newman and McNeil 2007b, 115). The following initiative applies to the study of ceramics in the region:

- **Initiative 6.1:** the available dataset should be greatly enlarged. Stratified artefact sequences from both small towns and rural settlements need to be collected, in order to establish the character of ceramic use throughout the region and to create the basis for socio-economic interpretation (Newman and McNeil 2007b, 117).

6.5.3 **Trade, exchange and interaction:** Liverpool is highlighted in the *Research Framework* for its capacity to elucidate the impact on the region of seaborne, especially Atlantic, trade and the onset of globalisation (*op cit*, 130), which ultimately led to the development of entirely new mercantile and social classes and trades:

- **Initiative 6.33:** improve the regional knowledge of ceramic vessel form and fabric-type chronologies (*ibid*).
- **Initiative 6.37:** target for investigation ports where little is known; study Chester and Liverpool together to see how/why one took over from the other (*ibid*).

6.5.4 **Industrial and Modern Period:** 'Britain was the world's first industrialised nation and the North West was in the vanguard of the process of industrialisation. One of the major challenges facing archaeologists is to recognise and define the extent and relative significance and distinctiveness of the region's industrial heritage' (Newman and McNeil 2007a, 133). The breadth and depth of change which occurred during the industrial period encompasses issues which 'are not merely technological but affect consumption, working patterns and organisation, religion and politics, gender relations, health and most other aspects of human life' (*ibid*). The excavation of the Pier Head section of the Canal Link provides a useful understanding of a piece of land which did not exist in its entirety until the first decade of the nineteenth century. The artificial creation of this land was entirely dependent on the available engineering technology and tools of the time. In addition, it is rare to be given the opportunity to examine a section of land which, as well as being entirely man-made, has undergone such a rapid series of changes in use and development over a comparatively short period of time. The archaeological evidence presents us with numerous aspects of the social, commercial and transport-related activities in the area, over a period of more than 200 years.

- 6.5.5 **Industrialisation and Infrastructure:** the industrial and urban developments of the later eighteenth and nineteenth centuries were intrinsically linked to developments in the transport infrastructure. The advent of the electric tram, and particularly the electric railway under the Mersey, were both particularly significant in stimulating urban growth, but are not well studied.
- **Initiative 7.2:** a study or studies of the North West's tram systems focused on both the associated structures and their wider landscape impact (Newman and McNeil 2007a, 139).
- 6.5.6 **The Urban Landscape:** particularly in view of the rapidity of change in the Canal Link area during the late eighteenth to twentieth centuries, and the unique datasets recovered by archaeological excavation, the full analysis of the artefactual assemblages and structures offers the opportunity to 'supplement and supersede the documentary record' (*op cit*, 144). The crucial aspect in the study of the development of the urban landscape is the identification and description of 'difference, similarity, change and continuity', both over time and between different geographical locations (*op cit*, 143).
- 6.5.7 **Trade, Exchange and Interaction:** the *Research Framework* notes that the current investigations of the earlier facilities at Liverpool docks should reveal more of the potential for the archaeological investigation of Industrial-Age ports. It will also be important for the archaeological study of warehouses, where there is a need to examine both their design and distribution (*op cit*, 155). The ergonomic factors linking the design of warehouses to the products they stored, the relationship with vernacular traditions of design and more recent experience in the design of canal and railway warehouses, and the effect of economic imperatives, are all ripe for further study. The *Research Framework's* initiatives for trade, exchange and interaction are:
- **Initiative 7.41:** the retention of later period artefacts and their routine analysis as part of all archaeological excavation projects (Newman and McNeil 2007a, 156);
 - **Initiative 7.42:** examination, mapping and evaluation of the occurrence of vernacular materials and objects in nineteenth-century contexts (*ibid*);
 - **Initiative 7.43:** excavation and scientific analysis of eighteenth- and nineteenth-century dock deposits (*ibid*).

7 UPDATED PROJECT DESIGN

7.1 AIMS AND OBJECTIVES OF THE PROGRAMME OF ANALYSIS

7.1.1 This section follows the guidance of English Heritage regarding the formulation of updated research aims (English Heritage 1991a, 2–3). The original aims for the project remain valid, but can be updated with new aims and objectives derived from the statement of potential set out in *Section 6*, as follows.

7.1.2 **Updated research aim 1:** how did the layout and character of the site develop through the post-medieval period?

- *Objective 1:* to characterise the nature of the main phases of activity *via* their stratigraphy and to detail the archaeological formation of the sites.
- *Objective 2:* to determine the phasing of the structures on the site to set its development within an historical context.

7.1.3 **Updated research aim 2:** what is the evidence for the development of trade and industry in post-medieval Liverpool, and its associated infrastructure?

- *Objective 1:* to examine the contribution of the docks to the development of Liverpool's production, industry, trade and transport.
- *Objective 2:* to explore the evidence from the site for the rise of consumerism.
- *Objective 3:* to integrate evidence for the wider development of transport and industrial infrastructure in Liverpool with the evidence for goods, trades and services provided by the artefacts and structures located by the excavation.

7.1.4 **Updated research aim 3:** what evidence is there for developments in engineering and methodology in Liverpool's 'dock system'?

- *Objective 1:* to detail the construction methods and materials, including adaptations and rebuilds, for all the maritime features within the site.
- *Objective 2:* to investigate the 'dock system', its development and use, examining the evidence for the Liverpool docks and in other global port cities.

8 METHOD STATEMENT

8.1 PROGRAMME STRUCTURE

8.1.1 The post-excavation programme, designed to fulfil the research aims outlined in *Section 7*, will be divided into the following stages:

- full cataloguing of any data representatively sampled
- further post-excavation investigation
- analysis
- synthesis
- preparation of draft text and illustrative material
- publication
- archive deposition.

8.2 MANAGEMENT, MONITORING AND REVIEW

8.2.1 **Task 1:** management and monitoring tasks have been built into the project. These tasks will include project monitoring, advice and co-ordination, problem solving, and conducting meetings with project staff and all interested external parties.

8.3 STRATIGRAPHY: ANALYSIS AND SYNTHESIS

8.3.1 **Task 2:** the stratigraphic data will need to be studied in greater detail in order to refine the provisional phasing. More detailed structural analysis will be undertaken on complex features, such as the dock and sea walls, and the warehouses. Existing matrices will require assimilation into one overall matrix for each investigation area, showing the amended periods and sub-phasing.

8.3.2 Once the data from all areas have been analysed and a stratigraphic narrative completed, it will be possible to prepare phase plans. Such phase plans are a prerequisite for specialist analysis of the artefact assemblages. Analysis and synthesis of the results of specialist analysis of the finds will, however, contribute to the site phasing, a reciprocal process which enhances both stratigraphic and artefactual datasets.

8.4 PROCESSING AND TRANSPORT OF ARTEFACT ASSEMBLAGES

8.4.1 **Task 3:** the finds will be marked to allow complete integration into the site database. This is also a prerequisite for archiving and submission to the museum. At an early stage in the analytical programme, arrangements will be made to transport all relevant assemblages to the appropriate external specialists, if they are not already in possession, to facilitate analysis and reporting of the material. Conversely, on the completion of this work, material

will need to be received from the specialists, sorted and checked against database records. Transport of large finds still stored on site is the responsibility of the individual client/contractor. The larger material, including the retained pieces of structural material from the sea walls and dock walls, has already been accessioned to the National Museums Liverpool.

8.5 DIGITAL DATA IN THE ANALYSIS PHASE

8.5.1 **Task 4:** at the start of the major fieldwork in Liverpool in 2004, a basic Microsoft *Access* database was set up to record finds and archaeological contexts, along with a CAD environment, in which all plans and elevations could be placed to produce an up-to-date composite view of the site, and a GIS (Geographical Information System), using *ArcGIS* version 9, for the integration of the two, and as a tool for interpretation. These have been used for all the work on the Liverpool docklands, including the Chavasse Park and Old Dock excavations (LUAU 2001; OA North 2010a), Mann Island (OA North 2010b), and other elements of the Canal Link project (OA North 2010c; 2011). The GIS has proved to be an invaluable method of interrogating the vast amount of data generated from nearly three years of fieldwork and has allowed datasets to be easily contrasted.

8.5.2 **Digital photographs:** links to digital photographs will be embedded within the database where appropriate. These photographs will require formatting, checking, and the creation of hyperlinks into the GIS.

8.5.3 **CAD Drawings and Laser Scan Data:** the database will link into plans of features and the overall site plan. The majority of the fieldwork plans have been digitised. Wall elevations were recorded on site through the use of laser scanning and rectified photographs.

8.5.4 **Additional GIS information sources:** the GIS will also incorporate the existing and any future documentary data, which will be an integral part of the analysis. Historical mapping has already been used within the CAD system to help identify phases of activity and structures.

8.6 DOCUMENTARY AND ARCHIVE MATERIAL

8.6.1 **Task 5:** further documentary investigation will be undertaken to enhance the fieldwork results. This will include a search of cartographic sources, and photographic records. A limited appraisal of these sources has already been undertaken as part of the ongoing research.

8.6.2 **Primary documentary sources and photographs:** the majority of the relevant primary documentary sources are in the County Record Office. The precise number of references of interest to the present study is unknown, but only references relevant to specific, identifiable buildings or other monuments within the study area will be selected for inclusion. A review of all cartographic sources will be undertaken and all relevant mapping will be digitised (**Task 4**).

8.6.3 The site will be considered in relation to other known sites of archaeological interest in the local area and the wider region. This will involve an element of library-based research. A

significant archive and research base has already been set up over the past six years which will allow the Canal Link excavation to be considered in relation to other significant areas of the Liverpool waterfront, including, but not limited to, Chavasse Park, Mann Island, the Mann Island Canal Link and the Central Docks section of the Canal Link.

8.7 POST-MEDIEVAL POTTERY

8.7.1 **Task 6:** the assemblage will be fully quantified and recorded. The vessels will be classified by fabric groups and those wares not originating in the locality or imported will be distinguished. The assemblage will be correlated with the stratigraphic analysis and with other material assemblages, especially the clay tobacco pipes, to maximise the dating evidence. A small number of objects identified may require illustration. A report will be compiled for incorporation in the publication.

8.8 CLAY TOBACCO PIPE

8.8.1 **Task 7:** a full catalogue will be prepared and comparative material sought. The bowls and stems in large and apparently tightly-dated deposits with large fragments will be examined for joins. Where possible, an attempt will be made to reassemble complete pipes. The most significant pit groups or sealed layers will be studied and described. Any kiln deposits will be identified and studied in more detail. An attempt will be made to determine the number and range of mould types represented, and the full range of types will be illustrated. The forms being produced in Liverpool will be described, discussed, and compared with examples from elsewhere, both regionally and nationally.

8.9 METALWORK

8.9.1 **Task 8:** the assemblage will be recorded (and a report prepared). Recommendations will be made, after discussions with the relevant curators, for the safe and appropriate disposal of material where appropriate.

8.10 GLASS

8.10.1 **Task 9:** the glass will be recorded and a report prepared. Recommendations will be made, after discussions with the relevant curators, for the safe and appropriate disposal of the bulk of the material.

8.11 SHELL

8.11.1 **Task 10:** the material will be fully recorded, and a short report prepared.

8.12 ANIMAL BONE

8.12.1 **Task 11:** no additional work required but the results of the assessment to be included in the final report.

8.13 INTEGRATION OF DATASETS AND SYNTHESIS

8.13.1 **Task 12:** the information gathered from the analysis of the finds will be reviewed and integrated into the stratigraphic narrative. This will allow re-interpretation of the site using a thematic approach.

8.14 ILLUSTRATIONS

8.14.1 **Task 13:** during each part of the analytical programme, a selection will be made of appropriate material for illustration. This will include general plans and sections, phase plans, and artefacts. Illustrations will be produced by experienced illustrators, using standard conventions.

8.15 PRODUCTION OF TEXT AND PUBLICATION

8.15.1 **Task 14:** following the completion of the analysis of the stratigraphic and artefactual evidence, an archive report will be produced. The results of the programme of archaeological works will also be submitted for publication in a suitable academic vehicle (*Section 9*).

8.16 ARCHIVE DEPOSITION

8.16.1 **Task 15:** OA North undertakes to liaise throughout the project with the receiving museum to meet its deposition policies. On completion of the analysis, a discard policy will be implemented (*Section 5.5*). On submission of the completed text for publication, the archive will be updated as necessary and the receiving museum will be contacted to obtain the latest information on its deposition arrangements. Material in files and boxes will be checked, and indices and box lists will be compiled and appended.

8.16.2 The digital archive will be checked and indexed, and hard copies made of the data if required by the recipient museum. The digital data will be accompanied by metadata, which will explain origin and accuracy.

9 PRESENTATION OF RESULTS

9.1 INTRODUCTION

- 9.1.1 Following the analysis and interpretation of the data, the results should be placed in the public domain, as required by the planning condition. Given the immense importance of the material, it is anticipated that dissemination will consist both of the final client report, and a more accessible publication, targeting other audiences in Liverpool and beyond.
- 9.1.2 The Canal Link excavations form one element of a sequence of archaeological excavations and investigations undertaken along the Mersey shoreline since 2001, including Chavasse Park and Environs (LUAU 2001; OA North 2010a), the site of the new museum (MAS 2008), and the Mann Island development (OA North 2010b). Together, these works have recovered an unparalleled assemblage of artefacts and environmental remains, and sophisticated evidence for sequences of structures and engineering techniques during two centuries of intense technological and economic development.

9.2 PROPOSALS

- 9.2.1 **Archive/Client Report:** it is proposed that a client report is produced, formatted for limited distribution in paper copy to local libraries, the Record Office, and the HER. This will include details of structural and stratigraphic elements of the docks and associated activity, and reports on the finds.
- 9.2.2 **Publication:** the results from the archive report will either be published in an appropriate academic journal or incorporated into a formal monograph with the results of other excavations from Liverpool Docks, such as the results of recent work on the site of the National Museums Liverpool (MAS 2008), and the Countryside Neptune development site (OA North 2010a). The scope and scale of such a potential publication will be determined in consultation with Liverpool City Council.

9.3 STRUCTURE

- 9.3.1 The following sections provide a provisional breakdown of the contents of the proposed archive report. In advance of completion of the full post-excavation analysis, this synopsis can only be regarded as a draft.
- 9.3.2 It is anticipated that the **archive report** will work to the following general headings and content:

Summary and Acknowledgements

1 Introduction

Site location

Circumstances of project

2 Archaeological Background

Documentary evidence

Historical background

3 Results of the Archaeological Excavations

Outline of the archaeological works

Later industrial period, 1800–1900: description of the development of sea walls, docks, land reclamation and early buildings, their construction and adaptation

4 The finds

Reports on the finds by category, with a brief comment on the significance of the overall assemblage

5 General Discussion

Interpretation of the site, describing the results of the archaeological excavations and what they show about the conditions and changes through space and time within the study area

Bibliography

10 OTHER MATTERS

10.1 HEALTH AND SAFETY

10.1.1 All OA North post-excavation work will be carried out under relevant Health and Safety Legislation, including the Health and Safety at Work Act (1974). A copy of the Oxford Archaeology Health and Safety Policy can be supplied on request. The nature of the work means that the requirements of the following legislation are particularly relevant:

- Workplace (Health, Safety and Welfare) Regulations (1992): offices and finds processing areas;
- Manual Handling Operations Regulations (1992): transport of bulk finds and samples;
- Health and Safety (Display Screen Equipment) Regulations (1992): use of computers for word-processing and database work;
- COSSH (1998): finds conservation.

10.2 INSURANCE

10.2.1 The insurance in respect of claims for personal injury to or the death of any person under a contract of service with the unit and arising out of and in the course of such person's employment shall comply with the Employers' Liability (Compulsory Insurance) Act 1969 and any statutory orders made thereunder. 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.

10.3 PROJECT MONITORING

10.3.1 Any proposed changes to the project design will be discussed with the client and relevant bodies.

10.4 TOTAL COSTS

10.4.1 The total costs for the analysis stage and report production are set out in the Financial Breakdown in *Appendix I*.

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APPENDIX 1: FINANCIAL BREAKDOWN

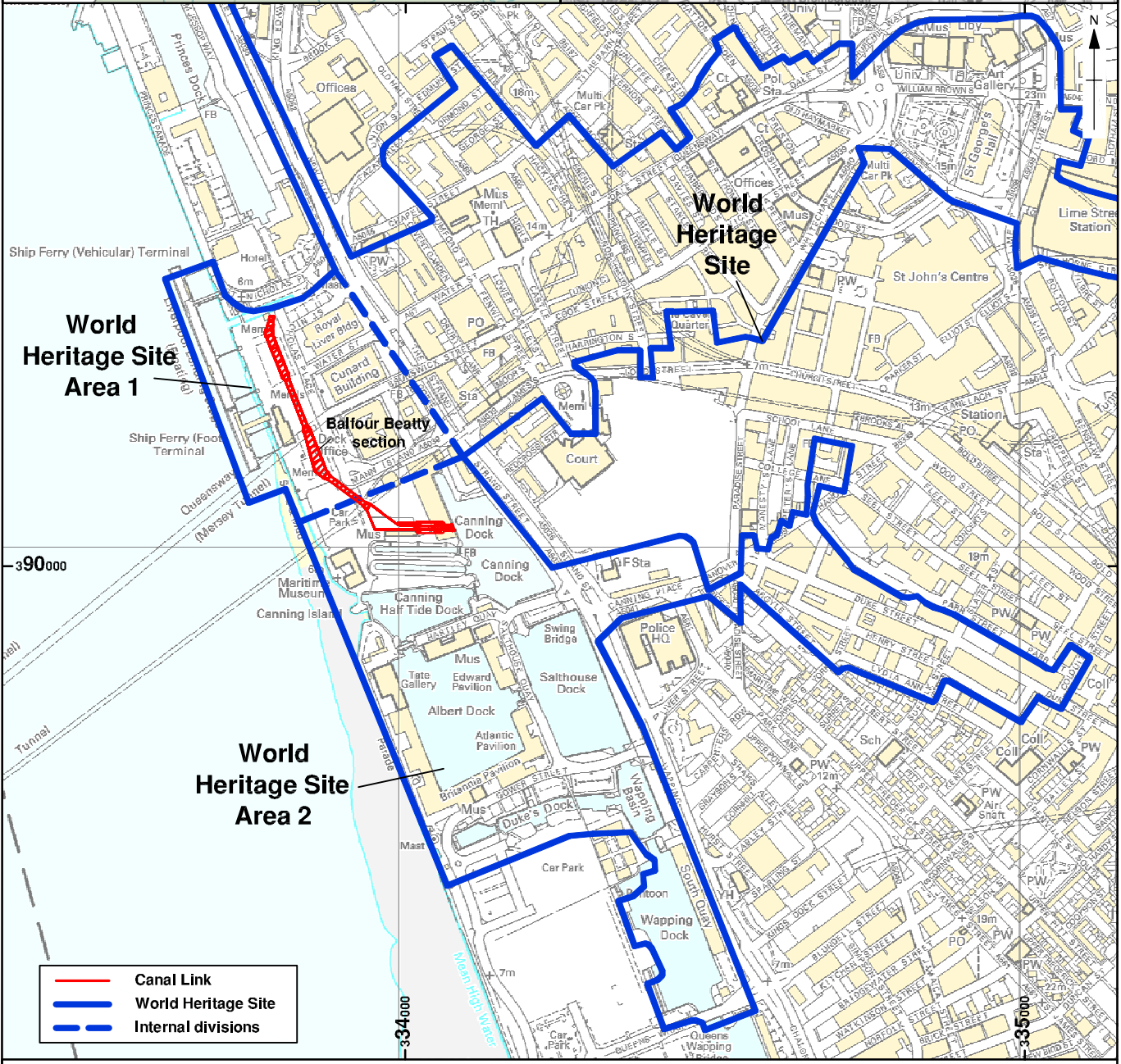
POST-EXCAVATION COSTINGS

The total cost quoted for the post-excavation is a fixed price which is inclusive of all management, overheads, and other disbursement costs (travel and expenses), to undertake the programme of work as defined in this project assessment. Any other variations from this programme of work at the client's direction will require recosting. All staff costs are inclusive of holiday entitlement, as well as NI and Superannuation. The costs for publication exclude printing costs.

Set-up / management / travel costs	£ 1680.00
Design and enhancement of GIS	£ 1044.00
Documentary Sources processing	£ 1464.00
Post-excavation analysis: stratigraphy	£ 5340.00
Finds analysis	£ 5195.00
Environmental processing	£ 2042.00
Site Illustrations	£ 1800.00
Baseline academic publication preparation and production	£ 6240.00
General outreach publication	£ 2539.00
Archive	£ 1631.00
<hr/>	
Total	£ 28,975.00

Notes:

1. Salaries and wages inclusive of NI and Superannuation
2. Costs incorporate all office work necessary to produce the report and publication
3. Costs are at 2008–9 prices
4. Costs are exclusive of VAT



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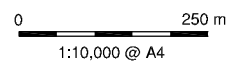


Figure 1: Site location

JQ*L9808*AMS*14-11-08

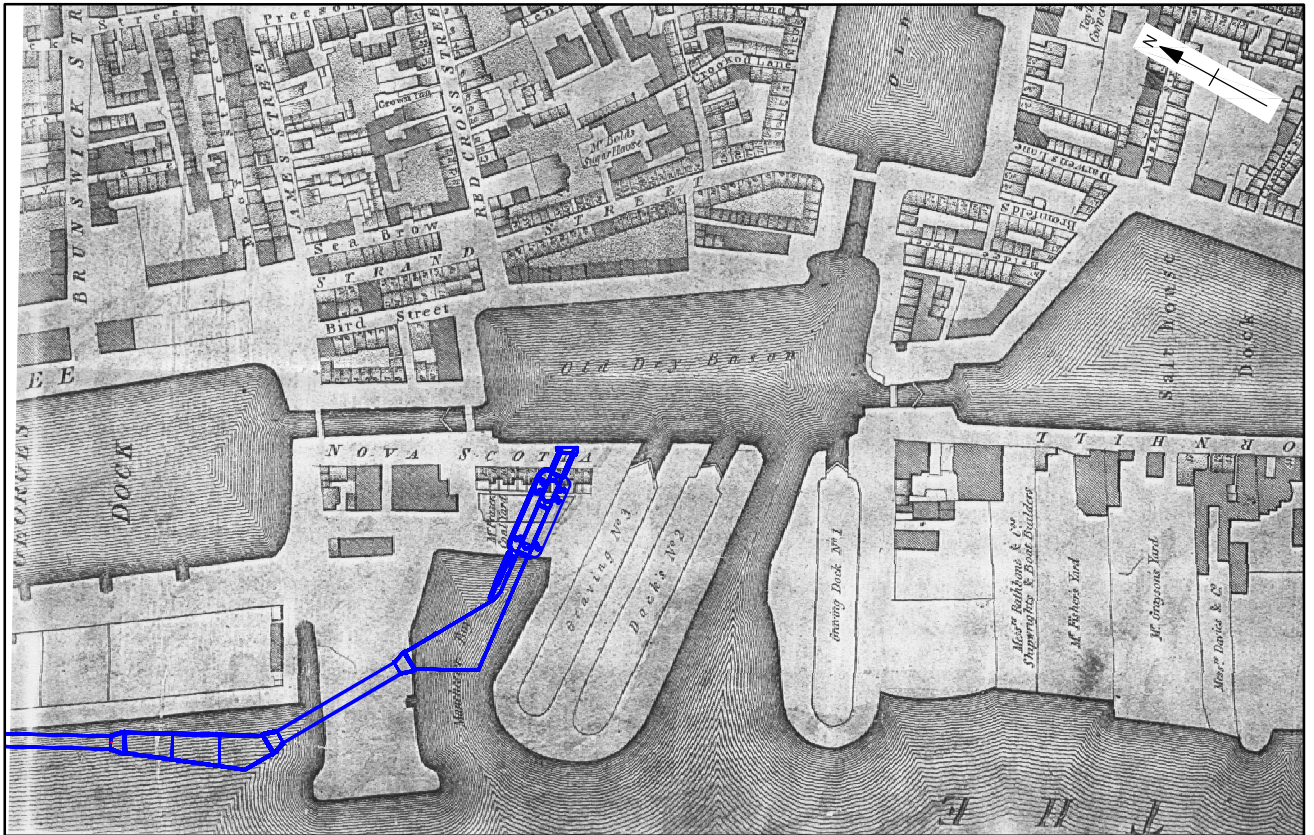


Figure 2: Canal Link excavation area superimposed on an extract from Horwood's map of Liverpool, 1803

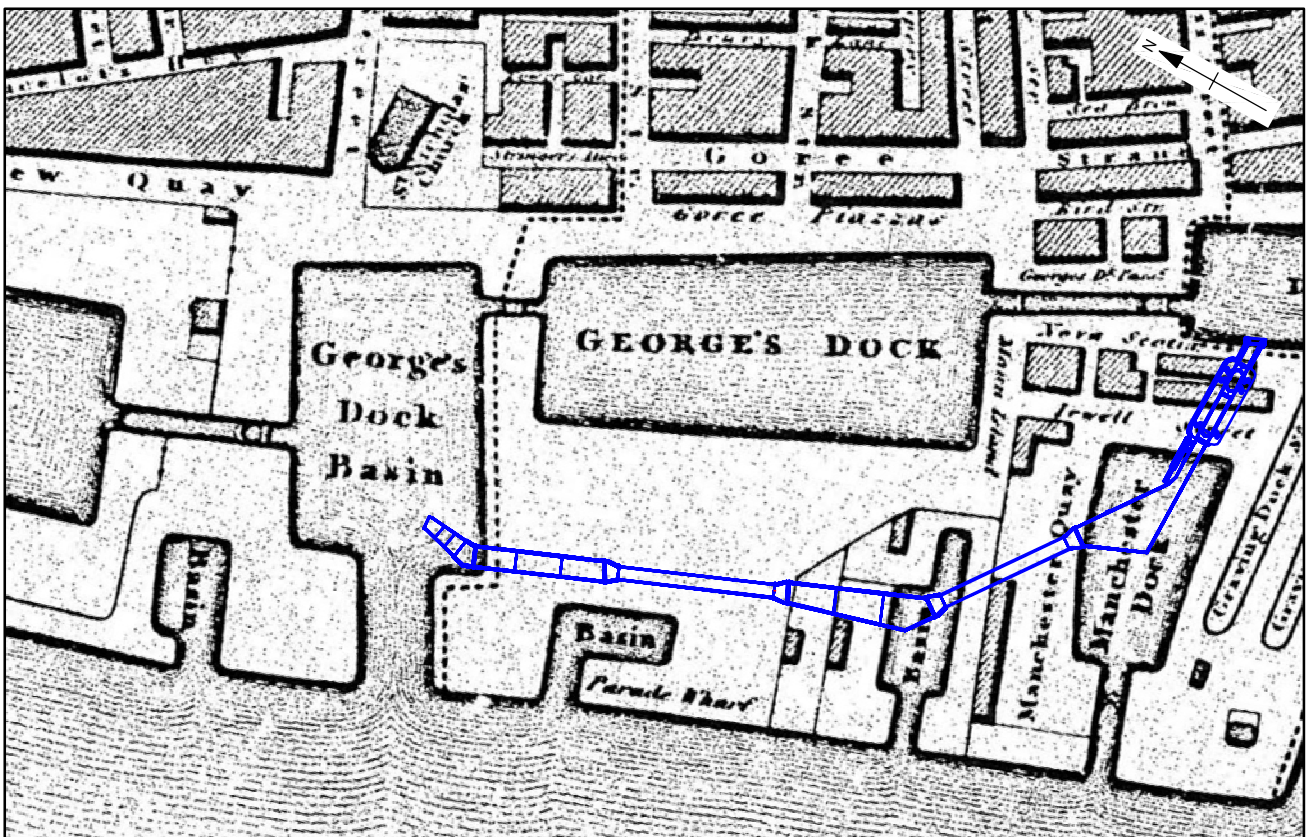



Figure 3: Canal Link Excavation area superimposed on an extract from Sherwood's map of Liverpool, 1821

 Canal Link

not to scale

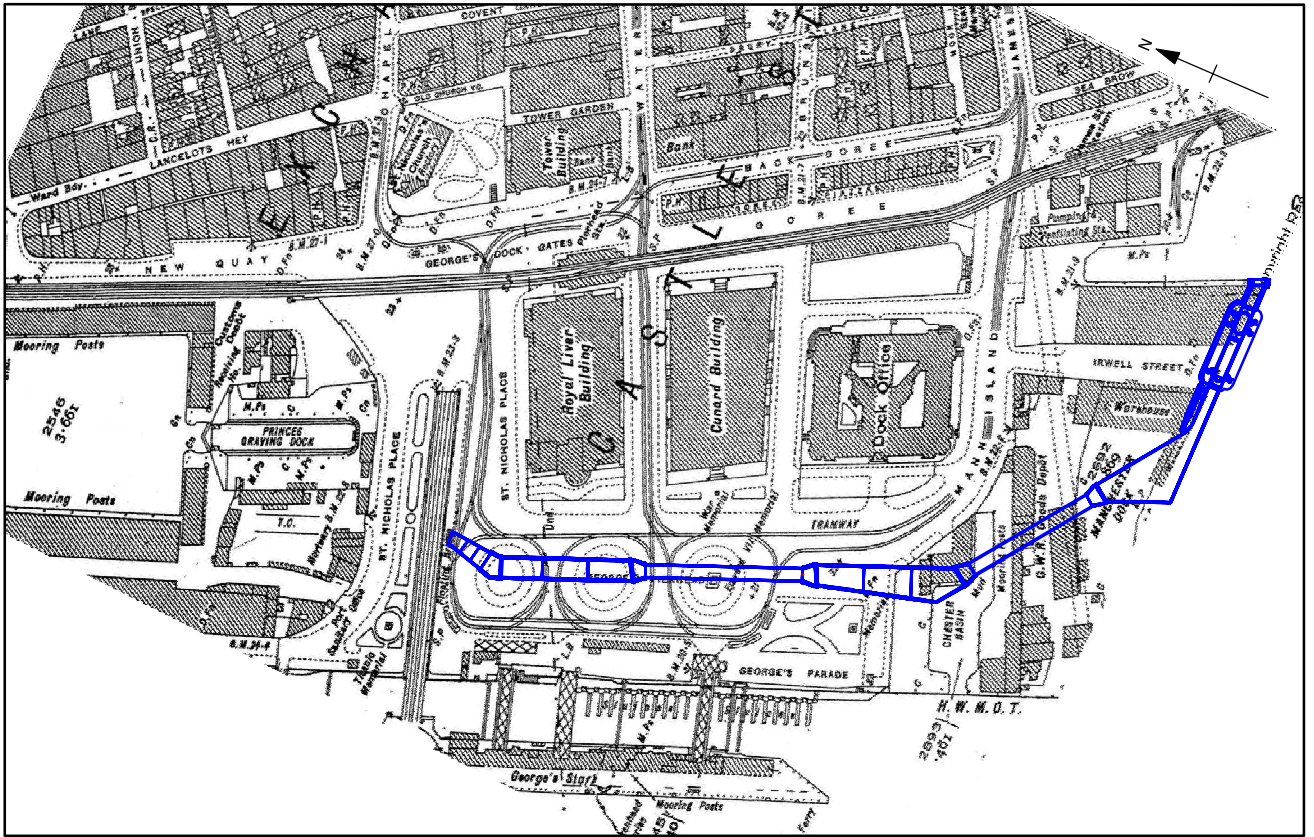



Figure 4: Canal Link excavation area superimposed on an extract from the Ordnance Survey 6" to 1 mile map of Liverpool, 1927

 Canal Link

not to scale

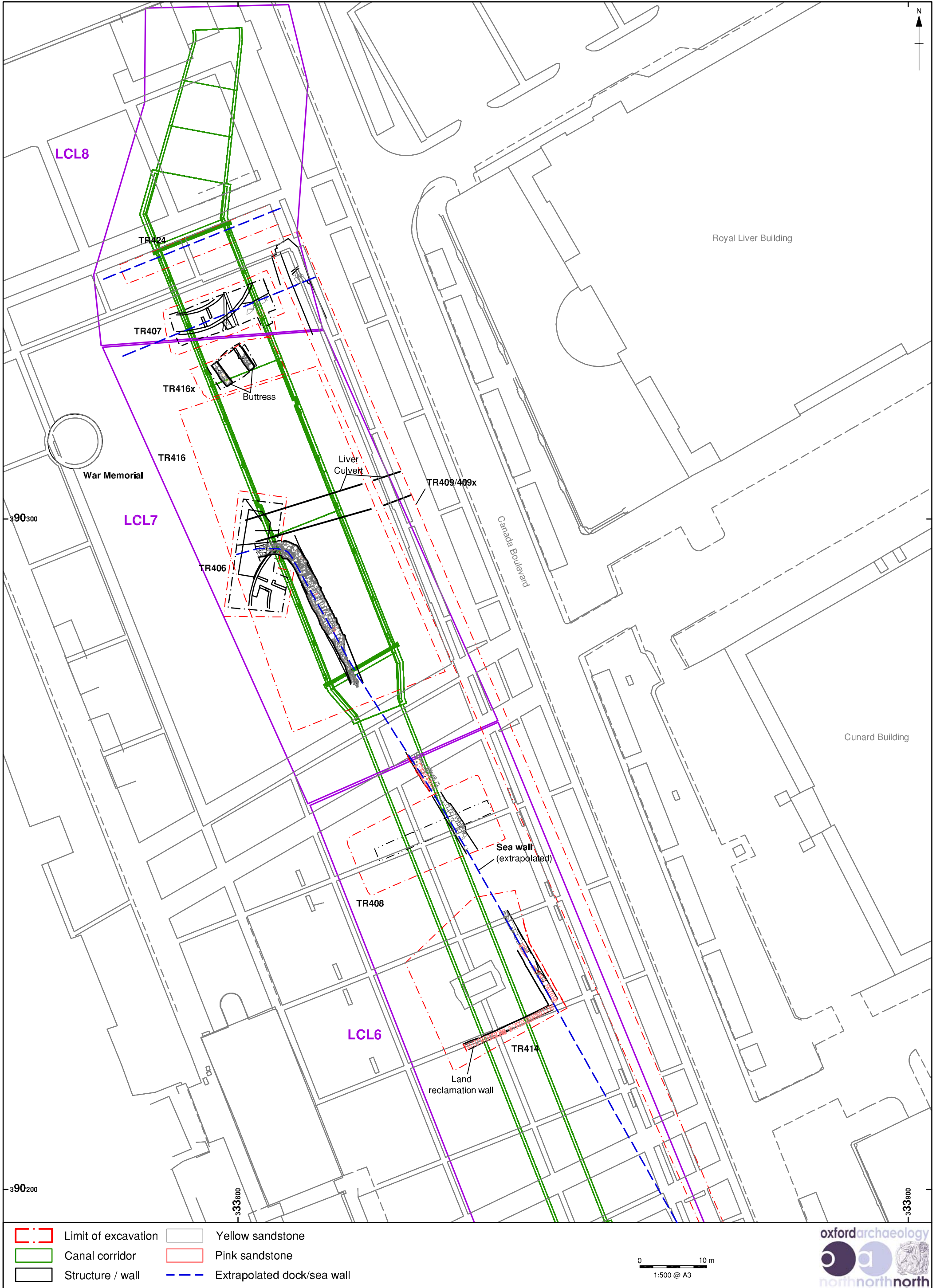


Figure 5: Liverpool Canal Link: excavation areas LCL6-8

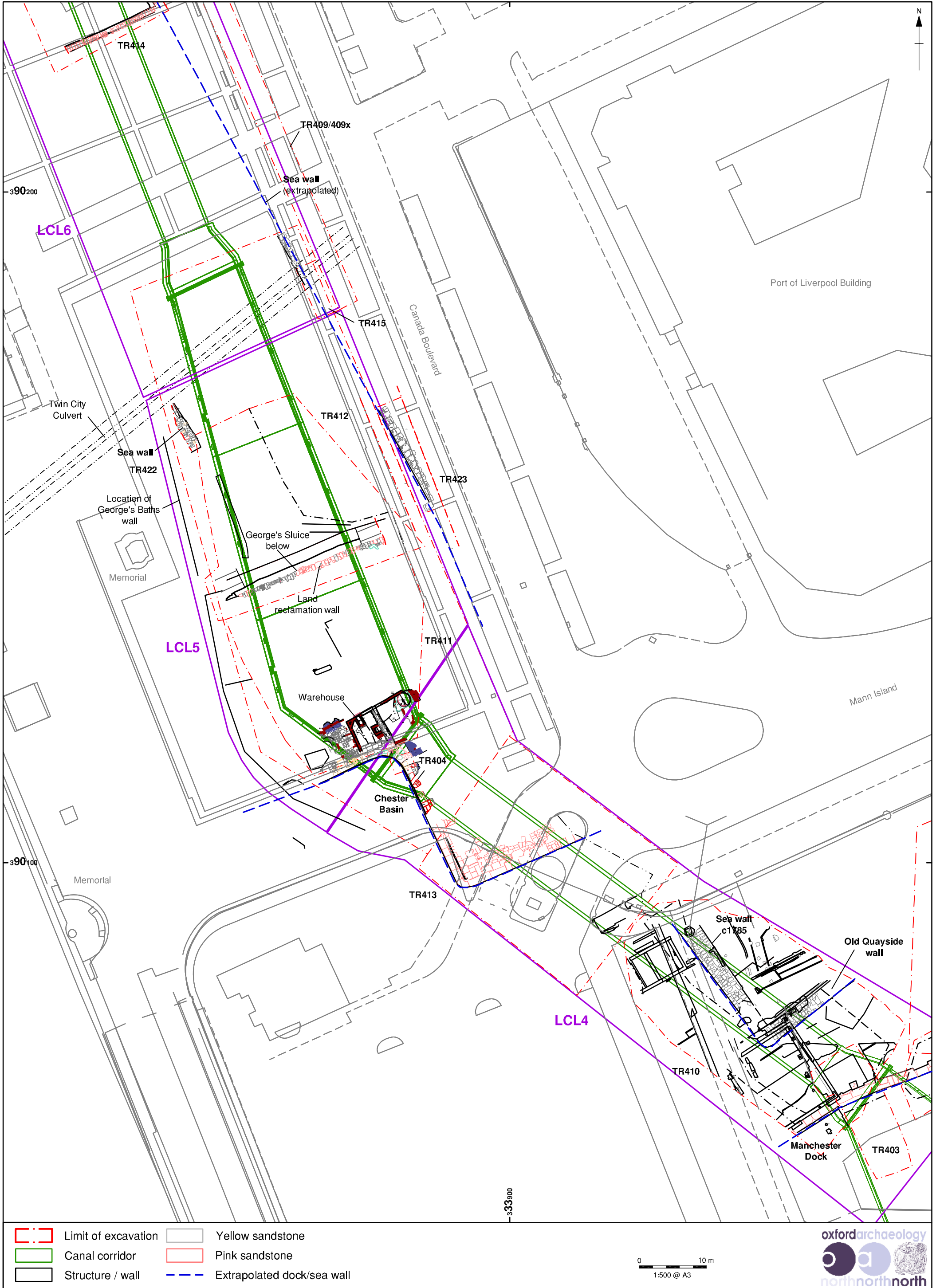


Figure 6: Liverpool Canal Link: excavation areas LCL4-6

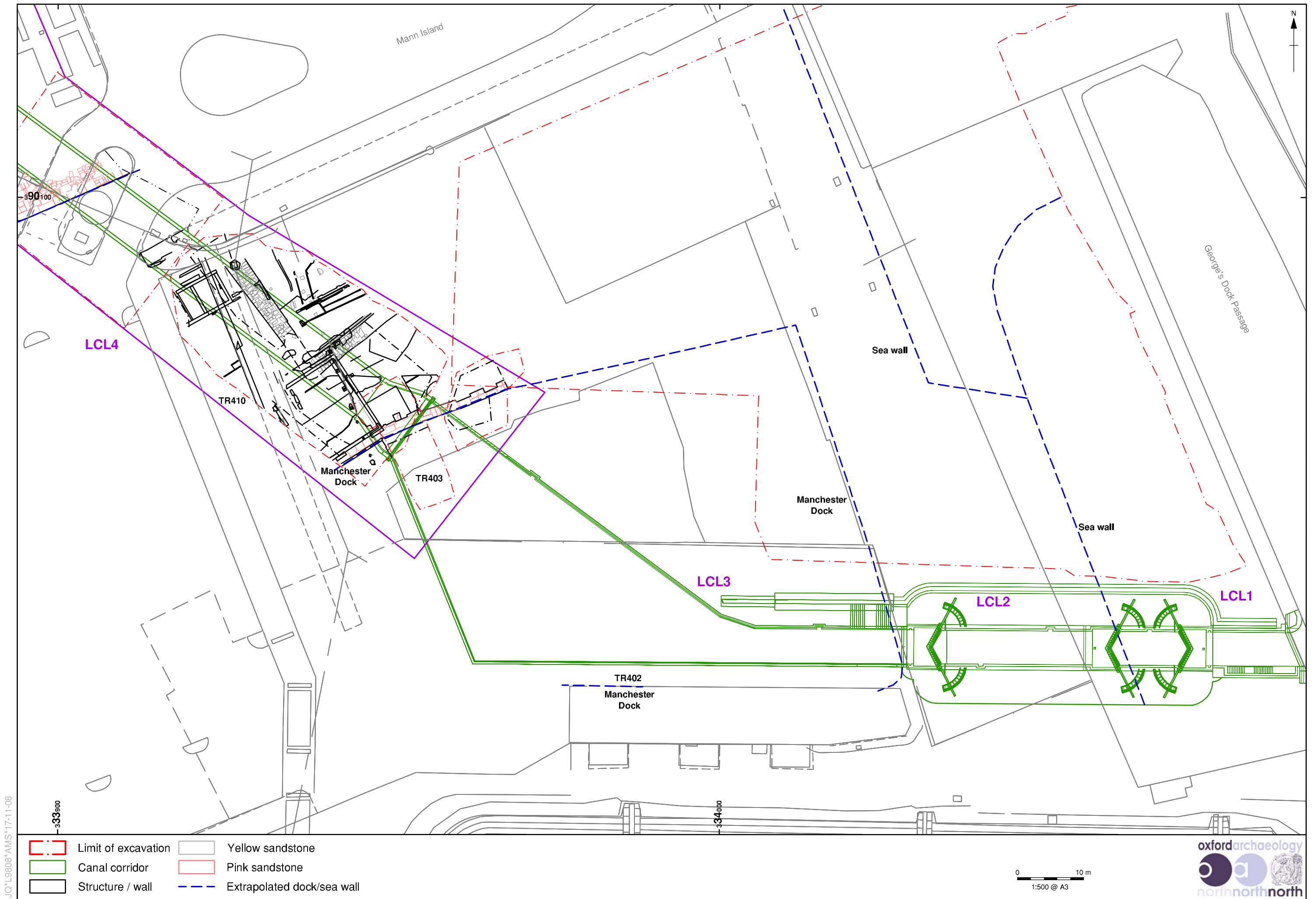


Figure 7: Liverpool Canal Link: excavation area LCL4



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Plate 7: Trench 416 (LCL7), from the east, showing the mid-eighteenth-century sea wall truncated by the Liver Culvert



Plate 8: Trench 416x (LCL7), showing buttresses associated with the east return of the sea wall



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