MANN ISLAND,

Liverpool

Merseyside

Archaeological Excavation Report

Oxford Archaeology North

March 2012

Countryside Neptune llp

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SUMMARY

The area known as Mann Island (centred at SJ 3403 9008) is bounded on the north by a road of the same name, on the east by The Strand, and on the west by the Mersey itself, while the Canning Graving Docks form the southern limit. The Strand, as the name implies, marks the approximate position of the natural shoreline of the Mersey, prior to two centuries of land reclamation. Mann Island itself, which lies partly within the Maritime Mercantile City of Liverpool World Heritage Site, consists entirely of made ground, created during the construction of a series of docks.

The process of reclamation began in the early eighteenth century, when a tidal basin to ease the approach to the Old Dock (built 1710–17) was established. The later extension and development of this, from *c* 1738, created the Dry Dock, from which Canning Dock was adapted in 1829. Further phases of reclamation westwards culminated in the establishment of Manchester Basin (later Dock) in 1785.

The archaeological excavations on Mann Island, carried out by Oxford Archaeology North between May 2007 and May 2008, with further work in July 2009 and May 2011, on behalf of Countryside Neptune, occupied ground extending from the early eighteenth-century reclamation close to the original shoreline, westwards to the northern and eastern walls of Manchester Dock, and included successive limits of land reclamation in between. From an examination of historical records and maps, it was apparent that the excavation was likely to encounter the remains of sea walls, the Dry Dock, the passage between Canning Dock and George's Dock to the north, Manchester Dock, the Mersey Railway Pumping and Ventilation Station, and buildings which occupied the area marked on maps as Nova Scotia.

At the outset, a building survey was undertaken of the standing structures, which included the Transit Shed, and Voss Motor buildings. Following the demolition of these, a programme of excavation was implemented. The excavation took three forms: a watching brief on trenches excavated by the construction engineers to assess ground conditions; excavation, assisted by machine, of areas of complex building remains; and the bulk excavation by machine of infilled ground behind sea walls and within redundant docks. Details of the construction of each of the major features were revealed by these processes. In most instances, the dock and sea walls were all remarkably well-preserved, to almost their full original profile. Walling of the Dry Dock, George's Dock Passage, Manchester Dock and three successive sea walls was located, showing developments and variations in construction technique and material over a period of less than 50 years in the middle to late eighteenth century. A watching brief was maintained during piling works in the vicinity of the Dry Dock wall in July 2009 and 2011, some of which directly impacted upon the wall.

In all areas there were also the remains of the ancillary buildings serving the docks and providing accommodation for those engaged in their operation, which extended across the area of reclaimed land formerly called Nova Scotia. The buildings took the form of dwellings and warehouses, although a number of the warehouses also included dwellings in their cellars. Domestic buildings in the southern part of the site were subject to considerable change, and indeed demolition, whereas those to the north survived through to the early twentieth century and included a number of public houses, their function evidenced by trade directories. Towards the end of the eighteenth century, the name Nova Scotia had become centred on one of a series of streets and the area as a whole had acquired the name Mann Island.

The investigations generated large quantities of stratigraphical and structural data and substantial assemblages of finds. The excavation results thus add significantly to what was known and understood about the form and technology of some of Liverpool's most notable maritime engineering structures, and has enabled a detailed chronology of the early development of the dock system, and of the reclamation of land from the Mersey, to be compiled.

ACKNOWLEDGEMENTS

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Sincere thanks go to the site team of the principal contractor, BAM, which included Neil Millward, Peter Marner, David Mahoney, John-Luke Smith, Eamonn Murphy, and Dave Hanlon, for their help and support throughout the course of the excavation work, and especially the bulk excavation. From Tisdale, the demolition contractors, thanks are due to Terry Mason, and his team, for their essential on-site support and help. From Boundary, plant providers, thanks must be expressed to the machine-plant operators, for their patience and professionalism in undertaking the machining. Hylift operator Des Alcock, of Hylift Access Hire, is thanked for his assistance in capturing aerial photographs of the Mann Island bulk excavation as it progressed. We would also like to thank Mahers, plant providers, for the assistance and patience of their skilled digger drivers during the course of the bulk excavation, including Gordon Robinson, Andy Noakes, Simon Braithwaite, Bryan Sutton and Gary Agyse. The work would not have been possible without them.

The evaluation and excavation work was undertaken by Vix Hughes, Andy Lane and Caroline Raynor, with the assistance of Ric Buckle, Caroline Bulcock, Ged Callaghan, Tim Christian, Pascal Eloy, Will Gardner, Fiona Gordon, Annie Hamilton-Gibney, Joanne Hawkins, Pip Haworth, Paul Holmes, Gemma Jones, Andrea Kenyon, Tom Mace, Dave Lamb, Des O'Leary, Mark Oldham, Kieran Power, Andy Proctor, Elizabeth Murray, and Claire Riley. The watching brief work in 2009 was undertaken by Des O'Leary and Ric Buckle, and the watching brief work in 2011 was undertaken by Caroline Raynor. We would like to thank David Higgins for his specialist report on the clay pipes, and he is particularly grateful to Dr Susie White, who prepared the archival pipe illustrations, also to Bert van der Lingen, Ruud Stam and Jan van Oostveen from the Netherlands for their comments on the decorated Dutch stem. The stratigraphic analysis was undertaken by Vix Hughes and Caroline Raynor, who also compiled the historical research, the report being compiled by Nick Johnson and Caroline Raynor. The drawings were produced by Anne Stewardson and Caroline Raynor. The report was edited by Rachel Newman and Jamie Quartermaine, who also managed the fieldwork, the post-excavation process being managed by Jamie Quartermaine and Murray Cook.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Following the submission of planning applications for mixed use development at Mann Island (centred on SJ 3403 9008; Fig 1) by Countryside Neptune in July 2006, Oxford Archaeology North (OA North) was appointed to undertake the archaeological works to meet the condition attached to planning approval. This involved, initially, a building survey of the Transit Shed and Voss Garage buildings which stood on the site, then an evaluation of the survival of below-ground archaeological remains, after which watching briefs and large-scale excavations were undertaken, as appropriate, following the demolition of these buildings on the archaeologically sensitive areas of the site. The development area lies within the Maritime Mercantile City of Liverpool World Heritage Site, and within the Albert Dock Conservation Area (Liverpool City Council 2005, 54); World Heritage Site (WHS) status was granted in 2004. Within the WHS area, the buried archaeological deposits are regarded as 'a nationally significant resource', which is 'highly fragile and vulnerable to damage and destruction' (*op cit*, 99).

1.1.2 The archaeological sensitivity of the area had previously been highlighted by a desk-based assessment (Wardell Armstrong 2006), and the purpose of commissioning OA North was to mitigate any adverse effect that construction might have on the cultural heritage of this part of Liverpool. The development is focused on two sites on either side of the remains of George's Dock Passage, at the northern end of the present Canning Dock (Figs 1 and 2); one site (Areas A and C) was centred on the former Transit Shed and Voss Garage, and the other (Area B) on the site of the former Media House, adjacent to The Strand. The evaluation of the site (OA North 2006a) identified the survival of Manchester Dock, warehouses under the Transit Shed, which correspond to the former area of Nova Scotia, and cobbled surfaces and structures relating to the remains of the Mersey Railway Pumping and Ventilation Station and the Dock Police Station at the Media House site. Nova Scotia and Mann Island are historically significant areas of Liverpool, which were created as a result of extensive land reclamation, to provide docks and warehousing, existing from *c* 1740 to the wholesale destruction of the area in 1920 (Ritchie-Noakes 1984). These two areas represented a central hub within the early dock system, where victuallers, merchants, artisans and sailors congregated to provide the necessary skills and supplies vital to the early mercantile endeavours of the city (Belchem 2006).

1.1.3 Certain areas of the site were found to be archaeologically sterile, these areas largely corresponding to the infilling *en masse* of earlier docks and dock passages, such as Manchester Dock and George's Dock Passage, as both were infilled with sterile quarried deposits. This report and the preceding post-excavation assessment report (OA North 2010a) present the results of the building survey, archaeological evaluation, excavation, and watching briefs, undertaken over the period 2006–11, following the analysis of the material excavated.

1.2 SITE LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 The site lies on 1.1ha of reclaimed land, at Mann Island, south of the Port of Liverpool Building, north of Canning Dock, east of the new Museum of Liverpool, and west of the former Mersey shoreline, which is marked today by the course of The Strand (Fig 2). For the purposes of the archaeological excavation, the site was sub-divided into three smaller 'sites' or areas, Areas A–C (Fig 3), which represent the key locations of the excavations. The site was bounded to the south and west by the new Liverpool Canal Link, developed by British Waterways in 2008. This project now provides 1.4 miles of new navigable waterway, as well as incorporating existing elements of the historic dock system. As such, it required a series of archaeological investigations along the length of the development, extending from the western wall of Canning Dock, the length of the Pier Head to the west of the Three Graces (Port of Liverpool Building, Cunard Building and Liver Building), and on to Princes Dock, Princess Half Tide Basin, Waterloo, Trafalgar, Victoria and Nelson Docks (Mann Canal, OA North 2011a; Pier Head Canal Link, OA North 2011b; and Central Docks, OA North 2011c).

1.2.2 Mann Island is part of the Maritime Mercantile City of Liverpool World Heritage Site (Fig 1), and was reclaimed from the river in the mid-eighteenth century (*Section 2.2*); it now forms a uniform plateau, at 6m OD. Prior to demolition works in 2007, much of the development area consisted of upstanding buildings of various ages and functions. The remainder of the site consisted of open plots of land sited within the footprint of the infilled Manchester Dock, which were used as car parks. The buildings included twentieth-century structures, such as the Voss Garage, which was a steel-framed commercial structure, designed in the style of Herbert Rouse (R G McDonald *pers comm*), in order to complement the nearby Mersey Tunnel Ventilation Building. There were also older buildings, that included a dock transit shed and the tower of the pumping and ventilation station (Listed Building no 359069) constructed to serve a subterranean railway in 1886 (Duffy 2003, 55). An archaeological building survey was carried out on the older structures before their demolition (OA North 2007). The pumping station has been left *in-situ* and has been incorporated into the new development.

1.2.3 The drift geology of this part of Liverpool includes alluvium and intermixed silts and sands along the estuarine margins of the Mersey, which used to reach as far east as The Strand (Philpott 1999). Reclamation at Mann Island commenced with works to enable the construction of the Dry Dock, from 1738 onwards, and were recorded in the Minutes for the Common Council of Liverpool Docks (MDHB/MP/25, 50; Hyde 1971, 74–5; Ritchie-Noakes 1984, 27).

1.3 PREVIOUS WORK

1.3.1 An environmental statement was prepared by Wardell Armstrong on behalf of Countryside Neptune llp and British Waterways, in which the archaeological value of the remains of dock and sea walls, and ancillary structures, was recognised (Wardell Armstrong 2006). In 2006, OA North was instructed by Wardell Armstrong, on behalf of Countryside Neptune llp, and commissioned by British Waterways and Galliford Try, to undertake a programme of archaeological evaluation in advance of the then proposed construction in the area of Mann Island. A project design was formulated to meet the requirements of the Merseyside Archaeologist, and the work formed a continuation of similar investigations that were

undertaken as part of the Liverpool Canal Link project (OA North 2006b; OA North 2011a; OA North 2011b). A survey of the transit shed and Voss Motors buildings was undertaken in 2006, and provided a mitigative record of the structures to enable their demolition in advance of the redevelopment (OA North 2007).

1.3.2 The first phase of the below-ground archaeological investigation, within the area occupied by the Mann Island development, consisted of the excavation of four evaluation trenches (Trenches 1, 3A, 3B and 4), beginning in February 2006. The evaluation successfully identified the substantive survival of Manchester Dock, along with the remains of warehouses under the transit shed, and cobbled surfaces and structures at the Media House site (OA North 2006a).

1.3.3 The report on the evaluation (*ibid*) made specific proposals for future archaeological works, encompassing a range of strategies appropriate to the significance of the archaeological remains likely to be encountered in different areas of the development footprint. A revised project design for further excavation and a watching brief was issued in late 2006 (OA North 2006c).

2. METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 Following a request from Wardell Armstrong and Countryside Neptune 11p, a Project Design was developed (OA North 2006c), outlining methodologies designed to mitigate the impact on archaeological remains revealed as part of the demolition programme and during the course of construction works at Mann Island. Building on the Environmental Statement (Wardell Armstrong 2006), and the results of the evaluation (OA North 2006a), the significance of the archaeological features known, and thought to be preserved, was assessed, and appropriate levels of investigation and recording were specified.

2.1.2 The overall aim of the mitigating works was to provide an appropriate, specialist response to known or newly discovered archaeological remains during the course of construction works, including the recording of archaeological and structural features, with particular attention paid to those features considered significant, such as the dock and sea walls, and remains of early buildings. This would serve the aim of enhancing knowledge about the development of the Liverpool docks and associated areas of the waterfront, including domestic activity (Wardell Armstrong 2005).

2.1.3 A series of research questions was formulated:

- what techniques were employed in the construction of the various docks, and were particular techniques characteristic of a specific engineer?
- what is the evidence for earlier dock structures?
- what is the evidence for earlier sea walls?
- what is the evidence for buildings associated with the docks, and ancillary fittings and furniture?
- what is the evidence for the development of trade and industry in post-medieval Liverpool, and its associated infrastructure?
- how can the evidence further our understanding of the social history of post-medieval Liverpool?

2.2 EXCAVATION AND WATCHING BRIEF

2.2.1 The results of the evaluation (OA North 2006a) had indicated the widespread survival of archaeological material relatively close to the present ground surface. Between May 2007 and May 2008, a programme of larger-scale excavation and watching briefs was undertaken, occupying three principal areas, A–C (Fig 3), and followed by further watching brief work in July 2009 and May 2011 in the area of Area A (OA North 2011d).

2.2.2 The recording sheets for field records utilised a format acceptable to the *Institute for Archaeologists* (IfA 2008), a unique alpha-numeric project code being applied to all records. All archaeological features were accurately located on a site plan and recorded by photographs, scale drawings and written descriptions. The evaluation trenches and open-

area excavations were accurately surveyed, tied into the Ordnance Survey (OS) datum, and located on an up-to-date 1:1250 OS map base. Artefacts were retained for processing and analysis. An extensive digital and analogue photograph archive was built up, recording the progress of the excavations and details of significant features. The resulting artefactual, paper and digital archive has been prepared for deposition in accordance with the aims and objectives set out in the assessment report (OA North 2010a, 16).

2.3 UPDATED PROJECT AIMS

2.3.1 The assessment (OA North 2010a) updated and added to the original research aims and objectives. These were formulated in accordance with the guidance of English Heritage (English Heritage 1991, 2–3), and were as follows:

Updated research aim 1: how did the environment of the river Mersey foreshore and its human use develop over time?

- Objective 1: to examine the early environment of the river Mersey, including evidence for early sea level and vegetational changes;
- Objective 2: to examine the nature of post-medieval exploitation of the river Mersey, including evidence for the changing shoreline and land surfaces.

Updated research aim 2: 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 site;
- Objective 2: to determine the phasing of the structures on the site to set its development within an historical context.

Updated research aim 3: 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.

***Updated research aim 4*:** how can the evidence further our understanding of the social history of post-medieval Liverpool?

- Objective 1: to use historical archaeological methods to study 'the poor' or 'the inarticulate' (Ascher 1974), *ie* those invisible in the documentary record.

Updated research aim 5: 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 those in other global port cities.

2.4 THE ARTEFACTS

2.4.1 The assessment (OA North 2010a) confirmed the likely value of post-excavation analysis on specific categories of finds, including the pottery, the ceramic building material, the clay tobacco pipe, the metalwork, the glass and the animal bone. Each category was analysed by a specialist, with the aim of extracting the information anticipated by the assessment, and in accordance with the methodologies outlined in that document (*ibid*).

2.5 ARCHIVE

2.5.1 A full archive, produced to professional standards, has been prepared, in accordance with English Heritage guidelines (English Heritage 1991) and both *Environmental standards for the permanent storage of excavated material from archaeological sites* (UKIC 1984, Conservation Guidelines 3) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (Walker 1990), now that the project is complete. The project archive collates and indexes all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IfA in that organisation's code of conduct. The archive will be deposited with National Museums Liverpool, which meets the criteria of the Museums, Libraries and Archives Council for the long-term storage of archaeological material (Museums and Galleries Commission 1992).

2.5.2 ***Structural and Stratigraphic Data*:** the context record generated by the excavation, which forms part of the site archive, describes 1219 contexts in total. The archive of primary field drawings and photographs comprises the following:

Multiple context CAD survey files	333
Monochrome film images	4952
Colour slides	4940
Medium-format images	90
Digital images	4886

2.5.3 The digital data have been temporarily stored on the server at OA North, which is backed up on a daily basis. CDs are being used for long-term storage of the digital data, the content including the reports, plans, scanned images and digital photographs. Each CD is fully indexed and is accompanied by the relevant metadata for provenance.

2.5.4 ***The Finds*:** all dry and stable finds have been packed according to the Museum's specifications, in either acid-free cardboard boxes, or in airtight plastic boxes for unstable material. Each box has a list of its contents and in general contains only one type of material, such as pottery or glass.

2.5.5 The assemblage is currently well-packaged, and box lists derived from the site database have been compiled. The paper records are in acid-free storage, fully indexed, and with the

contents labelled.

2.6 RECIPIENT MUSEUM

2.6.1 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 Codes: MI06 and MI07.

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.

2.7 DISCARD POLICY

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

3. HISTORICAL BACKGROUND

3.1 LIVERPOOL'S EARLY HISTORY AND THE CONSTRUCTION OF THE OLD DOCK

3.1.1 The docks at Liverpool have come to define the core element of the city's development from a quiet fishing town, initially recognised as a Royal Borough in a charter of 1207, to one of the most strategically crucial commercial hubs of the British Empire in the eighteenth and nineteenth centuries (Belchem 2006). The name 'Liuerpol' is first mentioned in a charter of 1190–4, where it is one of several vills, or townships, forming the hundred of West Derby (Nicholson 1981; Belchem 2006, 59). Prior to the rise of Liverpool, the premier port for the North West was Chester, on the river Dee, but by the end of the medieval period, this was suffering severe problems from the silting of the river. Liverpool's initial development, however, can be attributed to the intervention of King John, who required a base for military operations in Ireland, and in 1207 he made Liverpool a borough, granting it urban status. The settlement then consisted of six streets, later seven, when Castle Street was laid out in *c* 1235 (Belchem 2006, 61). The town was positioned next to the Pool, a prominent topographical feature and natural inlet which served as the port, where ships could be beached at low water and cargo unloaded beneath the castle, and small ships could be careened and repaired (*op cit*, 63). The Pool was awkward to enter from the Mersey, a river with a considerable tidal range, of *c* 10m, and rapid currents, which were to present challenges in both dock construction and maintenance, from the beginning of the eighteenth century onward. During the seventeenth century, sluices had been installed in the Pool, probably to provide a means of scouring out accumulations of silt and to maintain an open channel for ships (Ritchie-Noakes 1984, 18). After the English Civil Wars, in the middle years of that century, there was a considerable increase and diversification in the goods traded, both into and out of the port, as a result of the development of colonies in the New World. The port's status rose as a result, finally allowing Liverpool to acquire its own Custom House in 1700, which meant full independence from Chester (Hyde 1971, 9). This rise may also be deduced from records of shipbuilding on the margins of the Pool in the last two decades of the seventeenth century (Stewart-Brown 1932, 89–92).

3.1.2 Two key attributes conferred distinct advantages on Liverpool from the late seventeenth century, when England was poised for significant growth in overseas trade (Jackson 1983, 24). Firstly, its position on the west coast allowed easy access to the Atlantic Ocean and its merchants were also not constrained by precedent, guilds or chartered companies, but were willing to seek new markets and employ new methods; indeed, they had already developed experience in trade in the Irish market (Jackson 1983, 27–8; Belchem 2006, 118). These attributes created a potent mix with two recent developments: the establishment of new colonies across the Atlantic, including the take-over of those originally occupied by the Dutch; and the availability of new commodities to trade, such as tobacco, sugar, and the new lightweight cloths, alongside the increased availability of older products, such as salt and coal (Jackson 1983, 25). However, even at this stage, it was not clear exactly how large a portion of this burgeoning trade Liverpool might hope to receive without the appropriate provision for an increasingly large volume of shipping. This pronounced surge in shipping, coupled with the problems implied by the sluices in the Pool (*Section 3.1.1*), and the shortage of space and draught in the Pool to accommodate new trade and new, larger,

transatlantic ships, undoubtedly fostered much concern to find a solution. In 1699, the Common Council of Liverpool, the majority of whom were already established as merchants and traders, convened to consider what improvements and management of the waterfront and Pool would be appropriate to encourage and promote growth and secure future trade (MDHB/MP/25, 2). At the start of the eighteenth century, discussions were opened between the Council, and the prominent engineer, George Sorocold, who was established as a civil engineer with experience of constructing military docks in London, notably the Howland Dock at Rotherhithe. The aim was to develop an enclosed dock within the area of the Pool (Ritchie-Noakes 1984, 19). While this was a considerable innovation, it is important to recognise that it was driven by the needs of traders, rather than speculation: dock-building was expensive and, for years to come, was directed at existing, rather than future trade (Jackson 1983, 46). With the sponsorship of two leading Liverpool merchants and MPs, Thomas Johnson and Richard Norris, a Dock Act was passed by Parliament in 1709, permitting the Liverpool Council to proceed and empowering them as the trustees of the dock to levy dues on the ships entering the harbour. Shortly afterwards, the process of raising the necessary finance to construct what became known as the Old Dock was initiated (Ritchie-Noakes 1984, 19; Belchem 2006, 121–2).

3.1.3 The man appointed to build the dock, a civil engineer named Thomas Steers, began the construction process in 1710. Steers probably worked alongside George Sorocold at the Howland Dock and so came to Liverpool with a level of experience and knowledge which would have been vital to the success of this ambitious project (Stewart-Brown 1932). The construction process and methods were not recorded in detail at the time, and only limited mention is made to the building of the dock in the records of the Common Council; however, the position of the dock in relation to the shoreline of the Pool shows that its brick walls were constructed below the high-tide mark and the bedrock at the shoreline was worked by masons to provide an adequate shelf upon which to site the dock wall (OA North 2010b). The construction of the retaining walls allowed the reclamation of the land behind them, to be developed as a quayside. The long axis of the dock was orientated east/west, measuring 179m long by approximately 85m wide, and covering an area of 13,750 sqm. Chadwick's map of 1725 (Fig 4) indicates the presence of a small octagonal entrance basin, along with a Graving Dock to the north; however, it is not clear at what precise date, between 1710 and 1725, these were constructed. The sea walls shown on this map to the west of these features, and the land immediately behind them, marked the first stage in a series of expansions out into the Mersey, both further west and to the north and south, over the next 180 years (Jarvis 1991a, 230–4). Initially, Nova Scotia and then Mann Island were formed by this reclamation in the mid-eighteenth century, as shown on both John Eyes' map of 1765 (Fig 5) and Perry's Map of 1769 (Fig 6).

3.1.4 The Old Dock opened in 1715; the Minutes of the Common Council, however, suggest that those elements that would have completed the dock were still not in place by as late as 1731. The records of 5th January 1731 state that '... all monies raised by leasing the ground around the dock be applied to finishing the dock' (MDHB/MP/25, 32). Further to this, the records from 1726 onwards make it abundantly apparent that the Old Dock was already proving to be problematic from the perspective of maintenance, as it was prone to silting, which dramatically reduced the depth of the basin, causing problems for the passage of larger vessels.

3.1.5 In 1724, author, traveller and social commentator Daniel Defoe engaged in his tour of the

British Isles, which resulted in an epistolary narrative, published in 1726 under the title, *A Tour Through the Whole Island of Great Britain.* Defoe visited Liverpool three times: in 1680, 1690 and again following the opening of the Old Dock in 1724. He considered Liverpool to be *'one of the wonders of Britain...'* and commented on the changes which had been wrought to the town since the time of his previous visits:

'... the town was, at my first visiting it, about the year 1680, a large handsome, well built and increasing or thriving town. At my second visit, anno *1690, it was much bigger that at my first seeing it, and, by the report of the inhabitants, more than twice as big as it was twenty years before that; but I think, I may safely say at this my third seeing it, for I was surprised at the view, it was more than double what it was at the second; and I am told that it still visibly increases both in wealth, people, business and buildings. What it may grow to in time, I know not' (*Defoe 1726, 541).

3.1.6 Defoe also states that the town had an opulent, flourishing and increasing trade, although he goes on to emphasise that this trade was not a rival to Bristol (*op cit*, 541). Defoe's perceptions were probably accurate at this stage as the Old Dock had only been open for just over a decade and its full impact was yet to be felt. He goes on to note of the Liverpool Merchants that, '*They trade round the whole island* [Britain], *send ships to Norway, to Hamburgh* [sic] *and to the Baltick* [sic], *as also to Holland and Flanders; so that in a word, they are almost become like the Londoners, universal merchants' (ibid*). This high praise indicates that even as early as 1724, the transformation of the developing maritime mercantile town of Liverpool was substantial with a rapid development of infrastructure, including elegant houses and public buildings.

3.2 THE DRY DOCK AND NOVA SCOTIA

3.2.1 Following the completion of the Old Dock, Thomas Steers remained in Liverpool and leased three plots of land along the waterfront, upon which to establish businesses, as well as taking on the role of Dock Engineer and the first Dock Master. In November 1732, Steers travelled to London and from there onwards to Dover, 'to view the pier there and to consider by that what improvement be made to our dock' (MDHB/MP/25, 35). By 1737, records indicate that the Common Council was under increasing pressure from local merchants and ship owners to continue the expansion of the dock estate. The entry dated 11th January 1737 is strongly worded, stating that '*It having been heretofore and is now again represented to this council that there is an absolute necessity to have an addition made to the present dock or bason for light ships to lye in whilst refitting and other necessary uses and a convenient pier to be erected in the open harbour on the north side of the entrance into the present dock, towards Red Cross street...' (op cit,* 41).

3.2.2 Thomas Steers was once again called upon to provide a plan and estimate for the work which was completed in January 1737, for the much sought-after Dry Dock, explaining that the new plans for the proposed dock would encompass at least seven acres of waste ground (*ibid*). In 1738, another act of Parliament authorised the developments which had been petitioned for by local merchants and ship owners (*op cit*, 73). These initially consisted of further land reclamation, to allow the construction of what was variously called the New Pier, the Dry Pier, and Dry Dock, which extended the area of the entrance basin and was opened in 1739 (Fig 5; MDHB/MP/25, 53; Hyde 1971, 73–4; Ritchie-Noakes 1984, 21). The minutes of the Common Council of Liverpool Docks indicate to

what extent the Council was able to control activity on the waterfront, particularly relating to the activities of ships as they entered and departed from the dock. In July 1738, the Common Council ordered that ships were to discharge their ballast at, and near, the west wall of the intended New Pier (MDHB/MP/25, 50), with fines imposed for contravention. The order for ships to dump ballast at the outside wall of the intended New Pier is significant, as the repeated dumping of large quantities of ballast (ships of the period were typically capable of carrying over 50 tons of ballast (Hahn 1981)) in this relatively shallow area, which was not deeper than 6.2m, would have quickly led to the build-up of a small island or bank of unstable land and was the forerunner of the area later known as Mann Island, Nova Scotia and Bird Street.

3.2.3 The Committee of Works for the construction of the Dry Dock and new pier largely comprised merchants and ship owners, who probably had only a limited knowledge of the techniques required to construct a new dock. However, Thomas Steers was listed as being a member of the committee and it is likely that he played a key role in the proceedings, ensuring the correct implementation of his design. The committee was not only responsible for managing the finances of the project, but was also required to source and purchase the necessary materials and also a suitably skilled workforce. With this in mind, advertisements were placed in the public newspapers from Chester and Manchester, for persons willing to undertake mason's work at the New Pier. (MDHB/MP/25, 48*)*. The records show that the outward wall of the new pier was constructed by Mr Edward Litherland, who proposed '*to undertake the building of said outward wall and to build the same of Quarry Hill stone at five shillings for every cubical yard sufficiently and workmanlike and to find all (services excepted)...' (ibid).*

3.2.4 The Dry Dock (Fig 6) was so called because it provided protection for shipping from the wind and the currents of the Mersey, but was nevertheless tidal, and became dry at low tide. Fundamentally, its construction was intended to ease the threefold constraints of operating a sailing vessel: firstly, because it was too hazardous, many merchants did not engage in trade during the winter, and laid up their ships (Jackson 1983, 43); secondly, subtle and adverse variations in tide and wind, inevitably magnified by the funnel shape of the Mersey estuary, forced ships to wait for more favourable conditions; and thirdly, because it was only possible to enter the Old Dock at high tide (Ritchie-Noakes 1984, 21). Before its construction, the only harbour was provided by the Old Dock itself, which consequently became crowded. Its narrow entrance restricted the number of ships which could enter and leave on the tide, and the crowding hindered manoeuvring within the dock itself. The presence of a Dry Dock made it easier for ships to leave the Old Dock, alleviating the pressure on space and mitigating against the increased risk of any outbreak of fire spreading from ship to ship when they were moored at close quarters within the Old Dock. The addition of a Dry Dock also enhanced and widened the mouth of the Old Dock, making it easier to enter harbour.

3.2.5 In the period between the opening of the Old Dock and the addition of the Dry Dock, there was relatively little growth in the total tonnage of shipping using the port, with inward and outward traffic amounting to 36,800 tons in 1716, and only 39,900 tons in 1737 (Hyde 1971, 235). Complete figures are not available to allow the calculation of the distribution of this trade between transatlantic ports and more local destinations, such as Ireland. Ships operating out of Liverpool were relatively small, however, with transatlantic vessels in the range of 50–200 tons, and many smaller craft were engaged in the inshore trade (Belchem

2006, 116). This contrasts markedly with contemporary Whitby colliers, which were running cargoes of *c* 400 tons south from Newcastle to London (Barker 2011, 119). Nevertheless, the modest increase in annual trade at Liverpool of a little over 3000 tons, or the equivalent of the cargoes of perhaps 25 vessels, shows that the Dry Dock was constructed to aid navigation, rather than ease any restraint on trade.

3.2.6 The facilities at the Dry Dock were augmented between 1740 and 1750, with the improvements to the area effectively creating land in a prime location for merchant offices, warehouses and dwellings (MDHB/MP/25, 56); these improvements paved the way for the creation of the area initially known as Nova Scotia (Fig 5). The land was a central hub for various activities: production and repair of ships in the Dry Dock to the south; careening and repair of ships to the west of the Dry Pier, on the graving bank (an area of the river bank which was accessible at low tide); and also the expansion of business, production and storage of goods along the eastern quay of the Dry Pier (east of the Dry Dock).

3.2.7 The first phase of augmentation occurred after a meeting of the Common Council on 18th October 1740, where it was decided that '*taking into consideration the great necessity of making the new pier useful and to enlarge the same and that the Dry Dock and the ground lying on the west side thereof...*' (MDHB/MP/25, 56). This enlargement of the riverside quay to the west of the Dry Dock ensured the creation of a more useful space, particularly as a point of disembarkation for cross-river ferries and for smaller boats unloading locally acquired cargoes, thus helping to reduce the traffic moving in and out of the Old Dock.

3.2.8 On 18th August 1743, Thomas Steers entreated the council to pave the new pier (the area to the east of Nova Scotia). The area on the north side of the Dry Dock had already been satisfactorily paved by its landowners, Joseph Bird and Owen Pritchard (*op cit*, 57), who had, as part of the improvement to the area, and with a view to creating a suitable quay, already paved several feet in front of their properties extending along the length of the quayside. The expansion and paving of the new pier was completed by February 1744 (*op cit*, 61). The land described in this entry encompasses the area which would first become known as Man's Island or Mann's Island and Nova Scotia, the heart of 'sailor town' (the name applied locally to the central hub of the largely itinerant maritime population), and future heart of the local trade to the Wirral, Chester and Manchester.

3.2.9 In 1746, the network of docks was further enhanced by the construction of a new Graving Dock, constructed by the Town Corporation, opening off the north quay (Ritchie-Noakes 1984, 19; Fig 5). This structure was necessary as a replacement for the original Graving Dock, which had been destroyed by the construction of the Dry Dock. Again, this work was overseen by Thomas Steers, who was supported by a committee of merchants and aldermen. At the same time, it was decided that appropriate dock furniture should be installed on the quays, with the addition of two fixed capstans on the north and south piers to facilitate the movement of ships in and out of the Dry Dock. With the installation of the gates between the Dry Dock and the Graving Dock came the first footbridge to link the area between Joseph Bird's land and the newly expanded quay on the west side of the dock. It seems likely that the northern extent of the Pool was covered over at this time by the development of Paradise Street, and Whitechapel (Sharples 2004, 7).

3.2.10 From 1747 onwards, traffic within the Dry Dock and the Graving Dock was sufficiently high to warrant the appointment of Alderman Joseph Bird to take account of all the ships entering and leaving the Dry Dock (MDHB/MP/25, 65). Minutes of the Common Council suggest that Bird and Owen Pritchard were the first people to take up residence in the area

following the land reclamation and consolidation to the north-east of the Graving Dock. Both were merchants and slave traders (Williams 1897, 82) with extensive involvement in the development of the dock network, and Bird sat on the committee formed to oversee the construction of the Dry Dock (Ritchie-Noakes 1984). Both were also involved in the early establishment of the Old Dock and the developing dock estate, and served as Aldermen and later as Mayor; Owen Pritchard served as mayor in 1744-5 and Joseph Bird took up that position for the years 1746-7. Bird also had links to Charles Goore and, along with 20 other shareholders, invested a total £2000 (£100 per share, of which many individuals held half shares) in his ship the Golden Lion, which operated as a whaling vessel in the area of the Greenland Fisheries (*ibid*). It is likely that Bird Street, shown on John Eyes' map of 1765 (Fig 5), and Bird's Slip and Bird Alley, shown on Perry's map of 1769 (Fig 6), are named after him, as the historical directories (Gore 1766).

3.2.11 Joseph Bird is listed in Gore's *Directory* of 1766 as occupying the area to the east of the Graving Dock (Bird Street), and his name is attached to two properties, one of which was his home and the other a warehouse listed under the name of Bird and Jones, mug warehousemen. Bird's Slip, however, lay west of the land originally reclaimed to create the Dry Dock, and it is likely that Bird Street was similarly developed some years later, although no historical mapping has been traced for the period 1725–65 that would confirm this. This was substantially adapted, in the 1760s, to provide a passage within the dock system, from the South Docks through to the newly constructed George's Dock further north (Ritchie-Noakes 1984, 27).

3.2.12 In 1748, the Common Council ordered that ' *the ground about the New Pier and dry docks be sold at public auction in lots according to the plan, proposals and conditions of sale...'* and this was followed in 1749 by the addition of a wall and cart road to be constructed from the slip on the Dry Pier down to the graving bank (MDHB/MP/25, 69). The presence of the graving bank is officially noted on the John Eyes' map of 1765 (Fig 5), and although it is mentioned in the records prior to this, it only appears on this single episode of historical mapping, before a further phase of land reclamation, coupled with the construction of the Manchester Basin and the Old Quay, rendered it obsolete (*Section 4.6*).

3.2.13 The expansion of the dock system gained pace with the completion of the Salthouse Dock in 1753 (Ritchie-Noakes 1984), which was again conceived of and designed by Thomas Steers. The construction, however, was completed by Henry Berry, who succeeded Steers as Liverpool's dock engineer following the former's death in 1750 (*ibid*).

3.2.14 In 1754, the Old Dock received its first set of replacement gates, but there are no other entries from the minutes of the Common Council suggesting that the first dock in the system was failing to cope with the increased tonnage of cargo arriving and departing from Liverpool. In the same year, Joseph Bird was formally appointed as Superintendent of the Dry Dock and was awarded a wage of 15 guineas *per annum* for carrying out this work (MDHB/MP, 82). This role was equivalent to that of the later Dock Master, and Bird's role would have included superintending the docking and sailing of ships, appointing them berths within the dock for the receiving and unloading of cargo, and attending to the dock gates, where present.

3.2.15 On 12th June 1757, the *Liverpool Chronicle and Marine Gazetteer* contained a series of adverts relating to the sale of three properties at Mann Island, specifically, the area on the east side of the Graving Dock known as Bird Street. The first is described as: '*A new well built messuage or dwelling house situate(d) on the east side of the Graving Dock and*

fronting not only said dock but also a street or alley leading to Bird Street; containing to the front towards the dock about six yards and to the said street or alley about twelve yards and two feet...' (*op cit*, np). This property was previously owned by Mr Thomas Ford, a glazier, held by lease under the Corporation for three lives and 21 years under a small yearly reserved rent of 3/ 6d.

3.2.16 An additional two properties, both previously belonging to Alderman Owen Pritchard, are also described as messuages or dwelling houses, with the first being on the east side of the Graving Dock and the second on the west side of Bird Street. Both were to be let for 15/- *per annum* (Hf 072 CHR 1757). These records provide an insight into the type and size of dwellings available at Mann Island during its early history.

3.2.17 The map of the area produced by John Eyes in 1765 (Fig 5) provides a clear view of the waterfront to the north and west of the Dry Dock. The area is defined by the presence of Bird Street, the old Graving Dock, Bird's Alley, New Strand Street, and to the west by Nova Scotia. It is likely that Nova Scotia derived its name from the colony in Canada, and it seems there was a close connection with it in the mid-eighteenth century, shown by the founding of a settlement there named 'Liverpool', also on a river Mersey, in 1759. The North American colonies were vital to Britain during the wars with France and Spain in 1739-63 (Conway 2006), and it is tempting to see a recognition of this, and the importance of the west-bound North Atlantic sailing route, in the choice of the name.

3.2.18 Two blocks of buildings and an enclosed area are shown occupying Nova Scotia on Perry's map of 1769 (Fig 6), along with Bird's Slip and the land reclamation necessary to permit the construction, *c*1746, of a Graving Dock off the north end of the Dry Dock (Ritchie-Noakes 1984, 19). Perry's map also reveals that the northern block of buildings at Nova Scotia, shown on John Eyes' map of 1765 (Fig 5), had been divided by the insertion of a street, which on later mapping is identified as Irwell Place (for instance, on Gage's map of 1836).

3.2.19 From 1766 onwards, the north-facing aspect of the port underwent radical alterations, with Henry Berry overseeing further expansion of the dock estate. The next major development of the docks was the construction of a new sea wall, known as 'Sea Strand' (MDHB/MP/25, 109), with reclamation behind it, to permit work to build what was originally to be known as the Townside Dock, but would come to be known as St George's Dock (latterly George's Dock). There is very little certain evidence for the condition of the Mersey foreshore prior to this, since John Eyes' map of 1765 interpolates the conjectured layout of the new dock into what is otherwise a generally reliable document. The inclusion of proposed works is not an uncommon feature of Liverpool's historical mapping, particularly at such times of great change and expansion; the Eyes' map also includes a projected position and design for a new Graving Dock to the west of the Salthouse (South) Dock, located to the south-west of Mann Island. The construction work immediately encountered a number of difficulties, including serious storm damage, which destroyed the new sea wall, and forced a delay in further works until 1767 (Hyde 1971, 74–5; Ritchie-Noakes 1984, 27). In 1770, the Common Council ordered that a draft view and estimate be made for enclosing a parcel of land (the area now known as Pier Head) to the west of the new dock from out of the sea or river (MDHB/MP/25, 109); following this, Henry Berry was authorised by the council to lease a piece of ground at Quarry Hill to fulfil the construction needs of the latest public works (*op cit*, 109).

3.2.20 The completed dock was opened in 1771 at a cost of £21,000, and despite the expense, this

dock now offered an expansive 2460 square yards (2249.4m) of enclosed water with a quay measuring 700 yards (640m) long (Lewis 1831, 101). The new dock did not stand alone at the northern limit of the port as it was paired with a spacious Dry Basin, depicted on the Charles Eyes map of 1785 (Fig 7). In 1775, the Minutes of the Common Council note that a committee had been formed to oversee '*the destroying of one Dry Dock for the use and making of a passage or entrance from out of the Dry Pier and into the new or George's Dock' (*MDHB/MP/25, 129), suggesting that the dock was not linked to the southern network from the time of its opening and that the southern element of George's Dock passage was established later, by reusing the channel formerly occupied by the Graving Dock at the northern end of Dry Dock (*Section 3.2.11*; Perry 1769; Ritchie-Noakes 1984, 19, 27). This work was carried out at the same time as the land to the west of George's Dock was paved to a width of 14 feet (4.26m) to increase the quay and landing space for goods (MDHB/MP/25, 130).

3.2.21 Along with the construction and expansion of the dock estate, the population living and working on the newly reclaimed areas of land, particularly those of Nova Scotia, were expanding, as trades and businesses established themselves to fulfil the demand of the itinerant population of sailors and merchants using the new facilities. The first available formal record for the area is Gore's *Directory* of 1766, although the directories tend only to name the principal person, landowner or leasee associated with a property, and it is not always clear how many people were domiciled at each residence at any given time. In 1766, approximately 25 years after the land had been reclaimed, there were six persons listed as living and working on Bird Street and five persons living and working in Nova Scotia. Many of the trades and occupations listed for the residents reflect the nearness of the dock and seafaring connections; Robert Breckell was a ship's carpenter, Thomas Davis a pilot, and John Robinson, an anchor smith.

3.2.22 A mere three years later, Gore's *Directory* of 1769 lists 39 persons as living and working within the area of Mann Island, Nova Scotia, Bird Street and the area to the east of the Dry Dock. This record clearly highlights the types of people and businesses being conducted in the area, although it does not provide an address for each individual, merely stating which street the person lived/worked on. Persons listed as living in Nova Scotia tend to be those involved in shipping; for instance, John Bibby and Henry Brewer both resided in Nova Scotia and are listed as pilots. William Chapman, a mariner, lived on the west (the Nova Scotia side) of the Old Graving Dock, as did Robert Lee, a ship's pilot. Persons living and working on Bird Street tended to be those employed in trades or manufacture: Thomas Clucas (tailor), Cope and Wright (ironmongers), Richard Hill (tobacconist), John Lawrence (flax dresser), and William West (ship's broker) are all listed as residing on Bird Street (Gore 1769). A further three years after this, Gore's *Directory* of 1772 indicates that the population of the area had increased substantially, with 66 persons and businesses being listed for the immediate area around the Dry Dock, Old Graving Dock, Mann Island and Nova Scotia.

3.2.23 Increasing populations and the steady increase in new property within the town, including the area around the north side of the Dry Dock and Nova Scotia, led, in 1774, to the introduction of street numbers within Gore's Directories (Table 1). Gore's *Directory* of 1774 is also very significant because it is the first time that the place name, 'Mann Island', appears in any of the contemporary historical sources. Only two persons are listed at Mann Island in 1774: William Jones, a flax dresser, at No 5 Mann Island, and John Mann, an

oilstone dealer (and the gentleman after whom the parcel of land may have been named), living at No 3 Mann Island. Although there are only two persons listed, the fact that the properties are numbered three and five suggests that numbers one, two and four had already been applied to other parcels of land, or that other properties already existed but the occupants chose not to be included within the directory for that year. Nine people are also listed as living on Bird Street, four persons at the east side of the Old Graving Dock, one person on the west side of the Graving Dock (adjacent to, but not part of, Nova Scotia) and one person at the northern side of the Dry Dock (east of Bird Street).

Name	**Address**	**Occupation**
John Barnes	Nova Scotia	Victualler
Henry Brewer	Nova Scotia	Pilot
Captain William Chapman	1, Nova Scotia	Ship's Captain
G Cherry	8, Nova Scotia	Boatman and Victualler
Captain John Evans	7, Nova Scotia	Newry Trader
Richard Gore	Nova Scotia	Not listed
Daniel Hadkinson	17, Nova Scotia	Liquor merchant
William Hall	Nova Scotia	Carter
Hind, Wilson and Hopwood	15 Bird's Slip, Nova Scotia	Coal Office
Thomas Holt	6, Nova Scotia	Flax Dresser
Hunter and Kirkhams	16, Nova Scotia	Sail Room
John Lacy	5, Nova Scotia	Pilot and Victualler
Naylor and Co	Nova Scotia	Tar warehouse
Alice Pilmore	2, Nova Scotia	Pilot and Victualler
Captain Richard Pritchard	7, Nova Scotia	Ship's captain
Thomas Williams	Nova Scotia	Not listed
Edward Winstanley	14 Bird's Slip, Nova Scotia	Smithy
Thomas Briggs	Nova Scotia	Coal Office
Castic Quay office	Bird's Slip, Nova Scotia	Not listed
Old Quay office	Bird's Slip, Nova Scotia	Not listed
Tyres and Roberts	Bird's Slip, Nova Scotia	Coal Office

Table 1: Residents in Nova Scotia listed in the Gore's Directory of 1774

3.3 MANCHESTER BASIN: LATE EIGHTEENTH-CENTURY EXPANSION OF THE QUAYSIDE

3.3.1 The next large addition to this area of waterfront came in the form of the Manchester Basin, a precursor of the Manchester Dock, which was constructed, probably in the late 1770s (Moss and Stammers nd, 17), superseding a pier that was built by Henry Berry on the site in *c* 1772 (Ritchie-Noakes 1984, 35). The formation of the Basin entailed further land reclamation, west of Nova Scotia, which included the enlargement of the Graving Docks on either side of the entrance from the Mersey (Fig 7: Eyes 1785). Initially, the basin was operated by the Mersey and Irwell Navigation Company, for river traffic, in barges or 'flats', between Manchester and Liverpool (Ritchie-Noakes 1984, 35). The construction of Manchester Basin, and the further consolidation of land, also enabled an expansion in the number of small sailing packets and ferries or wherries using the area of Nova Scotia and Mann Island as a central hub. In 1777, the Dublin packet office received the *Duke of Leinster* packet into the Manchester Basin, and the Castle Quay office and the Old Quay office both had small boats putting into port in this area to provide services to Dublin, the Wirral and Manchester (Gore 1777).

3.3.2 In 1779, further land reclamation took place, creating a projecting pier head, just to the south of the entrance to George's Dock Basin (MDHB/MP/25,137), which was probably intended to create a sheltering promontory to protect the ships as they turned into the open basin. This was the extent of large-scale works undertaken in 1779, since Britain's, and Liverpool's, attention then turned towards the American Revolutionary War. The entries of the Common Council for this time strongly suggest that Liverpool felt threatened as a prominent west-coast transatlantic port, particularly as Spain had joined the war in June 1779, and the Council went to great pains to protect the docks. Gunpowder was acquired and stockpiled, and the George's and Queen's Batteries were manned. Pilots were sent out into the river to gather intelligence from incoming ships and a light-based warning system was established at Bidstone lighthouse (*op cit*, 138).

3.3.3 In 1780, the Salem merchant, Samuel Curwen, visited Liverpool *en route* to a tour of the rest of Britain and Europe, and described it as '*the city so celebrated for its mercantile character...'* (Seed 2008, 2). His diaries illustrate the fact that he held high expectations; however, it is apparent from his subsequent entries that he was disappointed by the town itself, as he describes it as: '*Houses are by a great majority in middling and low style, few, very few comparatively rise above that mark. Streets long and narrow and crooked, and dirty in an eminent degree. Choosing a small abode here we scarce saw a well-dressed person, nor half a dozen gentlemen... the whole complexion nautical and so infinitely below all our expectations that naught but the thoughts of the few hours we had to pass here rendered it tolerable'* (*ibid*).

3.3.4 Curwen did not specify which streets in Liverpool he was describing; however, it is likely that he was exposed to the areas around George's Dock, Mann Island and the Old Dock. These areas were overly populous, ill-maintained and represent an area known as 'Sailor's Town' - a place filled with public houses and victuallers to serve the needs of the itinerant maritime populace. Despite his low opinion of Liverpool, Curwen did describe the docks as being '*stupendously grand*' (*op cit*, 2).

3.3.5 Although the war did not end until 1783, the immediate threat to the port of Liverpool was perceived as being lessened by 1780 and there is no further mention of its defensive procedures in the records. By 1781, small shipping companies operating from Mann Island and Nova Scotia were firmly established. Captain Joseph Connor had an office at Packet House, 12 Nova Scotia (the northern end of the block forming the core of Nova Scotia and identifiable on Horwood's Map of 1803: Fig 8), from which all the departures of the Dublin Packets were overseen. Arrayed along the Old Quay at Nova Scotia were the boat houses which served the local ferries; the Rock boathouse was operated by Joseph Williams, the New Ferry boathouse by Mrs Cherry and the Woodside boathouse by Mrs Barton (Gore 1781, 132).

3.3.6 Additions to the waterfront were, by this time, becoming more specialist, with boats being assigned to berths in docks based on their cargo type and which region they had sailed from (trades at the time included the Coastal, Irish, Transatlantic or Levantine Trade). This type of specialisation, and the need to maximise the efficiency of the existing dock space, led to work being carried out on the Manchester Basin in 1785 (Fig 7). Originally, this tidal basin lacked gates and was left dry at low tide. At high tide, however, the walls and the Old Quay were swamped, as the basin itself was too shallow and the walls too low to accommodate the high tidal range of the river appropriately. In order to deal with this, it was ordered that the heights of the wall be raised to prevent

flooding (MDHB/MP/25, 147).

3.3.7 The Liverpool Directory for the year 1790, produced by Charles Wosencroft, a printer based on Cook Street, provides a list of shipping businesses and packets operating from Nova Scotia (Table 2) and the Manchester Old Quay. The largest of these was the Dublin Packet Office run by William Charles Lake, who was operating seven Dublin Packets.

Ship	**Captain**
Duke of Leinster	John Buah
St Patrick	John Basely
Hibernia	James Hayes
Viceroy	William Wood
Prince of Orange	William Letman
Earl of Charlemont	James Cane
Hawke	James Sibbald

Table 2: Ships berthing in the Manchester Basin, based on the Liverpool Directory *of 1790*

3.3.8 The historical mapping outlines several further developments at the turn of the nineteenth century, which are not otherwise recorded. A map of 1795, by an unknown cartographer (produced for *The Strangers Guide to Liverpool* by William Moss), shows that there had been a small amount of further reclamation of land on the north side of Manchester Basin. This expanded the area of the Manchester Old Quay and was undertaken at the same time as the construction of the Chester Basin. The presence of the Chester Basin is indicated as an open channel of water to the north of the Manchester Basin on the 1795 map, the ambiguous shape suggesting that it was probably incomplete at the time that the map was drawn. It is not known for certain who was responsible for the design of the Chester Basin, but it was possibly Thomas Morris, who replaced Henry Berry as Dock Engineer after his resignation on 19th February 1789 (*op cit*, 160); Morris served as Dock Engineer until 1799. The completed structure was a small elegant basin, the shape and fabric of which complemented the early layout of the Manchester Basin. This reclamation was followed by a more substantial one, such that Horwood's map of 1803 (Fig 8) shows a sizeable pier in the same location, extending far to the west of the alignment of the seawall associated with George's Dock. The same map demonstrates that the basin had a layout more closely coincident with that of Manchester Dock, although it retained its wide entrance (and was named 'Manchester Bay'). Further reclamation was indicated by the position of the sea wall on the 1850 Ordnance Survey map relative to Horwood's map of 1803.

3.3.9 A descriptive paragraph in Gore's *Directory* of 1796 explains that '*the extent of the quays of the wet and dry docks alone is upward of 3 miles, independent of the Graving Docks, piers and outside quays, which are nearly four miles more. These docks, though capable of accommodating a most prodigious number of vessels, are yet hardly sufficient for the increasing trade of the town and others are said to now be in contemplation*' (Gore 1796, 195).

3.3.10 The ambiguity created by the rapid developments on the site of Manchester Dock, and the variations in its portrayal on the historical maps, make it uncertain when the extant walls of the dock were constructed. On this basis, it appears likely that Manchester Dock post-dates these, although it may incorporate some of the earlier walling of Manchester Basin. The source of the pink sandstone is not known, although Prince's Dock, under construction

from *c* 1810, used stone from quarries at Runcorn (Jarvis 1991b, 12).

3.3.11 Attributing numbers to properties within the areas of Mann Island, Nova Scotia, Irwell Street and the Old Quay, in order to relate these to listings within the directories, is problematic, as the numbering system was altered through the years. Within Mann Island and Nova Scotia, these changes probably came about as a result of the numerous subdivisions and alterations to properties which may have once existed as a single entity or business premise. However, the Horwood map of 1803 (Fig 8) shows the detailed extent of small residences at the southern end of Nova Scotia within the footprint of the third (southernmost) block and includes the numbers 1 to 12 for the row of small dwellings or messuages (Table 3).

Address	Names/ Residents	Employment or Trade
1 Nova Scotia	Lake and Brown	Packet Office
2 Nova Scotia	George Berry	Victualler
3 Nova Scotia	Not listed	-
4 Nova Scotia	John Maddock, James Reid	Woodside Boat House Victualler
5 Nova Scotia	Catherine Hughes	Joiner and Victualler
6 Nova Scotia	Catherine Bennett	Victualler
7 Nova Scotia	Not listed	-
8 Nova Scotia	Not listed	-
9 Nova Scotia	Ann Cooson	Victualler
10 Nova Scotia	Not listed	-
11 Nova Scotia	Mary Barnes	Victualler
12 Nova Scotia Dublin Packet House	William Thomas	Victualler and operator of the Dublin Packet House
13 Nova Scotia	Richard Parry	Boatman
14 Nova Scotia	William Winstanley	Blacksmith
15 Nova Scotia	William Glass	Cooper
16 Nova Scotia Old Quay Office	?? Wright and John Davies	Merchants and agents to the Manchester Old Quay Company
17 Nova Scotia	Cuthbert Kirkham	Sail Room

Table 3: List of residents and businesses for Nova Scotia, taken from Gore's Directory of 1803

3.3.12 Other persons listed as residing at Nova Scotia in 1800, but without a specific number being attributed to their property, include: Brooke, Owen and Barrow, Salt warehouse; James Fraser of the Ravenhead Coal Office; Joseph Hayes, block and pump maker; Hornby Corder and Company, Corn Merchants; James Percival, Brass and Copper Merchants; Nathaniel Rimmers' Sail room; Cooper, John Willacy; and John Stephens, Agent to the Parys Mine Company (Gore 1803).

3.4 MANCHESTER AND CANNING DOCKS: NINETEENTH-CENTURY IMPROVEMENTS TO THE QUAYSIDE

3.4.1 The most significant modifications to Manchester Basin were to turn it into Manchester Dock, which entailed the narrowing of the entrance, shown on Cole's map of 1807, and the installation of lock gates. Recent documentary analysis by National Museums Liverpool (M Adams *pers comm*) has been able to confirm that the lock gates were in position by 1807, in contrast to the date of *c* 1815 suggested by Ritchie-Noakes (1984, 35). Trade

through the dock, in coal and manufactured goods westwards, and corn and cotton inland, amounted to 1000 tons per day in the early nineteenth century (*op cit*, 36).

3.4.2 The historical mapping (Fig 9) shows that the construction of ancillary buildings followed soon after the dock gained its gates, and a range of offices, warehouses and agents' residences was established along its north side, forming the 'Old Quay Wharf'. A warehouse was built in the yard of the Mersey and Irwell Navigation Company, which overhung the east end of the dock, and provided two covered loading bays (Fig 10; Kaye 1816; OS 1850; Ritchie-Noakes 1984, 35).

3.4.3 In 1807, an Act of Parliament, entitled *An Act for the Abolition of the Slave Trade* (47º George III, session I, cap XXXVI), was passed, and with this the slave trade was 'abolished and prohibited and declared to be unlawful' (*ibid*). Many merchants operating in Liverpool asserted that the town would be ruined by the process of abolition (Clarkson 1830, 39); however, Liverpool, despite being heavily involved in the slave trade, had suitably diverse interests abroad to ensure that the development of the port continued almost unimpeded.

3.4.4 Very little remained static on the waterfront, and amendments and alterations to existing docks, as well as the construction of new ones, continued. The building of the Prince's Dock began in 1810; however, its construction came at a difficult time and it took over 21 years from the inception of the plans to the final completion of the structure (Jarvis 1991a, 230). The dock was designed by consultation, with dock engineers William Jessop and John Rennie (Jarvis 1996, 14), both of whom were aware of the problems of silting in the older docks, as well as fundamental issues relating to the integrity of the retaining walls (*op cit*, 14). In particular, there was a substantial drain on resources caused by the Napoleonic Wars, which hampered construction work. By the time the dock was completed in 1821, the dock was most noted for being the only one in the system to be enclosed by a secure walled compound, but this was later to become a standard feature as the dock estate continued to expand northwards.

3.4.5 The Dry Dock was modified during the late 1820s to form Canning Dock (Fig 9), a gated wet dock, which opened in 1829 and reused some sections of the original walling, although the angle to the south-east and the location of the northern wall was altered and moved further southwards (*Section 2.2.23*; Ritchie-Noakes 1984, 41). A half-tide basin, to extend the period when ships could enter and leave the dock system, was constructed in the position of the former Dock Gut (Perry 1769) and was opened in 1844 (Ritchie-Noakes 1984, 41). The majority of the development of the dock estate following this took place further north from Mann Island.

3.4.6 One of the most significant landmark events on the waterfront was that Thomas Steers' Old Dock was closed in 1826. In comparison to the later docks, particularly those north of Mann Island, the Old Dock was by that date land-locked and deemed to be too small and too prone to silting to warrant remaining as an integral part of the dock system. The first mention of issues to do with silting appears in the Minutes of Common Council in 1726, and in 1736, John Martindale was officially contracted to clean silt from the dock basin, indicating that this had been a problem, almost from the time of the dock's construction (MDHB/MP/25, 39). The closure and infilling of the dock removed a potential fire hazard, and also a hygiene hazard, as it had been a popular dumping ground for waste and sewage from the old town, with an open sewer and sluice being added to the north-east corner of the dock prior to it being infilled (OA North 2010b). In addition, it freed up additional land

for reclamation at the centre of the developing town, where space was now at a premium. The newly acquired land was given over to the construction of a new Custom House, a grand edifice, designed in neo-classical style by John Foster Junior (Sharples 2004, 15).

3.4.7 Throughout this period of great change and upheaval, the historical mapping suggests that the outlines of the buildings occupying the ground between Manchester Dock and Dry Dock, at Nova Scotia and Mann Island, remained mostly unaltered, although the internal subdivisions of the space changed considerably at the northern end, between 1769 and 1803 (Perry 1769; Figs 6 and 8). At the southern end of the site, there was considerable change between 1803 and 1836 (Gage 1836; Fig 9), with the complete removal of a terrace of housing (shown in 1803; Fig 8), and the development of a double row of warehouses (Fig 9).

3.4.8 Nova Scotia and Mann Island were occupied from the earliest period following the land reclamation in 1740, until demolition in the early twentieth century, by a mixture of working-class dwellings, warehouses, manufactories and public houses (Stammers 1999, 62 and 101). The north/south road to the west was named Irwell Street in *c* 1820 (Swire 1823), after the Mersey and Irwell Navigation Company, which used Manchester Dock, immediately adjacent. Additional streets in the area were named Irwell Place and Murray Place, with the name Nova Scotia continuing in use, but at this time being used to define only the area of quay immediately adjacent to the southern extent of George's Dock passage.

3.4.9 By contrast, in the late 1820s, the area east of George's Dock Passage was substantially altered, buildings and streets being swept away, to allow for the construction of the Weighing Machine and Dock Police Central Office (Fig 10; also home to the Marine Surveyor's offices and subsequently used as the Harbour Master's Office), as shown on Gage's map of 1836 (Fig 9) and the Ordnance Survey 1:1056 Town Plan of 1850 (Fig 10). The Liverpool City Police was founded in 1836, seven years after the Metropolitan Police Act of June 1829 (Belchem 2006). However, prior to this, a City Watch Committee had successfully operated the organisation of the policing of the town, waterfront and river. At the beginning of 1836, Liverpool had a daytime constabulary force of 54 men, an independent Dock Police Force and a force of 163 night watchmen, not including the people who operated the Bridewells (the term used for the police station and detention facilities; *ibid*). The closest Bridewell to the dock estate was at 17 Argyle Street, just behind the former site of the Old Dock, although this was not constructed until 1861 (*ibid*).

3.4.10 The creation of police stations on the waterfront frequently served a dual function, as the police and fire service was, at this time, one unit, the dock and town police being a single body before 1845, overseen by the Watch Committee. The preliminary construction of the dock estate boundary wall, which began with the enclosure of the Princes Dock in the 1820s, provided small lock-ups along the length of the waterfront, as the northern tower of each stone gate pier was fitted out to operate as a temporary holding cell (LCC 2005). The principal role of the police on the waterfront was to prevent plunder and disorder, and to ensure that the relevant import duties were paid, as well as to enforce the numerous rules and regulations which surrounded a ship putting into port. The 1845 Parliamentary Gazetteer of England and Wales states that the laws relative to the Port are ' *two hours before and one hour after high water there shall be an efficient person on the deck of every vessel in the docks, basins etc; that the anchor and stock shall be on deck; that the jib boom shall be run in; that no fire or lighted candle shall be suffered on board any of the*

vessels without permission, granted in cases of necessity, under the care of a policeman; that no article shall be suffered to lie upon any of the dock quays, whether landed from a vessel or for shipment, more than forty-eight hours' (Anon 1845, 143).

3.4.11 With such a comprehensive and stringent set of rules surrounding the operation of the dock system, there was a requirement for a central police station to serve the dock. It appears, from archived records of the Mersey Docks and Harbour Board, that the design for the Dock Police Office was originally put forward by Jesse Hartley in the 1830s. A revised, but almost identical, set of plans and elevations was redrawn and reissued by George Lyster after Jesse Hartley had retired due to ill health. The original plans might not have been completed until Lyster was in office as Dock Surveyor (MDHB/JH/117); however, it is clear that a version of the building was in place by at least 1836, even if it did not conform entirely to the original plans. Subsequently, the design for the Dock Police Office was attributed to Lyster, and was described as '*a handsome stone building*' (*ibid*). Original plans and elevations, now lodged at the Maritime Museum Archive, show that the Dock Police Office was a three-storey edifice with an ashlar pink sandstone facade, pitched roof and extensive basement.

3.4.12 Each elevation of the building was divided into five bays, with the central bay on the principal elevation having an iron-framework balcony projecting over the main doorway. The principal entrance was south-facing, with a view towards the newly remodelled Canning Dock, weighing machine and George's Dock Passage Footbridge. The later history of the Dock Police Office is obscure. It was extant in 1927 (OS 1927a), but absent by 1955 (OS); a rare photograph is published in Anderson (1996, 1). Given the extent of the damage sustained by areas of the waterfront during the Blitz of 1940 and 1941, it is not unreasonable to suppose that this building also suffered bomb damage.

3.4.13 Weighing machines had been present within the area of Mann Island and Nova Scotia for a substantial period of time. Thomas Rice is listed in the Gore's *Directory* of 1777 as both a victualler and overseer of the Weighing Machine, which was then at New Quay, to the north-east of Bird Street. Similarly, in 1781, Thomas Briggs is listed as being employed as an agent to the Weighing Machine at Mann Island, suggesting that it had become necessary to move the Weighing Machine to an area closer to where the goods were being disembarked (Gore 1781). There was also an increased number of counting houses, ships agents and brokers based at Mann Island and Nova Scotia from 1781 onwards. The location and significance of a Weighing Machine is not a matter that was ever included in the Minutes of Common Council, however, suggesting that it was probably not overseen by the dock committee, but was managed instead as a personal enterprise.

3.4.14 At the end of the 1820s, Liverpool was eagerly anticipating the changes which would be brought about by the completion of the Liverpool and Manchester Railway (L&MR). The line was opened to the public in 1830 (Marriner 1982, 25) and the volume of passengers and freight was large from the outset, with 71,951 passengers and 4063 tons of cargo being carried in the first year alone (*ibid*). Originally, the Liverpool to Manchester line terminated just north of the town centre at Crown Street; however, by 1832, the construction of a central terminus at Lime Street was underway, which was completed in 1836.

3.4.15 The opening of the railway, and its subsequent improvements, were to have a marked impact on the docks, including the arrangement, packaging and transportation of the goods entering and leaving the Port of Liverpool. Manchester Dock was leased in 1872 to the

London and North Western Railway (LNWR) which, in this transaction, also represented the Shropshire Union Railway and Canal Company, the Great Western Railway (GWR), and the Birkenhead Joint Lines (Ritchie-Noakes 1984, 36). The railway companies constructed offices, warehouses and transit sheds around the dock, including the extant buildings on the former south quay (Liverpool City Council 2005, 60–1), operated by the GWR and LNWR (Moss and Stammers nd, 17, 20). In the absence of its own direct rail link, this facility was the GWR's foothold on the eastern shore of the Mersey, and allowed the company to transfer goods into Liverpool from its facilities at Morpeth Dock in Birkenhead (Atkins and Hyde 2000, 139).

3.4.16 In conjunction with the changes in the area relating to imports and the handling of goods, alterations can also be seen in the overall reduction of small industry and businesses within the area of Irwell Street, although these continue to thrive in the areas of Nova Scotia and Mann Island, with properties increasingly given over to named public houses (assuming the requirement of a licence, rather than the unlicensed victuallers and drinking houses of the eighteenth century). Groups of official representatives for various large companies, such as Mainwaring and Company Commission Agents, the Mersey Docks and Harbour Board Central offices for the cargo surveyors, the Shropshire Union Railways and Canal Company, and the GWR Goods Company, had all established themselves in the area of Irwell Street and the Old Quay by 1900, and improvements to the area followed, in the form of newly cobbled roads and tram lines installed in 1903 (Photographs of CF Inston (Wilkinson 2009)).

3.4.17 This influx of offices and companies associated with the transport network also saw modifications to the area around the Manchester Dock, specifically the addition of sheds and piers to accommodate the transfer of goods from the small boats which used the Manchester Dock, to the railway which now extended down the northern limit of the dock. The construction of three timber piers, which projected out from the eastern quay of the dock, was accompanied by a long shed overhanging the eastern quay. These structures are noted on the OS maps of 1850 (Fig 10) and 1908 (Fig 11), along with the GWR building (constructed *c*1890; Atkins and Hyde 2000), which forms the southern limit of the perimeter of Manchester Dock, being constructed directly onto the retaining wall.

3.4.18 The area of Nova Scotia, Irwell Place and Mann Island retained the smaller businesses, all of which continued to exist within the footprint established by the time of the 1765 map by John Eyes (Fig 5). The area of Mann Island, specifically the northern limit of Nova Scotia with the principal elevations facing George's Dock, was entirely populated by victuallers running public houses, with 1 Mann Island listed as a public house (although no name is given) run by John Henry Quayle, a victualler. Similarly, 2 Mann Island is listed as The Old House Public House, run by Francis Gore, and 3 Mann Island is listed as The Odd Fellow's Arms (no victualler's name is provided). This dense group of public houses is further complemented by the presence of The Old Lifeboat Public House at 1 Nova Scotia, the Packet House Public House at 1 Irwell Street and Dicky Sam's Inn at 8 Nova Scotia (Gore 1900).

3.4.19 Aside from public houses, the streets still accommodated a series of business enterprises which had been long established; for instance, there were salt merchants at 5 and 7 Irwell Street and 2 Murray Place, and a smithy at 10 Nova Scotia. The dock gateman lived at 9 Nova Scotia, directly opposite the gate and bridge over George's Dock Passage.

3.5 THE MERSEY RAILWAY

3.5.1 On the opposite side of the river, the Chester and Birkenhead Railway company had brought the first railway to the Wirral in 1840, and by 1866, a commuter line had been created to link Hoylake, and the intervening villages along the Wirral coastline, with the industrial hub of Birkenhead (MPTE 1986, 2). The launch of the Mersey Pneumatic Railway project was authorised in June 1866 (Act 29 and 30 Vict, cap 39), subsequently becoming known as the Mersey Railway Company. The Act of 1866 gave power to the company to connect Liverpool with Birkenhead by means of a railway under the bank and bed of the river Mersey, although this project stalled, due to a lack of capital investment (Slaughter 1869, 118).

3.5.2 Further upheaval to the area on the east side of George's Dock Passage occurred during the period 1881–6, when the Mersey Railway Company cut a tunnel linking James Street station, Liverpool, with Hamilton Square station in Birkenhead (Maund 2002, 68). Construction of the tunnels began formally on 29th October 1881, but there were problems with the geology which were not predicted by the engineers; however, the work moved steadily forward, particularly after the acquisition of a special boring machine designed by a Colonel Beaumont RE, which moved the work forward at a rate of 150 feet (45.7m) per week (MPTE 1986, 2). Trains on the line were originally steam-hauled, so that substantial investment was necessary to provide effective ventilation, in addition to the inevitable necessity of removing water from the tunnel. Pumping and ventilation stations were set up at each end of the tunnel, at Mann Island in Liverpool, and on Shore Road in Birkenhead (*op cit*, 15).

3.5.3 Both were fitted out with steam-driven pumps to clear water from the tunnel's drainage heading, while 'Guibal'-type fans, 40ft (12.2m) and 30ft (9.1m) in diameter respectively, produced by Black Hawthorn & Co (a steam-locomotive manufacturer based in Gateshead) created a vacuum in the ventilation heading, to draw fresh air into the tunnel via the stations at each end (Maund 2002, 6 and 15; Jones 2006, 132). The structures first appear on the 1891 1:500 Ordnance Survey Town Plan and comprised a group of long brick sheds with one square crenellated tower, situated parallel to The Strand (and latterly the overhead railway) which covered numerous subterranean chambers housing deep shafts. These descended into the rockhead and opened at a level just above the 1:27 gradient of the tunnel's main line. Large machine bases and engine rooms would also have been required as part of the design. Despite the inclusion of vast fans and an intricate ventilation system within the design for the tunnels, the Beyer and Peacock-built steam engines produced far more smoke and soot than the ventilation system could clear. Because of this, and despite the novelty, people returned to using the long-established ferry, especially during the summer months, and the Mersey Railway Company was soon making serious losses that affected the financial viability of the scheme. By 1888, the Mersey Railway Company was declared bankrupt (MPTE 1986, 3).

3.5.4 The area remained in heavy use, however, particularly by foot traffic, as a greater number of people used the ferry terminal at the Pier Head, rather than the Mersey Railway. In order to deal with this, the footpaths on the bridge across George's Dock passage were widened in 1895 from 4 feet (1.22m) to 7 foot 6" (2.28m), at a cost of £1200 (MDHB/G50/WUP).

3.5.5 In 1888, the year the Mersey Railway Company was declared bankrupt, the Liverpool Overhead Railway Company was formed, to create a double-track elevated railway which was to run the majority of the length of the dock estate, stretching a distance of six miles,

from Alexandra Dock in the north to Herculaneum Dock in the south. The line, which opened in 1892, hugged the cyclopean granite boundary wall of the dock estate, before passing the city centre, with stations also situated at the Pier Head, James Street (at Mann Island) and Canning Dock (LCC 2005, 141). Many of the historical images of Mann Island, particularly the area to the east of George's Dock Passage, show the heavily built-up area hemmed in by the piers and tracks of the Overhead Railway to the east. The overhead railway suffered damage during the Second World War; James Street station for the Overhead Railway, adjacent to Mann Island, was destroyed by a direct hit during the May Blitz of 1941 and was rebuilt on modern lines in 1942 (Liverpool Echo 2008). The Overhead Railway was closed on the 30th of December 1956 and was purchased by George Cohen and Sons who dismantled the structure for scrap.

3.5.6 Despite the financial issues of the Mersey Railway Company, the railway continued to operate, with passenger transport reaching a peak in 1890 after the transportation of ten million people in one year. In 1898, the receivers stated that '*If the tunnel could be freed from smoke and noxious fumes, the main obstacle to the development of traffic would be removed'* (MPTE 1986, 4). It is interesting to note that, as the fans were situated in parallel to one another, unless the smaller of the two fans was operating at a 33% faster speed than the larger fan, there was likely to be a mismatch in pressure, which would have made the ventilation system ineffective (Cory 2005).

3.5.7 In 1903, George Westinghouse (1846-1914), an American industrialist and entrepreneur, agreed to finance the electrification of the Mersey Railway, as well as settling the company's debts, in order to bring it out of the hands of the receivers. Westinghouse sought to improve the Mersey Railway at a cost of nearly £300,000 by importing the necessary electrical equipment from the United States and ensuring a smooth transition from steam power to electricity without any disruption to the functioning line (MPTE 1986, 5). This work was successfully completed in April 1903 and the first electrically powered passenger service left Central Station on Sunday, 3rd May 1903.

3.6 THE TWENTIETH-CENTURY DECLINE OF THE MANN ISLAND DOCKS

3.6.1 By the end of the nineteenth century, traffic using George's Dock was in decline, and it was proving to be a considerable impediment to the cross-river ferry traffic, which had grown substantially; it was therefore closed in 1900 (Ritchie-Noakes 1984, 28 and 30). The closure of George's Dock rendered other dock facilities in the locality redundant, and George's Ferry Basin and George's Dock Passage were also taken out of service (*op cit*, 28). The extant remains of the southern half of George's Dock Passage, including the wells for the gates, remain visible at Mann Island.

3.6.2 In 1901, the first steps were taken towards altering the landscape at Pier Head and Mann Island, with a move away from the transit sheds and warehouses. Instead, the Pier Head was to become the site of three buildings which would come to be representative of Liverpool and core elements of its famous skyline. The offices of the Mersey Docks and Harbour Board (now the Port of Liverpool Building) were designed in 1901 by Briggs, Wolstenholme and Thornley; constructed in Edwardian Baroque style, with pediments and tall lantern towers, this building occupies the southern end of the site of the former George's Dock (LCC 2005, 50). The construction of the Mersey Docks and Harbour Board offices was followed in 1908 by that of the Royal Liver Assurance Building, at the

northern limit of the former George's Dock. The Grade I listed Liver Building was designed by Aubrey Thomas, who also designed the Tower Buildings on the opposite side of The Strand. The Three Graces were completed by the addition of the Cunard Building, which was constructed in 1913 to provide offices for the world-famous Cunard Shipping Line (*ibid)*.

3.6.3 At the beginning of the twentieth century, Mann Island was regarded as being anomalous, not least because its small-scale domestic architecture (Fig 11) was now situated next to three large, ornate structures, and because it was the only place within the boundary of the dock estate where licensed premises were still allowed to operate. From 1891 onwards, a series of letters and correspondence (MDHB/2901/L88) was lodged with the Mersey Docks and Harbour Board, indicating that the buildings of Nova Scotia and Mann Island were in a particularly poor state of repair. In 1903, a group of Justices visited the area to assess the state of the buildings there, and the Clerk of City Justices recorded that ' *a committee of Justices have visited the public houses [at] Nova Scotia and in view of their dilapidated and insanitary condition and unsuitability for their present purpose, it will be necessary…. to consider whether all or any licences should be renewed'* (*ibid*). According to the Mersey Docks and Harbour Board records for this period, nos 1 and 3 Mann Island and 1 Nova Scotia and 1 Irwell Street continued operating as public houses after 1907. No 3 Mann Island was the first property at Mann Island to be occupied and appears to have operated as a public house from 1796 until the early twentieth century (Gore 1796; MDHB/2901/L88).

3.6.4 In 1909, the agenda for works for the Mersey Docks and Harbour Board (MDHB) records an agreement whereby the Mersey Railway Company filled in the vertical headings at Mann Island (surplus to requirements following the installation of the electrified line), leaving the horizontal headings in their present condition. The Mersey Railway Company was also asked to ensure that the point at which the redundant tunnels joined was blocked using concrete, and that the company in turn requested of the MDHB that an indemnity should be arranged against any future claims of subsidence or nuisance relating to the presence of the redundant tunnel headings (MDHB/M51 2 WUP, 252). This was followed by the Mersey Railway Company relinquishing its lease on the 720 square yards (658.36m^2) of land occupied by the ventilation station. The Mersey Railway Company retained elements of the pumping station adjacent to George's Dock Passage; the long southern shed was removed but the four-storey pump house tower, with its shallow pyramidal roof, was retained and is still in use today.

3.6.5 Manchester Dock was also gradually rendered redundant, following the construction of the Manchester Ship Canal, and as other means of transport were developed and became efficient. It was closed in the late 1920s and was infilled in 1928–36, using crushed pink sandstone waste from the excavation of the Mersey Road Tunnels (Ritchie-Noakes 1984, 36; Stammers 1999, 70). Map evidence suggests that the form of Manchester Dock was apparent for many years, revealed by the extant buildings around its quayside, and the GWR continued to operate a goods service from its own warehouses on the site during the 1930s (Atkins and Hyde 2000). Following the collapse of the Great Western Railway Company, its successors, the British Transport Commission, became the title holders of the land around the former Manchester Dock. On 2ndJanuary 1962, it was eventually permitted to surrender its lease, but was forced to pay £6700 in fines to cover the dilapidated state of the land being vacated (MDHB/2211/M38, 1962).

3.6.6 The buildings occupying Nova Scotia were demolished in *c* 1920 (English Heritage NMR Aerofilms Collection), removing the last structural remains of the late eighteenth- / early nineteenth-century port in this area, except for Manchester Dock. They were replaced by transit sheds serving both Manchester and Canning Docks (OS 1927b), which remained *in situ* at the start of the archaeological investigations of the site, and were surveyed in 2007 (OA North 2007a). At the northern end of the area that was cleared in *c* 1920, an Art Deco building, the Voss Garage, was constructed in the late 1930s (Sharples 2004).

3.6.7 Further changes at the same date affected the area to the east of George's Dock Passage, with the construction, in 1931–4, of a new fanhouse north of Mann Island and east of the Port of Liverpool Building (OS 1891; Sharples 2004, 156, 158). The fanhouse, known as the George's Dock Ventilation, and the central station of the Mersey Road Tunnel, was constructed to serve the needs of the Queensway Tunnel and was designed in Art Deco style, with Egyptian influences, by Mott and Brodie, with noted architect Herbert Rowse overseeing the project. Located directly east of the Port of Liverpool Building, this structure is decorated with relief sculptures symbolising Civil Engineering, Construction, Architecture and Decoration (LCC 2005, 51). On the eastern side the George's Dock passage a two storey brick building, the National Sea Training School was built in the 1950s; it later became Media House (OS 1955; Moss and Stammers nd, 23).

4. EXCAVATION RESULTS

4.1 INTRODUCTION

4.1.1 Generally speaking, land reclamation and development of the majority of the dock system in Liverpool initially progressed westwards and then northwards along the banks of the Mersey; documentary evidence for these developments may be tracked on historical maps (*eg* Figs 4–11). There is very little direct historical evidence for the methods employed to reclaim land from the river, or how the dock and sea walls were constructed, but the results from the excavation provide considerable detail for all of these activities. The historical mapping and trade directories show that reclamation and dock construction was accompanied by the construction of buildings connected in a variety of ways with activity in the docks, whether directly, such as warehousing, manufactories, and packet offices, or indirectly, in the form of facilities for mariners, and domestic accommodation for those working on the docks.

4.1.2 The evidence from the below-ground archaeological investigation takes a number of forms. There is the structural evidence provided by the massive remains of sea and dock walls, and other walls erected as working platforms at stages in the process of reclaiming land, as well as the material used to fill in behind the dock and sea walls. Evidence was also recovered for ancillary structures contemporary with the working life of the docks, and for buildings associated with the operation of the Mersey Railway tunnel. Finally, there are the artefacts, some incorporated in the reclamation material, others relating to activity when the docks were active. These remains reveal the history of the development of the river frontage, a history which culminated in the backfilling of some dock basins, including Manchester Dock itself, and a change in the landscape away from the earlier dockland character to one represented by the Three Graces and the central urban opulence.

4.1.3 The aims of the project (*Section 2*) required analysis to characterise and phase the activities identified on the site, including the episodes of construction. This has been achieved, and nine phases of activity have been ascribed, with supporting evidence from a synthesis of the artefactual and documentary analysis. A further research aim (*Section 5.1*) was to acquire information about the methods and raw materials used in the construction of the major structures (*Section 5*).

4.1.4 The site was divided into three areas of quay, which were partly dictated by the build plan of the site, and also by the existing topographical features, such as George's Dock Passage (Fig 3). The area to the west of George's Dock Passage and Canning Dock was designated as Area A, that to the east of George's Dock Passage, north of Canning Dock, was designated Area B, and the area to the north of the truncated limit of George's Dock Passage, adjacent to the pumping station, was designated Area C.

4.2 PHASE 1 (MERSEY FORESHORE: MEDIEVAL–MID-EIGHTEENTH CENTURY)

4.2.1 Before the start of the reclamation of land from the Mersey at Mann Island, in the mid-eighteenth century (*Section 3.2.2*), the area west of The Strand was foreshore, exposed twice daily at low tide (Fig 4). The excavation, which was focused on the ground occupied by the development and, therefore, was limited to its footprint and formation level, thus did

not encounter the original level of this foreshore as it would have been prior to the start of the land reclamation. At the formation level for construction, however, deposits were encountered which equate to the areas of foreshore following the start of the land reclamation activity after 1740 (*Section 3.2.7*). This comprised the construction of three consecutive sea walls (*Section 4.3*) and the Dry Dock (*Section 3.2.6*). The furthest of these sea walls lay more than 100m out into the Mersey from the edge of the dry ground, indicating that the Mersey foreshore was extensive and gently sloping. since land reclamation at this time did not attempt to extend below the low tide mark (Jarvis 1991b, 10). Historical mapping indicates the extent and rapidity of progress in the land reclamation programme and, by the mid-eighteenth century, the built-up area of Liverpool extended nearly half a mile north of the present Canning Graving Dock 3 (directly south of the site), and was occupied by quays and embayments, and a public baths.

4.2.2 In theory, the shallowly sloping and extensive foreshore would have made the earlier phases of reclamation relatively easy, providing sufficient backfill material was available. The earliest deposits discovered relating to this phase were the early riverine silts upon which the sea walls were situated. These deposits, ***7798*** and ***7799,*** a fine grey alluvial silt/clay with small fragments of organic material, were observed within a narrow sondage excavated against the east-facing (landward) elevation of sea wall ***5707*** (*Section 4.3.4*), and appear to be part of the foreshore that formed following the construction of the Dry Dock.

4.3 PHASE 2 (THE FIRST SEA WALL AND DRY DOCK: 1740S)

4.3.1 The construction of the Dry Dock (Fig 5), the second proper dock/basin in the fledgling dock system, was sanctioned under an act of Parliament of 1738 (*Section 3.2.9*), and the north wall, ***5270***, built from locally quarried yellow sandstone, was encountered in Area B of the excavations (Fig 12). Located at the southern limit of the excavation, this wall was a well-built sandstone structure, 1.35m wide, with a vertical seaward face, constructed in an irregular bond (an irregular mixture of large rectangular blocks and smaller square blocks, which were particularly prevalent at the point where the wall began to curve at the eastern limit) with no obvious sign of any mortar bond (Plate 1). No coping stones were found, suggesting that the wall had been reduced in height and that some of the upper courses, including the coping stones, had been removed for reuse elsewhere. The south-facing elevation had, in places, a series of largely geometric mason's marks, with several designs being repeated on other walls within Areas A and B (*eg* walls ***5270, 5707***, ***7735*** and ***7600*** *(Section 4.6.1*).

4.3.2 The Dry Dock was reconstructed in 1826-9 to form Canning Dock (*Section 3.4*), and the earlier northern wall of the Dry Dock was preserved beneath the quayside of Canning Dock. It is possible that the eastern Dry Dock wall may also be preserved behind the eastern Canning Dock wall, and although this lay beyond the limit of the Mann Island excavations. An archaeological evaluation of the proposed route for the Mersey Tram development in 2005 (OA North 2005), which extended along the Strand, did not, however, reveal any sections of an earlier Dry Dock wall.

4.3.3 Given that the northern wall of the Dry Dock was preserved, it was thought that the western wall may also survive, but the archaeological investigations in Area A did not reveal it. However, given that the position of the secant pile wall and ring beam was less

than 2.6m west of the existing western wall of Canning Dock, the Dry Dock wall either did not survive or the modifications to the Dry Dock did not include a dramatic alteration of the alignment of its western wall. This latter possibility is further supported by the excavations directly against the south-facing elevation of the Canning Dock wall, as part of the work within the LCL1 bay for the Liverpool Canal Link project (OA North 2011a) (Fig 3). Work within this area provided no evidence of an earlier wall, potentially supporting the idea that the western wall of the Dry Dock was left standing to serve as the western wall of Canning Dock. The rear of the Canning Dock wall was found to be constructed in a mixture of pink and yellow sandstone, with yellow sandstone being the principal construction material.

4.3.4 Sea wall ***5707*** (Plate 2), which matched the north/south orientation of the Dry Dock, was similarly constructed from yellow sandstone, and was exposed approximately 26m west of the western wall of Canning Dock (Fig 13). Towards the north end of Area A, the sea wall curved to the east, on a radius of approximately 14.3m (Plate 3). This wall then continued eastwards beyond the limit of excavation, but a projection on this east/west alignment demonstrates that it may have lain approximately 31m north of the north wall (***5270***) of Dry Dock. Comprehensive, and successive, redevelopment within Area B, particularly the alterations carried out to the width and alignment of the Graving Dock, which subsequently became George's Dock Passage (*Section 3.2.21*), appear to have erased all traces of this wall on the east side of George's Dock Passage.

4.3.5 The north/south element of sea wall ***5707*** survived some 0.5m below the ground surface, and was exposed to a depth of 13 courses (Fig 14). The wall was trapezoidal in profile, and measured 1.5m wide at the top, widening to just over 2m at the bottom of the excavation. The stonework was well-tooled, to a near-flat finish, on the western, waterside elevation, but was only roughly squared on the eastern, construction face. As with the northern wall of the Dry Dock (***5270***), the west-facing elevation of ***5707*** was found to have a number of mason's marks, again mostly geometric in pattern. Eight different mason's marks were identified, with at least four being a repeat of marks used on the stones of the Dry Dock wall. This structure continued to a depth of at least 1.4m beneath the formation level of the site and a limited portion of this was examined within a sondage which was sunk to establish the true depth of the wall. The construction technique and bond were found to be the same as in the upper part of the wall, but as a result of water ingress, it was not possible to establish whether or not this wall was sited on top of timber piles, which was a possible foundation technique used in later dock walls, such as Manchester Dock (*Section 4.6*). The area between sea wall ***5707*** and the west wall of the Dry Dock had been backfilled with layers of coarse sands, silty clays and coarse crushed pink sandstone. It is likely that an element of this crushed sandstone and coarse sand had been obtained as quarry waste; however, some of the material may originally have been used as ships' ballast (*Section 3.1.12).* In parts of the backfill deposits, particularly at the north-east side of ***5707***, it was possible to discern small tiplines, which sloped downwards from east to west, suggesting that, while much of the material had been dumped in bulk, there were also smaller localised episodes of deposition which contributed to the land that become the Dry Pier (*Section 3.2.6*). No artefacts were recovered from this area since the bulk excavation process was very rapid.

4.4 PHASE 3 (THE SECOND SEA WALL, BIRD'S SLIP, GEORGE'S DOCK PASSAGE AND NOVA SCOTIA OCCUPATION: LATE 1740S–EARLY 1760S)

4.4.1 Further reclamation west and north of the Dry Dock was necessary for the construction of a Graving Dock in 1746, and also to provide suitable wharfage for local river traffic (*Section 3.2.11*). A yellow sandstone wall, ***7638*** (Fig 13), 11m west of wall ***5707***, bounded this new land, and can be named the second sea wall. Evidence from historical maps (Figs 5 and 6) suggests that it once extended approximately 90m north from the point where it joined wall ***5707***. This was also constructed from well-tooled yellow sandstone blocks, arranged in an irregular bond without any evidence of mortar (Plate 4), and the rear of the wall was stepped, using a mixture of rubble and ashlar stone walling in the same material (Fig 15). Invariably, the ashlar masonry at the back face of the wall was not as cleanly worked as the stones comprising the face; however, many stones presented evidence of neat lines of toolmarks and squared-off edges. The narrow, rough steps at the back face of the wall created a rudimentary and continuous counterfort. The space between wall ***7638*** and its predecessor, ***5707***, was filled with layers of coarse sands, silty clays and possible sandstone quarry waste, and again it is likely that some of this material may have been obtained by the carefully directed discharge of ships' ballast as they put into port. Some of this reclamation material was industrial waste, indicated by a sizeable dump of pottery, consisting of 47.74% by weight of the total assemblage of sugar wares recovered from the excavations, which was found beneath a cellar in Area A (*Section 5.2.24*).

4.4.2 Bird's Slip is marked on John Eyes map of 1765 (Fig 5; *Section 3.2.10*) and named on Perry's map of 1769 (Fig 6). The excavation revealed a wall, ***7735*** (Fig 13), sloping downwards from north to south, and butting against wall ***7638***, which was *c* 1.6m wide at the limit of excavation, and which was recorded by laser scanning (Fig 16). The wall was constructed of yellow sandstone ashlar blocks, with large, slightly less well-dressed, coping stones in the same material (Plate 5). This was constructed subsequent to two phases of reclamation and was probably intended to facilitate unloading from the foreshore. Also revealed was a line of 14 wooden posts, aligned parallel to sea wall ***5707,*** rather than the slip (Fig 17). Excavation to the south of the site, within bays LCL1 and LCL2 of the canal link at Mann Island, revealed that the timbers continued, ending where a second slip or breakwater was encountered (OA North 2011a). All of the timbers appeared to have been roughly hewn, and removal of two of them, from the northern end of the group, showed that their bottoms had been shaped into roughly four-sided points to facilitate driving them into the river bed. The line of timbers was not found to continue to the north of the line of wall ***7638***, suggesting that the timbers were put in place following the construction of that wall. Its presence created a sheltered area to the north of that known as the *graving bank* and would have presented a useful place to moor smaller ships and river-based traffic that were not destined for the Old Dock (Plate 6). Bird's Slip was constructed a short time after the completion of sea wall ***7638*** (Fig 17), and provided additional shelter to this mooring as well as a slipway for foot traffic, enabling the movement of goods arriving and departing from the numerous boathouses which sprung up on Mann Island in the 1760s. Both features are of a scale and character appropriate for estuarine or small-scale coastal trading (*cf* Stammers 2007, 37–49). Wall ***7638*** exhibited numerous repairs, one of which, located approximately 12m from the northern limit, was quite substantial, with a much more irregular bond type, suggesting that at some point a section of the wall, measuring around 8m in length (and through its full thickness), had been breached. It is not known whether this repair was carried out after storm damage or as

maintenance to an area which had suffered badly from the long-term effects of water and mechanical erosion.

4.4.3 ***Warehouses and Dwellings on Nova Scotia:*** John Eyes' map of 1765 shows three irregular-sized blocks of buildings backing on to the sea wall itself, and the area to the east of these blocks is named as *Nova Scotia* (Fig 5). The more northerly of the two blocks of buildings is distinctive in that the properties have a stepped appearance at the southern end. Perry's map of 1769 (Fig 6) shows this block divided by a narrow street, which OS mapping recorded as Irwell Place (OS 1850; Fig 10). The historical maps of 1765 (Fig 5), 1769 (Fig 6), and that of 1795 which accompanies the *Strangers' Guide to Liverpool* (Anon 1795) all show these plots of land at Nova Scotia as blocks, rather than presenting them in any detail, and therefore it is difficult to understand any subdivisions which may have taken place within the larger plots at this time. However, from 1803, Horwood's map (Fig 8) provides a clearer illustration of the occupation of Nova Scotia. The plan of these buildings (Plate 7) persisted until their demolition in *c* 1920 (*Section 4.6.3*), probably because of the sizeable and durable nature of their sandstone footings, ***5141***; however, the historical mapping shows that the internal divisions changed, in a manner that was apparently largely undetectable by archaeological investigation, perhaps because of the extent of demolition (*Section 4.6.3-12*).

4.4.4 The excavation revealed, behind sea wall ***7638***, the cellars of a number of buildings (Plate 7), west of George's Dock Passage (Fig 13), which represent the occupation of land created by the reclamation. The earliest extant remains were constructed in yellow sandstone, comparable with the material used to construct the sea wall itself (Plate 8). Indeed, given the variations in levels and the missing coping stones, it is not unlikely that, as the sea walls were superseded and fell out of use through the progression of the land reclamation process, the top courses of stone were reused for local construction. Within Area A (Fig 13), yellow sandstone ashlar masonry provided three extant courses of the gable wall, ***5134***, at the southern end of one of the buildings on the north side of Murray Place, and the angled wall, ***5141***, which is shown on John Eyes' map of 1765 (Fig 5), and Perry's map of 1769 (Fig 6), and was probably once the gable of another building (Plate 7).

4.4.5 The unusual appearance of the upper course of sea wall ***7638*** (Fig 13) in the vicinity of these buildings may reasonably be explained if it once formed the foundation course of the first phase of those same buildings, as is implied by the historical mapping. This area of warehouses and associated cellars did not extend as far as the sea wall itself, in part to allow a sufficient mass of landfill to counter the water pressure on the wall, but, perhaps more importantly, this area provided a quayside for the servicing of the ships.

4.4.6 No further building in sandstone was identified, but later phases of brick walling north of Murray Place were revealed, which suggest that there was a degree of longevity to the buildings (Plate 9). Map evidence indicates that these brick buildings superseded the sandstone ones in the early nineteenth century (Figs 8 and 9). A burnt layer beneath the brick floor of one of the cellars in Area A, within the area noted as Mr Fraser's Coal Yard on the Horwood map of 1803 (Fig 8; Plate 10), with a range of artefacts of eighteenth-century date, may suggest the fate of earlier structures.

4.4.7 At the eastern edge of the excavation in Area C, a short length of eighteenth-century wall, ***7248*** (Fig 18), forming the west side of George's Dock Passage, was uncovered. George's Dock itself was opened in 1771, although the extensive works necessary to create it commenced in 1762 (Ritchie-Noakes 1984, 27). The passage provided a route for shipping

between George's Dock and the Dry Dock (later Canning Dock). The upper three courses of this, otherwise yellow, sandstone wall were executed in the more resilient pink sandstone that was typically used after 1785 (*op cit*, 37), and probably represents a repair (Plate 11). Additional elements of George's Dock Passage, including larger yellow ashlar sandstone blocks from the original configuration related to the old Graving Dock, were identified during a series of further works for the Public Realm scheme in May 2011, a programme of landscape improvement linked to the Canal Link development (OA North 2011b). Within this area, further to the south of the previously identified section of George's Dock Passage, the walls were entirely constructed of yellow sandstone, with the blocks being large and coarsely hewn; the coping stones were missing within this area. The yellow sandstone and the size and nature of the blocks suggest that some of what was observed may have related to the Old Graving Dock, which was constructed in 1740 (*Section 3.2.9*), as well as the later George's Dock Passage, which was partially excavated during the main phase of the work within Area C.

4.5 PHASE 4 (SLIP: 1770S)

4.5.1 A length of almost 40m of yellow sandstone walling, ***7636*** (Fig 13), was uncovered *c* 7m west of the second sea wall, ***7638***. The upper level of this wall, marked by *in situ* coping stones, dipped southwards. Its construction was similar to wall ***7638***, with a well-tooled finish to the regularly coursed stone blocks of the seaward face, and a less even rubble build on the landward side. At the northern limit of the excavation, the wall began to curve westwards (Plate 12; Fig 18) and may have continued beyond this a considerable way to the west (*c* 80m), to link in with a sea wall on a north-west / south-east orientation that was uncovered during the excavation of LCL5 to LCL7 within the Pier Head section of the Liverpool Canal Link (OA North 2011b; Fig 1). At its southern end, the toe of ***7636*** terminated in an earth-filled rectilinear wooden construction, ***7783***, consisting of oak planks, varying in width from 0.2–0.54m, set on edge (Fig 13). The function of this structure was not determined; however, it appeared to be poorly constructed and was likely to be incidental or temporary.

4.5.2 This wall does not appear on any of the historical maps, and is not otherwise recorded. It seems likely that it provided another slip, allowing vessels, with some effort, to take on and discharge cargo at all levels of the tide. It may have also been created to facilitate easier access for the transportation of raw materials, including timber and canvas, to the graving bank at low tide.

4.5.3 In the space between the second sea wall (***7638)*** and wall ***7636***, a row of yellow sandstone blocks, ***7764***, was revealed beneath the backfill (Plate 13), which was aligned perpendicular to both walls, and was no more than 0.7m wide. This was one of a series of such constructions, with four more revealed to the south (***7762***, ***7763***, ***7864***, ***7865***), at no fixed interval, but all on the same east/west alignment and on the same north/south axis (Fig 13). The level of the upper surfaces of these features was comparable with the base of the first and second sea walls, although their position implies that they post-date the second sea wall (***7638***), and pre-date wall ***7636***. Their closely comparable alignment, construction and orientation suggests they were related and all fulfilled a similar purpose, but the nature of this was not apparent, although it is possible that they were somehow connected with the construction of wall ***7636***. A further possibility is that these parallel lines of sandstone were used as hard standings or supports for the laying down of timbers which then allowed

a safe foot-way out onto the graving bank at low tide. Essentially, they may have provided the basis for a temporary roadway, which would have allowed timbers and other material (traditionally stored just north-west of the site at the newly reclaimed Pier Head) to be carried safely across the soft silts to the graving bank, where ships were careened for repair (Ritchie-Noakes 1984; *Section 3.3.2*). Once the process was completed, or at the rising tide, the timber boards could be lifted, leaving behind the stone platforms.

4.5.4 The material excavated from the space west of walls ***7638*** and ***5707*** consisted of several layers of tipped backfill, largely comprising quarry waste and dumped ballast material, sloping gently downwards from east to west. This series of tipped deposits also included large dumps of industrial waste, such as the failed firings of clay tobacco pipes (***5747***; *Section 4.4*). These dumps took the form of discrete tip lines within the sterile ballast and quarry-waste deposits, and represent a clearly defined period of dumping within the larger land reclamation phase. The clay pipes have been identified as deriving from the workshop of William Morgan, active in the late eighteenth century (*Section 4.4*), and similar to the dump recovered from the excavations on the site of the Liverpool Canal Link Mann Island section, immediately to the south (OA North 2011a) (Fig 24).

4.6 PHASE 5 (MANCHESTER BASIN, MANCHESTER DOCK AND MANN ISLAND OCCUPATION: 1770S–*C* 1815*)*

4.6.1 The Manchester Basin appears on historical mapping in 1785 (*Section 2.3.1*) but, on that mapping, it has a different shape from the dock which replaced it. Its construction required substantial land reclamation behind a sea wall to the west, beyond the limit of the present excavation. The subsequent development of the basin, shown on Horwood's map of 1803 (Fig 8), altered its outline, and finally, in *c* 1815, its entrance was narrowed, and twin-leaf lock gates were installed, to form Manchester Dock (*Section 2.4*). The excavation uncovered both the north and east walls (***7600***; Figs 13 and 19) of the dock, which were constructed with a waterside face of the harder pink sandstone (Plate 14), in coursed ashlar, and a rear face using both pink and yellow sandstone, which was probably recycled from the walling of the earlier basin. The wall was stepped out towards its base, providing a more substantial foundation, and was recorded by laser scanning (Fig 20). Towards the western limit of excavation, mooring rings were found *in situ*, and two types of bases for cranes serving the dock were also identified. Two bases of one type were situated behind the dock wall (Plate 15), and were probably early manual cranes, but there was also a second type, probably a later steam-powered derrick, that was built into the top of the north wall of the dock and housed in a brick-lined recess (Fig 19). Parallel with the north wall of the dock, at its base, the excavation revealed three discrete lines of stone blocks similar to those excavated between sea wall ***7638*** and slip ***7636*** (Plate 16). Although orientated entirely differently, these were otherwise comparable with those found near walls ***7636*** and ***7638***, and may have fulfilled a similar purpose during the dock's construction (*Section 2.3*).

4.6.2 Opposite the west entrance to Irwell Place, north of Manchester Dock, a rectilinear brick building, ***7693*** (Fig 13), 4.3m wide, was revealed, which partly bisected wall ***7636***. The east wall of this was likely to have been a gable end, constructed in English cross bond (Ching 2011), and the equivalent of four bricks wide. The length of the building could not be confirmed, as the west gable was not present, but the building was at least 8.02m long. The only historical map on which this building is potentially depicted is Horwood's of

1803 (Fig 8), where it would possibly have formed part of a range of buildings shown extending north from this approximate position. This identification is not certain, however, as the east wall of the building excavated seems closer to the west wall of the Nova Scotia buildings than the mapped example. The buildings shown on Horwood's map were later modified, at least to the extent of providing an entrance directly opposite Irwell Street, as shown on Gage's map of 1836 (Fig 9), and, because this building lay in the path of this entrance, it seems likely that it was demolished in the 1830s. No artefacts were recovered from this building to confirm its date or indicate its purpose, however.

4.6.3 From the evidence of the historical mapping, it would appear that, at the turn of the eighteenth century, the two blocks of properties between Mann Island and Murray Place were developed into the forms which largely persisted until their demolition, *c* 1920 (*Section 2.6*; Fig 21). The southern block, between Murray Place and Irwell Place, was investigated by excavations in Area A (Fig 13; Plate 7), while the excavations in Area C examined the northern block, between Irwell Place and Mann Island (Fig 18). Both blocks were identifiable from their cellars, substantial remains of which were extant in Area A, while those in Area C were more partial, and altered by later development (Plate 9). Each block was divided north/south, approximately along the centre, with separate properties facing each street.

4.6.4 The west walls of the ground floor of these buildings, reconstructed from reliable nineteenth-century OS mapping (1:1056 Town Plan, 1850), and supported by patches of brickwork found by the excavation, lay above the second sea wall, ***7638*** (*Section 4.4.1*), presumably because it was regarded as a firm foundation. A typical loading well, ***7681*** (Fig 18), for a warehouse, lined and floored in brick, was cut into the upper course of the sea wall, to serve the west-facing property immediately south of Irwell Place (Plate 17). Most of the extant walling and flooring of the cellars was executed in red brick, the same material evident from paintings produced by the Liverpool artist, WG Herdman, and also shown on nineteenth-century photographs, such as those taken by CF Inston (Wilkinson 2009). Sandstone was used to provide bases, in two of the cellars, for columns supporting upper floors, while three of the cellars in the southern block of buildings were filled at an unknown date with carefully stacked loose bricks, ***5785***.

4.6.5 The eastern extent of the northern block (Area C, Fig 18; Plate 9) is shown as having been sub-divided into four properties on the OS map of 1850, and sufficient structural evidence remained upon excavation to identify two of these divisions. The two properties at the south end of the block were excavated, while the bulk of the remainder lay beyond the limits of the excavation. The east frontage, comprising the eastern limits of rooms ***7201*** and ***7202***, executed in brick, was revealed, along with the yellow sandstone kerbs of the pavement, and the large river-rolled cobbles forming the road surface, ***7240,*** which demarcated the line of the pedestrian area along the quay at Nova Scotia. The loading quay itself was also constructed of river-rolled cobbles (Plate 11), although these were much smaller and had been laid in a more haphazard and less regular manner than the road. Details of the west frontage, onto Irwell Street, which probably directly overlay sea wall ***7638***, were not recorded, as the south-west and western limits of the structure appear to have been entirely removed by later activity, some of which can be attributed to the excavation of the foundations for the Porsche Garage (*Section 4.10.3)*. The interiors of the rooms produced heavily disturbed brick surfaces in rooms ***7201***, ***7202*** and ***7203***, with the remnants of walls ***7209***, ***7210***, ***7211*** and ***7216*** indicating the principal sub-divisions. Room

7203, at the western limit of Area C, had the most completely preserved brick floor (***7208***), containing the foundations of two yellow sandstone pillars, with square recessed sockets, for supporting the floor above. This part of the excavation, along with southern sections of Nova Scotia in Area A, enabled the surviving walls to be superimposed on the historical mapping evidence, particularly that of Horwood's map of 1803 (Fig 8) and the OS map of 1908 (Fig 11), showing the close correlation (Figs 21 and 22). The majority of the walls and structures were shown on the historical map sequence and this, coupled with the listings provided in the various editions of Gore's *Directory* (*Section 3.2.23*), provide sufficient information to assign names of the occupants and the functions of buildings to the evidence within the archaeological record.

4.6.6 Walls ***7209*** and ***7210*** (Fig 18) formed the southern boundary of what was 1 Irwell Street (The Packet House Public House), while Room ***7201***, with its brick floor and walls largely extant, spanned the area which can be attributed to the basement of number 2 Nova Scotia, in 1891 (OS 1:500 town plan) in use as a saddlers, and 2A Nova Scotia, the premises of a block and mast maker. While the historical mapping shows a clear division between 2 and 2A, no such division was apparent within the archaeological evidence. Similarly, Room ***7202*** was located within the area which was previously known as 3 Nova Scotia, although the function of this space at the end of the nineteenth century was not recorded.

4.6.7 The Ordnance Survey map of 1850 (Fig 10) shows the two properties at the north-east corner of this block occupied by public houses, while a nineteenth-century photograph shows that the large building at the southern end was a substantial five-storey warehouse, with cellars, and overhead hoists (Stammers 1999, 101). A brick-built access well, ***7245***, to permit easy movement of goods in and out of this cellar, using a hoist, was identified on the east frontage of this building, along with the partial remains of another, that served the property immediately to the north. The cellars of both properties were floored in brick.

4.6.8 The extensive range of cellars in the southern block of buildings, between Murray Place and Irwell Place, was almost entirely revealed by the excavation (Fig 21; Plate 7). The northern half of this block is shown as three properties on the 1850 Ordnance Survey map (Fig 10), and the divisions revealed by the excavation coincided with these. The properties are shown by maps and photographs to have served as public houses, dining rooms, warehousing and shipping offices with, over time, changes of use in some cases. While a large proportion of the cellars appeared to have served as storage space throughout their existence, the discovery of at least one fireplace indicated the possible provision of domestic accommodation. Further historical information taken from numerous editions of Gore's *Directory*, dating from 1850 onwards (*eg* Gore 1850), indicates that some areas had a continuity in the way they were used, with the buildings fronting onto Murray Place, specifically 5 and 7 Irwell Street and 2 Murray Place, being used as salt warehouses. Both of these buildings were identified during the course of the work, occupying the area marked on the Horwood map of 1803 map as belonging to Mr Fraser's Coal Yard (Fig 8).

4.6.9 The excavation allowed the identification of two of the three properties shown on the 1850 Ordnance Survey map in the southern half of the block. The return walls for a cellar for a third property, on the east side, fronting on to Nova Scotia, had been disturbed. Cartographic (OS map of 1850 and OS map of 1908; Figs 10 and 11) and photographic (Wilkinson 2009) evidence show that these buildings were in use during the nineteenth and early twentieth centuries as warehousing, ships' chandlers, and a smithy. Beneath the brick flooring of the central property (***5114***; Fig 13; Plate 10), was a burnt layer, from which a

variety of eighteenth-century artefacts was recovered. The historical mapping shows a change in the layout of this building in the period between the late eighteenth and the early nineteenth centuries (Fig 6; Perry 1769), and it is likely that a fire prompted its reconstruction.

4.6.10 Further south in Area A, the remains of four cellars, each *c* 3.8 x 3.8m, were excavated; they were all constructed from brick, two of them being floored in the same material, while a third had a cobble floor, ***5708***, from which a penny of 1799 was recovered (*Section 5.5*). A range of buildings, on a north/south axis, is shown in this area, somewhat schematically, on John Eyes' map of 1765 (Fig 5), and is represented in a similar manner on Perry's map of 1769 (Fig 6). More detail, and a different arrangement, is apparent on Horwood's map of 1803 (Fig 8), and the excavated remains appear likely to have coincided with these latter properties, rather than the earlier (Fig 13).

4.6.11 A variety of artefacts was recovered from floor ***5708*** of the south-western cellar, sufficient to suggest domestic use, ranging in date from the late seventeenth century through to the nineteenth. A fireplace, in the west wall of the north-eastern cellar, similarly suggests domestic accommodation. Fragments of other walls, of comparable style and appearance, were revealed to the south of this group, and probably represent the insubstantial remains of similar cellars, complementing the line of properties shown on Horwood's map of 1803 (Fig 8).

4.6.12 East and north of these cellars, in the roadways forming Nova Scotia and Murray Place, the remains of stone-built culverts were excavated, with later brick additions. No finds were recovered to provide a date for the construction of these, but their alignment suggests that the adjacent properties were extant.

4.6.13 Under an act of Parliament (2°Geo III 1762; Anon 1848, 142) which permitted the construction of George's Dock (*Section 3.2.20*), there was also a stipulation for the provision of bridges over to Mann Island, which would otherwise have been cut off (Brazendale 2007, 48). In the south-west corner of the excavation of Area B, the east abutment, ***5666*** (Fig 12), for one of these bridges was revealed, which was constructed in pink sandstone. The use of this material, and its position to the west of the yellow sandstone wall of the Dry Dock (***5270***), indicate that this bridge was a later replacement, and probably dated from the early nineteenth century, when the Dry Dock was adapted to create the wet Canning Dock (Ritchie-Noakes 1984, 41).

4.6.14 Elsewhere in Area B, short lengths of stone footings, ***5220***, ***5436***, and ***5481***, in yellow and pink sandstone, may represent all that remains of buildings shown in this part of the dockside on Horwood's map of 1803 (Fig 8). The buildings were almost certainly warehouses, and were possibly associated with Joseph Bird (*Section 3.2*), given their close proximity to Bird Street, and his apparent significance in the development of this part of the docks. No finds were recovered in association with these structural remains, although artefacts, dating from the late eighteenth century onwards, were recovered from the fill of a well, ***5420***, to the west of one of the buildings (*Section 5.2*).

4.7 PHASE 6 (DOCK POLICE OFFICE, FOREMAN SWEEPER'S OFFICE AND WEIGHING MACHINE: 1830S)

4.7.1 The Dock Police Office first appears on historical mapping in 1836 (Fig 9), where the

structure was annotated as 'Dock Police and Harbour Surveyor's Offices'. Only a fragment of these offices was revealed by the excavation, consisting of walling executed in finely tooled pink sandstone, which formed the foundations of the principal stepped entrance on the south-facing elevation of the structure (***5470***; Fig 12). Plans produced by the City Engineers show that the extensive basement of the structure extended beneath the front stairs in order the maximise storage space (MDHB Drawing 105752). The remainder of the offices lay to the north, beyond the limit of the excavation, with plans produced in 1892 indicating that the offices were used by numerous groups associated with the day-to-day maintenance and running of the dock, including the Graving Dock Office, Marine Surveyors and Public Enquiry Office (*ibid*). To the south of the stepped entrance lay a further structure, ***5408***, which was essentially rectangular but with bayed ends, such that it had an elongated octagonal plan; this was also constructed from finely tooled, well-constructed pink sandstone, and had a set of four hexagonal pink sandstone columns, ***5627***, ***5628***, ***5629***, ***5630***, along its central, long axis, presumably to support the ground floor over an open-plan basement. This building is not shown in great detail on any historical mapping, normally appearing only as a rectangle, with small square buildings adjacent to it, on contemporary maps; however, a schematic plan (MDHB Drawing 105752), drawn up by the City Engineers, shows this as a lozenge-shaped structure labelled as the Foreman Sweeper's Office. This lozenge-shaped structure, ***5408,*** was identified during the excavation, although it had been heavily disturbed by the later foundations for Media House (Phase 9; *Section 4.10*). No finds were recovered from it, and the function of such an office remains unclear, although it is not improbable that the position of Foreman Sweeper was one awarded to the individual in charge of maintaining a level of order and cleanliness on the quays and wharfs around Mann Island and the surrounding environs. Why this position warranted such a well-constructed office is also unclear. The characteristics of its construction, and its position relative to the Dock Police Office, suggest a comparable date and a close association.

4.7.2 This structure was clearly in use for long enough to be modified, with the blocking of apertures in the west-facing wall (both low-level windows or doorways) at a later date by red brick infill ***5625***, ***5664*** and ***5665***. An east/west-orientated sandstone wall, ***5626***, butted a contemporary brick structure, ***5421***, and this appears to have been the eastern wall of the office that housed the Weighing Machine Keeper and Police. The two buildings appear to have been linked by a small annexe, but it is not clear if this was part of the original design. Both structures had been disturbed by the installation of a later stone-lined water tank, ***5420***, and deep drain ***5636***, which were probably associated with the Ventilation and Pumping station that was constructed to serve the subterranean Mersey Railway (*Section 3.5*). To the north-west of these buildings was a flat, rectangular brick structure, ***5479***, which represents the remnants of the base for the Mann Island weighing machine. This also appears on the Gage map of 1836 (Fig 9).

4.7.3 A set of warehouses was first shown on the east quay of Manchester Dock on the Ordnance Survey map of 1850 (Fig 10). These were constructed to overhang the dock, for ease of discharge and loading, and the excavation revealed their timber supports, ***7645*** in (Fig 13), beneath the backfill of 1928–36 (Ritchie-Noakes 1984, 36). These remains comprised a series of eight vertical and four horizontal timber supports (made from pitch pine), projecting from the infilled dock (Plate 18). Due to the limitations of the formation level for the excavation work, the bottom of these timbers was not reached, nor was it possible to see what sort of deposits they were embedded in. The timbers themselves were squared

off with chamfered edges and were fitted with large iron bolts and chains, which contributed to the structural integrity of the piers. Also associated with this structure was a large sandstone counterbalance, identified at the rear (eastern side) of the eastern retaining wall for the Manchester Dock.

4.7.4 Gage's map of 1836 (Fig 9) shows a completely different arrangement of buildings south of Murray Place (*Section 3.4*) from those on the map produced by Horwood in 1803 (Fig 8). The Ordnance Survey mapping of 1850 (Fig 10) and 1891 reinforces this change, showing the area occupied by a large block of buildings, with frontages on to Nova Scotia and Irwell Street, and apparently incorporating those shown in 1836. The cellars revealed in this area by the excavation (*eg* ***5114***; Fig 13) were probably, therefore, partly demolished and backfilled in the early nineteenth century. This whole area was levelled again *c* 1920 (*Section 3.6*).

4.8 PHASE 7 (MERSEY RAILWAY TUNNEL: 1881–6)

4.8.1 The continued functioning of the tunnel to carry the Mersey Railway from James Street in Liverpool under the river to Hamilton Square in Birkenhead, constructed in 1881–6, required pumps to clear water from the 8ft diameter (2.43m) drainage heading, and fans to provide a supply of clean air, via the 7ft 2in (2.18m) ventilation heading (*Section 3.5*; Maund 2002, 6 and 15). The 'Mersey Railway Pumping and Ventilation Station' is marked on the 1891 1:500 Ordnance Survey Town Plan, at the north end of Canning Dock, an area that coincided with Area B of the excavation, where it took the form of two large brick structures. The construction of these heavily engineered structures necessitated the removal of part of the Foreman Sweeper's Office, Weighing Machine Office and the weighing machine itself. The Dock Police Office (or Harbour Master's Office, as it was known by this time; OS Map 1908; Fig 11) survived the advent of both the subterranean Mersey Railway and the construction of the Liverpool Overhead Railway.

4.8.2 The excavation revealed substantial pits, ***5234*** and ***5328*** (Fig 13), walled in brick and mostly intact (Plate 19), for the two ventilation fans (Maund 2002, 15), together with mounts for their horizontal axle bearings. The bases of the pits were finished in concrete, and were concave and semi-circular, to provide a close fit with the fans themselves. In the north-west part of Area B, a number of brick walls probably marked the outline of the basement of the building which once housed the steam engines to drive the fans and operate the pumps in the northern block, which functioned as a pumping station (Plate 20).

4.9 PHASE 8 (FIRST HALF OF THE TWENTIETH CENTURY: 1900–50)

4.9.1 The first half of the twentieth century saw a substantial change in the whole of the site. Some of the buildings east of George's Dock Passage were demolished, while at Nova Scotia, the whole site, from Mann Island to Murray Place (Fig 11) and beyond, to the edge of Canning Dock, was completely levelled, in *c* 1920 (*Section 3.6*). New buildings were constructed on both sites, whilst to the west, Manchester Dock, now redundant, was filled in (Plate 18), in 1928–36 (*Section 3.6*). The excavations were able to provide some evidence for all these changes.

4.9.2 In Area B, east of George's Dock Passage, on the site of the Pumping and Ventilation Station for the Mersey Railway tunnel, the OS map for 1927 shows that the buildings

housing the fans were altered substantially. Originally, fans of 30ft (9.14m) and 40ft (12.19m) respectively were provided at this station, but there was some evidence from the excavation to suggest that the position of the mountings for one of the fans was altered, perhaps to accommodate a smaller size. It also appears likely that a number of short walls were added at this time, creating rectilinear spaces (Fig 12; Plate 20). There was no evidence to show whether these were utilised, or remained as voids.

4.9.3 It may also be at this time that a rectilinear construction in brick, ***5479***, with metal fixing plates in its corners, and a drain across the floor, was inserted into a room of the Pumping and Ventilation Station (Fig 12). No evidence was recovered to confirm its purpose.

4.9.4 North of the fan pits, the excavation revealed the remains of a clay-lined cistern, ***5662***, and the cellar of a small, rectilinear, brick-built structure, ***5421***, immediately to the west, with windows, presumably lit via a light well, and a possible fireplace (Fig 12). The purpose of these structures was unclear, and they do not appear on the historical mapping. No finds were recovered that might provide a date for them, but the cistern superseded the octagonal building associated with the Dock Police, which itself no longer appears on historical mapping after 1938 (OS 6" to 1 mile map).

4.9.5 In several parts of the site, expanses of cobbles and stone setts, laid in concrete, provided hard-standing used to park cars following the closure of the docks (Moss and Stammers nd). Although this type of surface is frequently regarded as 'old', the use of concrete in this case suggests a date of origin in the twentieth century.

4.9.6 ***Transit Shed and Voss Garage:*** prior to the start of the below-ground archaeological investigations, several twentieth-century buildings occupied the site, of which only the Voss Garage and Transit Sheds were recorded as part of a standing-building investigation (OA North 2007; Fig 23; Plate 21), since they were associated with the maritime mercantile function of the area. The Porsche Garage and Media House were deemed to be of limited historic interest and architectural value and were not subject to recording. The Voss Garage and two adjoining Transit Sheds, which were constructed in 1921 to serve the needs of the Canning and Manchester Docks (*ibid*), stood within Area A (Fig 2). The Transit Sheds lay to the south of what had been Irwell Place, and extended as far as the Graving Dock. The excavations within Area A revealed the remains of four concrete stanchions, aligned north/south, which marked the position of the transit sheds, following their demolition (*Section 3.6*; OA North 2007), whilst north of the alignment of Irwell Place, and built directly on to the gable end of the transit shed, was the Voss Garage, dating to the 1930s (*Section 3.6;* Plate 21). A brick structure, ***7206***, 3.8m square, and centrally divided into two compartments, was revealed by the excavation in Area C, and probably housed diesel and oil tanks for the garage (Fig 18). Some brick walling on concrete foundations, and a set of steel anchor points mounted in concrete, also belong to the garage. The outline footprint of the garage building itself lay beyond the limits of the excavation, however.

4.9.7 *Transit Shed (1921):* the transit shed (Plate 21) was rectangular in plan, and was originally a single open space, which was subsequently sub-divided. It was a long, single-storey rectangular structure (*c*110m by 30m; Fig 23) with a twin-gabled roof, and had extensive steel trusses and bracing. Skylights had been let into the corrugated roof as the primary source of light, and there were two doors for pedestrian access. The building was arranged approximately north-west/south-east and followed the line of the western limit of Canning Dock. The external walls were constructed of hand-made brick, in an English Garden Wall-

style bonding.

4.9.8 The south-east wall was dominated by five concertina-type folding doors (Plate 21), spaced evenly along the wall, which were evidently replacements for large sliding doors that had fitted into tracks, still extant along the base of the wall. With the exception of some minor repairs and the addition of vents and utility access, this wall had not been subject to much alteration. Guttering, probably aluminium, ran the length of the south-east wall, with the downflow pipes placed at the south end of the building. The eastern elevation of the transit shed was largely obscured by large wooden sliding doors, but internally, a later breeze-block construction had been set against these doors, which were thus made redundant; these alterations were made shortly after the sheds became part of the Voss Motors showroom.

4.9.9 The internal floor plan of the transit shed (Fig 23) consisted of a single large open floor, subsequently sub-divided into three distinct areas. Office space and staff welfare facilities had been added to the floor plan, following a change of use from storage area to a working space for mechanics. The building was ostensibly constructed in one phase, with internal partitioning added later, reflecting its change of use, probably sometime between the 1930s and 1940s. The floor throughout the transit shed was of poured concrete, although subsequent excavations and trial trenching indicated the presence of an extensive earlier brick floor. After the change of use from warehouse to automotive garage, two vehicle inspection pits were set into the floor of Room 1 and various partitioned rooms were constructed. A covered hallway was constructed at the same time as doors were introduced between the transit shed and Voss Garage, at the point which marked a spatial transition between a work room and show room.

4.9.10 *Voss Garage (1930s):* the Voss Garage was a two-storey building that measured approximately 50m by 45m (Plate 22), which post-dated the transit sheds, and had been constructed after the infilling of the Manchester Dock, probably in the 1930s (*Section 3.6.5*). It was aligned south-west to north-east (along its long axis) and squarely abutted the transit shed (Fig 23). The rear and eastern elevations looked over Canning Dock, whilst the front faced onto the former offices of the Mersey Docks and Harbour Board, and to the west were the remnants of Irwell Street and the infilled Manchester Dock (OA North 2007).

4.9.11 The external walls of the garage were constructed of red brick, in an English Garden Wall-style bonding, using modern rectangular brick. Most of the internal walls were of solid construction (either breeze block or brick) although some of the office spaces had plasterboard partitions. The roof was corrugated sheet metal, with inset skylights, and was supported on an extensive steel framework of trusses.

4.9.12 The ground floor of the west wall contained two doors and three windows, the northernmost of which was a four-light floor-to-ceiling window. Five further windows were incorporated into the first floor of the same elevation. A parapet ran the length of this elevation to the straight joint with the transit shed (Plates 21 and 22). The eastern elevation of the building had no features beyond a modern fire door at the northernmost point.

4.9.13 The north façade of Voss Garage had finer bricks and a better bond, by comparison with the more coarse brick of the south-east wall. A round window, or possible clock housing, had been blocked at the first-floor level of this elevation. This northern elevation exhibited several Art Deco features; it was five bays wide, with bays two and four protruding by a

single course of brick at the first-floor level (Plate 22). The ground floor of the north wall had floor-to-ceiling segmented rectangular windows in bays two and four. Sliding glass doors were fitted into bays one, three and five, designed to allow vehicles access into the garage/showrooms. A large arched window dominated each of these two bays and was decorated with pronounced mullions and an exaggerated keystone. A parapet, with architrave and cornice, ran the length of the north-west wall and was higher over bays two and four, where it was designed in a classical style, with architrave and ionic volutes.

4.9.14 The internal floor plan had been extensively altered since its construction. The ground floor was occupied by two large showrooms, and within these, the floor was tiled in white ceramic, and both rooms had elevated platforms to display automobiles (Fig 23). Various offices and staff rooms lined the southern part of the ground floor, and judging by the construction and layout, it is likely that the rooms to the south-west were the original offices and welfare rooms for customers and staff. One larger room, later partitioned into three smaller spaces, was constructed later. The roof, similar to that of the principal room above the transit shed, was a corrugated sheet-metal construction, and was twin-gabled and hipped at the north and south ends.

4.9.15 None of the rooms contained features of note, comparable to the Art Deco elements displayed on the northern façade (*Section 4.9.12*). It is this facade which characterised the building above all else, particularly since the design was clearly sympathetic to the Art Deco ventilation tower for the Mersey Tunnels, located just north of the site (*Section 3.6.4*).

4.10 PHASE 9 (LATER TWENTIETH CENTURY: 1950–2000)

4.10.1 ***Phase 9a:*** in Area B, further development and adaptation of the site of the Pumping and Ventilation Station, which had been rendered redundant in the early 1930s, was apparent, in the form of a substantial concrete sill, ***5416***, extending north/south across the whole site, bisecting the Foreman Sweeper's Office (*Section 3.4.11*), along with other areas of concrete foundation (Fig 12). It extended across the subterranean remains of the ventilation station, and abutted the surviving section of the northern retaining wall of the former Dry Dock at the southern limit of Area B. The north/ south alignment of the sill corresponded to the footprint of the depot built for the Mersey Docks and Harbour Company, on the site of the boiler house for the Ventilation Station, and with the National Sea Training School, that was later changed in use to a media and printers' office known as Media House (Moss and Stammers nd, 23), which was constructed in about 1950. This structure was demolished to facilitate the development on the eastern side of the former George's Dock Passage; subsequent trial trenching and excavation found it to have been largely within the footprint of the former Pumping and Ventilation Station associated with the Mersey Railway (*Section 4.8*). Only one intrusive feature was observed, a modern oil tank associated with heating for the building, which had removed the south-western section of the Ventilation station.

4.10.2 ***Phase 9b (Porsche Garage: c 1990s)****:* Area C was occupied by the Porsche Garage (Fig 2), a modern structure with the principal north-facing elevation being constructed of glass and steel, and the south-facing elevation being constructed of brick. This building was constructed in the 1990s as a retail garage (OA North 2007), and as such was purpose-built to showcase vehicles on the ground floor and provide office space for sales staff on the

upper level. This structure had a very limited set of foundations, which had a relatively minimal impact on the archaeology within Area C, allowing the survival of cellars associated with public houses and dwellings at Mann Island, and the area associated with the infilled George's Dock Passage (*Section 3.6.1*).

4.10.3 The north-facing elevation of the garage was characterised by its large frameless glass windows and vertical steel supports, while the rear (south-facing elevation) was divided into four bays divided by brick-clad concrete pillars, constructed of reddish-brown machine-made bricks, arranged in a stretcher bond with buff-coloured mortar and series of four decorative stringcourses of yellow brick, also in a stretcher bond. A further windowless fifth bay was constructed entirely in this brick pattern.

4.10.4 The roof was constructed from a glass-clad steel framework and surmounted by a pyramid-shaped light well. The exterior walls of the structure were supported by large steel girders set into the concrete base, and the rest of the structure comprised a durable metal frame with floor to ceiling panes of glass and a glass roof. The centre of the structure was characterised by a spiral staircase, which led to a suspended mezzanine office floor around the central car showroom.

5. THE FINDS

5.1 INTRODUCTION

5.1.1 The quantities of artefacts recovered were divided by type (Table 4). The bulk of the material consists of pottery and clay tobacco pipe (2759 and *c* 20,000 fragments, respectively), almost all being recovered from layers of tipped backfill.

Type	Total Fragments
Post-medieval pottery	2759
Clay tobacco pipe	*c* 20,000
Metalwork	359
Glass	1339
Animal bone	*c* 300

Table 4: Artefact totals by type

5.2 THE POTTERY

5.2.1 In all, 2759 fragments of pottery, weighing 99.46kg, were recovered from a wide range of contexts, from occupation levels to land reclamation and backfill. It was all in good condition, being, for the most part, in small to medium-sized fragments, often with substantial parts of vessels represented. The range of fabrics was relatively restricted, but comprised almost entirely late eighteenth- and nineteenth-century types (Table 5; *Appendix 1*).

Fabric	No fragments	%age total assemblage	Weight (g)	%age total assemblage
Agate wares	19	0.69	112	0.11
Black-glazed redwares	473	17.14	31,986	32.16
Creamware	723	26.21	6566	6.6
Industrial slipwares	69	2.5	717	0.72
Pearlwares	173	6.27	1600	1.61
Porcelain	30	1.09	198	0.2
Self-glazed redwares	71	2.57	3871	3.89
Staffordshire-type and other slipwares	69	2.5	726	0.73
Stonewares, brown	117	4.24	8274	8.32

Stonewares, grey *etc*	19	0.69	3250	3.27
Sugar wares	719	26.06	37,954	38.16
Tin-glazed wares	34	1.23	261	0.26
White earthenwares	137	4.97	1638	1.65
White salt-glazed stonewares	15	0.54	195	0.2
Other minor fabrics	91	3.3	2112	2.12
Totals	*2759*		*99,460*	

Table 5: The fabrics present within the assemblage

5.2.3 A few sherds could be of medieval or earlier date, but, although their presence is of general interest, they have very little relevance for the interpretation of the site. A small out-turned rim (24g) in a slightly sandy, orange oxidised fabric, with a reduced core reminiscent of local Romano-British fabrics, was from an uncertain feature (fill ***5102***) within the warehouse complex at the north-west side of Area A beneath brick floor ***5101***, in room ***5708*** (Fig 13). Two small abraded sherds in an unglazed orange-pinkish gritty fabric, together weighing 22g, seem likely to be medieval in date, but were residual. Finally, a small fragment (14g) in a fine pinkish fabric, with a thin pale green glaze, is also most likely to be medieval, but came from an early nineteenth-century culvert.

5.2.4 A single rim fragment (44g), in an unusual, fairly soft, micaceous fabric, was noted in ***7260***, a late fill in Area C, where it must be residual. Part of a large, globular vessel, ostensibly unglazed, this seems most likely to be a post-medieval import, perhaps an amphora-type vessel from Spain. A similar fragment, with splashes of glaze, was found in recent excavations at Pier Head (OA North 2011b) and another was found at Castle Street, in an early eighteenth-century context (Innes and Philpott 1985, fig 42.314). Although in different fabrics, an unglazed handle from ***5409***, a nineteenth-century fill in Area B, and a thick wall fragment from a late eighteenth-century make-up layer, ***5336***, could also be from large storage vessels, although in the case of the latter, a Roman origin cannot be entirely ruled out.

5.2.5 ***Fine table wares:*** apart from the few early sherds, the tin-glazed wares (34 fragments, 261g; Table 5) are probably amongst the earliest pottery from the site. Most derive from flatwares with blue and white decoration (Plate 23), or from undecorated hollow-ware vessels. It is difficult to differentiate tin-glazed wares on the basis of their fabric (Cotter 2000, 229), but it seems reasonable to suggest that this group are probably all products of Liverpool. They are all worn and relatively fragmentary, perhaps suggesting that, along with the small amounts of other early fabrics, these represent a largely residual element in the assemblage. A single biscuit-fired fragment reflects Liverpool's thriving eighteenth-century tin-glaze industry, beginning *c* 1710 and coming to an end by the 1780s (Hildyard 2005, 100). Manganese Mottled wares are broadly contemporary with the main period of tin-glaze production (Kelly and Greaves 1974) but only seven fragments were noted

(104g). Although principally made in Staffordshire, evidence suggests that they were also made locally at Prescot (McNeil 1989; Davey 1991, 135), and at Buckley, in Clwyd, where they have been assigned to the period 1690–1720 (Amery and Davey 1979). It is likely that production elsewhere continued into the late eighteenth century, as excavations at the Greatbatch pottery site in Fenton, Staffordshire, have produced finds dated between 1765 and 1775, and probably from as late as 1782 (Barker 1984).

5.2.6 A small group of fragments of Staffordshire-type slipware was recovered, made from the later seventeenth to the mid-eighteenth century (Barker 1993). The 42 fragments (283g), probably not representing more than a handful of vessels, came from some 20 contexts, presumably indicating the level of disturbance and mixing caused by repeated dumping on the site. There was a single example of a large cup with trailed and combed decoration, and a band of spots around the rim (Plate 24), a style at its most popular between *c* 1700 and 1720 (*op cit*, 15). Most, however, were from press-moulded dishes, current well into the mid-eighteenth century (Poole 1995). There was also a small amount of other slipware (27 fragments, 443g), made in different fabrics, but probably falling into the same date range. Some of this material might well derive from Buckley, in Clywd, which supplied North Wales and the North West until the early eighteenth century, when its products become confined to a more local market (Barker 1993, 12). It must be noted, however, that press-moulded dishes continued to be made in some small potteries into the nineteenth or even the twentieth century (*op cit*, 30–1).

5.2.7 There was a single large fragment (134g) from a North Devon Gravel-tempered ware jug, likely to be of eighteenth-century date (Noel Hume 1969, 133; Allan 1984). North Devon Gravel-tempered ware has also been found in small quantities at other sites in Liverpool (see, for instance, Davey and McNeil 1985).

5.2.8 Early Blackwares were confined to three fragments (78g), with one possibly dating to the late seventeenth or early eighteenth century. The lack of fine early Blackwares probably reflects the date range of the site. Philpott (1985) has noted a serious decline in the use of black-glazed finewares in the later eighteenth century, and this is clearly reflected in the current assemblage.

5.2.9 Similarly, only a small amount of white salt-glazed stoneware was recovered (15 fragments, 195g), from ten contexts. This represents only 0.54% of the assemblage (0.2% by weight), which suggests that the principal period of deposition post-dated the widespread use of this fabric, regarded as typical of the first three-quarters of the eighteenth century (Jennings 1981, 222). Most comes from eighteenth-century land reclamation, and is probably contemporary with the deposits.

5.2.10 Only three white salt-glazed vessels could be identified to form, all being plates, two with rims decorated in ‘barley’ pattern, and one in ‘dot, diaper and basket’ (following Noel Hume 1969, 114, fig 35). Noel Hume (*ibid*) suggests that these patterns were not in production before the 1740s, when dinner services in this fabric first became popular (Hildyard 2005, 42), and are most likely to date to the 1750s–60s, when a wide range of rim designs were in use (*op cit*, 44), although production continued into the 1770s. The poor quality of the moulding on a plate from reclamation material might suggest that it was sold as a second (Plate 25), and is thus likely to have been produced in Liverpool, as seconds tend to be sold close to their place of production. Liverpool’s white stoneware production sites are well known, but have not been explored archaeologically (*op cit*, 49), although wasters were noted amongst material excavated from dumps elsewhere on Mann

Island, during the excavation associated with the construction of the Canal Link (OA North 2011a). White salt-glazed stoneware wasters have also, however, been found in Prescot (Holgate 1989), suggesting production there as well.

5.2.11 Six white salt-glazed stoneware fragments (124g) were decorated in the manner known as 'scratch blue', introduced in the 1720s, most popular from 1745–55 (Savage 1952), but continuing in production in a 'debased' form until *c* 1790 (Noel Hume 1969, 118). As is the case with one of the fragments recovered from these excavations, chamber pots often bore a medallion stamped with the cipher of George III (Plate 26). Similar chamber pots were also made in Pearlware between *c* 1785 and 1810 (Noel Hume 1969, 150).

5.2.12 Two small fragments were recovered of imported Westerwald stoneware (52g), probably of early eighteenth-century date (Hurst *et al* 1986, 222). The rim form of one suggests that it derives from a chamber pot, a commonly imported form from *c* 1710 (Noel Hume 1969, 148) until the 1760s, when the market was taken over by English producers (*ibid*).

5.2.13 Small amounts of Chinese porcelain (five fragments, 59g) presumably reflect the large-scale eighteenth-century importation of Chinese teawares by the East India Company, which ended in 1791 (Hildyard 2005, 123). The remainder of the porcelain from the site (25 fragments, 139g) came from a variety of different contexts spanning a wide range of dates. It was not analysed in detail, but seems most likely to be of Liverpool origin. The last decades of the eighteenth century saw a flowering of porcelain production in the city (*op cit*, 123) and excavations at Pier Head in 2007 produced biscuit-fired porcelain wasters (OA North 2011b).

5.2.14 Agate wares, popular from the 1750s to the 1770s (Barker and Halfpenny 1990), were represented in very small amounts (19 fragments, 112g), from only two contexts. A dish fragment is probably a Staffordshire product, and Noel Hume illustrates a vessel with similar rouletted slip decoration (1969, fig 49), dating to *c* 1760. Two fragments of tea-wares in black basalts or Egyptian black, an unglazed black stoneware made after 1750 by Josiah Wedgewood, and continuing in production by other potters throughout the eighteenth century (Noel Hume 1969, 121), were recovered from buildings on Nova Scotia. The greyish appearance of the sherds might suggest them to be from the Herculaneum pottery in Liverpool, known to have produced such wares between 1793 and 1841 (Hughes nd, 88). There was also a single fragment (4g) from a red stoneware teapot, a fabric made sporadically by a number of producers in the eighteenth century and into the early nineteenth (Poole 1995, 68).

5.2.15 Twenty-nine fragments (336g) of pink lustre ware were recovered, representing three vessels, a small bowl (Plate 27), a jug, and the lid of a serving dish (Plate 27). Lustre ware was developed at the very end of the eighteenth century (Cotter 2000) but most dates to the nineteenth century, with painted designs most popular from *c* 1815 to the 1860s (Hughes 1968).

5.2.16 Creamwares formed an important part of the assemblage, with 723 fragments (6.566kg) from 50 contexts, representing 26.21% of the total assemblage by fragment count (6.06% by weight). These were current from the mid-eighteenth century to the early nineteenth century, when they were largely replaced by Pearlwares (Noel Hume 1969, 125). They formed, by fragment count, the largest element of the entire assemblage (Table 5), but were not particularly varied in form, being mainly flatwares and chamber pots, with only a few fragments hinting at more decorative vessels. Although none are marked, it is quite

possible that some or all were products of the Herculaneum pottery, in Toxteth, which was in production between 1793 and 1841 (Hyland 2005). Reclamation deposit ***5730***, west of the second sea wall (***7638***), held the greatest concentration, with 158 fragments representing 21.85% of the creamware by fragment count, and 20.73% by weight; only nine other contexts produced more than 20 fragments. Most of the vessels represented were plates and shallow bowls with a variety of rim patterns (terminology after Noel Hume 1969), mainly the 'Royal pattern' and 'feather edge', but including 'spearhead', as well as shell-edged plates, mainly in blue, but with a few green-edged examples. The latter have their origins in the later eighteenth century. From the 1750s, Liverpool was an important centre for undertaking transfer-printed decoration on pottery (Poole 1995, 74), and several jugs bear the typically black, over-glaze transfer-printing associated with Messrs Sadler and Green of Liverpool, who decorated a range of Staffordshire products in the years between 1763 and the 1790s (*ibid*). Substantial parts of two jugs bear Masonic designs (Plate 28), and smaller fragments show nautical or other themes. A coffee- or teapot lid is printed in brown, again commonly used on creamwares.

5.2.17 Pearlwares, produced from 1779 (Coysh and Henrywood 1982), if not earlier, comprised 6.27% of the assemblage by fragment count (173), and 1.61% by weight (1.6kg), being recovered from 36 contexts. They are, for the most part, tableware and tea wares, painted or transfer-printed with mainly, but not exclusively, Chinese-influenced designs, including willow-pattern, which post-dates 1792 (Noel Hume 1969, 130). There are also shell-edged plates, and a complete small, straight-sided cup, with a blue-glazed rouletted band at the rim.

5.2.18 Later refined white earthenwares, dominating the market by *c* 1820 (Noel Hume 1969, 130), are also present, forming 4.97% of the assemblage by fragment count (137) and 1.64% by weight (1.65kg). The proportions and range of forms were almost identical to those of the Pearlware (*Section 5.2.17*). Even considered together, these two wares are far out-represented by creamwares, perhaps suggesting that the peak period of deposition, at least for fine tablewares, lay in the late eighteenth century, although it clearly continued well into the twentieth century. One of the few vessels bearing a maker's mark is attributable to WH Grindley, working in North Staffordshire during the late nineteenth and twentieth centuries (www.thepotteries.org/ mark/g/grindley.htm). The particular mark was in use *c* 1936–54. Most of the vessels bear blue transfer-printed decoration, although black and green printing was also noted, the latter appearing in the late 1820s (Neale 2004, 138).

5.2.19 Industrial slipwares represented 2.5% of the assemblage by fragment count (69) and 0.72% by weight (717g), and were present in 28 contexts. Decorative, but somewhat utilitarian in nature, these late slipwares appeared in the late eighteenth century (*c* 1770) and remained popular through the nineteenth century, and into the twentieth (Rickard 2006). Mocha-type decoration can be seen on some fragments (Plate 29), a form of decoration with a long life, possibly from the 1780s until the eve of World War II (*op cit*, 46). Pieces with decoration applied with a multi-chambered slip trailer are probably nineteenth-century in date (*op cit*, 13). Forms present include dishes, tankards, and chamber pots.

5.2.20 ***Coarse kitchen and storage wares:*** black-glazed storage vessels comprised 17.14% of the assemblage by fragment count (473) and, as might be expected from their substantial nature, considerably more (32.16%; 31.986kg) by weight. Made from the local red-firing coal-measure clays, these wares are difficult to assign to a particular source. There is, however, much similarity between the fabrics seen in this group and those of the Prescot

kilns (Philpott 1982–3, especially Fabric 6), known to have been major suppliers of black-glazed wares to Liverpool in the eighteenth century (Davey 1991, 135). Buckley, in Clywd, also supplied Liverpool, especially in the earlier part of the eighteenth century, exporting many of its products to America via the port (Noel Hume 1969, 133), but few of the black-glazed wares in this group show the lamination of red-and-yellow-firing clays regarded as characteristic of this pottery. This fabric group shows a very restricted range of forms, being dominated by only two utilitarian vessel-types: tall, more-or-less cylindrical, storage vessels with horizontal lug handles, similar to those seen at Prescot (Philpott 1982–3, figs 10.7.5, 10.8.10, 10.8.16), and in excavations in South Castle Street, Liverpool (Davey and McNeil 1985), and large pancheons and/ or bowls, again comparable to those from Prescot (Philpott 1982–3, fig 10.11.29), and the South Castle Street excavations (Davey and McNeil 1985). Although there are numerous slight variations in rim form, which might reflect different potters or sources, again all can be paralleled at Prescot (McNeil 1989) and in the assemblage from South Castle Street, Liverpool (Davey and McNeil 1985), and thus both fabric and form suggest that most were supplied from Prescot. There are a few thinner-walled sherds, perhaps deriving from jugs. The neck of a single vessel was recovered, and several bases seem to imply relatively small globular-bodied jugs.

5.2.21 A small group of self-coloured coarseware vessels was also noted, comprising 2.57% of the total assemblage by fragment count (71) and 3.87% by weight (3.871kg). They are clearly closely related to the black-glazed material, being in the same red-firing fabrics, and again they can be paralleled by material from Prescot (McNeil 1989). Where their form could be reconstructed, these were all shallow bowls and dishes (Plate 30), although other vessel forms cannot be ruled out.

5.2.22 Brown stonewares, made in Liverpool from the late eighteenth century (Hildyard 2005, 38), formed a relatively large element of the assemblage (Table 5) and comprised utilitarian storage vessels, mainly small bottles, with smaller amounts of kitchenwares. There are several fragments of large globular bottles with narrow necks, possibly dating to after 1785 (Green 1999, 151). Most of the more recent vessels are small bottles, often labelled as containing blacking, a type mass-produced from *c* 1800 on (Hildyard 2005, 35).

5.2.23 Late stonewares of other colours made up 0.68% (19) of the overall assemblage (3.25kg, 3.26% by weight) and were again utilitarian forms, including straight-sided 2lb jars and flat lids. A vessel with an unusual square neck came from a modern drain in Area B. As it bears a stamped registration mark, it can be dated with some precision, to after 1876, the design having been registered on 28th December of that year (Coysh and Henrywood 1982, 299). A bottle from the base of the pit for one of the Pumping and Ventilation Station fans bears the legend ‘F Metcalf and sons. Fine spirit and porter merchants. South Shields’.

5.2.24 ***Sugar wares:*** sugar wares (sugar-loaf moulds and syrup-collecting jars) comprised a significant element of the assemblage (Table 5). Vessel fragments were recovered from 39 contexts, but in few cases were more than 20 fragments recovered from any particular context. Two stand out as having particular concentrations, however: a dump, ***5079***, in Area A, which contained 42.9% of the sugar wares by fragment count (309), and 47.74% by weight (18.12kg); and a tipped layer, ***5150***, also in Area A, which produced 19.33% by fragment count, 21.18% by weight (8.04kg). Both contexts represent material deposited during land reclamation.

5.2.25 No attempt was made to reconstruct the vessels, but there were large numbers of rim fragments from relatively large-diameter sugar-loaf moulds, and variation in the rim profile

made it clear that there were several moulds present. A number of fragments seem to have rows of small holes running across them; this does not seem to be a normal feature, but was also seen in sugar-mould fragments from Princes Dock (OA North 2011b), and might point to a more specialist use, or a specific manufacturer. There were, in addition, the basal apertures from two moulds.

5.2.26 There were also six rim fragments from syrup jars, and three small pinched feet in a fabric similar to the loaf moulds, which could derive from syrup jars. Almost without a doubt, these vessels originate from the local sugar-refining industry, and were made in Liverpool, or perhaps Prescot, where it has been established that sugar wares were produced during the early eighteenth century (McNeil 1989), in fabrics effectively identical to those from the excavation. Interestingly, syrup-collecting jars at Prescot are described as over-fired to vitrification, and all the rim fragments in this assemblage have been similarly over-fired. It is quite possible that sugar wares were also made in Liverpool, although Davey (1991) has suggested that, as several potters had interests in both production centres, a split was made between finewares, which relied on imported clays brought to Liverpool by sea, and so were most economically made in Liverpool, and coarsewares, which used clays from the coal-measures, made in Prescot, where they were locally abundant.

5.2.27 ***Tin-glazed tiles:*** in all, 12 fragments of tin-glazed tile (180g) were collected. Liverpool was a well-known eighteenth-century production centre (Ray 1973), with tiles known from as early as 1716 (Honey 1969, 49). In 1756, a Liverpool entrepreneur developed the transfer-printing technique, effectively moving tile production onto an industrial scale (*ibid*), and subsequently production in Liverpool appears, to a degree, to have specialised in cheaply made tiles printed with designs in black. Although small, most of the fragments are obviously hand-painted rather than printed, most in blue (Plate 31), and one in a pale mauve, presumably manganese. Two joining fragments from Area B are decorated with carefully drawn polychrome flowers in the so-called 'Fazackerley palette', closely associated with Liverpool producers (Poole 1995).

5.2.28 ***Discussion:*** although a considerable amount of pottery was found during the excavation, the range of fabrics was fairly restricted, representing a typical late eighteenth- to early nineteenth-century assemblage, with some fragments indicating continuing use of the site into the twentieth century. The peak period for deposition appears to have been the late eighteenth century, a date reinforced by the relative lack of certain types of wares, which were no longer in use by this time. The assemblage reflects the wares made locally in Liverpool, perhaps at the Herculaneum pottery in Toxteth (Hyland 2005), or brought in from associated production centres such as Prescot (McNeil 1989), and possibly Buckley (Davey 1991), which appear to have had close economic links to the city. From the 1750s, Liverpool had been closely involved in the decoration of a range of Staffordshire products destined for the American market (Poole 1995), and it is not impossible that some of the material from the site (perhaps the Creamwares) derives from that activity, although it is equally likely that they are all Liverpool-made. In addition, the presence of porcelain, creamware, and black-glazed redware wasters, and 'seconds', raises the strong possibility that much of the assemblage was dumped industrial waste, rather than originating in domestic middens.

5.2.29 Sugar wares (sugar-loaf moulds and syrup-collecting jars) comprised 38.16% by weight of the total pottery assemblage, and appeared mainly to have been dumped in the course of land reclamation. Their form is strongly suggestive of an origin in Prescot, while their

presence is confirmation of the significant sugar trade through Liverpool, which increased by 277% over the period 1785–1810 (Hyde 1971, 26).

5.2.30 The absence of imported material reflects that, for these products at least, the trading was seemingly one way, and is in keeping with the premise of the triangular trade whereby home manufactured products, such as ceramics, were ultimately traded for grown commodities from the colonies, such as sugar.

5.3 THE CERAMIC BUILDING MATERIAL

5.3.1 A representative sample of 112 bricks was retained from a range of contexts across all three main areas of the excavation. All appear to be late eighteenth-century/early nineteenth-century in date, by an unknown maker. Some derived from the floors of the numerous cellars, while others came from the foundations and walls of buildings on Nova Scotia and north of Canning Dock. The majority of the bricks are hand-made, and comprise examples of slop-moulded and, possibly, pallet-moulded bricks (Ryan 1996, 92). From data gathered on site, most of the hand-made and machine-made bricks fit into the range of 220–240 x 105–115 x 60–90mm, reflecting the thicker standard that prevailed in the north of England in the eighteenth century (Brunskill 1997, 38).

5.4 THE CLAY TOBACCO PIPE

5.4.1 Fragments of clay tobacco pipe were typically found at Mann Island in two types of deposit: either as large dumps of clay pipe, including kiln waste produced in local pipe-making factories, which had then been dumped along the waterfront as part of the ongoing land reclamation process (only present within Area A), or as discrete deposits, where fragments of used pipe (commonly broken stems and mouthpieces, but also including pipe bowls) appear in occupational deposits in and around structures within Areas A, B and C (Fig 24). The assemblage principally consisted of a dump (***5747***; Phase 3) of waste material from a failed firing of a kiln, the manufacturer being identified as William Morgan, whose workshop is listed on Harrington Street in the 1780s (OA North 2011a). A similar dump was recovered from the excavations on the site of the Liverpool Canal Link Mann Island section (Figs 24 and 25) immediately to the south (*ibid*).

5.4.2 The Mann Island excavation produced *c* 17,000 fragments of clay tobacco pipe, the majority from dump ***5747***. This context alone produced well in excess of 16,000 fragments of pipe, as well as more than 1000 pieces of kiln debris. This kiln group is by far the largest that has yet been studied from Liverpool. There were also about 60 other excavated contexts that produced pipes, and these generated a total of exactly 750 fragments (103 bowls, 614 stems and 33 mouthpieces). Most of these contexts contained ten or fewer fragments of pipe, but there were about ten contexts that contained larger numbers, with three of these containing more than 50 fragments (discrete groups ***5194***, ***5116*** and small dump ***5147*** containing 67, 151 and 179 fragments, respectively). Two of the larger contexts, pipe dump ***5748*** and pipe dump ***5147***, also contained kiln waste from William Morgan's kiln (31 and 179 fragments, respectively).

5.4.3 The pipe fragments from most of the contexts have been individually examined and notes on each context group entered onto an Excel worksheet, including a dating of the pipe fragments present. The layout of the worksheet is based on the clay tobacco pipe recording

system that has been developed at the University of Liverpool (Higgins and Davey 2004). Some of the material was given different 'object numbers' though from the same context (catalogued as 'Ref' in the Excel worksheet), and so appear on different lines in the worksheet. The context summary shows the numbers of bowl (B), stem (S) and mouthpiece (M) fragments from each context and/or object number, and gives two date ranges for them, the overall range represented by the fragments and the most likely date of deposition based on the fragments present. The assessment and dating was prepared before any other context descriptions or relationships were considered. This methodology avoids any pre-conceptions being formed as to the dating or interpretation of a particular deposit. A copy of the Excel worksheet is lodged in the site archive (*Appendix 2*).

5.4.4 Although a few seventeenth-century fragments were recovered, these are all residual in the contexts in which they occur. The majority of the fragments date from the mid-eighteenth to the late-nineteenth or early twentieth century. This makes dating from stems alone difficult, since this is a period over which their form changed little (DA Higgins *pers obs*). The associated bowl forms, marks and decorated pieces, however, all provide reliable dating evidence. Despite the presence of odd residual material, and the problem of dating plain stems accurately, this is still a good-sized assemblage of pipes and one that provides a useful framework for refining the site's chronology and interpreting its post-medieval phases of use.

5.4.5 The pipes themselves are not only important for dating but also for interpreting the trading connections of the city. Despite Liverpool's size and importance as a commercial centre, there has been very little previous excavation in the city and its archaeology remains poorly understood. An English import is represented in the form of a spur bowl *c*1770-1810 with Masonic decoration from ***5708***, an early truncated cellar within Area A to the north-east of sea wall ***5707*** (Fig 13). Although Masonic bowl decoration was commonly used in the Liverpool area, this piece is unusual because it is of a Yorkshire style (White 2004). Pipes from London and the Netherlands were also recovered from the neighbouring Canal Link site (Higgins 2010) and so these imports, both domestic and international, are beginning to contribute to a broader picture of the artefacts that were reaching Liverpool as a result of her coastal and overseas trading connections.

5.4.6 Pipes of different qualities are also evident; an elaborately decorated eighteenth-century stem from ***5122***, a backfill layer overlying a Phase 6 cobbled area of quayside in Area A, represents a more expensive type of pipe from a local source. This stem dates from *c*1720-80, and has a tendril border and a decorated stem twist in the characteristic style of the pipes produced in Chester (Rutter and Davey 1980). The problem is that similar pipes with ornately decorated stems were certainly being produced in Rainford (Dagnall 1987) and they are to be expected in Liverpool as well, where the pipe makers would have been competing directly with those in Chester, especially for overseas orders.

5.4.7 During the late eighteenth and early nineteenth centuries, a distinctive range of decorated pipes were produced in the Liverpool area, which employed particular motifs, such as a stag's head facing the smoker, Masonic emblems, a Liver Bird and flower / foliage motifs (Fig 26; DA Higgins *pers obs*). A range of these pipes was recovered, including a particularly unusual one from Area B make-up layer ***5299***, which has a stag's head facing the smoker, and flutes on the opposing side. The right-hand side of the bowl is largely missing, but has traces of Masonic decoration, which was common locally (DA Higgins *pers obs*). What is unusual is the left-hand side, which depicts the Glasgow Arms (a bird

sitting on a tree with a bell and fish); this bowl dates from *c*1780-1810 and is the earliest known example of the Glasgow Arms being used to decorate a pipe (this design is shown in various early twentieth-century trade catalogues, *eg* Jung 2003, and has been recognised on various late nineteenth-century pipes, but never on anything earlier than *c*1860 (DA Higgins *pers obs*)). Another example, probably from the same mould, has been recovered from the Manchester Dock excavations (MOL forthcoming; 266 <3110>). It seems that this design must have been made in the Liverpool area, presumably as an export style destined for Scotland.

5.4.8 The excavations also produced some slightly later pipes, dating from *c*1820-50, which were typically decorated with a panel containing a variety of motifs above fluted decoration and, sometimes, a shield facing the smoker with the maker's initials. An example, marked EM in a shield, can be attributed to Elizabeth Morgan (working 1816-39; Higgins nd). There are not many late nineteenth- to early twentieth-century pipes, but a few occur, providing evidence for the pipes that were being used in the waterfront areas. These include examples marked with pattern names, such as 'DUBLIN PIPE' or 'LONDON', as well as makers' marks from firms in other areas, such as McDougall's in Glasgow and Southorn's in Broseley (*Section 5.4.18*). Both of these two firms had agents in Liverpool during the second half of the nineteenth century and were shipping their products out of the port (Higgins nd).

5.4.9 The assemblage from ***5116,*** a deposit of reddish-brown sandy backfill mixed with other finds and fragments of detritus within small room ***5115*** (Fig 24), comprised 151 fragments, of which five were bowls, and there were 132 stems and 14 mouthpiece fragments. This assemblage is unusual on two counts; first, it contains very few bowl fragments and, second, many of the fragments have been badly burnt so that the pipes' have become encrusted and/or warped. The range of makers' marks, however, shows that the group is domestic rather than kiln waste, with the most likely date of deposition being during the 1850s. Of the 14 mouthpieces, one is on a very flat stem with a diamond-shaped cross-section. This terminates with a slight nipple and has been cut at the end. It is too badly burnt to tell if there was any tip coating, but the stem may have been given a slight curve. The remaining 13 mouthpieces are all simple cut ends to round stems. One has no obvious surface finish but the other 12 are all glazed: 11 with a pale lemon green glaze and one with a dull purplish/brown glaze. There are also 16 other glazed stems, 15 of which have the lemon green glaze on them. This was clearly the dominant form of tip coating at the time. The other glazed stem has been too badly burnt to tell the colour but it is of a different form, since the tip is flattening out towards a nipple ending and it is clearly from a short-stemmed cutty pipe.

5.4.10 There is part of an incuse stamp on the stem, reading ….Co / ….18, which can be identified as part of a Southorn mark from Broseley in Shropshire (Higgins 1987). Another thin stem has a complete incuse stamp reading 'W. SOUTHORN & Co / BROSLY 1 SALOP'. Southorn's used incuse stem marks from around 1850 until they closed in 1960. A third marked stem has the incuse moulded lettering 'Mc DOUGALL / GLASGOW' within a relief-moulded beaded border. This firm operated from 1846-1967 (Anon 1987, 354).

5.4.11 Further dating evidence is provided by one of the bowls, which has enclosed flutes at its base, the Prince of Wales feathers facing the smoker, a small star on each side of the spur, and JONES / LIVERPOOL moulded in relief on the right-hand side of the bowl (the left-

hand side is missing). The lettering is placed upright, running from top to bottom of the bowl. This is a very unusual location, without any known parallels. This pipe would have been made by either John Jones or John George Jones of Liverpool (father and son), who were only working on their own account from *c*1837-57), thus providing a good date for this piece (John Senior worked as Morgan & Jones from 1834-5 and then the business was run as Harris & Jones from 1859-98; Higgins nd). This also provides the 1850s date for the group as a whole, since the McDougall mark must be after 1846 and the Southorn stamps after *c*1850, while this piece is probably no later than *c*1857. There is also a bowl fragment that appears to be from a second bowl from the same Jones mould, and a small decorated fragment with a beehive on it. The final two pieces are spur fragments from different bowls, but not enough survives to tell whether they were decorated or not.

5.4.12 The group retrieved from ***5147*** (a smaller dump of material, deposited as part of the land reclamation process, directly to the west of sea wall ***5707***, and east of Bird's Slip within Area A; Fig 24) comprised a total of 179 pieces, consisting of 29 bowls, 143 stems and seven mouth pieces. This group clearly represents a dump of pipe kiln waste, since none of the bowls has been smoked and many of the stems are over-fired or encrusted with clay or slag from having been used in muffle construction, or as slag/stem laminate within a kiln. Twenty-two fragments of pipe-kiln debris were also recovered from this context. This kiln waste can be attributed to William Morgan Senior (born 1743; working *c*1767-1804; died 1804; Higgins nd), since nine of the stems are stamped with a single line makers' mark, and all the identifiable examples (where the maker's name survives; six examples) read W. MORGAN LIVERPOOL. At least two different die types are represented, since one of the marks has a dot between the surname and place name, while another does not. There are seven cut mouthpieces, none of which is glazed, but there are also three stem fragments with glaze on them, showing that some of the pipes had pale yellowish-green glazed tips. The bowls are all rather fragmentary but it has been possible to identify eight different mould types (Table 6), all of which can be matched with a dump of 1780s kiln waste, produced by William Morgan, which was excavated from the Liverpool Canal Link site (Higgins 2010; Fig 25). There are two examples from a mould with a star mark on each side of the spur and one with a dot on each side, most clearly visible on the left. Given that all eight of the mould types are duplicated in the 1780s dump, this group is likely to have been deposited at much the same time.

2010 Mould Type	No of Frags	Min No represented
D	2	**1**
F	1	**1**
G	1	**1**
H	2	**2**
K	1	**1**
M	1	**1**
N	1	**1**
O	3	**2**
Plain bowl fragments	17	-
Total	**29**	**10**

*Table 6: Mould Types from kiln waste **5147** attributable to William Morgan*

5.4.16 The 22 pieces of kiln debris comprise one piece of slag; three pieces of slag/stem laminate; five pieces of thin clay sheet; one piece of grass- or straw-tempered clay, seven round rolls

and five flattened rolls. One of the round rolls is quite thick (about 14mm in diameter) but most are in the 5-7mm diameter range and most show signs of having been curved. Both sizes show stem impressions, sometimes on two faces (the inner and outer of the curve). The flattened strips have generally been pressed against a flat surface on one side and one shows slight bowl impressions on the other surface. One of the flattened strips has been pressed against a sharply curved surface and appears to have made a ring originally, with the contact surface on the inside. This ring would have had an internal diameter of about 75mm and the strip is about 5mm thick, so that the outer side would have had a diameter of about 85mm. There appear to be light stem impressions on the outer surface.

5.4.17 The group retrieved from ***5748*** (a smaller dump of material, deposited as part of the land reclamation process, directly to the west of sea wall ***5707***, and east of Bird's Slip within Area A, and adjacent to dumped material ***5747***; Fig 24) comprised a total of 179 pieces consisting of 31 bowls only. This context group must represent kiln waste, since none of the bowls has been smoked and there are also three pieces of pipe-kiln waste (two fragments of clay sheet and a clay strip) in the same assemblage. The kiln waste can, however, be attributed to William Morgan Sr (born 1743; working *c*1767-1804; died 1804), since all of the identifiable examples can be matched with a dump of 1780s kiln waste, produced by Morgan, that was excavated from the Liverpool Canal Link site (Higgins 2010; Fig 25). There are 22 plain bowl fragments, including two with moulded marks (one with stars and one with 'all-seeing eyes'), and nine mould-decorated fragments (eight from a stag and Masonic design and one from a scallop and crown design). Apart from 13 plain bowl fragments, all of the pieces could be matched with mould types identified from the 1780s Canal Link dump (Table 7). Given that all the mould types are duplicated in that dump, this deposit is likely to have been deposited at much the same time.

2010 Mould Type	No of Frags	Min No represented
D	8	**3**
F	1	**1**
H	2	**1**
I	1	**1**
L	1	**1**
M	1	**1**
N	1	**1**
O	8	**1**
Plain bowl fragments	13	-
Total	**31**	**9**

*Table 7: Mould types from kiln waste **5748**, attributable to William Morgan*

5.4.18 ***Marked Pipes:*** apart from the large kiln groups (*Section 5.4.19*), 36 marked pieces were found during the excavations. These carried a total of 39 marks, since three of the fragments had double marks (moulded name or initials on the bowl as well as moulded symbols on the spur; Table 8).

Cxt	Mark	Position / Type	Decoration	Date	Comments
5116	JONES / LIVERPOOL	bowl mark - moulded	flutes and Prince of Wales feathers	1850-60	An unusual decorated bowl, marked JONES/LIVERPOOL in upright lettering on the right-hand side (the left-hand side is missing) and with a star mark on either side of the spur. This bowl can be attributed to John Jones of Liverpool

					(father and son), who were working on their own account from *c*1837-57 (Higgins nd). There is part of a second bowl from the same mould in the same context, but without either of the marks surviving. The context from which this piece was recovered probably dates from the 1850s (Higgins nd).
5194	EB	bowl mark - moulded	stag's head, flutes and shield	1820-50	The upper part of a bowl (spur missing), decorated with a stag's head, flutes, and shield containing the relief-moulded letters EB. These do not match any known Liverpool maker and it could be an 'import' from a neighbouring centre, such as Rainford.
5194	EM	bowl mark - moulded	stag's head, flutes and shield	1816-39	A bowl decorated with a stag's head, flutes, and a shield containing the relief-moulded letters EM. These appear twice, once faintly at the sides of the shield, and once, more boldly, beneath the stag's head. These initials can be attributed to Eliza/Elizabeth Morgan, who is listed in Liverpool directories from 1816 to 1839. There is also a moulded double ring mark on the sides of the spur (qv) (Higgins nd).
5249	?J J	bowl mark - moulded	flowers, star, *etc*	1837-57	Lower part of a bowl that stylistically dates from *c*1820-50. This is decorated with a spray of flowers or berries towards the base on each side, and a star on the right-hand side of the bowl (left-hand side is missing). There is a double-lined shield facing the smoker, with the initials ?J J. This can be attributed to John Jones, one of the principal manufacturers in Liverpool from *c*1837-57. Stem bore 6/64".
5478	J …	bowl mark - moulded	scalloped, shield, *etc* *x 1*	1820-50	Bowls of *c*1820-50, with scalloped decoration with stars and foliage, and a shield facing the smoker, with just the initial J surviving of the Christian name. The spur is marked with moulded stars (qv).
5116	stars	heel/spur mark - moulded	flutes and Prince of Wales feathers	1850-60	An unusual decorated bowl marked JONES/LIVERPOOL in upright lettering on the right-hand side (the left-hand side is missing) and with a star mark on either side of the spur. This bowl can be attributed to John Jones of Liverpool (father and son), who were working on their own account from *c*1837-57. There is part of a second bowl from the same mould in the same context, but without either of the marks surviving. The context from which this piece was recovered probably dates from the 1850s (Higgins nd).
5147	stars x 2	heel/spur mark - moulded		1780-1800	Two plain bowls from a deposit of kiln waste dating from *c*1780-1800, with moulded star marks on each side of the spur. These pipes come from William Morgan's workshop (mould type H; Higgins 2010).
5147	dot	heel/spur mark - moulded		1780-1800	Plain bowl from a deposit of kiln waste dating from *c*1780-1800, with a moulded dot mark on each side of the spur (not very clear on right side). This pipe comes from William Morgan's workshop (mould type G; Higgins 2010).

5155	W? B	heel/spur mark - moulded		1710-70	The bowl is of a typical London style (Type 25; Atkinson and Oswald 1969) and has a stem bore of 5/64". There is no internal bowl cross but the heel is marked with relief-moulded initials. The Christian initial is chipped and trimmed short, but appears to have been a W, while the surname is B. Although similar bowl forms were made in Chester (Rutter and Davey 1980), the use of moulded initials at this date is extremely rare in the North West (DA Hiiggins *pers obs*) and this is most likely to be an imported example from London, where this form of bowl and style of marking was extremely common from *c*1700-70 (Higgins nd).
5194	Ring and dot	heel/spur mark - moulded	leaf seams and flower designs on the bowl	1820-50	Bowl of *c*1820-50 with a ring and dot mark on the sides of the spur. The bowl has a locally common scheme of decoration, with three stylised flowers (the central one the right way up, flanked by two inverted ones) on each side of the bowl and leaf decorated seams.
5194	double ring x 2	heel/spur mark - moulded	one plain and one with stag's head, flutes and shield	1820-50	Two bowls of *c*1820-50 with a double ring mark on each side of the spur. One of these has a plain bowl but the other is decorated with a stag's head, flutes and shield. The shield contains a moulded EM mark (qv).
5194	illegible x 2	heel/spur mark - moulded	leaf seams, flutes, *etc*	1820-50	Two bowls of *c*1820-50 with illegible marks on each side of the spur. These are just crude lumps and may never have been intended to be actual letters or symbols. Both bowls have leaf seams. Only a very small part of one survives, with traces of moulded decoration on the bowl sides. The other has panel decoration above enclosed flutes. There is a bird on the right-hand side and, probably, a wheat sheaf on the left (badly obscured by rust and staining).
5409	double ring	heel/spur mark - moulded	fluted, *etc*	1810-50	Bowl fragment of *c*1810-50, with a double ring mark on both sides of the spur and the start of fluted decoration on the bowl, which is largely missing.
5478	stars x 2	heel/spur mark - moulded	wheat sheaf and bird x 1; scalloped, shield, *etc* x 1	1820-50	Two bowls of *c*1820-50, both with stem bores of 5/64" and star marks on each side of the spur. One bowl is decorated with a panel decoration, above enclosed flutes, depicting a wheat sheaf on the left side and a bird on the right. The other has scalloped decoration with stars and foliage, and a shield facing the smoker with just the Christian name initial J surviving (qv).
5748	stars	heel/spur mark - moulded		1780-1800	Plain bowl from a deposit of kiln waste dating from *c*1780-1800, with a moulded star mark on each side of the spur. This pipe comes from William Morgan's workshop (mould type H; Table 7).
5748	eyes	heel/spur mark - moulded		1780-1800	Plain bowl from a deposit of kiln waste dating from c1780-1800, with a moulded star mark on each side of the spur. This pipe comes from William Morgan's workshop (mould type I; Table 7).
5116	McDOUGAL L /GLAS GOW	stem mark - moulded		1850-60	A McDougall stem from Glasgow - incuse moulded lettering within a relief-moulded and beaded border, with loops at the ends. This firm operated from 1846-1967 but the stem comes from a group that probably dates from the 1850s (Higgins nd).

5117	??GARI BALDI / …..	stem mark - moulded		1850-1900	A cutty pipe of *c*1850-1900, with a moulded mark on the sides of the stem. This comprises incuse moulded lettering within a relief-moulded beaded border with pointed ends, but the mark has either worn almost completely smooth or has been deleted from the mould. Very faint shadows suggest the first side may have read GARIBALDI, a popular pattern name for pipes following the rise to popularity of the Italian General of that name (DA Higgins *pers obs*). Stem bore 5/64"
5118	LONDON / LONDON	stem mark - moulded		1850-1900	An almost complete spurless style with thick walls. This has a good form and is neatly finished. On the stem sides is the incuse-moulded sans-serif lettering LONDON / LONDON, within a relief-moulded beaded border with loop ends. It is possible that LONDON represents the pattern name for this particular pipe, rather than necessarily being its place of origin. Stem bore 5/64".
5132	DUBLIN / PIPE	stem mark - moulded		1850-1910	A thick piece of stem with the incuse-moulded sans-serif lettering DUBLIN / PIPE, without any border. This would have come from an Irish-style cutty of *c*1850-1910. Stem bore 5/64" (Higgins nd).
5116	W. SOUTH ORN & Co / BROSLY 1 SALOP	stem mark - stamped		1850-60	A thin stem with an incuse stamped William Southorn & Co mark from Broseley. This firm operated from *c*1823-1960, but this style of mark dates from after *c*1850, and the context it comes from suggests an 1850s date for this example (Higgins 1987).
5116	…Co / …18	stem mark - stamped		1850-60	A stem with burnt glaze and part of an incuse-stamped Southorn mark from Broseley (Higgins 1987). This firm operated from *c*1823-1960, but this style of mark dates from after *c*1850, and the context it comes from suggests an 1850s date for this example.
5147	W.MORGAN LIVERPOOL x 9	stem mark - stamped		1780-1800	Nine stems with complete or partial W Morgan stem stamps. From a kiln dump of *c*1780-1800.
5271	J.ATHER TO…	stem mark - stamped		1769-1805	Quite a thick stem with a stem bore of just over 6/64", stamped J.ATHERTO…. James Atherton is recorded as a Liverpool maker from 1769-1805 (Higgins nd).
5273	.... LIVERPOOL .	stem mark - stamped		1770-1820	Stem of *c*1770-1820, with the end of a Liverpool maker's stamp on it (with a full stop after the word 'LIVERPOOL.'). The stem bore is rather irregular, but about 6/64".
5763	CHA. …	stem mark - stamped		1760-1820	One partial stem mark of *c*1760-1820 survives (stem bore 5/64"). This starts 'CHA.', with a dot separating the next letter, which appears to have been a B, E, F, H or P. The only recorded Liverpool maker at this date called Charles and with one of these surname letters is Charles Powell, recorded working from 1790-6 (Higgins nd).
7212	C.KENY ON - LIVERP OO…	stem mark - stamped		1770-1840	An almost complete stem mark of Charles Kenyon of Liverpool, who is recorded working from at least 1772-1811. Stem bore 5/64" (Higgins nd).

Table 8: Maker's marks arranged by mark type and context

5.4.19 ***The Kiln Groups:*** although there are individual pieces of pipe that are important in themselves (*Section 5.4.18*), most of these come from small context groups and only

provide individual insights into the history of the city. Of much more significance are the three dumps of kiln waste that were used as landfill within Area A (***5147, 5747,* 5748**; *Sections 5.4.12* and *5.4.17*; Fig 24), all of which can be identified from the associated stem marks and/or bowl forms as having come from William Morgan's workshop. All three of these dumps contain a very similar range of bowl forms to the Morgan kiln waste of the 1780s recovered from the Canal Link site (Higgins 2010; Fig 25), and are all likely to be broadly contemporary. Kiln dump ***5747*** is by far the largest and most important of the three individual dumps, and is the largest dump that has yet been studied from the city; for the first time, it allows the full range of Morgan's products at this time to be identified with confidence.

5.4.20 The kiln dump from land reclamation deposit ***5747*** probably dates from the 1780s, both because of the similarity of forms with the Canal Link finds and because the Mann Island deposits are likely to have been laid down at this time as the Mersey was reclaimed for the construction of the Manchester Basin towards the end of the 1780s (*Section 3.3.1*). This allows the waste to be attributed to the first William Morgan, who was born in 1743 and is recorded as working from *c*1767 until his death in 1804 (Higgins nd).

5.4.21 William Morgan and various members of the Morgan family were working as pipemakers in Liverpool during the late eighteenth and early nineteenth centuries and William Morgan (I) appears to have been one of the principal members of this family. William was the son of Henry Morgan, tailor, born on 13th November 1743 and baptised on 20 November 1743 at St Nicholas' Church, Liverpool (Higgins 2008). It is unclear exactly when he started pipe making, but he appears regularly in the earliest trade directories from 1767 onwards (*eg* Gore 1767). He would only have been 23 or 24 in 1767 and is unlikely to have been working on his own account any earlier than about 1764, when he would have been 21. The directories show that he moved between several different addresses during his career, as follows (the property number, where listed, is given in brackets):

Hackin's Hay	Gore 1767; 1769
Harrington Street	Gore 1772; 1773; 1774 (44); 1777 (44); 1781 (40); 1787; 1790 (40)
Gradwell Street	Universal Directory 1794; Gore 1796 (6); 1800
Parliament Street	Gore 1796.

5.4.22 The early directories usually give the working address, but the 1796 directory gives William as a pipe maker in Gradwell Street, with a pipe manufactory being listed in Parliament Street as well. This is the only reference to William having a Parliament Street address, but various later members of the family are recorded as having a pipe warehouse and/or manufactory in Parliament Street between 1816 and 1839 (Gore 1816; 1821; 1823; 1825; 1827; 1832; 1834; 1835; 1837 and 1839), and this may well have been the same site that was originally established by William in about 1796. The other three addresses are likely to represent the locations of his earlier workshops, with the two different property numbers in Harrington Street simply reflecting late eighteenth-century changes in the street numbering, rather than an actual change of workshop location.

5.4.23 Further information about William (I) can be gleaned from the Liverpool parish registers; although these have not been systematically checked, the burials at St Nicholas show that he lost at least six children between 1777 and 1798: James (1777); Thomas (1777); Thomas (1779); John (1780); Kitty, aged five (1794); and Elizabeth, aged ten (1798) (LRO 283 1/6; 283 1/7). The 1794 entry is particularly useful, since it records that Kitty was the daughter of

William Morgan and Mary Hayes, his wife. His wife's maiden name hints at an interesting marriage link between the Morgan and Hayes families, both of whom were prominent pipemakers in Liverpool at this time (Higgins 2008). There is also evidence that not only was William literate but also actively involved in the local community, since Gore's *Directory* of 1790 lists him as *'pipemaker and clerk of St George's'* (where his daughter Betty, born 13th April 1788, was baptised on 11th May 1788; Gore 1790), while the St Nicholas Parish Register entry for the burial of this same daughter in 1798, now given as 'Elizabeth', describes him as a pipemaker and clerk of St Peter's (LRO 283 1/7). William Morgan died in 1804 and the record of his burial in the St Nicholas registers notes that he died on 14th October 1804 aged 61, was buried on 18th October 1804 and was late Clerk to St Peter's Church (LRO 283 1/8). William is described as a pipemaker in the burial register but the last reference to him in the trade directories was in 1800, suggesting that he may have retired at about this time. This suggestion is reinforced by Gore directory entries of 1803 and 1804, listing a 'William Morgan Junior' in Gradwell Street, which presumably relate to a son of the same name having taken over the business.

5.4.24 ***The William Morgan Kiln Waste (Dump 5747):*** this dump probably dates from the 1780s and so is most likely to have come from the period when William Morgan was working in Harrington Street *c*1772-90 (Gore 1772; 1790; *Section 5.4.21*). The kiln waste recovered from this site was enumerated as containing 16,377 pieces of pipe and 956 pieces of kiln debris. These figures, however, are both acknowledged to be under-estimates, since there is a considerable quantity of unsorted residue that still contains large numbers of small fragments of both pipe and kiln waste. These have not been extracted, since they are all relatively small pieces and unlikely to produce any useful return from further sorting.

5.4.25 The important factor about this group, however, is its size. It is known that pipe makers at this period would have produced a range of different pipe styles for different markets including, in Liverpool, the export trade (Jackson and Price 1974, 84). Small kiln groups rarely provide sufficient examples to be sure that a full range of products has been identified. It is only when multiple examples of all types represented within a given group have been identified that the full range can be stated with some confidence. This kiln group is some ten times larger than any that has previously been studied for Morgan and so allows his production range at a single point in time to be examined with some confidence.

5.4.26 The methodology adopted for studying this group was to identify the individual mould types represented, so as to establish the number and range of moulds that were being used. Since most of the bowl forms were plain, this had to be done using small scratches or mould flaws that left some sort of mark on the surface of the pipe itself. These flaws are sometimes so fine that they can only be seen clearly under a lens and are most frequently encountered around the heel or spur. This was the most difficult part of the mould to bring to perfection and so often retains marks from where the metal was worked. This part of the pipe is also the most useful to identify, since it can be used to provide a count of the minimum number of examples represented. Each bowl only has one heel or spur (or bowl junction if it is a spurless type), thus providing an easy means of counting. This also avoids the problem of decorated bowl fragments being easy to identify, as opposed to plain bowls, so leading to a higher fragment count for decorated forms if just the total number of pieces is considered.

5.4.27 When the Morgan kiln waste from the Canal Link site (Pier Head section) was studied (Higgins 2010), there was only a relatively small sample, and much of this was contaminated with waste from another factory. As a result, there was uncertainty over whether the mould

types could reliably be attributed to Morgan, and the range of forms identified often relied on just a few examples of each (and sometimes just one). This much larger group has allowed the 2010 findings to be tested and a much more robust range of forms identified.

5.4.28 In 2010, the individual mould types were identified using letters (A, B, C, *etc*) and these same designations have been retained here (Tables 6 and 7). From the 2010 work, it was suggested that Morgan was using 15 mould types during the 1780s (A-O), three of which were specific forms only produced for the export market (A-C). Two of the forms were only represented by single fragments, including one that was only represented by a single spur knocked off a pipe bowl (J). This study was able to find multiple examples of 14 of these mould types, and confirms that they have been correctly identified as Morgan product (Fig 26). The only form not represented was J, which suggests that the 2010 find was just a stray spur from pipe produced elsewhere, or even a fragment of later date that was intrusive to the deposit.

5.4.29 As well as the 14 bowl forms previously identified, analysis of this new kiln group has shown that there are at least two, and possibly as many as five, more types that were being produced by Morgan than had previously been recorded, bringing the total number of forms represented to 16-19. The two definite mould types are represented by multiple examples of small plain bowls, similar to types K and M. The other three types are only represented by one or two examples (Fig 26), and so they cannot be attributed with confidence, since they could be stray pieces from elsewhere that have got into the kiln dump. Having said that, they do not appear to have been smoked, and two of these types look like kiln wasters, which strengthens the case for their having been made by Morgan. All three types had plain bowls. Two are broadly similar to mould type G, one with dots on the spur and one without, while the other was just represented by heel fragments, with a dot on either side. All of the mould types represented in kiln dumps ***5147*** and ***5748*** also fell within the 14 mould types initially identified (*Section 5.4.12*) and so, taken together, it now seems that we can reliably say that Morgan was producing around 16-19 patterns of pipe during the 1780s, at least three of which were specifically produced for the export trade. The recovery of earlier and later groups is now needed to explore how his production range changed over time and how frequently the moulds needed to be replaced.

5.4.30 ***Summary and Conclusions:*** during the eighteenth century, Liverpool grew to become one of the most important trading ports in the world. By the 1830s, Lancashire (which then included Liverpool) contained no less than 17.4% of all English pipemakers (Higgins 2008, 138) and Liverpool had grown to become a major pipe production and export centre. More than 350 pipemakers have been documented working in the city, and pipes bearing Liverpool marks or designs are well known from all around the world – from fur trapping sites in Canada, to the Caribbean, and from Africa to Australasia. Despite this, there has been virtually no publication of pipes from the city itself and not a single group of kiln waste has yet been published. This makes it almost impossible for researchers elsewhere even to identify Liverpool pipes, let alone to date or interpret them accurately. The finds from this excavation therefore make a very significant contribution to knowledge and one that will be of relevance to archaeologists in many parts of the world.

5.4.31 The smaller context groups have provided evidence of Liverpool's eighteenth-century trade networks, with finds from London, Yorkshire and the Netherlands being particularly notable pieces. Other finds from the site reflect the continued importance of Liverpool as a trading centre into the nineteenth century. The pipe with the Glasgow Arms (*Section 5.4.7*) was probably made in Liverpool for the domestic market, while products from

McDougall's and Southorn's (*Section 5.4.8*) show goods from other parts of Britain coming into Liverpool, some destined for shipment overseas.

5.4.32 The most important groups from the excavation, however, are the three Morgan kiln groups, dating from the 1780s. These tips come from the workshop of William Morgan (I), who was one of the most prominent Liverpool manufacturers and exporters during this period (Higgins 2008). The large tip confirms that Morgan was producing around 16-19 patterns of pipe at any one time and that at least three of these patterns were specifically designed for the export trade. Several other kiln tips have recently been excavated in Liverpool (OA North 2011b) and a detailed analysis and comparison of the Morgan tips with these other finds will provide a sound framework for the identification and interpretation of Liverpool pipes that will be of international significance.

5.5 THE METALWORK

5.5.1 In total, 359 fragments of metalwork were recovered. The majority of the material consisted of ironwork, such as nails and other fastenings, with no significant analytical value. An assemblage of 17 copper-alloy coins and tokens was recovered, however (Table 9); all but one of them was in extremely poor condition, and most have proved unidentifiable, except on grounds of size.

Context	Material	Type	Condition	Description	Period
5077	Copper alloy	Farthing?	very poor	Badly corroded, illegible	Post-medieval, not closely dated
5117	Copper alloy	Token	very poor	Badly corroded. Possibly shows the arms of Liverpool. Perhaps token of Thomas Clarke	Issued 1791–4 http://www.nmm.ac.uk/collections).
5194	Copper alloy	Penny	very poor	Badly corroded, probably a penny with right-facing Britannia	George IV; issued 1825–30 (Spink and Sons Ltd 2010)
5194	Copper alloy	?	very poor	Badly corroded, illegible	Post-medieval, not closely dated
5194	Copper alloy	?	very poor	Badly corroded, illegible	Post-medieval, not closely dated
5194	Copper alloy	Penny	very poor	Badly corroded, illegible	Post-medieval, not closely dated
5194	Copper alloy	Halfpenny?	very poor	Badly corroded, illegible. Britannia left-facing. Third (1799) or fourth (1806) issue.	George III (Spink and Sons Ltd 2010)
5194	Copper alloy	Halfpenny	very poor	Badly corroded, illegible	George III? (Spink and Sons Ltd 2010)
5396	Copper alloy		very poor	Badly corroded, illegible	Post-medieval, not closely dated
5708	Copper alloy		very poor	Badly corroded, illegible	Post-medieval, not closely dated
5708	Copper alloy	Penny	good	Penny. Third issue	George III; 1799 (Spink and Sons Ltd 2010)
5708	Copper alloy		very poor	Badly corroded, illegible	Post-medieval, not closely dated
5712	Copper alloy	Halfpenny	very poor	Badly corroded, illegible	Post-medieval, not closely dated
5754	Copper alloy	Farthing?	very poor	Badly corroded, illegible	Post-medieval, not closely dated

Context	Material	Type	Condition	Description	Period
5754	Copper alloy	Farthing?	very poor	Badly corroded, illegible	Post-medieval, not closely dated
U/S	Copper alloy	Halfpenny	very poor	Badly corroded, illegible	Post-medieval, not closely dated
U/S	Copper alloy	Halfpenny	very poor	Badly corroded, illegible	Post-medieval, not closely dated

Table 9: Coins from the site

5.5.2 Size suggests that most of the coins are halfpennies or farthings, very small denomination coins which might not have been sought for particularly assiduously when lost or dropped. The only firmly identified example is an unusually well-preserved (for the site) penny of 1799 from the cobbled floor, ***5708*** (Fig 13), of a small single room cellar in Area A, identified as part of the early development of Nova Scotia and visible on the 1803 Horwood Map (*Section 4.6.11*). Two of the coins from deposit ***5194*** can also be relatively confidently identified as coins of George III, and are probably the third or fourth issue of his reign (Spink and Sons Ltd 2010), dating to 1799 and after 1806 respectively. This deposit represented the earliest phase of backfill within two small brick chambers constructed against the west-facing elevation of the earliest sea wall, ***5707*** (Fig 13). A third coin from the same context is a penny of George IV, second issue, dated 1825–30 (*ibid*).

5.5.3 Two halfpenny tokens were noted, one from backfill deposit ***5117***, within the northern area of warehousing in Area A, and the other from backfill deposit ***5712***. The copper disk from ***5117*** is an issue of the Associated Irish Mine Company or AIMC (Dalton and Hamer 1915, token 428), which had an agent and offices in Liverpool. The token bears the coat of arms of the AIMC, depicting a windlass over a shield decorated with the company's coat of arms, consisting of two spades, three picks and a horn of gunpowder for blasting. The inscription around the shield reads 'ASSOCIATED IRISH MINE COMPANY 1789'. On the opposite side of the token, in reference to the Irish heritage of the company, is the image of St Patrick, shown in profile and surrounded by the words 'CRONEBANE HALF PENNY' (Object 11766). The token from backfill deposit ***5712*** has been identified as a so-called Portsea halfpenny of 1794, which appears to bear the arms of the City of Liverpool, and bears some resemblance to tokens issued for Thomas Clarke during the period 1791–4 (National Maritime Museums website; http://www.nmm.ac.uk/collections).

5.6 THE GLASS

5.6.1 In all, 1339 fragments of glass were recovered, of which 1208 were from a limited range of blown and moulded vessels, and 131 were small fragments of window glass. All were in relatively good condition, although some vessels, especially those from earlier contexts, bore iridescent weathering and some flaking of surfaces. In general, the fragments were large, with the more robust parts of vessels, like bases and necks, often surviving complete.

5.6.2 The majority of the glass comprised bottles of various forms and types of manufacture. Most of the bottle assemblage (1014 fragments, *c* 84%) were dark green wine and beer bottles, with 307 fragments from this group (*c* 30%) being the distinctive dark olive green wine bottle or 'English bottle', in use from the late seventeenth century, throughout the eighteenth, and into the early nineteenth century (Hurst Vose 2008, 367). Only one

'English bottle', from a residual context, was earlier in date than the end of the eighteenth century, its rim form suggesting a date in the 1760s. Others were of late eighteenth- or early nineteenth-century date. By far the majority of the dark green bottle glass, however, was from two deposits: one, ***5118***, the early twentieth-century demolition backfill of a cellar between Irwell Place and Murray Place (Fig 21); the other a dense glass layer, ***5154***, located within the cut of pit ***5152***, which itself was located within room ***5114*** in Area A (Fig 13). The nature of this feature was uncertain, but it is likely that the room was once part of a public house or victuallers, many of which existed in Nova Scotia and Mann Island from the early nineteenth century until the end of the 1920s, when the area was levelled (*Section 4.7.5*). These produced 160 and 628 fragments respectively. All are from narrow diameter (76–8mm) mould-blown bottles, with a distinctive embossed four-pointed star on the base, and, on a simple base count, there were at least 37 bottles in ***5154***. These are unlikely to be any earlier than the mid-nineteenth century in date and could be considerably later.

5.6.3 Other late eighteenth-century dark green glass vessels were represented by several fragments from square or polygonal-sectioned bottles, one from a reclamation layer west of the second sea wall, ***7638*** (*Section 4.2.2*), and others from contexts where they are likely to be residual. Again, these probably date to the late eighteenth to early nineteenth century. Part of the rim of a very thick-walled vessel with an applied string rim, possibly a demijohn, was noted.

5.6.4 Two complete colourless pharmaceutical phials were recovered, along with a fragmentary base. Whilst in use by the seventeenth century (see, for instance, Gooder 1984), these simple vessels usually appear in colourless metal from the mid-eighteenth century (Noel Hume 1969, 74), and the cylindrical form suggests a date after *c* 1780.

5.6.5 A further 119 fragments were from bottles in colourless or almost colourless metal. All were from mould-blown vessels, and nothing suggests that any of them were earlier than the mid–late nineteenth century. Fragments of greenish-colourless egg or Hamilton bottles are unlikely to pre-date *c* 1870, although they were patented in the early part of the century (Hurst Vose 2008, 370), and continued in production into the twentieth century. An almost complete cylindrical vessel, from a modern drain in Area B, is probably machine-blown, placing it, at the earliest, in the last years of the nineteenth century, and most probably in the twentieth, as bottles were being produced in Manchester, using this fully automated technique, by 1907 (Hurst Vose 2008, 369). A machine-blown, colourless, twentieth-century milk bottle, embossed with the name of the dairy (Reece's), was also recovered from Area B. Three press-moulded lids from Area A, including one found in a cellar, are all of late nineteenth- and early twentieth-century date.

5.6.6 Fine table wares are restricted to a group of four wineglasses from a cellar on Nova Scotia (*Section 3.2*). All are in a colourless leaded metal, and are identifiable as 'rummers', a style of glass introduced into England in the last quarter of the eighteenth century, which was most popular in the early nineteenth century, and remained popular until *c* 1830 (Noel Hume 1969, 195). Two heavy bases in good-quality leaded glass are probably drinking beakers; one, clearly blown, has the pontil-mark polished away. An insufficient amount remains of either vessel (one from the floor of a cellar north of Irwell Place (Phase 6), the other in late backfill in Area B) to allow them to be dated, although they are almost certainly of nineteenth-century or later date.

5.6.7 A group of 50 fragments of thin colourless glass from a cellar between Irwell Place and

Murray Place (*Section 3.4.8*) appears to have come from a lamp glass of some kind, and can be dated to the later nineteenth century. Two fragments of mould-blown cobalt blue glass from the same cellar have been tentatively identified as from a glass fire grenade, a method of fire-fighting in use from about 1870 into the early twentieth century (www.london-fire.gov.uk).

5.6.8 Window glass represented just under 10% (9.78%) of the total glass assemblage, a relatively small proportion, perhaps reflecting a lack of glazed lights, even in the modern buildings on the site, or that glass was extensively scavenged for reuse. Most were relatively small mid-pane fragments in slightly greenish, slightly bluish and colourless metals, and cannot be dated with precision, except to note that they are probably not earlier than the late eighteenth or nineteenth century, as cast glass was not produced in England until 1773, when the British Plate Glass Company was opened in St Helen's (Barker and Harris 1994, 112). Only six small fragments are likely to be earlier, being thin greenish, probably muff-blown glass of late seventeenth- or early eighteenth-century date, some from a deposit closely associated with the clay pipe kiln dump *(Section 5.4.20*), and some from land reclamation material west of the second sea wall (***7638***; *Section 4.4.5*).

5.7 THE ANIMAL BONE

5.7.1 In total, *c* 300 fragments of animal bone were recovered from backfill and levelling layers. The assemblage was, however, too small and fragmentary to draw any meaningful conclusions, particularly given the context of its disposal.

5.8 DISCUSSION

5.8.1 By far the largest proportion of the finds recovered by the excavation derived from redeposited layers, either backfill or demolition debris levelled for new construction. In terms of their utility in constructing the chronology of land reclamation, and dock construction, they have provided useful insights, confirming and enhancing what was known from historical documentation.

5.8.2 Certain of the assemblages, such as the pottery and clay pipes, are intrinsically interesting, and are of national, indeed international, importance, in that they reveal features of the transatlantic trade, as well as of taste and fashion. Clay pipes were fragile and in regular use and, therefore, regularly replaced, so that new manufacture was constant. This makes this type of artefact a particularly useful chronological marker, and the rapidly changing designs on the bowls of these pipes provide an index of social and political trends. The dating evidence from the pipes has shown that land reclamation west of the second sea wall (***7638***) was occurring in *c* 1780–90, while some of the designs, such as depictions of the liver bird, may suggest increasing local pride, confidence and identity. The analysis of the pottery reinforces this chronology, with the principal period of deposition occurring in the late eighteenth century. The development of Liverpool's hinterland is also highlighted by this assemblage, with a large proportion of the material either entering Liverpool along the recently constructed canal network, or being manufactured in the town itself, now that the raw material could be readily imported through the docks.

5.8.3 There were indications that at least some of the pottery was manufacturing waste, and the dumps from clay pipe kilns were certainly waste. Assemblages recovered from reclamation

material do not allow patterns of use to be deduced, but manufacturing waste can provide precise dating by comparison with a domestic midden, where deposition occurs over a lengthy period and can involve artefacts manufactured long before their disposal.

5.8.4 It might have been expected that trading activity would be reflected in the presence on the site of obvious imports, especially durable items like pottery, since Liverpool was, by the late eighteenth century, one of the country's main seaports (Belchem 2006). With the exception of sugar, transported as molasses in barrels, and then refined in Liverpool using locally made sugar wares (*Sections 5.2.24-5*), this is not the case.

5.8.5 On the east coast of the country, the situation was very different, as European pottery imports are a notable element of assemblages from the major ports (see, for instance, Cotter 2000). This is not, however, the case in Liverpool, where imported ceramics are few, from both elsewhere in Britain and further afield, and tend to be earlier than the main period of Liverpool trade. This can be seen at Mann Island in the presence of fragments of North Devon gravel-tempered ware (*Section 5.2.7*) and possible Spanish containers (*Section 5.2.4*). Bideford, a centre of production for the former, traded clay to Liverpool in small amounts in the first half of the eighteenth century (Weatherill 1971) and it is quite likely that limited numbers of gravel-tempered ware vessels reached the port, not in trade, but as personal possessions; small numbers of vessels in this ware have also been noted in assemblages around the Irish Sea and on the Isle of Man (Cubbon *et al* 2002), as well as from further afield. Similarly, it is possible that individual items of Bristol tin-glazed wares reached Liverpool by sea, but, as these are difficult to distinguish from locally made Liverpool wares (*Section 5.2.5*), it is reasonable to assume that most of the tin-glazed wares from the site were local products. There is no doubt that late seventeenth- and early eighteenth-century Staffordshire wares were reaching Liverpool in reasonable amounts (*Section 5.2.6*), and they are most obviously represented on the site by slip-decorated cups and press-moulded plates. The main period of production of these wares was, however, before the main flowering of pottery production in Liverpool (Poole 1995), and they would have been brought to the town along with contemporary vessels from Buckley (Barker 1993), and from the South Lancashire coalfields, for instance, from Prescot (mCnEIL 1989; Davey 1991).

5.8.6 The eighteenth-century Chinese porcelain teawares (*Section 5.2.13*) are the one obvious import, but it is highly unlikely that these were entering Liverpool via a maritime route. It is more likely that these were being moved northwards from London, in the course of the tea-trade, arriving overland, and latterly by canal (Richards 1999).

5.8.7 Most of the later eighteenth- and nineteenth-century pottery from the site appears to be relatively locally made, or to be Staffordshire wares brought to Liverpool for finishing, before being exported to America and the Caribbean (Hyland 2005). Whilst some of the assemblage undoubtedly derived from Liverpool households, and thus reflects what was available in the town and in use at that time, the presence of white salt-glazed stoneware seconds, and the large amounts of creamware flatwares, might well suggest the disposal of broken consignments of pottery made in Liverpool and intended for the Atlantic trade. Even after the abolition of slavery in 1807, Liverpool's domination of the Atlantic trade (Belchem 2006) meant that enormous amounts of pottery were shipped westwards through the port, both from local producers (for instance, from Buckley, and later the Herculaneum pottery in Liverpool itself; *Section 5.2.16*) and the great Staffordshire producers, but, rather than bringing finished goods back to Liverpool, the return trade centred on sugar and

tobacco, neither of which are easily identifiable within the archaeological record.

5.8.8 In the nineteenth century, when Liverpool became the pivotal point in the mass movement of migrants bound for America (www.unesco.org/pg.cfm?cid=31&site=1150), the majority of those passing through the port were poor and of low status, and had already been travelling for some time (Belchem 2006); they were thus unlikely to have brought significant amounts of disposable possessions with them. Thus the identification of ceramics and other finds 'lost in transit' would be very unlikely and entirely serendipitous.

6. DISCUSSION

6.1 INTRODUCTION

6.1.1 The value of the archaeological results obtained from a site such as this is twofold: some of the information is wholly different from anything available historically and, therefore, provides new insights into the past, while other elements are complementary and may serve either to confirm or enhance existing historical data. This is particularly significant where the excavations have served to identify the presence of major structures such as slips, piers and sea walls, which were not clearly illustrated on any of the historical mapping. This reinforces our understanding of the speed at which land reclamation and the construction and implementation of maritime engineering innovations were taking place along the waterfront. The archaeological evidence supports the fact that work was so extensive that frequently elements of the waterfront were constructed and then made redundant in the relatively short intervals between the mapping. A further significant element of the excavations at Mann Island was that it served to highlight that when a structure became redundant within the dock network, it was not demolished or converted or reused, but instead, the massive walls and jetties were simply backfilled, and new walls were constructed in new locations. Not only does this throw into sharp relief the wealth of raw material and man-power that was available at the time, but it also provides an indication that elsewhere on the waterfront major historical structures may not have been demolished, but survive buried beneath later additions (Ritchie-Noakes 1984).

6.1.2 The excavations at Mann Island were situated entirely within an area of reclaimed ground and have exposed sea and dock walls, and the foundations of warehouses. The use of sea walls and wet docks was still at an early stage of technological innovation in Britain in the middle decades of the eighteenth century (Jackson 1983). At Mann Island, these developments included the construction, in 1739, of the Dry Dock and its associated sea wall, which was the first piece of major dock engineering since the Old Dock opened in 1715 (Hyde 1971, 14). Also, there is evidence for an attempt to marry the requirements for both local river traffic and a burgeoning international trade; the presence of the Dry Dock, the berths provided at Bird's Slip, and the form and function of Manchester Dock are all testament to this.

6.1.3 Aside from the significance of the docks as major feats of eighteenth- and nineteenth-century engineering, the evolution of housing, warehouses, workshops and sewers, provide an important insight into an element of society which has left behind little or no first-hand written documentation. The people who lived in the cramped confines of Mann Island and Nova Scotia would have been a poor and, to a certain extent, transitory group. Despite the existence of valuable historical sources, such as the many editions of Gore's *Directory for Liverpool*, it is not possible to understand fully the nature of the buildings that were listed in the directory without also examining the archaeological remains.

6.1.4 The programme of archaeological work involved the recovery of a wide variety of finds, including pottery and clay pipe assemblages of certainly national, and, indeed, international significance, as well as evidence for the methods by which reclamation was achieved, and for developments in dock design and construction techniques. Artefacts recovered at the waterfront mostly fell into three principal categories: objects made in Liverpool which were designed for consumption by the local market; objects manufactured

in Liverpool which were designed for the export market, and were not available for sale in the city; and finally, imported objects from elsewhere in Britain or abroad, which were assimilated into the material culture of those living and working on the waterfront.

6.2 RECLAMATION AND SEA WALLS

6.2.1 The evidence from historical mapping suggests that land was reclaimed at Mann Island in two major phases, although this provides only a partial picture of the process of reclamation. Once development of this area began in the late 1730s, with the construction of the Dry Dock, a number of changes appear to have taken place in rapid succession, that were unmatched by the pace of map production. The known mapping of the docks in this part of Liverpool begins with Chadwick's production of 1725 (Fig 4), and continues with John Eyes' map (1765; Fig 5), followed by Perry's (1769; Fig 6), Charles Eyes' (1785; Fig 7), and Horwood's (1803; Fig 8). After this date, the rate of production increases, although, frequently the emphasis is placed upon the development of the town as a whole rather than just the waterfront. John Eyes' map of 1765 provides the most useful evidence concerning the positioning of the sea walls, but the most useful map showing the culmination of major dock developments at Mann Island is that by Gage in 1836 (Fig 9; compiled upon the completion of the alterations to the Dry Dock, which subsequently became known as Canning Dock), while the Ordnance Survey series, from 1850 (Fig 10), provides useful details of the buildings associated with the docks, and changes to them. By this date, however, many of the buildings were given over to businesses and warehousing rather than the earlier residential occupation which started in the 1750s.

6.2.2 The archaeological evidence from the excavations at Mann Island suggests three phases of reclamation, and implies a fourth, marked in turn by sea walls ***5707***, ***7638***, and ***7636***. A further sea wall, beyond the limit of the excavation, but within the LCL4 basin of the Liverpool Canal Link (OA North 2011b), enabled the construction of the Manchester Basin (Fig 25).

6.2.3 ***First Reclamation:*** the arrangement of the first phase of reclamation, with a north/south wall, ***5707*** (Fig 13), curving round to the east, is not marked on historical mapping, as this structure was constructed between 1740 and 1743 and therefore fell between the mapping sequences undertaken by Chadwick in 1725 and John Eyes in 1765 (*Section 3.2.6*). It was followed by the construction of the Dry Dock, the principal aim being to provide additional quay space (Ritchie-Noakes 1984, 27). It lay in the south-east corner of the excavation, 25.7m west of the Canning Dock wall. The sections of the wall revealed by the excavation were constructed of squared blocks of yellow sandstone, in regular coursing, without mortar, but with a smooth, almost ashlar, finish on the waterside. A distinct batter on the rear was achieved by stepping the blocks back from the vertical line with each course. The curve at its northern end suggests it continued in an easterly direction, parallel with the north wall of the Dry Dock, ***5270*** (Fig 12). Given the lack of any evidence for a western wall of the Dry Dock to the west of the modern-day Canning Dock, it is likely that the western wall of Canning Dock, created in the 1830s, coincided with the line of the earlier Dry Dock (*Section 3.2.2*).

6.2.4 ***Second Reclamation:*** the second phase of reclamation, where wall ***7638*** was built at an angle westwards from its junction with earlier wall ***5707***, before continuing on a north/south alignment beyond the limit of the excavation, is marked as such on maps by

John Eyes (1765; Fig 5), Perry (1769; Fig 6), and Charles Eyes (1785; Fig 7). It did not entirely replace the first wall, but was joined to it by a short section that was angled to cross the gap (Fig 13). This wall was not found to butt or be keyed into the existing section, and a series of tipped layers was recorded between the two, indicating the presence of a earthen ramp or slip, which was possibly also associated with a line of timber structures. The two lines of staggered, parallel walls (***5707*** and ***7638***) are shown on Eyes' 1765 map, with a gap between them depicted and this would appear to correspond to a slipway to afford access to the foreshore; it also tallies closely with the physical evidence. Excavation at the northern end of the site indicated that wall ***7638*** continued beyond the boundary of the excavation, dividing into two, with one element turning eastward and the other westward (Fig 18). Both turned beneath the present Mann Island Road and it is not clear where these walls terminated, although the wall that continued eastward may have formed the limit of an area known as Sea Bank (Ritchie-Noakes 1984). This is, indeed, intimated by the arrows shown on John Eyes' map of 1765, which may represent some kind of slope or banking to the north of the Graving Dock. The reclaimed land, subsequent to the second reclamation, comprised the Dry Dock, a Graving Dock, orientated north-west/south-east, extending from the north-western corner of the dock, and a narrow strip of new land between the Dry and Graving Docks and the sea, appropriately called Nova Scotia, upon which warehouses and housing had been established by the time of Eyes' map of 1765 (*Section 3.2.1*). The Graving Dock was converted in the early 1770s, to form a passage from the Dry Dock through to George's Dock, thus linking it with the rest of the established network (Ritchie-Noakes 1984, 27).

6.2.5 ***Third Reclamation:*** the third phase of reclamation is suggested by the construction of wall ***7636*** (Fig 13), to the west of wall ***7638***, which in part served as a slip, providing access to the river, and particularly to the graving bank located to the west of the earlier sea wall, but seemingly also defining an area of reclamation. A notable feature of wall ***7636***, which formed a slip, was that it turned to the west at its northern end (Fig 18), implying that there was an area of reclaimed ground to the north, beyond the limit of the Mann Island excavations, from which access to the slip itself was possible. Such an arrangement ought, in theory, to be clearly identifiable on any map, and its absence suggests that it was a development which occurred sometime in the 1770s, between the production of Perry's map (1769; Fig 6) and that by Charles Eyes (1785; Fig 7). It is possible that the construction of this wall was halted, never to be completed, because of the implementation of the construction of the Town Dock, or George's Dock as it later became known. Eyes' map of 1765 indicates the outline for the proposed dock and arrows adjacent to the modern location of George's Dock Passage suggest that the land there was already ramped as part of the reclamation process (Fig 5). With the approval of the Act enabling the construction of George's Dock (MDHB/MP/25,137), additional land was required to provide adequate quay space, which meant that the sea wall, presumably still under construction at that stage, was abandoned, and new sea walls were built further to the west. Pier Head was subsequently completed in 1771 and was designed specifically to form an outer enclosure around George's Dock (LCC 2005, 51). The archaeological evidence indicates that wall ***7636*** marked an intermediary episode of reclamation between the second and a later episode, and, given that the latter is depicted on the Eyes' map of 1785 (OA North 2011b), wall ***7636*** must reflect either a transient or incomplete section of sea wall. It is therefore a reasonable supposition that its replacement was related to the changes to the landscape brought about by the construction of George's Dock (also completed in 1771). As part of

this construction programme, the Graving Dock was converted in the early 1770s, to form a passage from the Dry Dock through to George's Dock, thus linking it with the rest of the established network (Ritchie-Noakes 1984, 27), and this turned Nova Scotia into an island connected only by bridges. The new sea wall was also contemporary with the initial work to construct the Manchester Basin, from the late 1770s (Moss and Stammers nd, 17), and it was perhaps acting as a point of access even after the graving bank had ceased to be in use.

6.2.6 The form of the stonework of wall ***7636*** appeared to be virtually identical to that of the second sea wall (***7638***), perhaps a direct consequence of the seemingly short period of time between the construction of each. Both walls, and indeed wall ***5707*** as well, were built of the same type of stone, a relatively soft sandstone (*op cit*, 37), that was a vivid chrome yellow when freshly broken, but weathered to a yellow-brown colour. The waterside face of each of the walls was evenly coursed, without mortar, and the stone was dressed in shallow angular flutings, while the rears of the walls were less regularly coursed and stepped from a wide base to a narrower coping.

6.2.7 ***Fourth Reclamation***: the new works to the west of George's Dock, forming Pier Head, became the limit of the fourth phase of reclamation, which lay behind a sea wall *c* 120m west of the edge of the Mann Island excavation, at the limit of what was known as the Old Quay (OA North 2011b). This wall, once established, allowed the construction of Manchester Basin, and was probably adapted several times during its existence, to take account of alterations to Manchester Dock in the period up to *c* 1815 (*Section 4.6.1*).

6.3 DOCK WALLS

6.3.1 The earliest dock wall revealed by the excavations was that of the Dry Dock, ***5270***, opened in 1740 (*Section 3.2.9*), a short section of which was extant at the southern limit of Area B (Fig 12). The wall was constructed from yellow sandstone, in regular courses, without mortar, as were all of the early structures (*Section 6.2*), apart from the Old Dock, which was constructed of red brick with a mortar bond (OA North 2010b); it is apparent, that this bond, combined with the weight of the sandstone, contributed to the structures stability without the need for mortar. At its east end, the start of a return to the south was uncovered, which would ultimately have turned into the east wall of the dock. Its projected alignment would place it east of the east wall of the present Canning Dock, which was modified from the Dry Dock, after work carried out by Jesse Hartley from 1826, and was opened in 1829 (Ritchie-Noakes 1984, 41). Further large sections of sandstone, associated with the swing bridge at the southern entrance to George's Dock Passage, were also identified, but these were large and built of the pink sandstone associated with the alteration to create Canning Dock, and the subsequent addition of a bridge to allow rolling stock from the dockside railway across to the Mann Island and Nova Scotia warehouses and transit sheds (MDHB/G50/WUP).

6.3.2 A section of walling, ***7248***, was identified in Area C (Fig 18), which was clearly the west wall of George's Dock Passage, constructed in the 1770s to provide access from the Dry Dock to George's Dock, which itself was opened in 1771 (Ritchie-Noakes 1984, 27). The wall was constructed of yellow sandstone, with a later, pink sandstone repair to some of the upper courses. A small section of the east wall of the passage was revealed in the south-west corner of Area B, where it had been modified and rebuilt in pink sandstone to accommodate a footbridge (Fig 12). Its position indicated that it post-dated the

construction of Canning Dock, which replaced the Dry Dock. George's Dock was closed in 1900, and partly backfilled (*op cit*, 28), the 'Three Graces', the Port of Liverpool Building, the Cunard Building, and the Royal Liver Building, constructed over the period 1903–16, now occupying the site of the dock (Sharples 2004, 67). More than half of George's Dock Passage was backfilled at the same time, leaving a short section extant, that still opens off the northern end of Canning Dock.

6.3.3 The most recent dock walls exposed by the excavation formed the east and north quays of Manchester Dock (Fig 3). The dock was exposed almost in its entirety during construction work at Mann Island, with the western limits, including gates, being excavated by the National Museums Liverpool on the site of the new Museum of Liverpool (MoL forthcoming) and additional sections being excavated in bays LCL3 and LCL4 of the new Liverpool Canal Link (OA North 2011b; Fig 25). The precise date of the construction of Manchester Dock is not known; however, it first appears as the Manchester Bay (or Basin) on the Charles Eyes' map of 1785, and a sister structure, in the form of the Chester Basin, was constructed to the north of it in 1795 (Anon 1795). The final major development took place in *c* 1815, when the late eighteenth-century Manchester Basin was modified by narrowing its entrance, to accommodate the installation of twin-leaf lock gates, that are shown on historical mapping (Ritchie-Noakes 1984, 35). The walls were constructed with a waterside face of the harder pink sandstone, in ashlar finish, and an irregular bond, behind which were both pink and yellow sandstone. Access ladders were situated in bays recessed into the walls on both the northern and eastern sides, and the reverse side was stepped out towards its base, providing a more substantial foundation, situated upon a series of vertical timber piles (Plate 18). The Manchester Dock was in use for 145 years, and during this time was subject to at least two major phases of alteration, thus prolonging its life. Following its conversion to a gated dock, further alterations related to the advent of the railway on Merseyside, as its eastern retaining wall was adapted to accept three timber piers, sheltered by overhanging transit sheds (*Section 4.7.3*). These projected from the eastern side of the dock on an east/west orientation and were held in place by massive stone counterweights located on the eastern face of the wall.

6.3.4 In contrast to the massive enterprises of sea wall and dock construction by the Common Council, a more modest, probably private, commercial development was revealed by the excavation, in the form of Bird's Slip (*Section 3.2.12*). While no supporting documentary evidence has been identified concerning it, aside from the fact that its presence is recorded on the Perry map of 1769 (Fig 6), and by several entries in Gore's *Directory* (Gore 1766), the weight of other evidence points to the involvement of Joseph Bird in its construction, given its name, the naming of a street north of Dry Dock (*Section 3.2.10*), the involvement of Joseph Bird in the committee formed to oversee the construction of Dry Dock, the fact that he was Bailiff in 1736 and Mayor in 1748, that he was the first Superintendent of the Dry Dock, and was one of the most successful slave traders of the period (Ritchie-Noakes 1984). These all suggest his involvement in the commercial development of this area. Whether the structure was commissioned by Bird, or simply named after him for his extensive involvement in trade and mercantile endeavour in that area, is unclear. George Mann, one of the first registered inhabitants of the area which became known as Mann Island or Mann's Island (MDHB/MP/25, 56), also seems to have been afforded the same honour.

6.4 WAREHOUSING ACROSS NOVA SCOTIA AND MANN ISLAND

6.4.1 A considerable variety of buildings was revealed by the excavation. In Areas A and C, domestic dwellings and trade premises, including workshops, pubs, boathouses, warehouses and coal and timber yards formed the area known as Nova Scotia (Figs 21 and 22; *Section 4.6.3*), while in Area B, the remains of part of the Dock Police Office, Weighing Machine and Foreman Sweeper's Office were excavated (Fig 12), along with a substantial proportion of the below-ground workings associated with the Pumping and Ventilation Station for the Mersey Railway tunnel, overlying earlier warehousing (*Sections 4.7* and *4.8*).

6.4.2 While the function of some of the buildings on Nova Scotia can be tracked on the historical mapping, and using the corresponding entries in the various editions of Gore's *Directory*, this does not identify them all, and does not reveal either the history of their construction or its character. Papers relating to the later activities on Mann Island exist as part of the Mersey Docks and Harbour Board archive (MDHB/2211/M38) and this provides a sporadic but frequently indepth record of occupants of each dwelling, including those who actually lived in warehouses and cellars, as well as the modifications, repairs and modernisation that were carried out within these premises, and the rents the occupants paid. The excavations were able to show phases of construction, and changes in the choice of building materials, principally the move from sandstone to hand-made red brick, and latterly that from red brick to iron, steel and concrete.

6.4.3 In Area C, at the northern end of Nova Scotia, between Mann Island and Irwell Place, the excavated remains consisted of the cellars of a group of warehouses, public houses, and offices, dating from the late eighteenth century (Plate 9: Fig 21; *Section 4.6.3*). Area A, south of Irwell Place, contained the remains of cellars for buildings used for similar purposes (Fig 22; *Section 4.6.11*), while further south, beyond Murray Place (Fig 13), there was a group of cellars associated with a line of buildings that were probably constructed at the very end of the eighteenth century, and which did not persist through to the modern period (*Section 4.7.4*). Some, at least, of these cellars appeared to have been used as domestic accommodation; however, the buildings above them were demolished and replaced in the 1830s (Gage 1836 (Fig 9); OS 1850 (Fig 10)). The whole area of Nova Scotia was redeveloped in the 1920s and 1930s, when all of the buildings were demolished, and a new transit shed, serving Canning and Manchester Docks, was erected, along with a garage for an automotive business at the north end of the site (Fig 23; *Section 4.9*).

6.4.4 The earliest remains of buildings in Nova Scotia were executed in yellow sandstone, and were few and dispersed, having been largely destroyed by later foundations and by the mid-late nineteenth-century introduction of subterranean culverts and drainage. Their positions appeared to correspond to what is represented on eighteenth-century historical mapping, and Horwood's map of 1803 (Fig 8). The majority of the remains were constructed from red, hand-made brick, and, in one case, the gable end of a building was in a different position from that shown on the earlier mapping. Taken together, this suggests that the majority of the remains revealed by the excavations were of buildings constructed in the early nineteenth century, with the deposits beneath them dating from the 1740s onwards.

6.4.5 On the east side of George's Dock Passage, in Area B, a few short lengths of walling were revealed (Fig 12), which may have formed part of the cellars for the warehouses that

occupied this site before it was redeveloped in the 1830s (*Section 4.6.15*). The surviving lengths were too short to be certain of the layout of the spaces they once enclosed, and no flooring associated with them was identified, as the majority of the surfaces in this area had been heavily disturbed.

6.4.6 The historical mapping (Fig 8), and some photographic evidence, shows the uses to which these buildings were put. There were, however, few artefacts, apart from some wine bottles and wine glasses recovered from the cellars, that could potentially elucidate their function. Some cellars on the western side of the Dock Passage had been stacked with bricks, suggesting a planned modification rather than gradual redundancy and disuse. This is further supported by the overall evidence from the Mersey Docks and Harbour Board record (MDHB/2211), which shows a meticulous level of control being exercised over the properties situated within this valuable piece of waterfront real estate. The records do not suggest that the buildings in this area were well maintained and numerous entries make mention of the fact that this was a particularly antiquated and squalid area of the waterfront (*eg* Gore 1766; presumably in comparison to the more modern warehouses and dock accommodation to the north of Princes Dock); however, every application to sub-divide or sub-let warehouse space seems to have been carefully recorded, along with all the maintenance work, or lack thereof, which took place in the area. It is possible, therefore, that a relatively high standard of tidiness was effected at the end of the lifetime of the cellars. The exceptions were those south of Murray Place, which were probably redundant by the early nineteenth century, when the site was redeveloped (*Section 4.7.4*). These appear to have been roughly backfilled, while a certain amount of domestic refuse remained on the floor.

6.5 OTHER BUILDINGS

6.5.1 The area east of George's Dock Passage was cleared in the 1830s and the site was used for the Dock Police and Harbour Surveyor's Offices. An engraving of the elevation depicts an imposing building, of some architectural pretension (MDHB/JH/117). Original plans lodged at the Maritime Archive suggest that this structure was originally designed by Jesse Hartley, and the plans were then copied and reissued by George Lyster (*ibid*). The structure itself comprised a large sandstone facade, two storeys high, and with a substantial cellar complex. All the elevations have five large, equally spaced bays, with the principal south-facing elevation being distinguished by a wrought-iron balustrade around the central bay on the first floor, and a set of stone steps marking the principal entrance. The excavations revealed a small section of the south side of the basement of this building, that roughly coincided with the stepped entrance; it was constructed in pink sandstone, in a fine finish. It was associated with another structure, forming an elongated octagon (Fig 12), which was known as the Foreman Sweeper's Office, although the exact function of this building is unclear, it being poorly documented (*Section 4.7.1*). It is known that the office was also used as a base by the Dock Police, and was associated with the maintenance of the Weighing Machine. No additional evidence was recovered from the excavation to explain its use or history, although it survived as a well-constructed basement with hexagonal pink sandstone columns, suggesting that it had been built to the same exacting standards and at a similar time as the Dock Police and Harbour Surveyor's offices.

6.5.2 The tunnel under the Mersey for the Mersey Railway was constructed in 1881-6 (*Section 4.8.1*). A steam-powered pumping and ventilation station was established at each end of the

tunnel to keep it clear of water and provide a supply of fresh air, by creating a convection current to draw out the smog and smoke produced by the steam trains as they hauled carriages up and down the 1:27 gradient beneath the river. The Liverpool pumping and ventilation station was within Area B, and its intrusive subterranean workings effectively obliterated the earlier remains relating to Bird Street, Bird Alley and the dwellings around the north quay of the Dry Dock (Fig 12). Sporadic sections of roughly hewn yellow sandstone wall were identified to the west of the ventilation station; however, these were too fragmentary to be associated with any particular structure from before 1880. The remains of the Pumping and Ventilation station consisted of the pits to accommodate the 'Guibal' fans, designed to create a sufficient vacuum to draw fresh air into the tunnel (Maund 2002, 6–8 and 15; Jones 2006, 132). The excavation also revealed parts of other structures that were clearly associated with the Pumping and Ventilation Station, which were marked on the Ordnance Survey Town Plan of 1891; these included the perimeter of the brick sheds which protected these workings. Later development of the site, following the replacement of the station in the 1930s, had disturbed some of the remains, however, and it was not possible to identify the purpose of these structures from the evidence available (*Section 4.9.7*).

6.5.3 Following the clearance of the buildings occupying Nova Scotia in the early 1920s, two transit sheds were constructed on the site, to serve Canning and Manchester Docks, of which that for Canning Dock survived until the outset of the development and was subject to a building survey (*Section 4.9.7;* OA North 2007; Fig 23). These structures effectively encompassed the whole area previously known as Nova Scotia, although Irwell Street survived as the access road to the west. The excavation in Area A revealed the concrete footings of columns supporting the Canning Dock transit shed roof. North of the transit shed was the site of the Voss Garage in Area C, which was also surveyed before demolition (OA North 2007; *Section 4.9.7*; Plate 22). The excavation uncovered the sites of below-ground storage tanks associated with this building, and also some of its concrete footings.

6.5.4 Some structural remains, probably associated with the National Sea Training School, the most recent building on the site at the time of the excavations, were revealed in Area B (*Section 4.10.2*). The substantial concrete footings cut through and overlay a number of early nineteenth-century features.

6.6 RESEARCH AIMS

6.6.1 Four research aims were outlined in the assessment report (OA North 2010a; *Section 2.3*); each of these, and their accompanying objectives, has been addressed in this programme of analysis. The first aim was directed at the changing environment of the Mersey, with the intention of detecting changes in vegetation and shoreline during the course of land reclamation and dock development. Achievement of this aim is principally dependent on the availability of palaeoenvironmental samples of the requisite quality from appropriate locations. The stratigraphic analysis has shown that there were no deposits of the original, pre-reclamation foreshore, revealed by the excavation which had the capacity to sustain this type of investigation. However, some understanding of how the foreshore has changed has been established from the historical studies and from the archaeological examination of the reclaimed land, which have provided some insight into the modifications and use of the foreshore.

6.6.2 The second aim was to chart the post-medieval development of the layout and character of the site. The phased account of the results from the excavations (*Section 4*), incorporating key data from the analysis of the finds, together with research on historical documents, has been able to demonstrate the steady reclamation of land from the river during the mid-eighteenth and early nineteenth centuries, and the establishment of facilities for shipping, including the construction of Dry Dock and Manchester Dock, and access from within the dock system to George's Dock. Sequences of different buildings were revealed on Nova Scotia, between Canning Dock and Manchester Dock, and north-east of Canning Dock.

6.6.3 Another aim was focused on the evidence for the development of trade and industry in post-medieval Liverpool, and its associated infrastructure. Two main categories of evidence are relevant here: the structural evidence of the various buildings excavated at Nova Scotia and north of Canning Dock; and the results from the analysis of the pottery (*Section 5.2*), glass (*Section 5.6*), and clay pipes (*Section 5.4*).

6.6.4 Two principal areas of buildings were revealed by the excavations. One, north-east of Canning Dock, was shown to preserve the vestigial remains of eighteenth-century warehousing (*Section 4.4.5*), which was superseded by the Dock Police Office in the 1830s (*Section 4.7.1*). The southern end of this site was occupied by the pits for the fans of the late nineteenth-century Pumping and Ventilation Station for the Mersey Railway tunnel (*Section 4.8.1*), and the concrete footings of twentieth-century structures (*Section 4.9.6*). The other area lay west of Canning Dock, and was known from the second half of the eighteenth century as Nova Scotia. Within this area, there were three separate blocks of buildings, divided by east/west streets. The remains of the northern block possibly included some eighteenth-century sandstone footings, and even a section of wall (*Sections 4.4.6*), but otherwise consisted of early nineteenth-century brick-built cellars (*Section 4.6.3*), backfilled in the early twentieth century, and overlain by brick and concrete structures associated with an automotive business (*Section 4.9.9*). The cellars all belonged to public houses, warehouses, and offices identified on mid-nineteenth-century mapping and historical photographs. The middle block preserved some late eighteenth-century sandstone footings for warehouses (*Sections 4.6.10*), but principally consisted of cellars constructed in brick, for buildings which could also be identified from historical mapping and photographs, as public houses, warehouses and offices (*Section 4.6.8*). The site was cleared in the early twentieth century, and a transit shed constructed, which was still standing at the start of the archaeological investigations (*Section 4.9.7*). The third, southern, block appeared to date from the very end of the eighteenth century, and consisted of brick-built cellars, some of which had probably served as domestic accommodation (*Section 4.4.6*). Historical mapping showed that these were replaced by warehouses in the early nineteenth century (*Section 4.6.4*). No archaeological remains of these were found, but some of the concrete foundations for the early twentieth-century transit sheds were recorded (*Section 4.9.6*).

6.6.5 It is of interest that the finds from Mann Island, and especially the pottery, closely reflect those seen on other excavations in the immediate area, including the Liverpool Canal Link sites. All seem to include a mix of domestic waste, possibly midden dumps cleared and brought to the sites as backfill, rather than piecemeal deposition by individual households. It is undoubtedly mixed with small dumps of material representing production or processing waste, especially glass, pottery and clay tobacco pipe. The amounts of creamwares and other refined earthenwares dumped at any one time do not seem to reflect

the disposal of kiln waste *per se*, which would presumably have accumulated in considerable quantities, and probably would have been dumped at the production site. Rather, deposits of small numbers of plates or dishes might represent the disposal of breakages in consignments intended for cargo. The presence at both Mann Island and the Liverpool Canal Link of significant numbers of dark olive green bottles, all of similar sizes and manufacture, might suggest the same level of disposal. Finds in other materials are not well represented at either site, although Mann Island has more metalwork, much of it structural, presumably deriving from buildings.

6.6.6 The possibility that these assemblages might, in part, reflect the accumulation of material intended for export is of considerable significance in considering Liverpool's maritime past. There is no doubt that Liverpool was exporting tin-glazed pottery and tiles to America from the early eighteenth century (Hyland 2005, 5; Noel Hume 1969, 288). Tin-glazed wares are present, although no evidence for the production of either was seen in the Mann Island assemblage. The industry is, however, well-attested (Hyland 2005, 5) and tin-glazed wasters and associated saggars were recovered from Chevasse Park (OA North 2010b). Porcelain was also made in considerable quantities in the late eighteenth century, up to *c* 1800, when Liverpool producers lost market to the Staffordshire producers, and the continuing improvements in refined white earthenwares, which, produced on an industrial scale, were considerably cheaper (Hyland 2005, 7). Liverpool porcelain was present in both assemblages, although the lack of biscuit-fired wasters in the Mann Island assemblage might reflect a slightly later date for the build-up of dumped material. The close, almost symbiotic, link between the great Staffordshire pottery producers, especially Wedgewood, and printers in Liverpool is well known from the mid-eighteenth century (Hyland 2005, 11), and probably helped to foster Liverpool's own earthenware pottery industry, seemingly leading directly to the establishment of the Herculaneum pottery in 1796 (*op cit*, 22), products of which made up a significant part of the Mann Island assemblage. Many of the factory workers were recruited from Staffordshire (*op cit*, 29). Indeed, both Liverpool and Staffordshire products crossed the Atlantic in vast amounts during the late eighteenth and nineteenth centuries, all being known, on arrival in America, as Liverpool Wares, from their mutual port of origin (*op cit*, 9).

6.6.7 Liverpool was of necessity reliant on imported white-firing clays, coming mainly from the West Country (*op cit*, 20), for the production of porcelain and refined earthenwares. It is no accident that the great pottery production site at Herculaneum was situated by the riverside and had its own waterfront, allowing imported clay to be unloaded directly onto the quayside for weathering (*ibid*). The kilns were fuelled with coal from the South Lancashire coalfields, brought by canal from St Helens (Hyland 2005, 20). At the Herculaneum pottery, built on the site of a former copper-smelting business, a supplementary income came from selling on copper slags left on the site, either as road metalling, or as ship's ballast (*op cit*).

6.6.8 Although finewares and refined earthenwares are the most obvious pottery exports, red-bodied coarsewares, common in the Mann Island and the Liverpool Canal Link assemblages, also passed through the port, coming from a number of local producers, including the Buckley kilns; these are found in significant quantities on many early American sites (Noel Hume 1969, 132). Coarsewares from Rainford and Prescot probably followed the same route, and, certainly in later years, the link between the Liverpool fineware producers and the coarseware manufacturers of its industrial hinterland were so

close as to be indivisible, with factories in the two places owned by the same people, and probably using the same canal systems to bring robust coarsewares to the city.

6.6.9 A significant export market is indicated by the recovery of sugar moulds from the excavations. Raw sugar was imported from the West Indies and refined in Liverpool from the late seventeenth century (Hyde 1971, 27), and during the period 1785–1810, the trade expanded from 16,600 tons annually to 46,000 tons (*op cit*, 26). Refineries were established close to the dockside, and the moulds were used for preparing the refined sugar for onward trade, both inland and for export. The inland traffic was particularly focused on Duke's Dock, opened in 1773 (Ritchie-Noakes 1984, 32), which lies a short distance to the south; this is now closed and partly filled in (*ibid*).

6.6.10 The dumps of clay pipes found in both the Liverpool Canal Link excavations (OA North 2011a; Fig 25), to the south of Mann Island, and that on the Mann Island site itself (***5247***; Fig 24), is strongly suggestive of a thriving local industry, and clay pipe workshops are known along Strand Street, immediately adjacent to the docks (D Higgins *pers comm*). The raw material, pipe clay, had to be imported, with sources in the south and south-west of England, in Devon, the Isle of Wight and Poole (D Higgins *pers comm*). Evidence from the excavations on the site of the Liverpool Canal Link showed that the clay pipe kilns were coal-fired (OA North 2011a) and, by the late eighteenth century, canal networks for the transport of this commodity were well established, with the Duke of Bridgewater's canal from his colliery at Worsley, near Manchester, to Runcorn (opened in 1773; Ransom 1984, 36–7), and the Sankey Brook Navigation from St Helens to the Mersey, which was completed in 1757 (*op cit*, 36).

6.6.11 The rise of consumerism is also clear from the detail recovered from the clay pipe assemblage (*Section 5.4*). While fragile, and regularly replaced, the pipes also changed rapidly in design and decoration. Users do not appear to have wished to replace like for like, but rather to possess and display the latest fashion. There was also a developing range in terms of quality, which will have served a similar social purpose.

6.6.12 The final research aim addressed the development of engineering techniques and operational methodologies in the Liverpool dock system. The excavations encountered three different sea walls constructed over a period of less than 40 years, each reclaiming further land to the west, along with the remains of two separate docks, and a linking passageway. Although the land was reclaimed westwards and northwards, the chronology of the extant structures does not follow this sequence exactly, because of rebuilding programmes.

6.6.13 No alteration in the construction techniques applied to the sea walls was discernible, with each using similar squared yellow sandstone blocks, regularly coursed, without mortar, on the waterside face, with a more irregular, rubble construction to landward. The walling of George's Dock Passage and Dry Dock was found to be similar. Later constructions utilised pink sandstone, apparent in the regularly coursed, waterside work of Manchester Dock, and the modifications associated with the footbridge across the southern end of George's Dock Passage (*Section 4.4.7*). The yellow sandstone did not fall out of use completely, as it was found incorporated within the wall of Manchester Dock, but only as backing material. This preference is thought to have been dictated by the superior durability of the pink sandstone (Ritchie-Noakes 1984, 37). Canning Dock, dating from 1826–9 (*Section 4.3.3*), and still operational, is provided with walls in pink sandstone.

6.6.14 Most of the land reclamation and dock development at Pier Head was undertaken by the Corporation (Ritchie-Noakes 1984), and the excavations revealed some of the changes which had occurred in construction technique and materials over the course of *c* 70 years, between the commissioning of Dry Dock (1738), and the completion of Manchester Dock as a gated, wet dock (*c*1815). The most obvious change is that pink sandstone became the material of choice for the wall facing, in preference to the yellow sandstone, and that the development of an hydraulic mortar meant that walls were no longer wholly reliant on precise coursing and shaping of stonework for their waterside strength and durability. While mortar was not apparent in the eighteenth-century sea walls, excavation of the construction face of the early nineteenth-century wall of Manchester Dock revealed a sandy lime mortar. The use of mortar and grouting was to be developed to a peak of effectiveness under the tenure (1824–60) of the dock engineer, Jesse Hartley (Jarvis 1996, 59).

6.6.15 The results of the excavations provide a degree of insight into the operation of the docks. The warehouses, public houses, packet offices, and transit sheds on the quaysides of Manchester and Canning Docks, were part of larger complexes shown on historical mapping. The cellars of these buildings were revealed, with evidence, in some of them, for their use as domestic accommodation. There was no certain evidence for what goods passed through the warehouses, however, or for the means or manner in which their internal space was organised, but the historical maps and photographs show that there was a mixed and varied economy in this part of the docks. The buildings served the needs of merchants, sailors and travellers; goods were traded and ships were supplied; sailors were fed and accommodated; and those wishing to cross the Irish Sea, to Ireland or the Isle of Man, could secure their passage.

6.7 CONCLUSIONS

6.7.1 The archaeological evaluation, excavations and watching briefs at Mann Island have been able to provide firm evidence for the sequence of development of the docks in this part of Liverpool. The standing remains have been securely linked to the historical mapping, and the artefacts in the deposits around them have been dated, where possible, with the relationship between these and the structures being rationalised. The physical evidence for techniques of construction and land reclamation has been recorded, for a crucial stage in their development, during the second half of the eighteenth century and the beginning of the nineteenth. The analysis of the artefacts has both confirmed existing evidence, and revealed new, tangible evidence for trade. It has also provided insight into the dramatic scale of production, and has been linked to the development of additional transport infrastructure in the North West.

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APPENDIX 1: POTTERY FABRICS

A1.1 INTRODUCTION

A1.1.1 In order to provide a basic record of the pottery assemblage, the material was divided into broad fabric groups and, within those, it was quantified by fragment count and weight. In addition, the entire group was recorded by digital photography.

A1.2 AGATE WARES

A1.2.1 These have a distinctive streaky fabric formed by mixing two differently coloured clays to achieve a marbled effect, and then turning the vessel to reveal the marbled surface (Barker and Halfpenny 1990, 31). A colourless glaze deepens and enhances the colours, suggesting polished agate, hence the name. These were made almost exclusively in Staffordshire during the eighteenth century, being popular through the 1750s, and continuing in production until (probably) the 1770s (*ibid*).

A1.3 BLACK-GLAZED REDWARES

A1.3.1 Made from the local red-firing coal-measure clays, these wares are difficult to assign to a particular source. There is, however, much similarity between the fabrics seen in this group and those of the Prescot kilns (Philpott 1989, especially Fabric 6), known to have been major suppliers of blackwares to Liverpool in the eighteenth century (Davey 1991, 135). This fabric group shows a very restricted range of forms, being dominated by only two vessel-types: large storage vessels with horizontal lug handles similar to those seen at Prescot (Philpott 1989, figs 10.7.5, 10.8.10, 10.8.16) and from excavations in South Castle Street, Liverpool (Davey and McNeil 1985); and large pancheons and/or bowls, again comparable to those from Prescot (Philpott 1989, fig 10.11.29) and the South Castle Street excavations.

A1.4 BROWN STONEWARE

A1.4.1 Brown stonewares were made in England from the seventeenth century, mainly by John Dwight at Fulham (Cotter 2000, 246). Nottingham salt-glazed stonewares, identified by the characteristic presence of a thin white or grey line between fabric and glaze (Jennings 1981, 219–21), were produced from the late seventeenth century into the nineteenth, and a parallel industry in Derbyshire remained in production into the late twentieth century. Other brown stonewares were widely produced, and include a wide range of utilitarian wares (Oswald *et al* 1982).

A1.5 CHINESE AND ENGLISH PORCELAINS

A1.5.1 Chinese hard-paste porcelain began to enter the European market in the later sixteenth century, and was known in England from 1596 (Allan 1984, 105–9). It became increasingly common during the seventeenth century, and, imported in huge quantities by the East India Company as an adjunct to the tea trade, it dominated the fine pottery

market during most of the eighteenth century. The development of English-made substitutes, however, brought an end to the trade, and the East India Company ceased importing it in 1791 (Hildyard 2005, 123).

A1.5.2 Despite many attempts, porcelain was not produced in England until the 1740s (Godden 1974, 13). By the mid-eighteenth century, Liverpool was a major producer, with several factories documented (*op cit*, 262–4). The assemblage from Mann Island was fragmentary, but comprised a range of teawares, and, importantly, a few biscuit-fired vessels, which are a clear indication of the production of soft-paste porcelain in the locality. No attempt was made to identify the products of various Liverpool producers.

A1.6 CREAMWARE

A1.6.1 This was also known as Queensware. A fine cream-coloured earthenware with a transparent colourless lead glaze, this was introduced *c* 1740. Within 20 years, it had almost entirely replaced tin-glazed wares and white salt-glazed stonewares as the good-quality tableware in general use (Cotter 2000, 253). Although originally a Staffordshire product, it was widely imitated, and Liverpool was a noted production centre (Draper 1984, 47) and also decorated Staffordshire products. A range of teawares, dinner wares (including shell-edged plates and tureens), and bedroom wares was present in the assemblage.

A1.7 INDUSTRIAL SLIPWARES

A1.7.1 Industrial Slipwares comprise a number of widely made slip-decorated white earthenwares, amongst them banded and marbled wares, Terra Tersia, and Mocha ware. They were made from the late eighteenth century, being particularly popular *c* 1790–1810 (Hildyard 2005, 173). Although they remained in production well into the nineteenth century, quality declined considerably in the later products.

A1.8 MOTTLED WARES

A1.8.1 These are characterised by a distinctive mottled glaze and were produced from the late seventeenth century at a number of production sites in Staffordshire, where they were in production between 1680 and 1750 (Kelly and Greaves 1974). Evidence suggests that they were made locally at Prescot (McNeil 1989; Davey 1991, 135), and Buckley, in Clwyd, where they have been assigned to the period 1690–1720 (Amery and Davey 1979). It is likely that production continued into the late eighteenth century, as excavations at the Greatbatch pottery site in Fenton have produced finds dated between 1765 and 1775, and probably from as late as 1782 (Barker 1984).

A1.9 PEARLWARE

A1.9.1 This fabric is essentially a variation on Creamware, the blue-tinged glaze being an attempt to create a whiter-seeming fabric. It was produced from 1779 (Draper 1984, 51) into the nineteenth century. Widely produced, it was often under-glaze transfer-printed, and, again, much of the Staffordshire production was sent to Liverpool for decoration

(Hildyard 2005, 100). The range of forms present is similar to that of Creamwares (see *Section A1.6*).

A1.10 RED STONEWARE

A1.10.1 Although known in the late seventeenth century, when the Elers brothers were producing high-quality vessels (Hildyard 2005, 31), red stonewares seem to have gone out of production in 1698 (Poole 1995, 38), only re-emerging in the mid-eighteenth century (Barker and Halfpenny 1990, 44), and continuing in production into the nineteenth century (Poole 1995, 68).

A1.11 SELF-GLAZED REDWARES

A1.11.1 These are in essence identical to black-glazed redwares, but with a colourless glaze which does not obscure the original colour of the fabric. The composition of the fabric seems identical to that of the black-glazed redwares, and it seems likely that they derive from the same sources.

A1.12 SUGAR WARES

A1.12.1 These are represented by two quite different types, the use of which is discussed in detail by Brooks (1983). Sugar-loaf moulds are unglazed redwares, with a characteristically smoothed interior and a distinctive aperture at their base (*ibid*). Again, the fabric is very similar to those seen at Prescot, where sugar-loaf moulds are known to have been produced, and it is quite likely that they were also made in Liverpool. Syrup-collecting jars are wide-shouldered vessels with a distinctive narrow rim. The rim and upper part of the interior are black-glazed, but apart from occasional splashes, the exterior is unglazed.

A1.13 TIN-GLAZED (DELFT) WARES

A1.13.1 The production of tin-glazed wares in England is thought to have begun in London in 1567, at the hands of Dutch émigrés (Honey 1969, 33). The industry expanded during the seventeenth century, with Bristol becoming a major producer not later than 1669 (*op cit*), and by the early eighteenth century (*c* 1710), Liverpool had also become a large-scale producer, with much of its output destined for the American market (Mankowitz and Haggar 1968, 68). Production in Liverpool had come to an end by the 1780s (Hildyard 2005, 100).

A1.14 WHITE EARTHENWARE

A1.14.1 True white earthenwares were perfected in *c* 1810, from which time they rapidly replaced both Creamwares and Pearlwares. Again, although Staffordshire was the major producer, Liverpool was a leading manufacturer and continued to decorate the products of other producers. Much of the Liverpool output was destined for export to the USA (Coysh and Henrywood 1982).

A1.15 WHITE SALT-GLAZED STONEWARE

A1.15.1 White salt-glazed stoneware was made in London in the late seventeenth century (Draper 1984, 36), but it was not until the 1720s that Staffordshire began production on a commercial scale (Jennings 1981, 222), achieving a hey-day of popularity *c* 1745–65 (Hildyard 2005, 49). Production was not entirely confined to Staffordshire, and white salt-glazed stonewares were produced in Liverpool and Prescot in South Lancashire (Oswald *et al* 1982).

APPENDIX 2: CLAY PIPE CATALOGUE

The context summary gives details of the Context (Cxt), Area, 'object number' (ORN) and provisional Phase (Ph) for each group. This is followed by the numbers of bowl (B), stem (S) and mouthpiece (M) fragments recovered from each context, together with two date ranges. The first (Range) gives the maximum overall range of the pipe fragment present in each group, while the second (Deposit) gives the likely date of deposition, based on the latest datable pipe evidence present in the group. Note that some contexts are split between more than one 'object number' (ORN) and that the large kiln group (***5747***) is not shown in this table.
NB: RHS = Right-Hand Side; LHS = Left-Hand Side

Cxt	AREA	ORN	Ph	B	S	M	Tot	Range	Deposit	Marks	Decoration	Comments
2829	A	12043	6/7		3		**3**	1700-1820	1700-1820		Dutch roll stamped stem x 1; burnished stem x 1	This is an interesting group, even though it only contains three stems, all of which probably date from somewhere between 1700 and 1820. One stem is typically English but the other two are probably Dutch and from different pipes. Both of these pieces are quite narrow straight stems with stem bores of 5/64". One piece is certainly Dutch since it has a typical scheme of 'ring of pearls' decoration flanking four serrated bands (Higgins nd). This stem is not burnished and appears to have extremely fine black particles visible under magnification in the broken fabric. The other stem is not marked but it is thin, perfectly straight and has a good burnish. These characteristics all suggest it might be Dutch rather than English. The fabric is fine and without any visible black inclusions and so it must have come from a second pipe. Dutch pipes were never common in the North West and these pieces are likely to represent individual items carried on a ship rather than traded goods intended for sale in the region.
5068	A	12050	5		1		**1**	1760-1820	1760-1820			A long (103mm) stem fragment, fairly thin and with a curve, but with a large stem bore (6/64"). There is an unusual, sharply rectangular void in the fabric where some sort of inclusion has been.
5082	A	11900	6/7		7	2	**9**	1660-1900	1850-1900		pale green glaze x 1; pale brown glaze x 1; nipple mouthpiece x 1	Mixed stems with one large piece of residual late seventeenth-century stem (local fabric; burnished). There is one stem with a splash of pale green glaze on and a curt mouthpiece with pale brown glaze. The latest piece is a nipple mouthpiece from a cutty pipe of *c*1850-1900.

5084		11876	4		3		**3**	1610-1850	1770-1850		pale green glaze x 1	Two joining fragments (freshly broken) of a seventeenth-century stem made of a coarse local fabric (not burnished) and a stem of *c*1770-1850 with pale green glaze on it.
5102		12040	4		1		**1**	1750-1850	1750-1850			
5102		12042	4		2		**2**	1700-1900	1760-1900			
5116	A	11841 and 11849	5	5	13 2	14	**151**	1760-1910	1850-60	JONES / LIVERPOOL and stars x 1; McDOUGALL / GLASGOW x 1; W. SOUTHORN & Co / BROSLY 1 SALOP x 1; …Co / …18 x 1	Flutes and POWF x 2; beehive x 1; beaded border x 1; flat stem x 1; glazed tips x 12; glazed stems x 16	A large group with many burnt fragments but few bowls. One tip has a dull purplish brown glaze but 11 others and 15 stem fragments have a lemon green glaze on them. One stem with burnt glaze has part of a Southorn mark from Broseley, and a full Southorn mark survives on another stem (both later than *c*1850; Higgins 1987). There is a McDougall stem from Glasgow (post-1846) and an unusual decorated bowl marked JONES/LIVERPOOL in upright lettering on the RHS (LHS missing). This can be attributed to John Jones of Liverpool (father and son), who were working on their own account from *c*1837-57 (Higgins nd). There is part of a second bowl from the same mould; part of a bowl with beehive decoration, and a flat stem with diamond section. The group as a whole probably dates from the 1850s.
5117	A	11861	6/ 7		3		**3**	1700-1900	1850-1900	??GARIBALDI / ….. X 1		Three stems of mixed date, the latest being from a cutty pipe of *c*1850-1900 with a moulded mark on the sides of the stem. This comprises incuse-moulded lettering within a relief-moulded beaded border with pointed ends, but the mark has either worn almost completely smooth or has been deleted from the mould. Very faint shadows suggest the first side may have read GARIBALDI, a popular pattern name for pipes following the rise to popularity of the Italian General of that name (Higgins nd). Stem bore 5/64".

5117		11888	6/7		5		**5**	1760-1910	1780-1910		pale green glaze x 2	
5117	A	11905	6/7		1		**1**	1610-1720	1610-1720			
5118		11846 and 11906	5	1	4		**5**	1680-1900	1850-1900	LONDON / LONDON	shaped mouthpiece x 1	The four stems include one residual fragment but are otherwise of late eighteenth- or nineteenth-century types. One of them is flattened at one end where a mouthpiece is starting - this would have come from a short-stemmed cutty pipe and would probably have had a nipple end. The bowl is an almost complete spurless style with thick walls. It has a good form and is neatly finished. On the stem sides is the incuse-moulded sans-serif lettering LONDON / LONDON, within a relief-moulded beaded border with loop ends. It is possible that LONDON represents the pattern name for this particular pipe, rather than necessarily being its place of origin. Stem bore 5/64".
5122	A	11892	6/7		2		**2**	1660-1780	1720-80		Chester-style border and twist x 1	One stem of *c*1660-1720 and another of *c*1720-80 with Chester-style stamped decoration, comprising a tendril border similar to Higgins Die 780, and a decorated spiral, similar to Higgins Die 835 (Higgins nd). This piece has a stem bore of 5/64".
5132		11869	6/7		5		**5**	1780-1910	1850-1910	DUBLIN / PIPE x 1		Mixed stem fragments, including a thick piece with the incuse-moulded sans-serif lettering DUBLIN / PIPE, without any border. This would have come from an Irish-style cutty of *c*1850-1910. Stem bore 5/64".
5132		11875	6/7		5		**5**	1750-1910	1780-1910			
5133		11902	5		2		**2**	1750-1850	1750-1850			
5147		11848	2	29	143	7	**179**	1780-1800	1780-1800	W.MORGAN LIVERPOOL x 9; star x 2; dot x 1	scallop and crown x 1; stag, Liver Bird and Masonic x 3	A large group of pipes and kiln waste that can be attributed to William Morgan's workshop (stem marks and matching bowl forms; Higgins 2010).

5155	A	12051	2	1			**1**	1710-70	1710-70	W? B x 1		The bowl is of a typical London style (Type 25) and has a stem bore of 5/64" (Atkinson and Oswald 1969). There is no internal bowl cross but the heel is marked with relief-moulded initials. The Christian initial is chipped and trimmed short, but appears to have been a W, while the surname is B. Although similar bowl forms were made in Chester (Higgins nd), the use of moulded initials at this date is extremely rare in the North West and this is most likely to be an imported example from London.
5186	A	11897	4		1		**1**	1700-1840	1700-1840			
5188		11871	4		2		**2**	1760-1900	1760-1900			
5193	A	11884	4		1		**1**	1780-1910	1780-1910			
5194		11855; 11856; 11857; 11870; 11880; 11881; 11886; 11890 and 12045	4	14	53		**67**	1750-1900	1820-50	Ring and dot x 1; double ring x 2; illegible x 2; EB x 1; EM x 1	3 x leaf seams only; 9 x leaves, flutes, *etc*	A large group with all the diagnostic pieces ranging from the late eighteenth- to mid-nineteenth-century and with a core group of *c*1820-50 examples. Many of the pieces are burnt and most are badly iron stained. There is one scallop and crown bowl that can be attributed to W Morgan (Type N) and another is probably mould Type H - both *c*1780-1800 (Higgins 2010). There are a few plain fragments that may be also of this date and residual, but the rest have decoration and marks typical of *c*1820-50. These include five moulded heel marks (two of which are unintelligible crude marks) and two stag's head and shield bowl marks - one EB (no known Liverpool maker) and the other EM (the initials being repeated twice within the shield). The EM mark can be attributed to Eliza/Elizabeth Morgan, who is listed in Liverpool directories from 1816-39 (Higgins nd). No stem stamps are present and just one stem that appears to have a splash of burnt glaze on it.

5225	B	11891	5		3		**3**	1680-1900	1760-1900			One residual stem and two others of late eighteenth- or nineteenth-century date.
5230		118853	6/7		6		**6**	1750-1900	1750-1900			
5236	B Tr 8	11862	5		1		**1**	1760-1900	1760-1900			
5248	B Tr 8	11843	4		2		**2**	1700-1840	1760-1840			
5249	Tr 8	11887	4	1			1	1837-57	1837-57	?J J x 1	Flowers, star, etc x 1	Lower part of a bowl of c1820-50 decorated with a spray of flowers or berries at the base on each side, and a star on the RHS (LHS is missing). There is a double-lined shield facing the smoker, with the initials ?J J. This can be attributed to John Jones, one of the principal manufacturers in Liverpool from c1837-57 (Higgins nd). Stem bore 6/64".
5271	B Tr 8	11851	4		9		9	1700-1840	1770-1810	J.ATHERTO… x 1	pale green glaze x 1; light brown glaze x 1	Nine stems of eighteenth- to early nineteenth-century types, two of which are glazed (one pale green and the other light brown). One quite thick stem with a stem bore of just over 6/64" is stamped J.ATHERTO…. James Atherton is recorded as a Liverpool maker from 1769-1805 (Higgins nd).
5273		11858	4		1		1	1640-1740	1640-1740		burnished x 1	Stem fragment of c1640-1740, made of a gritty local fabric and with a poor burnish on its surface.
5273	B	11860	4		4		4	1700-1840	1770-1820	…LIVERPOOL. x 1		Four quite thick, chunky stems, with relatively large bores, making them hard to date accurately but most likely all are late eighteenth century. One has the end of a Liverpool maker's stamp on it (with a full stop after the word 'LIVERPOOL.'). Stem bore of this piece is rather irregular, but about 6/64".
5274		11864	4		2		2	1760-1900	1760-1900			

5299	B	12053	2	1			1	1780-1810	1780-1810		Stag's head, Masonic and Glasgow Arms	A typical Liverpool-style bowl of c1780-1810, with a stag's head facing the smoker and traces of Masonic motifs on the RHS. What makes this bowl notable is the depiction of the Glasgow Arms (bird, tree, bell and fish) on its LHS, surrounded by flowers. Another example, probably from the same mould, has been recovered from the Manchester Dock excavations (MOL forthcoming (97 266 <3110>). It seems that this design must have been made in the Liverpool area, presumably as an export destined for Scotland.
5335	B Tr 8	11844	4		1		1	1680-1800	1680-1800			Abraded stem fragment - appears to be water-rolled. May well be residual.
5356		11842	6/7		2		2	1610-1880	1780-1880			
5396	B		6/7		1		1	1780-1900	1780-1900			
5407	B Tr 8	11863	6/7		1		1	1780-1910	1780-1910			
5409	B Tr 8	11852	5	2	9	1	12	1750-1900	1810-50	double ring x 1	fluted, etc x 2	The stems are mainly of late eighteenth- or nineteenth-century types and there is one simple cut mouthpiece, not glazed. The bowl fragments both date from c1810-50. One has a double ring mark on both sides of the spur and the start of fluted decoration on the bowl, which is largely missing. The other piece is a rim fragment with vertical-moulded lines at the top and then scalloped decoration with stars above, on the seam away from the smoker.
5478	B Tr 8	11847	6/7	2	7		9	1750-1900	1820-50	stars x 2; J … x 1	wheat sheaf and bird x 1; scalloped, etc x 1	Stems of general later eighteenth- or nineteenth-century types but both bowls are c1820-50 and substantially complete, and with up to 87mm of surviving stem. Both have stem bores of 5/64" and star marks on each side of the spur. One bowl is decorated with a panel decoration above enclosed flutes depicting a wheat sheaf on the left side and a bird on the right. The other has scalloped decoration, with stars and foliage and a shield facing the smoker with just the initial J (Christian name) surviving.

5660	B	11882	4		1		1	1680-1750	1680-1750			
5701	A	11839	5		2		2	1680-1780	1680-1780			Two abraded fragments, both of which look as if they have been water-rolled for some time.
5708	A	12047	2	5	42	1	48	1700-1850	1770-1810		almost clear glaze x 3; pale brown glaze x 2	Stem fragments are all general 1700-1850 types, but the five bowl fragments are all decorated and suggest a date of c1770-1810 (Higgins nd). There is one complete spur bowl with Masonic decoration, which is unusual as it is of a Yorkshire style (Higgins and Davey 2004). This has an internally trimmed and lightly wiped rim but no internal bowl cross. Stem bore 5/64". There are fragments of two local bowls with stag's head and Masonic decoration from different moulds (one with a wheat sheaf on the left and Masonic emblems on the right; only the right side of the other survives, with Masonic emblems) and two smaller decorated fragments from similar bowls (too small to identify the exact designs or mould types). Five stems have glaze splashes on (three almost clear and two light brown). The single mouthpiece is cut and not glazed.
5712	A	11894	2		3		3	1740-1840	1740-1840			Most likely later eighteenth- or early nineteenth-century in date.
5725		11883	2		3		3	1740-1840	1740-1840			Most likely later eighteenth- or early nineteenth-century in date.
5730	A	11879	3		6		6	1700-1850	1760-1850			
5730	A	11885	3		6		6	1680-1850	1760-1850			Some stems appear to be residual late seventeenth-century or early eighteenth-century, but the rest are later eighteenth- to mid-nineteenth-century types.
5732	A	11874	4		1		1	1680-1800	1680-1800			
5735		11903	2		1		1	1700-1850	1700-1850			Small fragment, hard to date, but most likely later eighteenth- or early nineteenth-century in date.

5739	A	11898	3	1	7		8	1700-1850	1760-1850		pale green glaze x 1	The stems look to be mixed eighteenth- to mid-nineteenth-century types, with the latest being a long (130mm), fairly thin fragment (straight) and a piece with splashes of pale green glaze on. The single bowl fragment is a plain piece of eighteenth- or early nineteenth-century date.
5748		12041	2	31			31	1780-1800	1780-1800	stars x 1; eyes x 1	stag, Masonic, etc x 8; scallop and crown x 1 - plus three kiln furniture fragments	This group must represent kiln waste, since none of the bowls is smoked and there are also two fragments of clay sheet and a clay strip in the same context. Stems do not appear to have been collected. The waste can be attributed to William Morgan, since several of the mould types match 1780s waste from the Canal Link site (Higgins 2010). There are 22 plain bowl fragments, including two with moulded marks - stars and all seeing eyes - and nine mould-decorated fragments - eight from a stag and Masonic design, and one from a scallop and crown design.
5751	A	11859	3	2	10	1	13	1760-1850	1820-50		Panel decorated with crowned harp and Masonic motifs; purplish brown glaze x 1	The stems are all later eighteenth- to mid-nineteenth-century types and the simply cut mouthpiece has an unusual purplish-brown glaze on it. There is part of a plain spur bowl and a decorated bowl of c1820-50, which provides the best dating for the group as a whole. This has its spur missing but is otherwise complete, with panel decoration comprising a crowned harp and flowers on the LHS and Masonic motifs with flowers on the RHS. There is a deep moulded band, lined with cross motifs around the rim, enclosed flutes on the lower part of the bowl and leaves on the seams. Stem bore 5/64".
5752		11893	6/7	1	2		3	1750-1910	1780-1910			The latest stem is of late eighteenth- or nineteenth-century type and the small fragment of plain bowl is of similar date.
5752		12046	6/7		2		2	1760-1830	1760-1830			

5754	A	11872	6/7		1		1	1680-1780	1680-1780			
5756	A	11878	6/7		1		1	1780-1840	1780-1840		pale green glaze x 1	Stem fragment with pale green glaze.
5758	A	11899	6/7		2		2	1760-1850	1760-1850			
5761	A	11877	6/7	1	5		6	1760-1840	1790-1830		Stag's head and Masonic x 1; pale green glaze x 2	Stems of late eighteenth- or early nineteenth-century type, two of which have traces of pale green glaze on them. The bowl is damaged, but with 75mm of surviving stem, and is decorated with a stag's head motif with flutes, foliage, Masonic emblems, etc. Stem bore 6/64".
5763	A		4	2	16		**18**	1700-1900	1760-1820	CHA. … x 1	scallops x 1; green glaze x 1; light brown glaze x 1	The stems could range from *c*1700-1900 but all the more diagnostic pieces point to a late eighteenth- to early nineteenth-century date. One stem has a green glaze and another traces of a light brown glaze. One bowl fragment is plain and the other has a large scallop design away from the smoker (the style that usually has a crown facing the smoker). One partial stem mark survives with a stem bore of 5/64". This starts 'CHA.', with a dot separating the next letter, which appears to have been a B, E, F, H or P. The only recorded Liverpool maker at this date called Charles with one of these surname letters is Charles Powell, recorded working from 1790-6 (Higgins nd).
5773	A	11840	3		6	1	**7**	1740-1850	1760-1850		pale green glaze x 2	One mouthpiece (simply cut) and a stem have pale green glaze on them.
5793	A	12048	6/7		26	3	**29**	1700-1900	1780-1840		Yellowish-brown glaze x 9; pale yellowish-green glaze x 1	This group contains two cut mouthpiece, one unglazed and the other with yellowish green glaze on. There is also a stem that has been counted as a mouthpiece, since it is glazed across the end, but this has clearly been broken some way from where the actual tip should have been. This piece joins another glazed stem to give a fragment 57mm long, almost all of which is covered with a pale yellowish brown glaze. Seven other stems also have pale yellowish-brown glaze on, the exact colour varying slightly from piece to piece.

5793	A	12052	6/7		7		**7**	1750-1880	1780-1880		pale brown glaze x 3; pale green glaze x 1	Seven stems, most likely of late eighteenth- or early nineteenth-century date. There are three with pale brown glaze on them and one with pale green glaze.
5799		11896	3		4		**4**	1760-1850	1760-1850			Four fairly thin, straight stem fragments, three of which are very highly fired (near stoneware) and encrusted, perhaps from having been built into a muffle. If not, then they almost certainly represent kiln waste.
5885		11973	2		1		**1**	1740-1840	1740-1840			Quite a thick, straight stem. Most likely later eighteenth-century in date.
7212	C	12044	5		15	2	**17**	1660-1910	1770-1840	C.KENYON - LIVERPOO… x 1	light green glaze x 2; light brown glaze x 1	A group of stems, almost all of which would fit with a late eighteenth- or early nineteenth-century date (one or two residual pieces). One tip and a stem have light green glaze and another tip is light brown. There is an almost complete stem mark used by Charles Kenyon of Liverpool, who is recorded working from at least 1772-1811 (Higgins nd). This has a stem bore of 5/64".
7282	C	13089	6/7		2		**2**	1780-1880	1780-1880		purplish-brown glaze x 1	One stem has traces of a purplish-brown glaze on.
7683		20131	4		6		**6**	1680-1850	1760-1850			One residual stem (late seventeenth-century to early eighteenth-century) is water-rolled. Most of the stems are likely to be later eighteenth- to mid-nineteenth-century, including one overfired piece and two joining pieces (freshly broken) making a long section of 131mm.
7786		20124	1		1		**1**	1700-1850	1700-1850			Very abraded fragment - looks to have been water-rolled.
7787		20123	1		2		**2**	1740-1900	1760-1900			One fragment probably dates from *c*1740-1840 and the other *c*1760-1900.
7855		20135	1		1		**1**	1680-1800	1680-1800			

General Cleaning Layer 05/09/07*		11889	6/7	4	5		**9**	1740-1900	1780-1850			The stems are all later eighteenth- or nineteenth-century types. Three plain bowl fragments fit (freshly broken) to make up an almost complete bowl of *c*1780-1850. There is the heel from another of similar date.
U/S	A	11907	6/7		1	1	**2**	1780-1900	1780-1900		pale green glaze x 1	Two late eighteenth-century or later fragments, the mouthpiece having a simple cut end and a pale green glaze coating.
U/S	A Bulk		6/7		1		**1**	1660-1710	1660-1710		burnished x 1	Fragment of stem made of a local gritty fabric and with a good burnish.
TOTAL				**103**	**614**	**33**	**750**					

ILLUSTRATIONS

FIGURES

PLATES

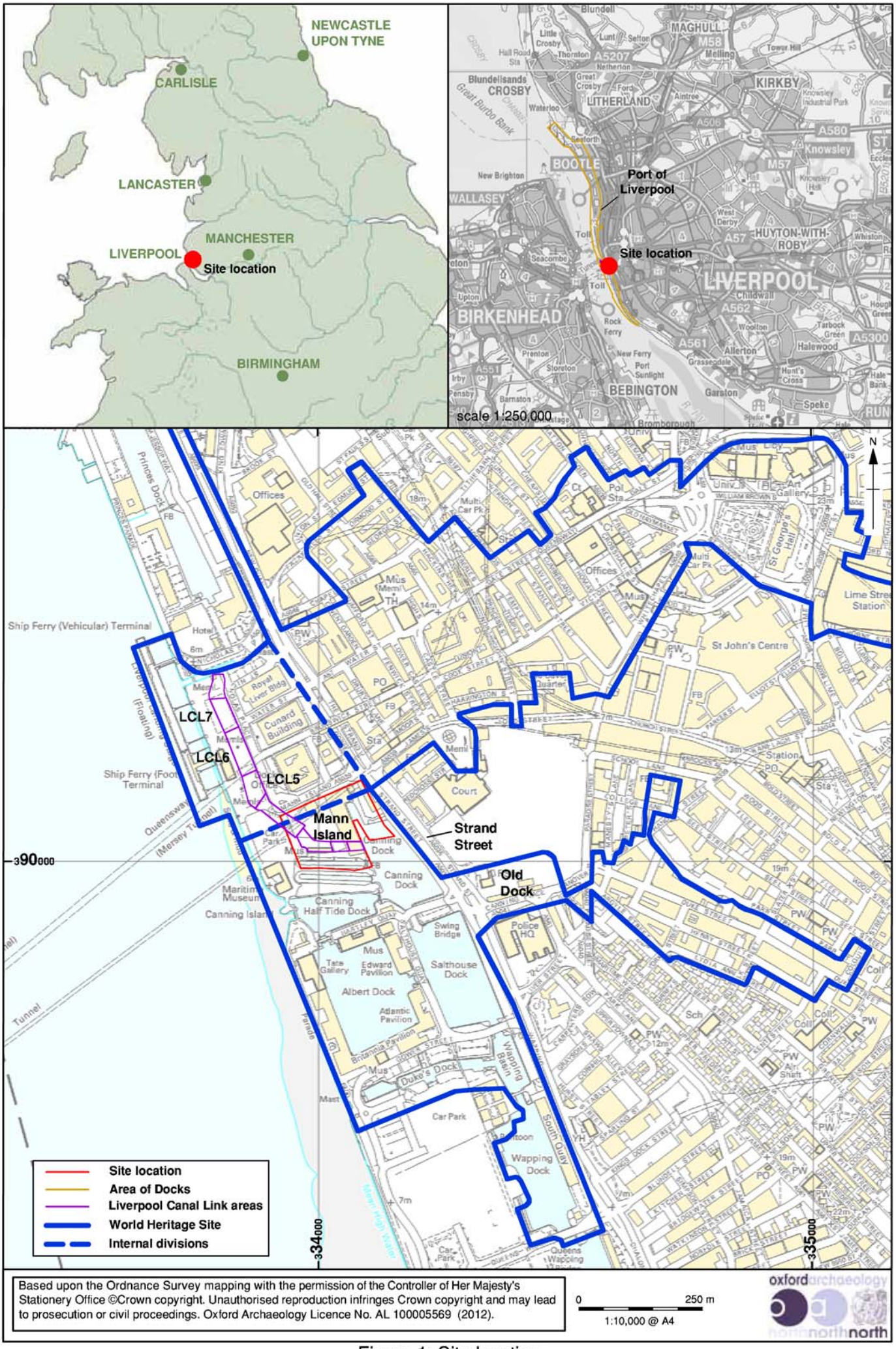


Figure 1: Site location

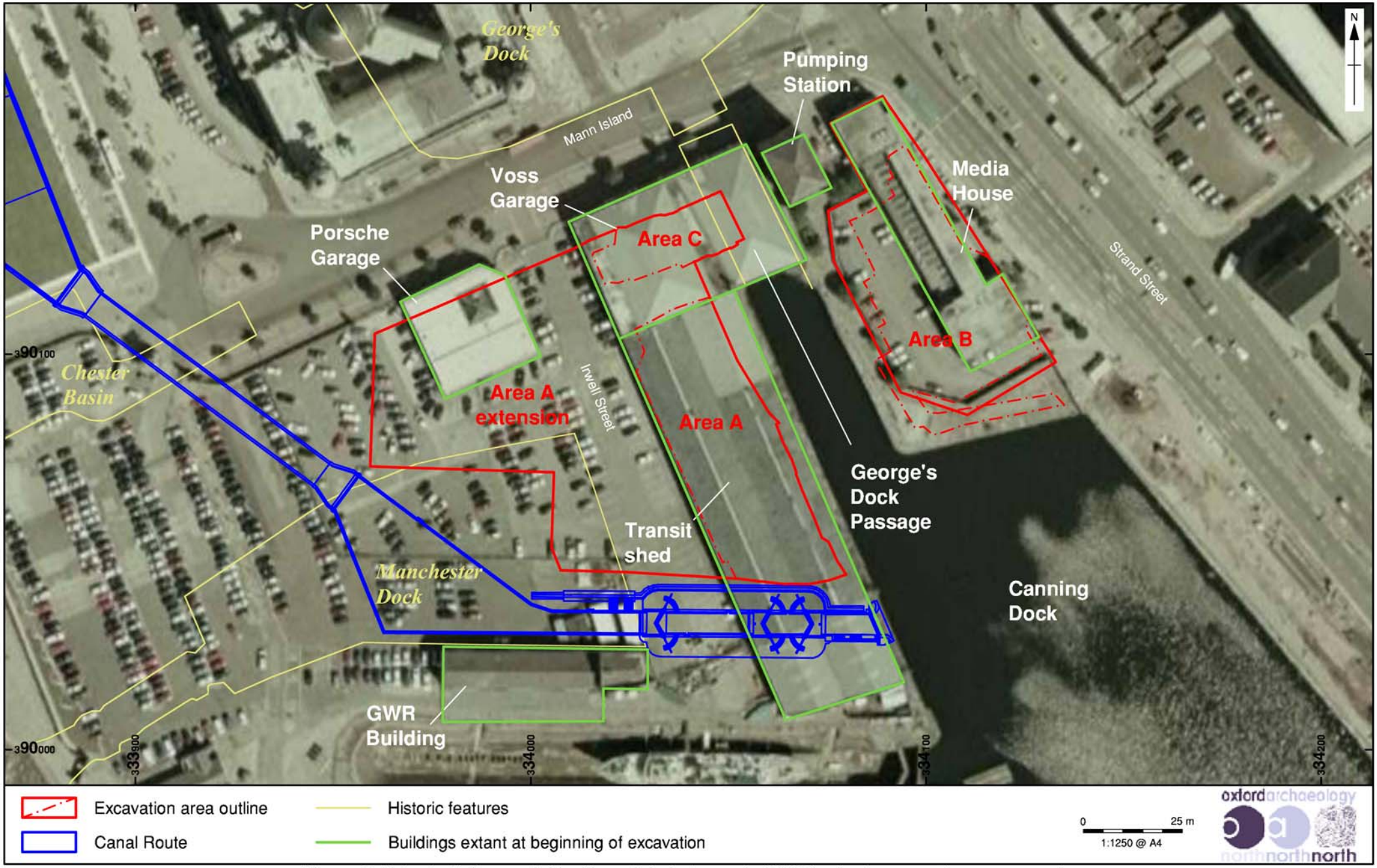


Figure 2: Extent of site overlaid with aerial photograph (2008) prior to excavation commencing

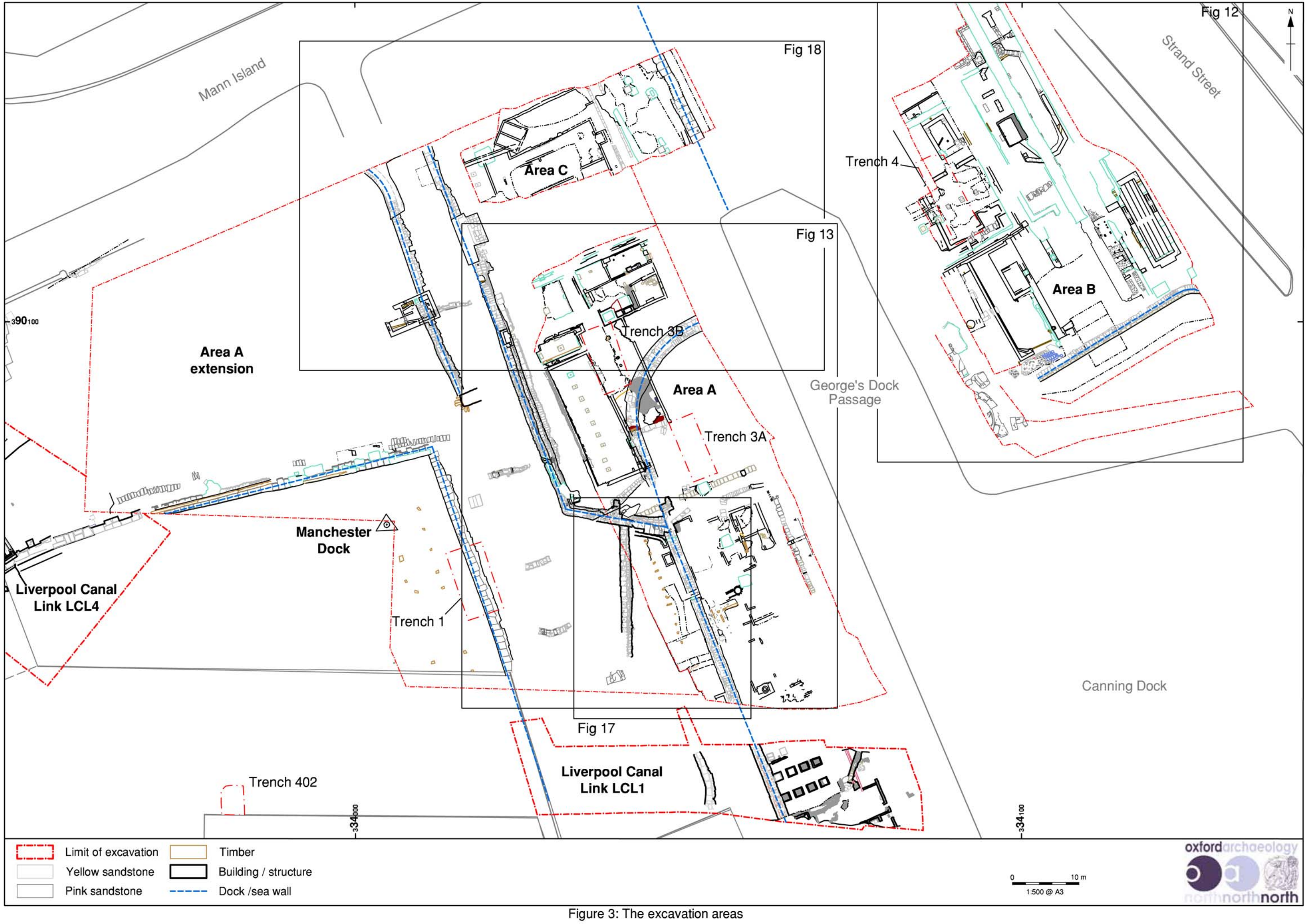


Figure 3: The excavation areas

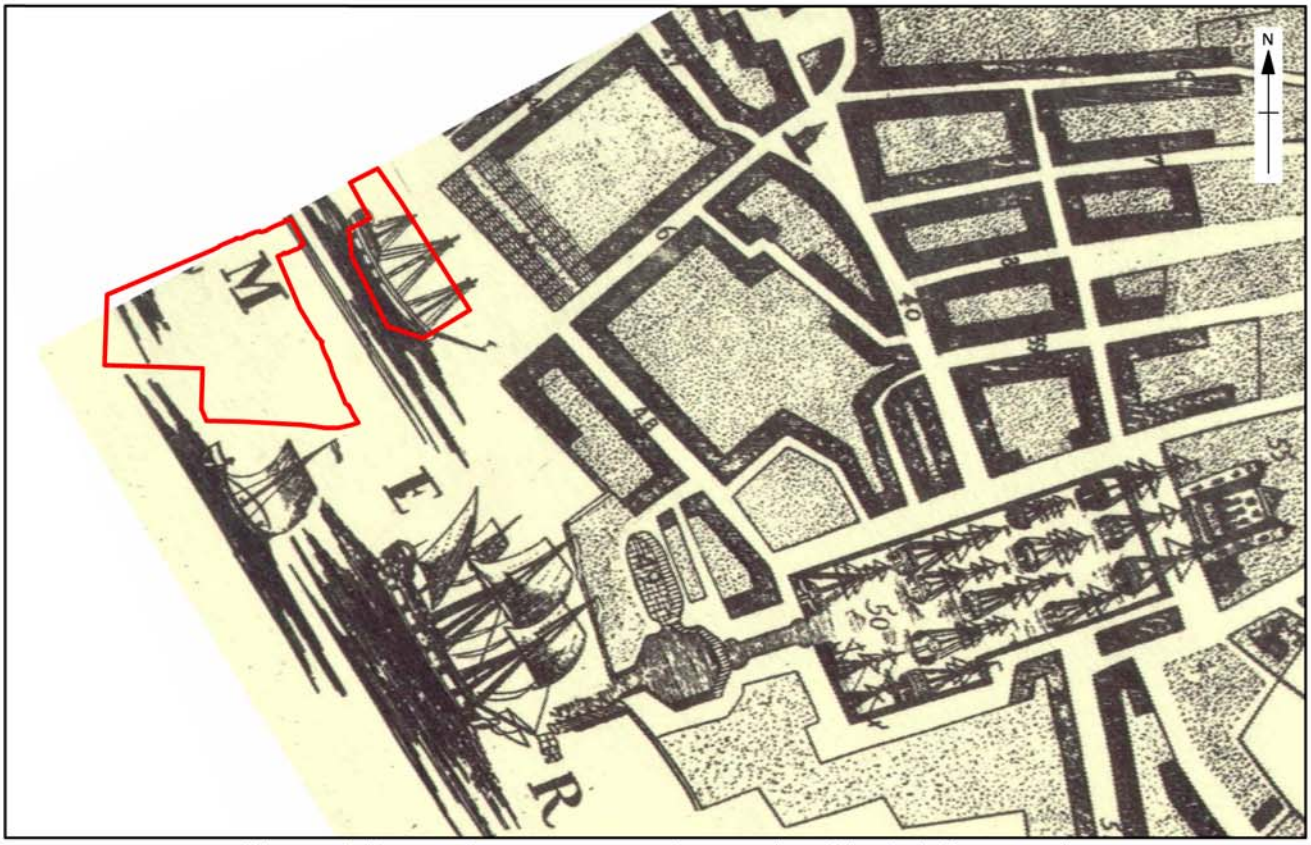


Figure 4: Excavation areas superimposed on Chadwick's map of Liverpool, 1725

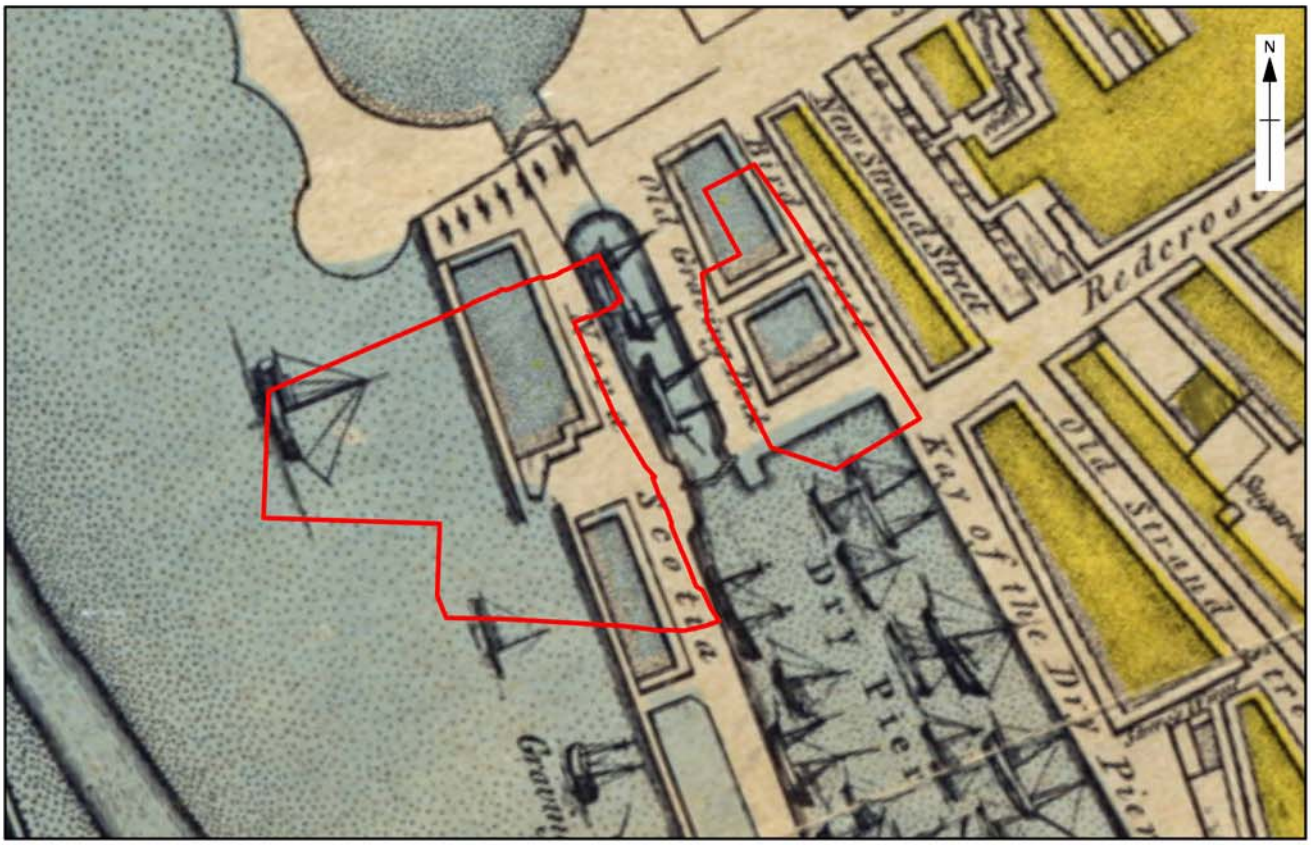


Figure 5: Excavation areas superimposed on John Eyes' map of Liverpool, 1765

Excavation area

not to scale

oxfordarchaeology northnorthnorth

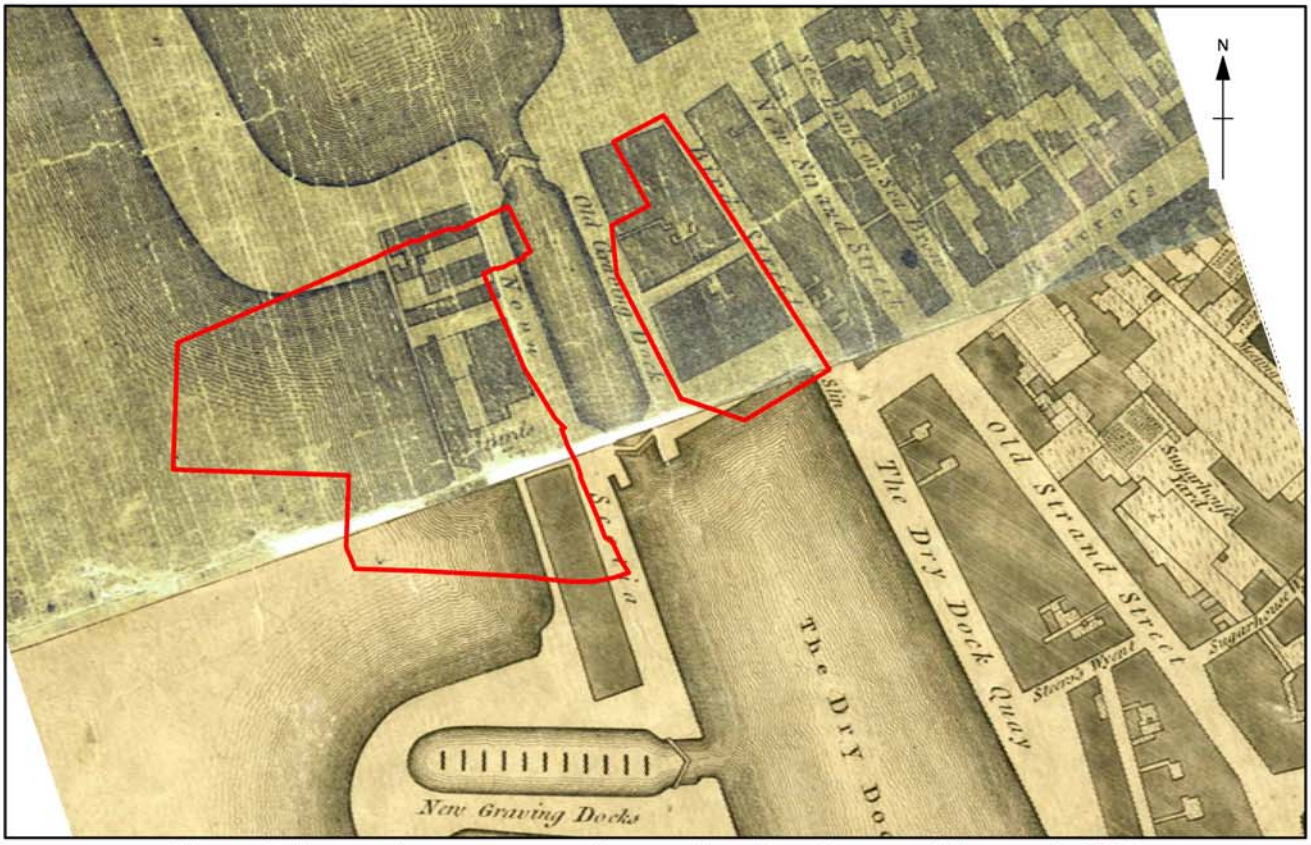


Figure 6: Excavation areas superimposed on Perry's map of Liverpool, 1769

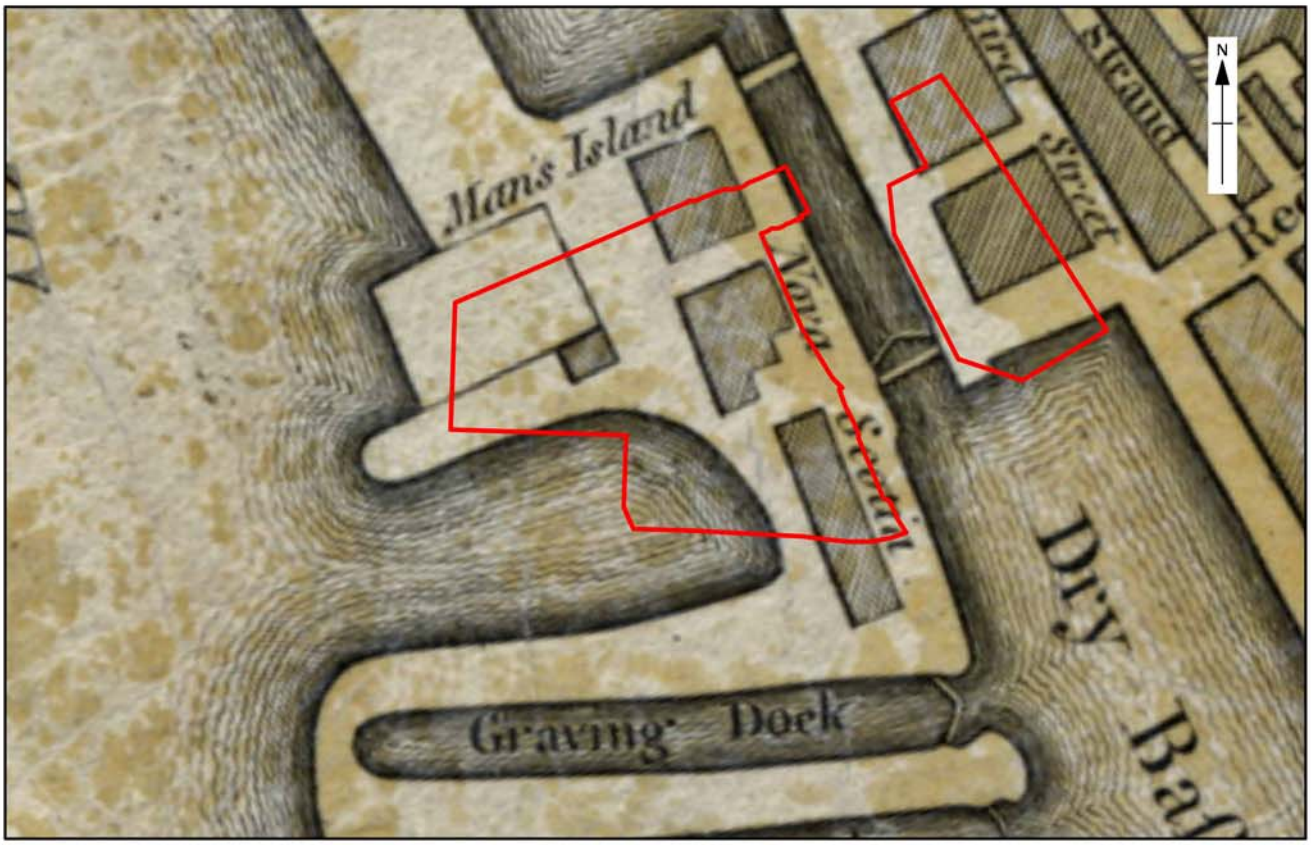


Figure 7: Excavation areas superimposed on Charles Eyes' map of Liverpool, 1785

Excavation area

not to scale

oxfordarchaeology north

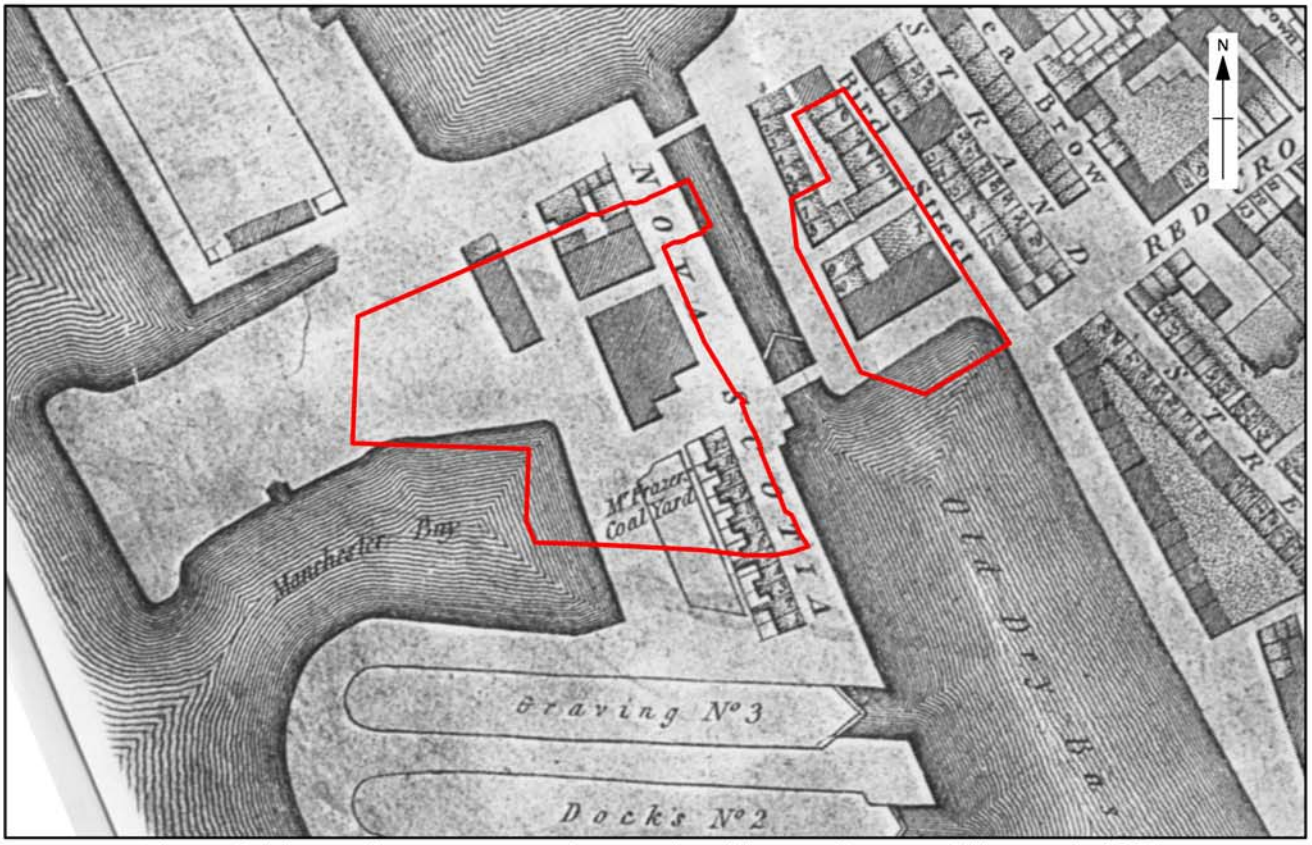


Figure 8: Excavation areas superimposed on Horwood's map of Liverpool, 1803

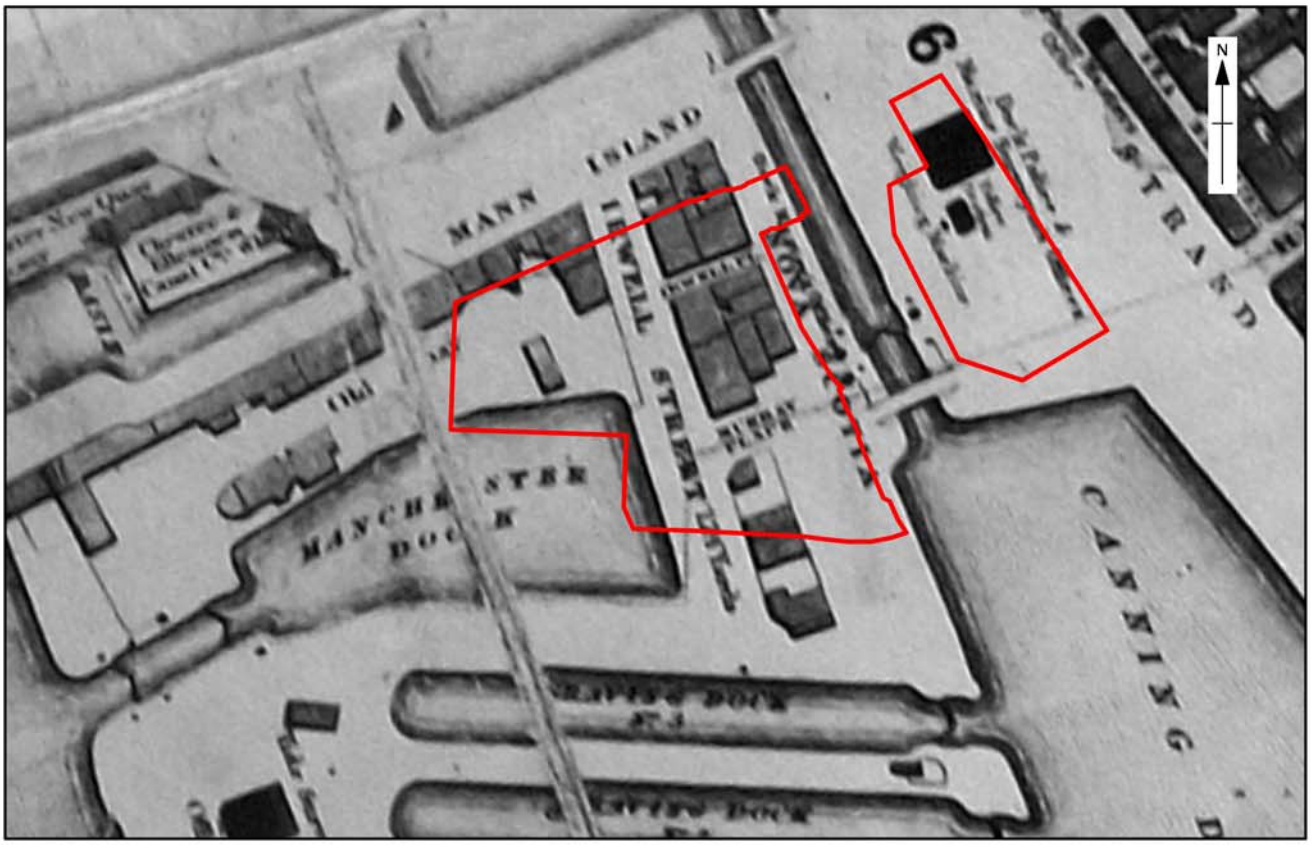


Figure 9: Excavation areas superimposed on Gage's map of Liverpool, 1836

Excavation area

not to scale

oxfordarchaeology north

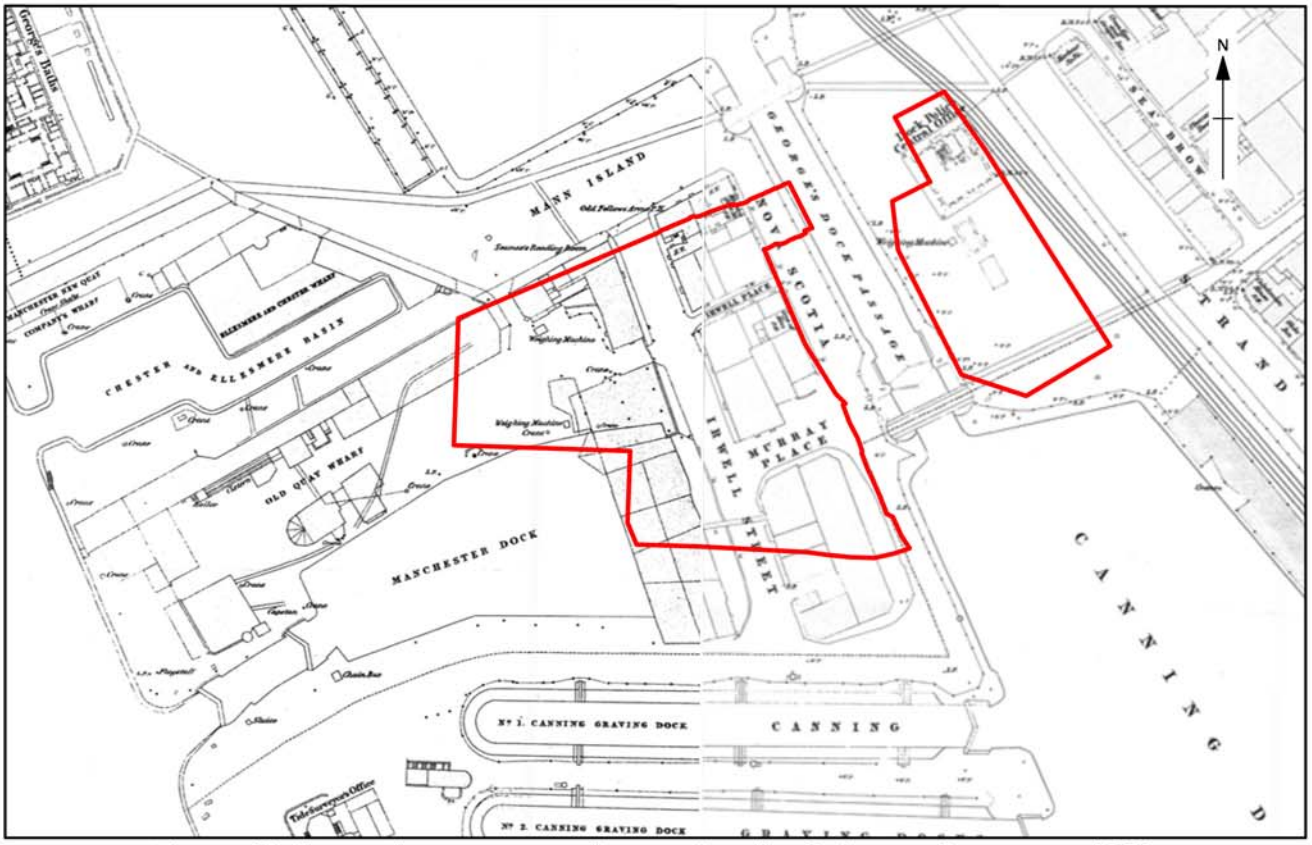


Figure 10: Excavation areas superimposed on the Ordnance Survey map1850

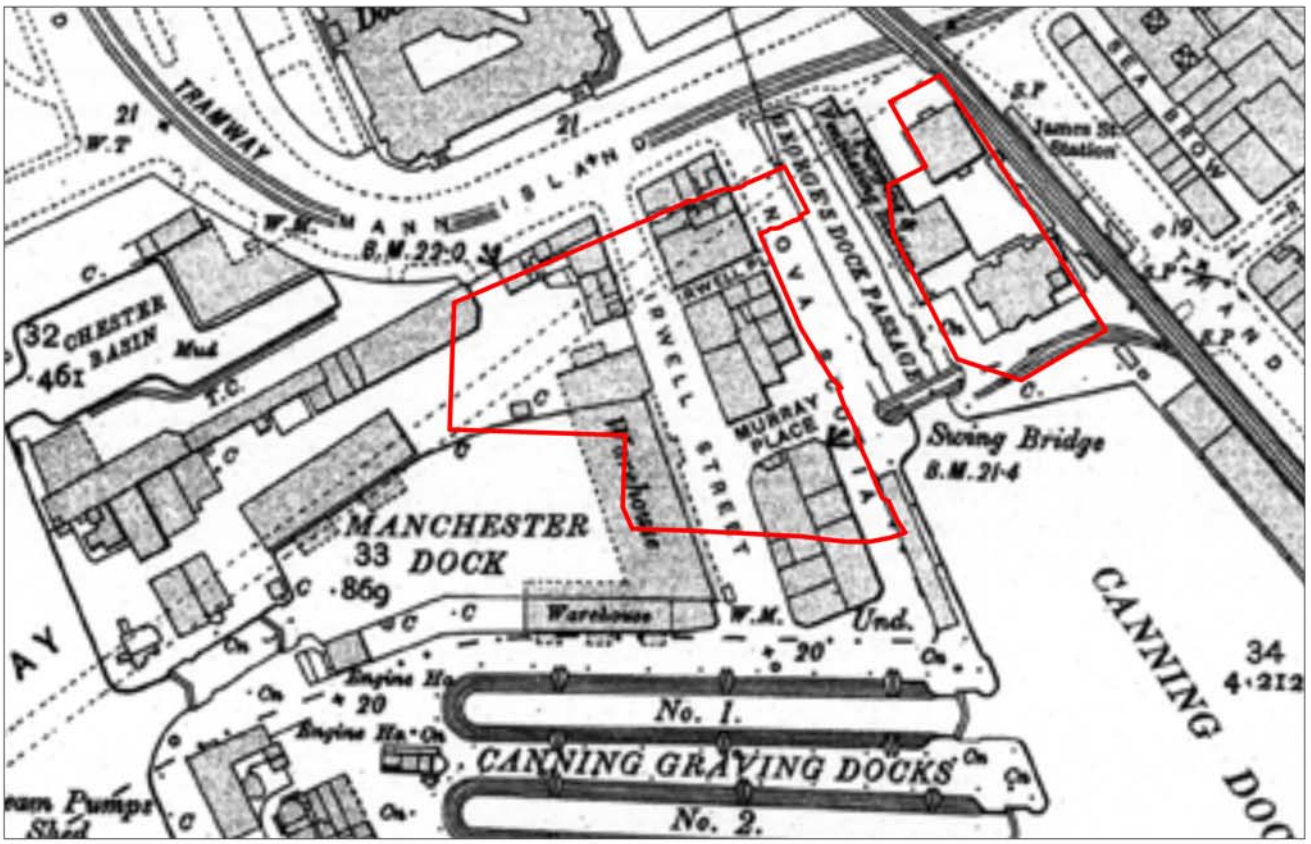


Figure 11: Excavation areas superimposed on the Ordnance Survey map 1908

Excavation area

not to scale

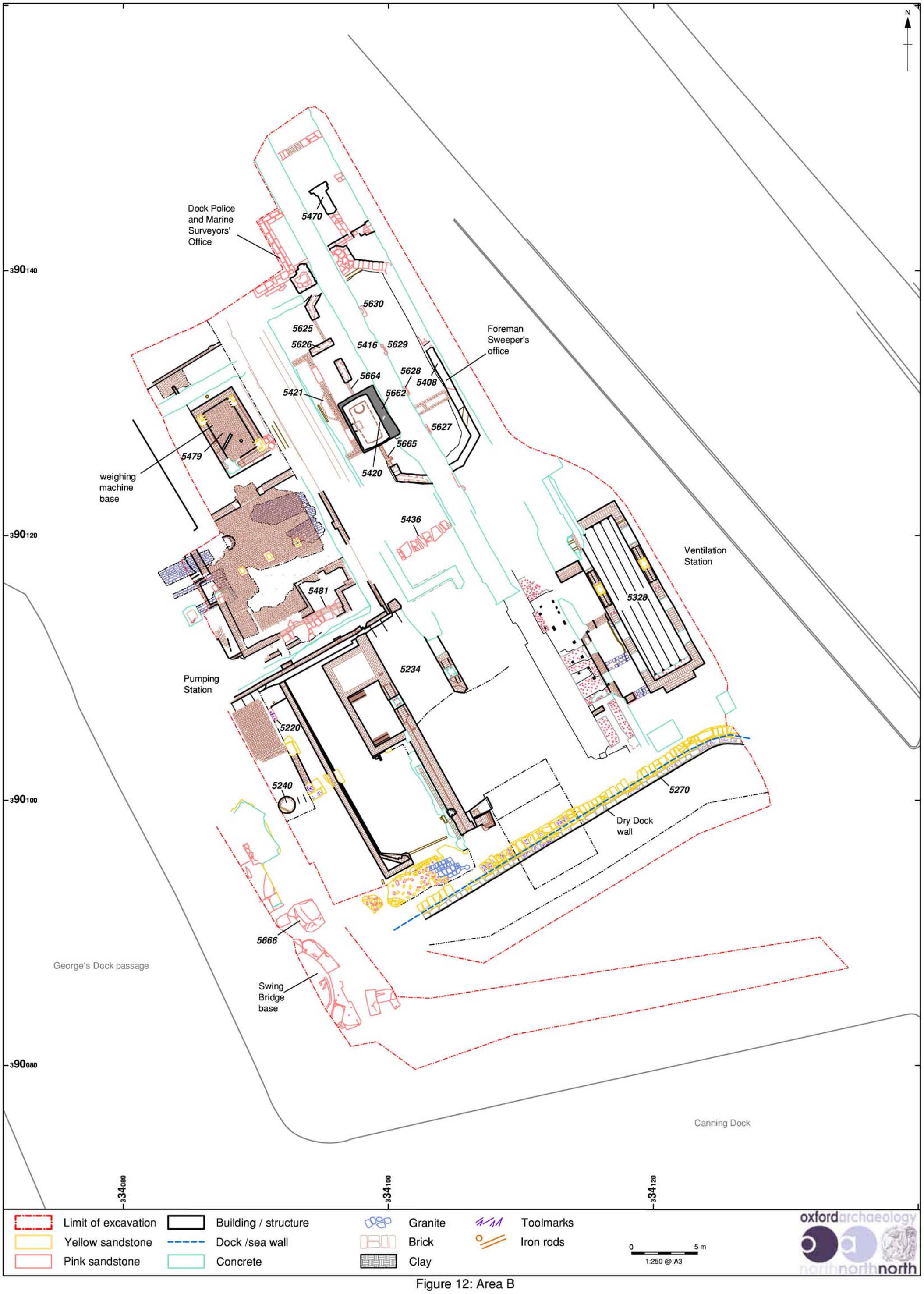


Figure 12: Area B

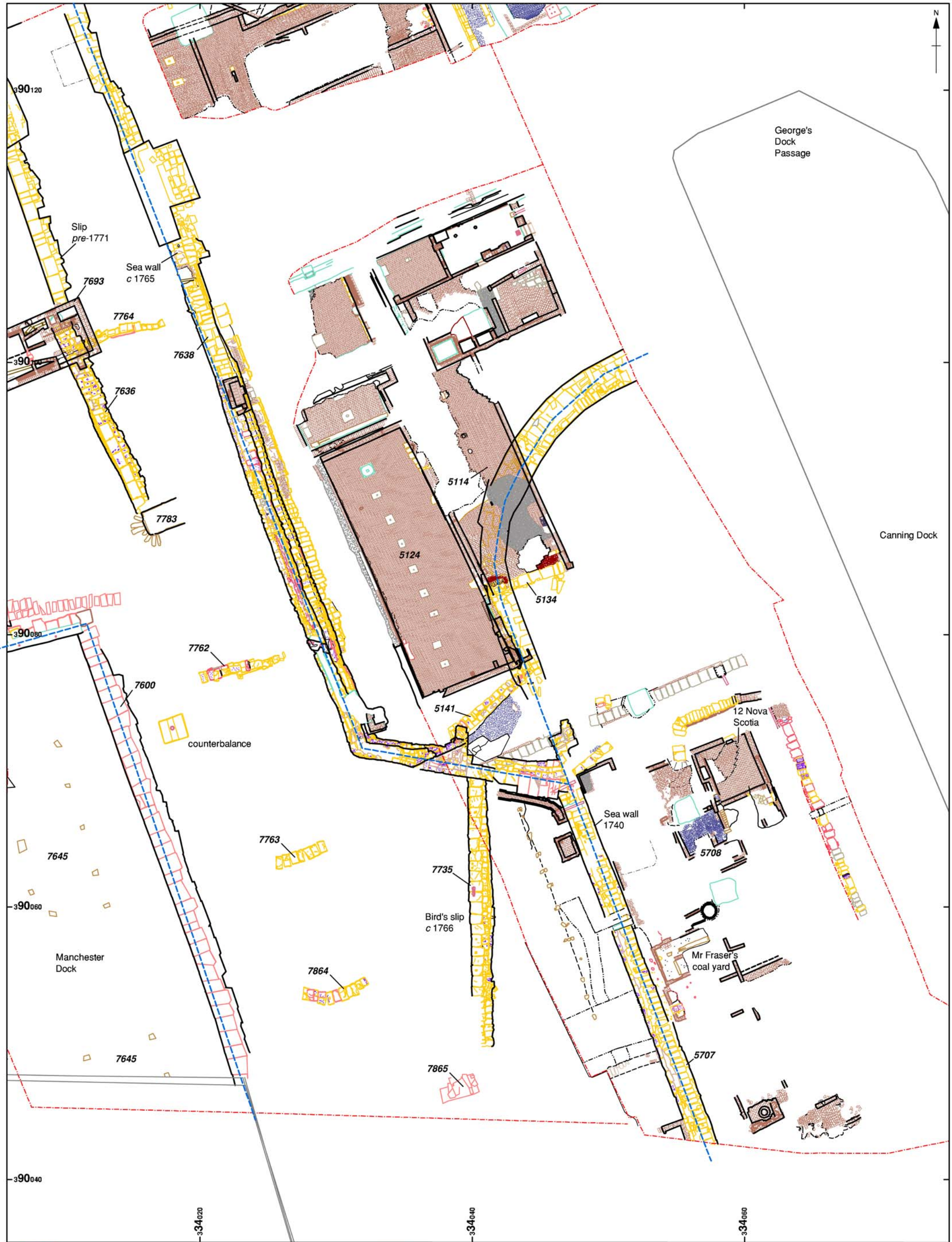


Figure 13: Area A

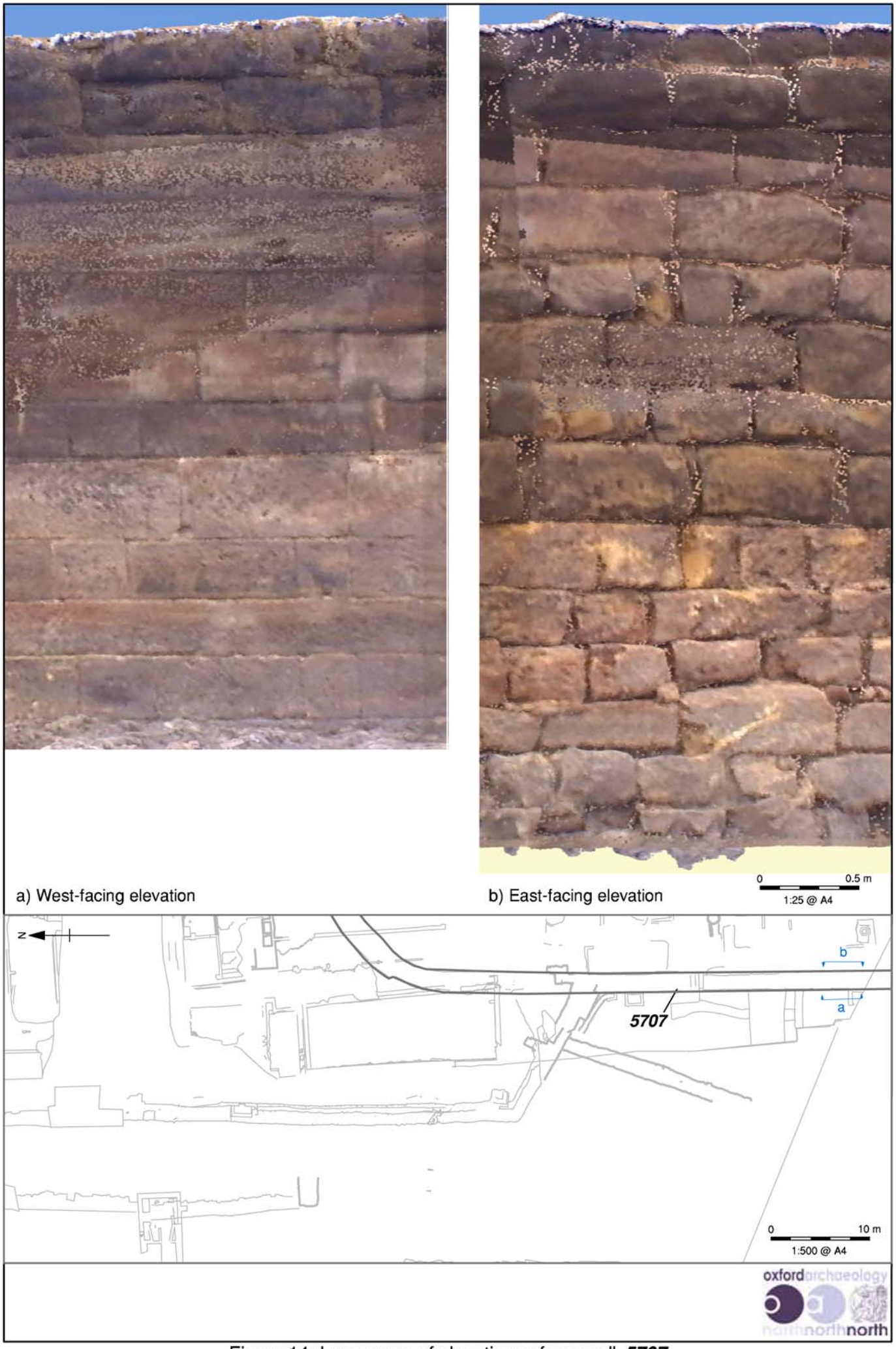


Figure 14: Laser scan of elevations of sea wall ***5707***

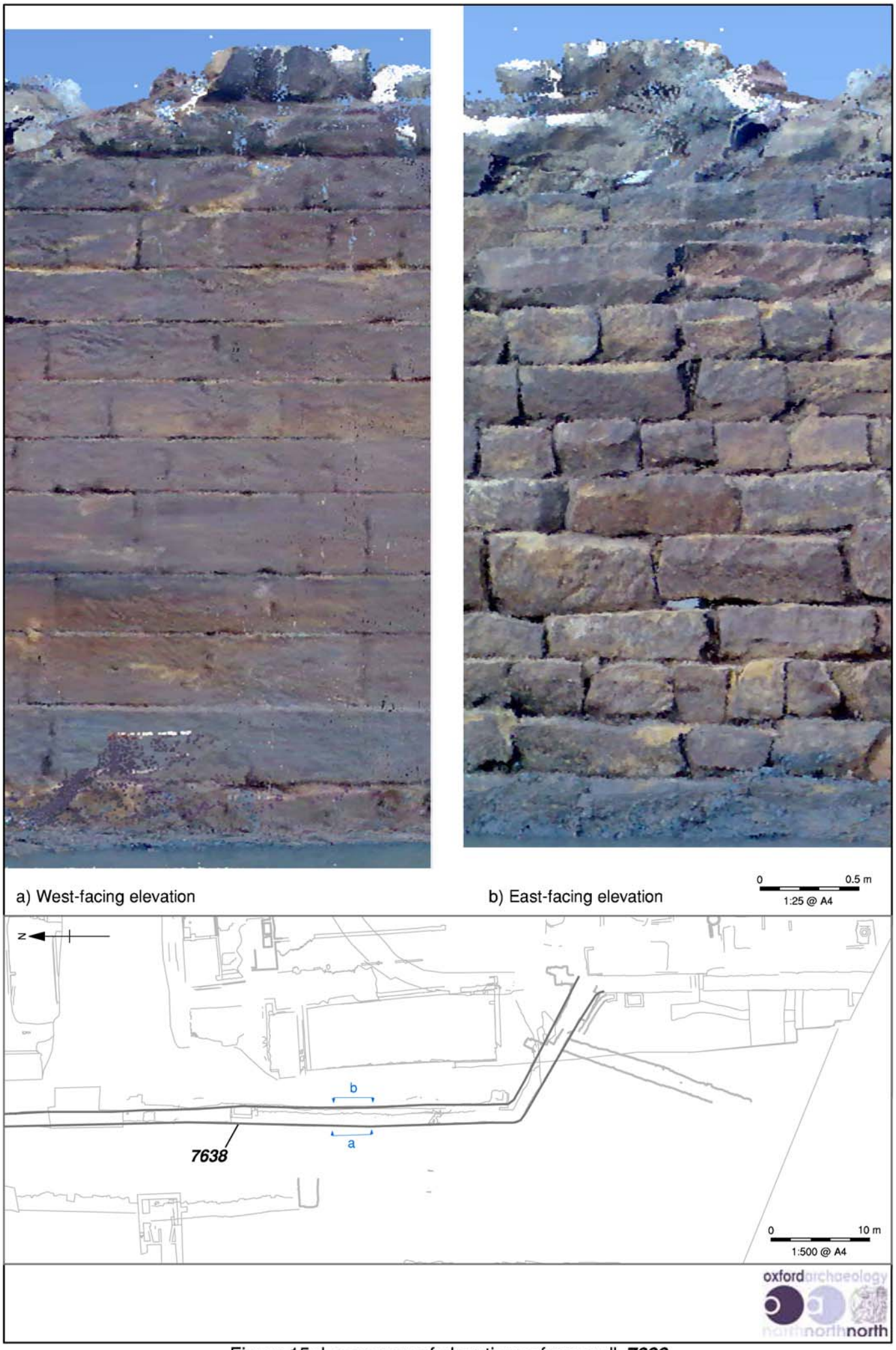
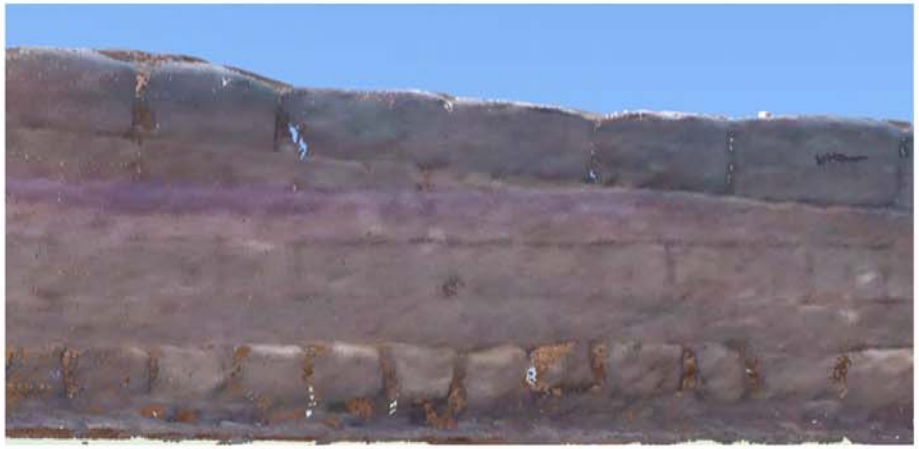
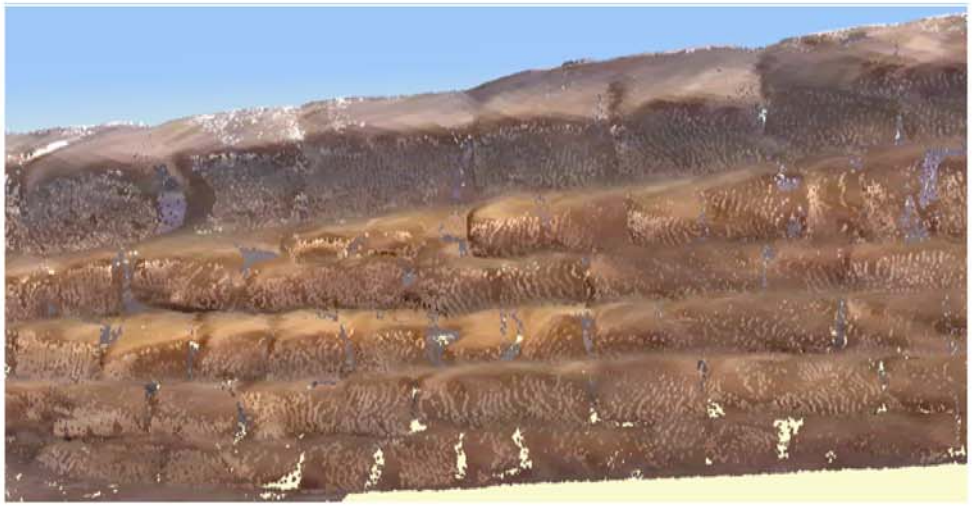


Figure 15: Laser scan of elevations of sea wall ***7638***



a) West-facing elevation



b) East-facing elevation

0 1 m
1:40 @ A4

Figure 16: Laser scan of elevations of Bird's Slip, ***7735***

Figure 17: Area A, showing the interface between ***5707***, ***7638*** and ***7725***

Figure 18: Area C

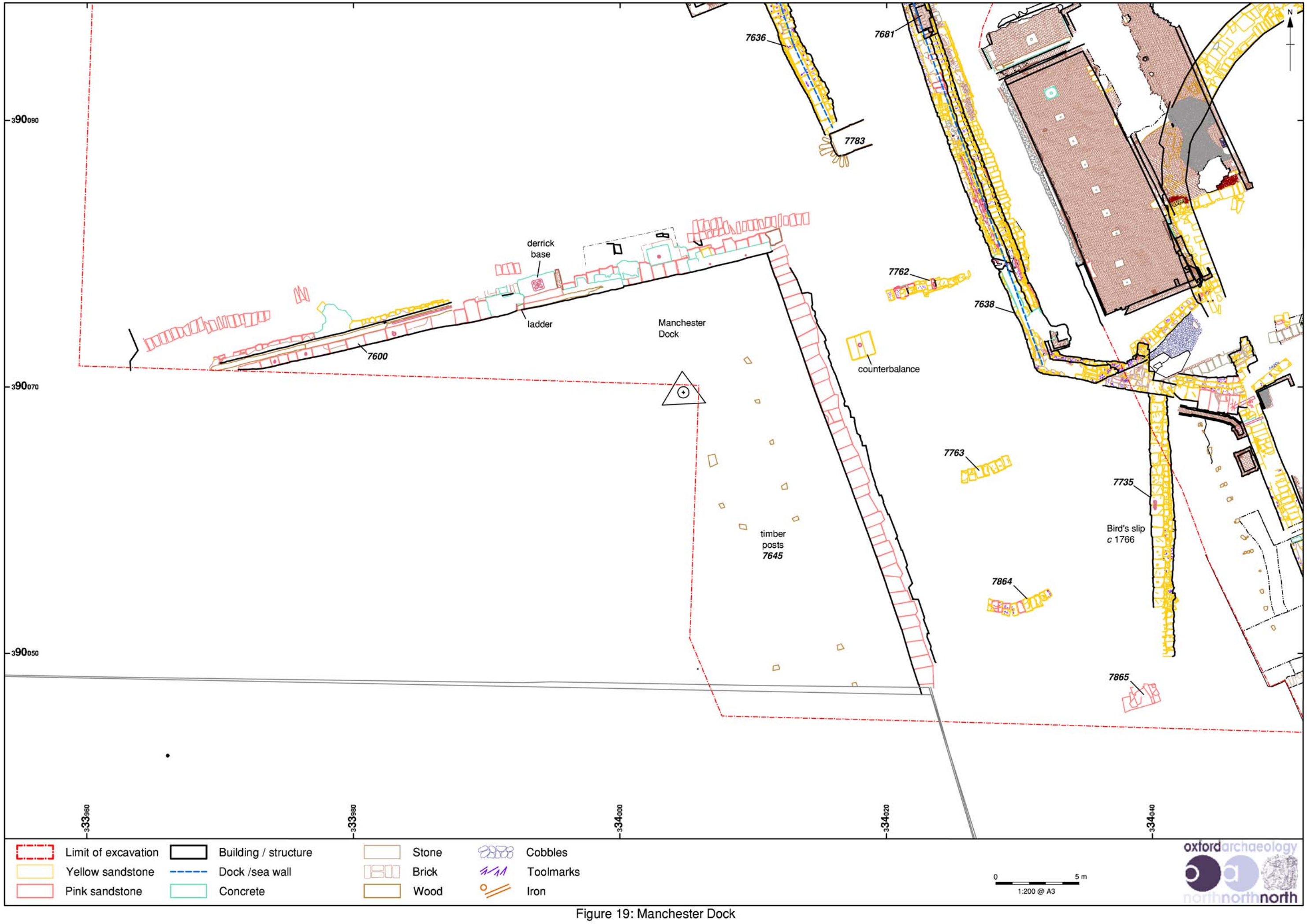


Figure 19: Manchester Dock

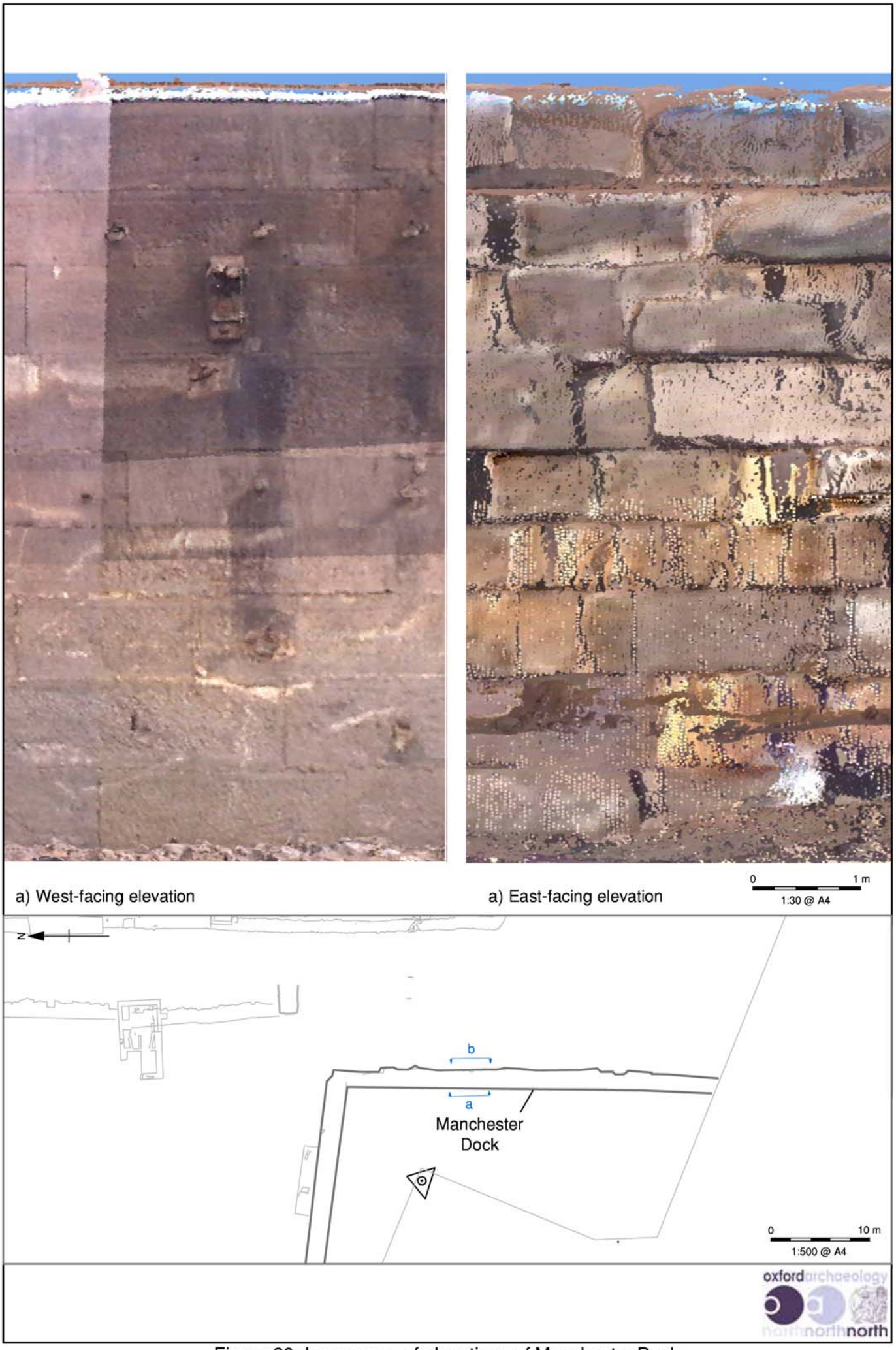


Figure 20: Laser scan of elevations of Manchester Dock

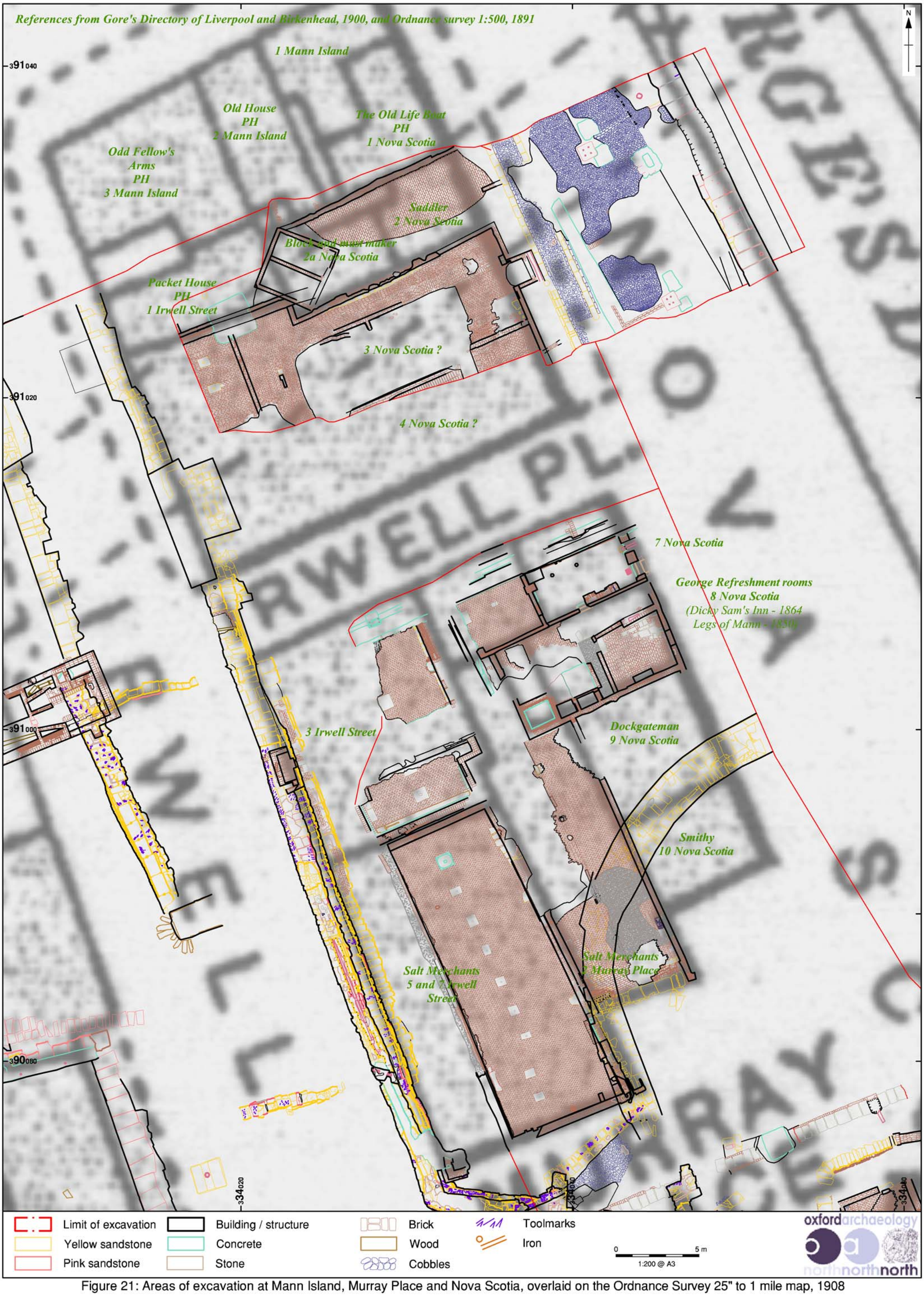


Figure 21: Areas of excavation at Mann Island, Murray Place and Nova Scotia, overlaid on the Ordnance Survey 25" to 1 mile map, 1908

Figure 22: Area A (south) superimposed on Horwood's map of 1803

JQ*L10312*AMS*040112

Figure 23: Plan of Voss Garage and Transit Shed

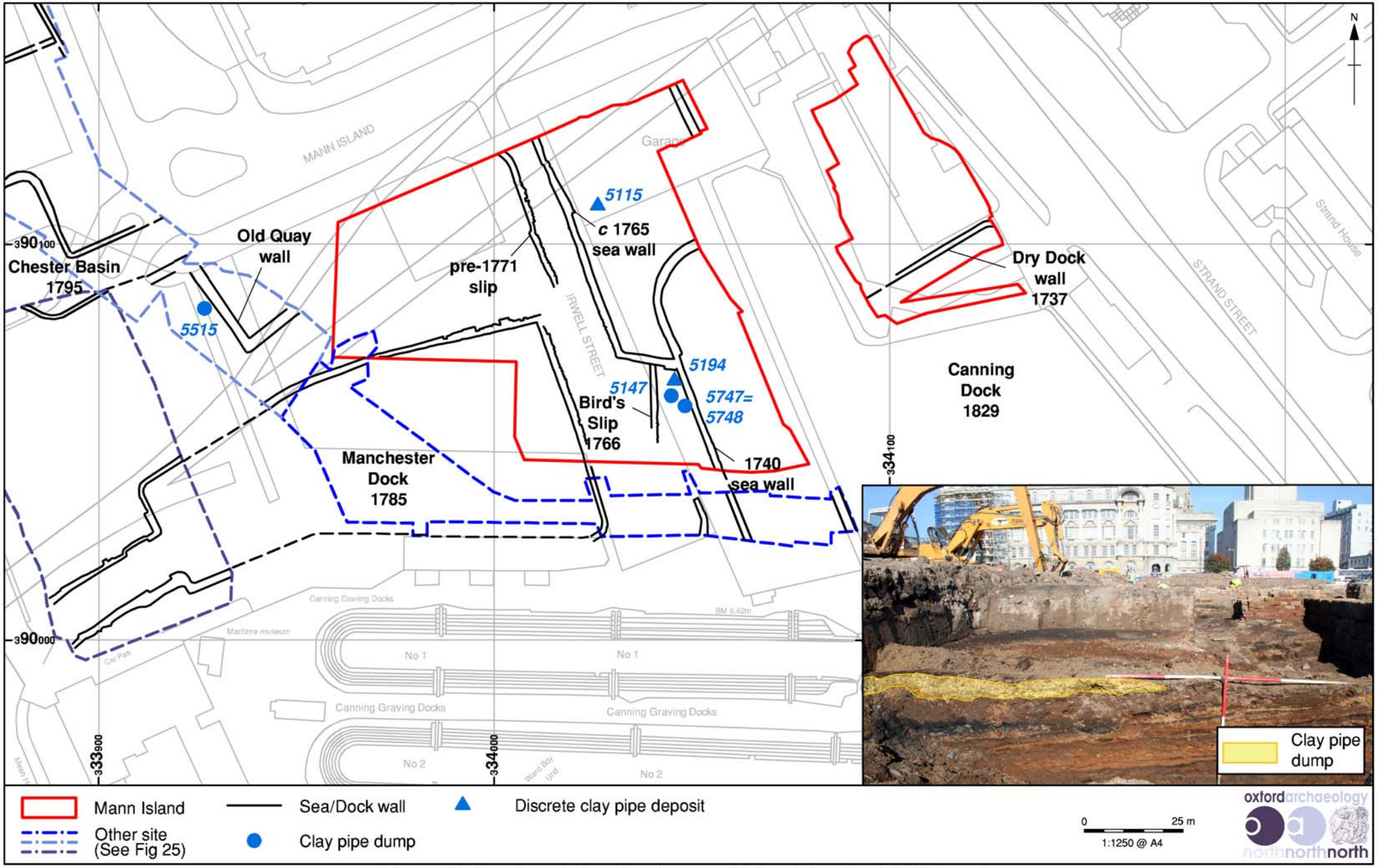


Figure 24: Location of clay pipe dumps, with inset showing ***5115*** in section

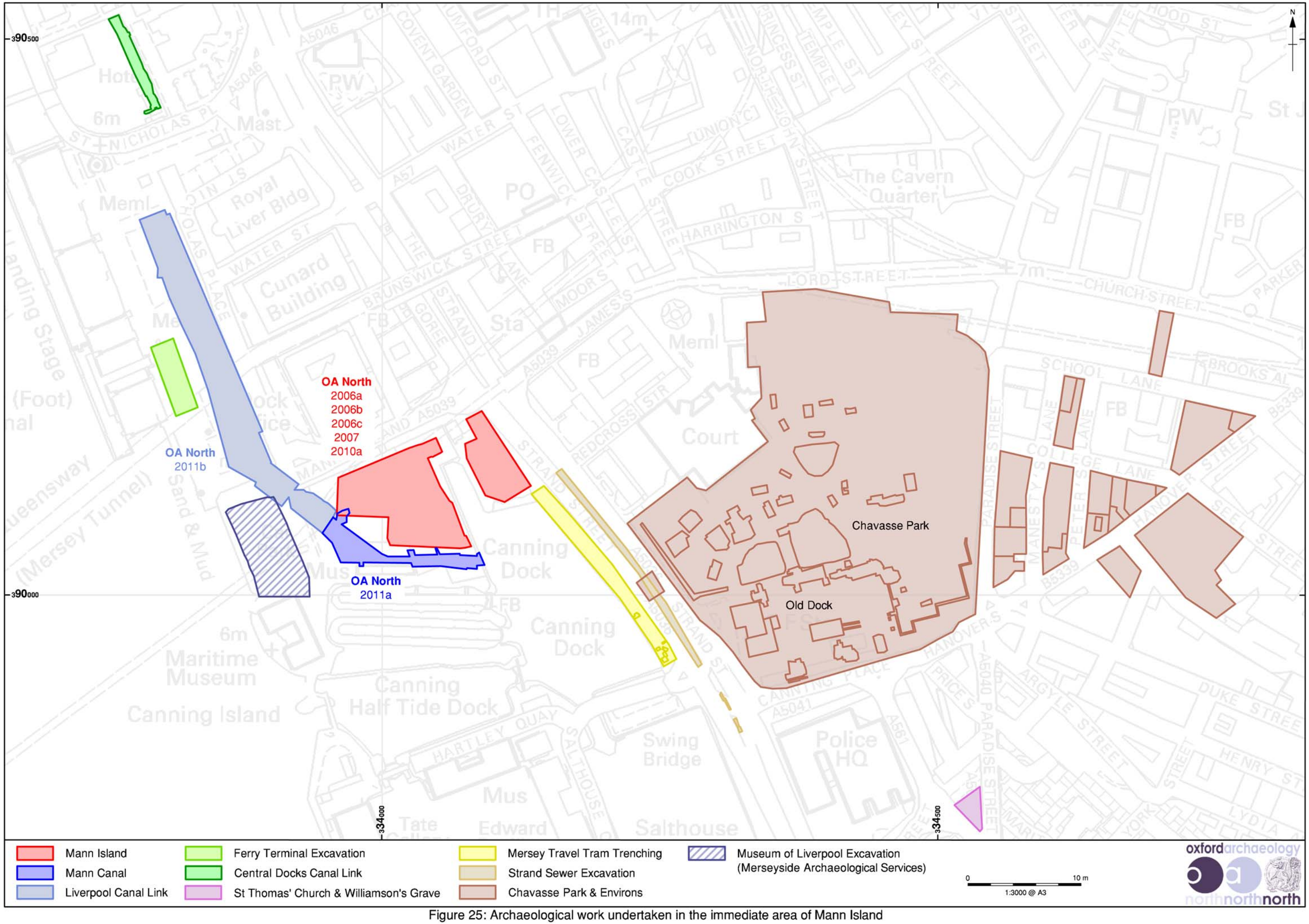


Figure 25: Archaeological work undertaken in the immediate area of Mann Island

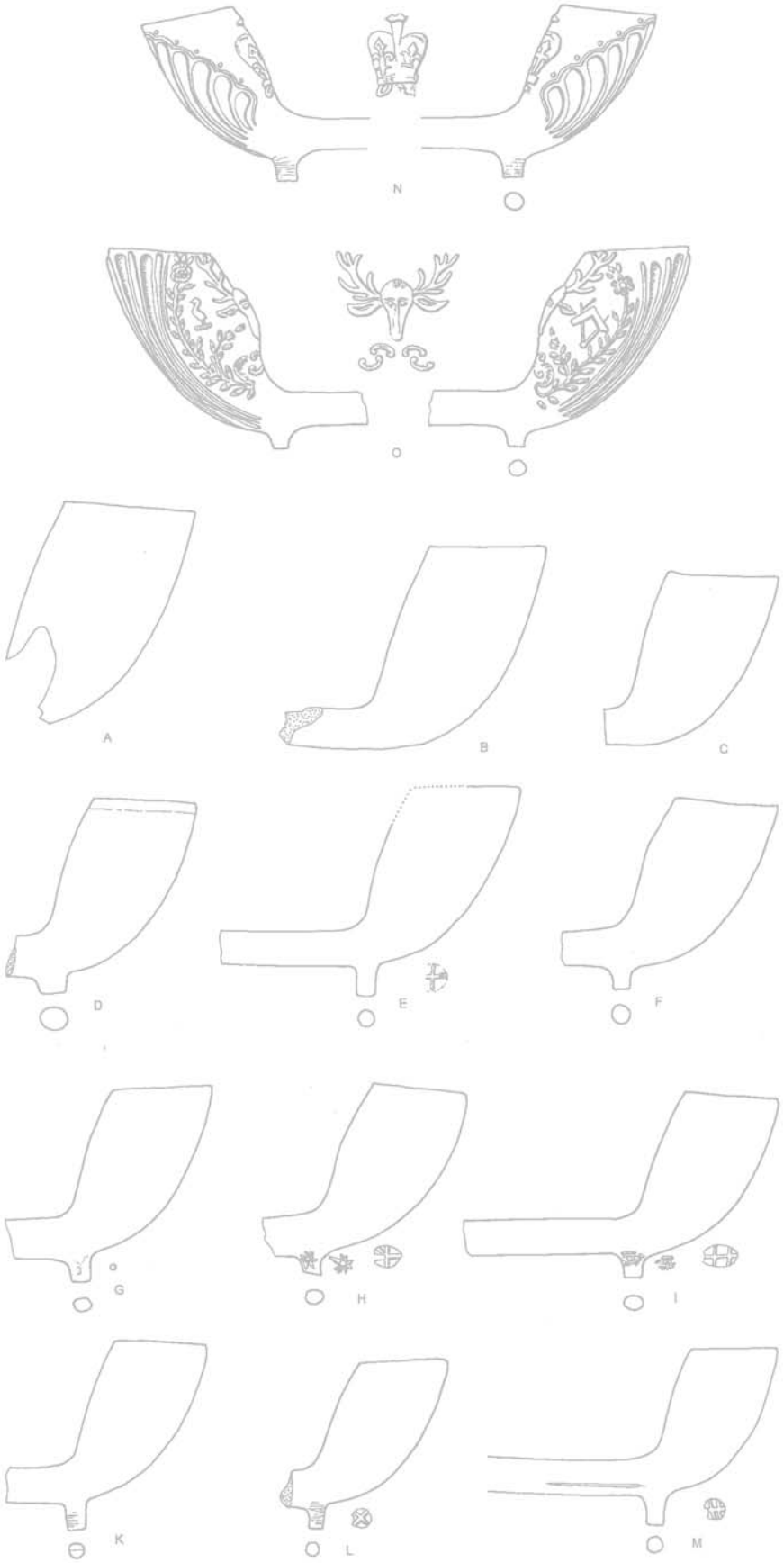


Figure 26: Decorated clay pipe bowls and mould types produced by William Morgan

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