



# Northern Hub, Manchester and Salford

## Archaeological Watching Brief



**Oxford Archaeology North**

November 2014

**Skanska BAM Northern Hub Joint  
Venture**

Issue No: 2014-15/1590

OA North Job No: L10728

NGR: SJ 8305 9768 – SJ 8301 9839

**Document Title:** NORTHERN HUB, MANCHESTER AND SALFORD

**Document Type:** Archaeological Watching Brief

**Client:** Skanska BAM Northern Hub Joint Venture

**Issue Number:** 2014-15/1590  
**OA Job Number:** L10728  
**National Grid Reference:** SJ 8305 9768 – SJ 8301 9839

**Prepared by:** Dr Richard Gregory  
**Position:** Senior Project Manager  
**Date:** November 2014

**Checked by:** Ian Miller  
**Position:** Senior Project Manager  
**Date:** November 2014

Signed 

**Approved by:** Alan Lupton  
**Position:** Operations Manager  
**Date:** November 2014

Signed 

**Oxford Archaeology North**

Mill 3  
Moor Lane Mills  
Moor Lane  
Lancaster  
LA1 1GF  
t: (0044) 01524 541000  
f: (0044) 01524 848606

**Oxford Archaeology Ltd (2014)**

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

w: [www.oxfordarch.co.uk](http://www.oxfordarch.co.uk)  
e: [info@oxfordarch.co.uk](mailto:info@oxfordarch.co.uk)

Oxford Archaeological Unit Limited is a Registered Charity No: 285627

**Disclaimer:**

*This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Oxford Archaeology Ltd being obtained. Oxford Archaeology Ltd accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person/party using or relying on the document for such other purposes agrees, and will by such use or reliance be taken to confirm their agreement to indemnify Oxford Archaeology Ltd or all loss or damage resulting therefrom. Oxford Archaeology Ltd accepts no responsibility or liability for this document to any party other than the person/party by whom it was commissioned.*

---

## CONTENTS

---

|  |           |
|--|-----------|
| <b>SUMMARY .....</b>   | <b>2</b>  |
| <b>ACKNOWLEDGEMENTS.....</b>   | <b>3</b>  |
| <b>1. INTRODUCTION .....</b>   | <b>4</b>  |
| 1.1 Circumstances of the Project.....  | 4         |
| 1.3 Archaeological and Historical Background .....   | 6         |
| <b>2. METHODOLOGY.....</b>   | <b>13</b> |
| 2.1 Watching Brief.....  | 13        |
| 2.2 Finds.....   | 13        |
| 2.3 Archive.....   | 13        |
| <b>3. RESULTS.....</b>   | <b>14</b> |
| 3.1 Introduction.....  | 14        |
| 3.2 Results.....   | 14        |
| <b>4. DISCUSSION AND RECOMMENDAIONS .....</b>  | <b>19</b> |
| <b>BIBLIOGRAPHY .....</b>  | <b>20</b> |
| Primary and Cartographic Sources .....   | 20        |
| Secondary Sources .....  | 20        |
| <b>APPENIX 1: SUMMARY OF OBSERVED INTERVENTIONS .....</b>  | <b>22</b> |
| <b>ILLUSTRATIONS .....</b>   | <b>27</b> |
| List of Figures .....  | 27        |
| <br><b>LIST OF PLATES</b>  |           |
| Plate 1: The phasing of extant railway architecture area .....   | 9         |
| Plate 2: View along the viaduct, leading to Irwell Street .....  | 14        |
| Plate 3: An example of the cobbled surfaces encountered, from test pit G4HP07 .....  | 15        |
| Plate 4: An example of the stepped viaduct arch foundations exposed during test pitting, from pit G4FP06 between arch 13 and 14..... | 16        |
| Plate 5: The brick floor and associated walls in TP03.....   | 17        |
| Plate 6: The L-shaped building as depicted on the OS 1:2500 map of 1896.....   | 18        |

---

## SUMMARY

---

Oxford Archaeology North (OA North) was commissioned by Andy Sharrock, acting on behalf of the Skanska BAM Northern Hub Joint Venture, to maintain an archaeological watching brief during the course of a geo-technical investigation as part of the Ordsall Chord rail link. This investigation was undertaken within a linear corridor running for a distance of *c* 920. This corridor lies both within the Castlefield area of Manchester, adjacent to the Museum of Science and Industry (MoSI), and also traverses that part of Salford located to the south-west of Salford Central Station. The proposed development will involve the construction of an elevated chord linking the Bolton Lines railway on the existing Castlefield Manchester, South Junction & Altrincham Railway viaduct (known historically as the MSJ&AR Viaduct) with the Chat Moss Lines railway on the existing Middlewood Liverpool & Manchester Railway viaduct near Salford Central Station. The works will necessitate the erection of a new viaduct across the River Irwell, and some alterations to the existing viaducts, most of which are afforded statutory designation as Grade I, II\* or II listed buildings. Given the potential for buried archaeological remains across this area, and following consultation with the Greater Manchester Archaeological Advisory Service (GMAAS), which provides archaeological advice to Manchester and Salford City Councils, it was recommended that an archaeological watching brief should be maintained during the geo-technical investigations.

The geo-technical programme was conducted and monitored intermittently between the 17th March and 30th June 2014, during which time 42 interventions were observed. During monitoring, deposits, surfaces, and structural remains were recorded in several of the interventions, all of which appear to date to the nineteenth century. These deposits consisted primarily of made-ground deposits, or disturbed natural, associated with the construction of the various railway viaducts and bridges within the ground-investigation area. The majority of the structural features related to the footings of individual viaduct arches and included some brick-built features forming drains. As such, these remains provide further, albeit minor, constructional details of the specific railway viaducts and bridges that they are associated with. In addition to these, the remains of a building were observed to the north of the Water Street viaducts, on the Manchester side of the Irwell. This building is depicted on late nineteenth-century mapping and was possibly built around 1863, when the adjacent Prince's Bridge was constructed. These remains are considered to hold little archaeological significance.

Based upon the results of the watching brief, there are no significant archaeological deposits of interest across the ground-investigation area, beyond the upstanding listed elements of the rail infrastructure. It is therefore recommended that no further archaeological mitigation is merited, with regard to below-ground remains. However, the forthcoming works associated with the Ordsall Chord rail link will necessitate modifications to several of the listed buildings contained within the ground-investigation area. Given the status of these structures, it is recommended that the proposed work associated with these modifications should be monitored and recorded by a historic-building specialist or engineer, with a particular expertise in historic-railway architecture.

---

## ACKNOWLEDGEMENTS

---

Oxford Archaeology North (OA North) would like to thank Andy Sharrock for commissioning and supporting the project on behalf of Skanska BAM Northern Hub Joint Venture. OA North would also like to thank Norman Redhead, Heritage Management Director, Greater Manchester Archaeological Advisory Service, for his advice.

The archaeological watching brief was carried out by Phil Cooke and Lewis Stitt. The report was written by Richard Gregory and Adam Tinsley, and the drawings were produced by Mark Tidmarsh. The project was managed by Ian Miller.

---

## 1. INTRODUCTION

---

### 1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 As part of a major programme of improvements to the region's railway infrastructure, Network Rail has proposed to develop a new rail link to connect Manchester Piccadilly, Oxford Road, and Victoria stations in Manchester. The rail link is termed Ordsall Chord and its design will remove an existing bottleneck to the south of Piccadilly station, and free up space on the rail network to better connect towns and cities across the North West.
- 1.1.2 The development proposals comprise the construction of an elevated chord linking the Bolton Lines railway on the existing Castlefield Manchester, South Junction & Altrincham Railway viaduct (MSJ&AR Viaduct) with the Chat Moss Lines railway on the existing Middlewood Liverpool and Manchester Railway viaduct, near Salford Central Station. The works will necessitate the erection of a new viaduct across the River Irwell, and some alterations to the existing viaducts, most of which are afforded statutory designation as Grade I, II\*, or II listed buildings. The development works will also require the construction of some foundation piers for the new viaduct, which will necessitate earth-moving works.
- 1.1.3 During the initial stages of the project, Oxford Archaeology North (OA North) was commissioned by Parsons Brinckerhoff, acting on behalf of Network Rail, to produce an archaeological desk-based assessment for the entire area covered by the proposed railway link, as well as a wider buffer zone (OA North 2012). This was intended to establish, as far as possible, the nature and significance of the subsurface archaeological resource within the area, and to establish the impact of any future development upon this resource.
- 1.1.4 This study indicated that the proposed rail link passes through areas where there is potential for *in-situ* buried remains of archaeological interest to survive. It further concluded that these might comprise possible prehistoric and Roman remains in the southern section of the proposed development area, with possible medieval and early post-medieval remains being present in its northern area, within Salford's historic core. However, it was noted that these early remains, if originally present, would be highly susceptible to truncation and destruction by later activity and might therefore only survive in small isolated pockets. Apart from early remains, the desk-based assessment suggested that the majority of below-ground within the proposed development area would probably date to the late eighteenth and nineteenth centuries. These, in turn, would directly form elements of Manchester and Salford's industrial-era settlements, whose growth and expansion were largely a result of the rise of the region's textile industry.

1.1.5 Following the production of the desk-based assessment, a programme of geo-technical investigations was initiated, which focused on the southern part of the development area. Given the potential for buried archaeological remains across this area, and following consultation with the Greater Manchester Archaeological Advisory Service (GMAAS), which provides archaeological advice to Manchester and Salford City Councils, it was recommended that an archaeological watching brief should be maintained during the geo-technical investigations. This would record any significant below-ground remains uncovered within the geo-technical interventions. OA North was subsequently commissioned to perform this archaeological watching brief.

## 1.2 LOCATION, GEOLOGY, AND TOPOGRAPHY

1.2.1 **Location:** the area earmarked for the ground investigation forms a linear corridor running for a distance of *c* 920m (NGR SJ 8305 9768 to SJ 8301 9839; Fig 1). This corridor lies both within the Castlefield area of Manchester, adjacent to the Museum of Science and Industry (MoSI), and also traverses that part of Salford located to the south-west of Salford Central Station.

1.2.2 More specifically, the geo-technical investigation focused on the pre-existing railway viaducts in this area. These included that section of the MSJ&AR Viaduct, which runs north-west/south-east and is carried across Water Street on a cast-iron girder bridge, and across the River Irwell on a stone and cast-iron girder bridge. All of these features fall in the south-eastern part of the ground investigation area and together form a Grade II listed building (railway viaduct Listed Entry No. 1200837; Irwell Bridge Listed Entry No. 1386189).

1.2.3 To the north of the MSJ&AR Viaduct, the ground-investigation area covers a group of significant viaducts and bridges that cross the Irwell and Water Street, immediately west of MoSI, all of which have been afforded statutory protection. These include: a masonry bridge, spanning the Irwell, which forms a Grade I listed building (Listed Entry No. 1270603); a linking brick-built viaduct on the eastern side of the masonry bridge, which represents a Grade II listed building (Listed Entry No. 1254726); and a linking iron-girder bridge across Water Street, which is also a Grade II listed building (Listed Entry No. 1254726). An animal ramp also runs down from the viaduct, and this represents a Grade II listed building (Listed Entry No. 1254726). In addition, this area also contains another railway viaduct and two brick-built and cast-iron bridges, spanning the River Irwell and Water Street, that form Grade II listed buildings (Listed Entry Nos 1254829 and 1391929).

1.2.4 To the north of this significant group of railway viaducts and bridges, the ground-investigation area lies on the Salford side of the River Irwell. It initially follows the course of a railway viaduct that formed an early link between Ordsall Lane and Victoria Station, which has a later addition. Further to the north-east this viaduct contains elements that constitute Grade II\* and II listed buildings (Listed Entry Nos 1386162 and 1386119). At its far northern end, the ground-investigation area contains a series of inter-linked nineteenth-century viaducts that run to Salford Station. Further to the north-west, elements of this group of inter-linked viaducts form Grade II listed buildings (Listed Entry Nos 1386161 and 1386160).

- 1.2.5 **Geology:** the solid geology across the ground-investigation area consists of Sherwood Sandstone (formerly classified as Bunter Sandstone), which is overlain in the Castelfield area, by Devensian Glaciofluvial deposits (BGS 2014). The superficial geology across the remaining portion of the ground-investigation area consists of Devensian Till.
- 1.2.6 **Topography:** as a region, the Manchester and Salford conurbations lie within an undulating lowland basin, which is bounded by the Pennine uplands to the east and to the north. The region comprises the Mersey river valley, which is dominated by its heavily meandering river within a broad floodplain (Countryside Commission 1998, 125). The River Irwell forms a tributary of the Mersey and is partly crossed by the ground-investigation area. Within the vicinity of MoSI the topography across the ground-investigation area slopes westwards towards the River Irwell, falling from *c* 28.3m to 26.2m above Ordnance Datum (aOD). That part of the ground-investigation area on the Salford side of the Irwell lies at *c* 27m aOD.

### 1.3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

- 1.3.1 **Introduction:** the following section presents a summary of the archaeological and historical background pertinent to the ground-investigation area. This information has been derived from the earlier desk-based assessment, which provides further details relating to specific sites, the wider scheme, and its setting (OA North 2012).
- 1.3.2 **Prehistoric:** immediately adjacent to the ground-investigation area, on the Salford side of the Irwell, some evidence for prehistoric activity has been recovered in the form of several 'Neolithic water-rolled flints', along with a 'Neolithic flint core'. These are reported to have been recovered from an area sandwiched between East Ordsall Lane and the River Irwell, which was later occupied by the Salford Goods Station, which lay immediately west of the ground-investigation area (Hampson 1945, 162). However, the provenance of these finds is far from secure, and it is quite possible that they were originally recovered from Woden's Cave, which lay further to south-east, close to Ordsall Lane (*ibid*). In addition, the Greater Manchester HER also notes the presence of a circular stone structure from this area, reminiscent of a prehistoric house or cairn, though its form, date, and precise location are from clear.
- 1.3.3 Further evidence for prehistoric activity has been recovered immediately east of the ground-investigation area, in the Castlefield area. This includes re-deposited prehistoric artefacts recovered during archaeological excavations at Collier Street, Barton Street, Byrom Street, and Liverpool Road (Gregory 2007, 181). These artefacts include Mesolithic-Bronze Age lithics, and late Bronze Age or Iron Age pottery (*ibid*).
- 1.3.4 Given the presence of prehistoric artefacts either side of the River Irwell, it is clear that some form of prehistoric activity did occur close to, or even within, the ground-investigation area. However, the nature and extent of this activity is far from clear, though it is likely to have been of a peripatetic nature.



- 1.3.5 **Roman:** during the early centuries of the first millennium AD the Roman fort of *Mamucium* was established on a sandstone bluff close to the confluence of the rivers Irwell and Medlock, immediately to the east of the ground-investigation area, within Castlefield (Bryant *et al* 1986). Archaeological excavation has shown that the fort was first built in the late first century, and although modified, appears to have remained in use until the end of Roman rule in Britain three centuries later (*ibid*). Outside the defences of the fort, a substantial extra-mural settlement, or *vicus*, was also established in the late first century, which was occupied until the early third century (Jones and Grealey 1973; Proctor 2005; Gregory 2007). Based on recent archaeological excavation and the distribution of Roman finds, the limits of this settlement appear to have extended northwards from the fort to approximately Quay Street, westwards along Liverpool Road for *c* 100m from the north-west corner of the fort, eastwards across Deansgate to the area now occupied by the Beetham Tower, and south-eastwards along Chester Road, terminating somewhere in the vicinity of Great Jackson Street.
- 1.3.6 Whilst the ground-investigation area falls outside the suspected limits of the settlement core, it is possible that Roman remains associated with the *vicus* may exist within the far eastern part of the ground-investigation area, and also along the eastern bank of the River Irwell. In terms of this latter area, six Roman coins, at least five of which dated to the second century, are reported to have been found ‘in 1876 while foundations were being dug for a bridge over the Irwell, near Quay Street’ (Conway *et al* 1909, 84-5). These finds may therefore suggest that the eastern bank of the Irwell, including the portion traversed by the ground-investigation, witnessed more ephemeral activity on the fringe of the Roman settlement. Furthermore, it is also possible that a Roman road, perhaps linking Manchester with the settlement at Wigan, forded the Irwell directly within the study area at a point close to Prince’s Bridge, although this awaits confirmation.
- 1.3.7 **Medieval and early post-medieval:** the Castlefield section of the ground-investigation area, on the Manchester side of the Irwell, lies within an area that formed part of a small medieval deer park, named Aldport Park. This park is documented in 1282 and seems to have been still in existence in about 1599. According to one report, it was destroyed in the Civil War. Its boundaries are believed to have been the rivers Irwell and Medlock and the approximate line of the later Quay Street and Peter Street on the north (GM HER 112.1.0).
- 1.3.8 **Late eighteenth to early nineteenth century:** in the latter decades of the eighteenth century both Salford and Manchester entered a period of massive expansion, largely as a result of the rise of the region’s textile industry. This resulted in a rapid increase in population, and a concomitant growth of both urban centres, which continued throughout the nineteenth century.
- 1.3.9 The cartographic evidence indicates that initially during the late eighteenth and early nineteenth century, much of the ground-investigation area formed undeveloped agricultural land. However, one part of the ground-investigation area had been developed during this period. This area lay on the eastern bank of the River Irwell, adjacent to the MoSI, and contained a dye works (OA North 2012, Site 77).

- 1.3.10 This works could be accessed from Water Street which was probably laid out in about 1750 (Gregory and Bell 2008). The late eighteenth-century dye works consisted of a large building with an irregular T-shaped plan, six smaller ancillary buildings immediately to the south-west, and a further ancillary building to the north-east. During the early nineteenth century this dye works was modified and was then partly demolished in 1830, during the construction a railway viaduct (*Section 1.3.12*). Its remaining elements were demolished in *c* 1837 as a prelude to the construction of a railway arrival station (*Section 1.3.13*; OA North 2012).
- 1.3.11 The late eighteenth and early nineteenth century was also characterised by significant advances in waterborne infrastructure and the development of pre-existing areas of wharfage, and two areas relevant to these advances are located within the central portion of the ground-investigation area. One of these areas contains a series of six extant locks, which connected the Manchester, Bolton, and Bury Canal to the River Irwell. This canal, which was in use by 1795, was designed as a means of transporting coal to Manchester and Salford from the collieries situated to the north in the Irwell valley (Gray 1989, 6). However, the river locks were not an original feature of this navigation, and were not opened until 1808 (*ibid*). The Manchester side of the Irwell, along Water Street, also witnessed considerable development during the late eighteenth and early nineteenth century through the construction of a series of warehouses within a wharf-side area (George and Brumhead 2002). One of these warehouses, the New Botany Warehouse (OA North 2012, Site 78), was positioned within the ground-investigation area. This warehouse, which was demolished in 1981, was constructed by the Old Quay Company in 1824, had five storeys, with its first floor being supported by cast-iron columns (Fitzgerald 1980, 32).
- 1.3.12 **Mid-nineteenth to twentieth century:** across the ground-investigation area, the period dating between the mid-nineteenth and twentieth centuries was dominated by the development of railways. Significantly, the ground-investigation area contains a series of sites, which hold great relevance for understanding railway development across a wider regional area (Plate 1).
- 1.3.13 Within the ground-investigation area, the earliest railway dates to 1830 and was built by the Liverpool and Manchester Railway (L&MR) Company. This railway linked Liverpool and Manchester, and Liverpool Road Station, now forming part of MoSI, formed its Manchester terminus. This lay either side of Water Street and the line was originally carried across the River Irwell and Water Street by a skewed masonry bridge (OA North 2012, Site 79; Plate 1), designed by George Stephenson (Fitzgerald 1980, 19), and a brick-built viaduct (*op cit*, Site 80; Plate 1) and brick and cast-iron girder bridge (*op cit*, Site 81; Plate 1), which were both constructed by Brockbank and Findlay (Thomas 1980, 50). These elements lie directly within the ground-investigation area and, although the cast-iron and girder bridge was demolished and rebuilt in 1905, the masonry bridge and brick-built viaduct are still extant and form Grade I and II Listed Buildings respectively, whilst the later 1905 bridge is a Grade II Listed Building. The area beneath the brick-built viaduct was also originally used as stabling (Gregory *et al* 2004).

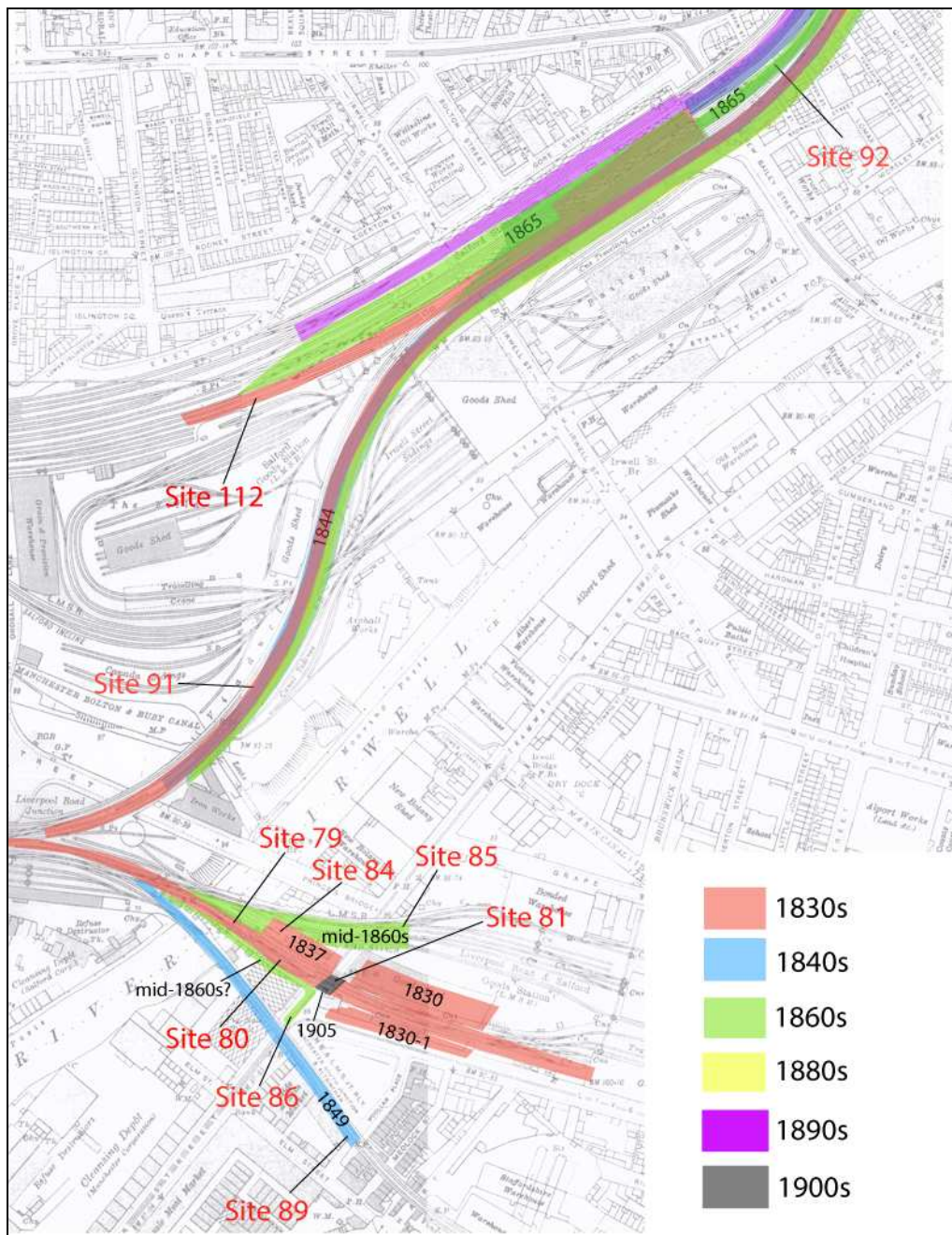


Plate 1: The phasing of extant railway architecture within and adjacent to the ground-investigation area, superimposed on the Ordnance Survey 1:2500 maps (sheets CIV.10 and CIV.6) of 1932 and 1933 (Site numbers are those used in OA North 2012)

1.3.14 Several other elements associated with the 1830s railway terminus also fall within the ground-investigation area. To the west of Water Street these elements included a ramp (OA North 2012, Site 82), allowing cart access over the masonry bridge, a water tower, and a single-storey building (*op cit*, Site 83), all of which had been demolished by the late nineteenth century. In addition, the Liverpool Road arrival station (*op cit*, Site 84) was also located in this area. This station was designed by Haig and Franklin and was constructed in 1837 immediately north of the 1830 viaduct (*op cit*, Site 80). Its platform was accessed via an inclined roadway and, at platform level, cast-iron columns supported its roof, whilst its western end functioned as a loading dock.

- 1.3.15 Beneath, and supporting, the station were also vaults used for stabling and storage and it appears that these elements, along with the station's outer façade, facing Water Street, are partially extant and were incorporated into a later viaduct (*op cit*, Site 85; Plate 1). This later structure is a Grade II Listed Building.
- 1.3.16 During the late 1830s Manchester's and Salford's rail network was further developed through the construction of the Manchester, Bolton, and Bury (MB&B) railway. This railway was carried across Salford on a brick-built viaduct (*op cit*, Site 112; Plate 1), which partly lies within the ground investigation area, and its original terminus was Salford Central Station.
- 1.3.17 Further developments to the rail system occurred in the 1840s due to the opening of a railway line in 1844 (*op cit*, Site 91; Plate 1), running from Ordsall Lane to the newly opened station at Hunt's Bank (later Victoria). This line was constructed by the L&MR and was carried on a brick-built viaduct, part of which lies within the ground-investigation area. This line was carried through Salford Station onwards to Victoria and elements to the north-east of the ground-investigation area form a Grade II\* listed building. The construction of this line, and Hunt's Bank Station, also had a significant effect on Liverpool Road Station (*see above*). In consequence, the station became defunct as a passenger terminus and was thus converted into a goods station, resulting in several alterations to the fabric of the original station buildings (Fitzgerald 1980, 53).
- 1.3.18 In addition to the 1844 line, the ground-investigation area also contains another railway line dating to the 1840s (*op cit*, Site 89; Plate 1). This line was constructed by the Manchester and South Junction and Altrincham Railway (MSJ&AR), opened in 1849, and was designed as a link between London Road (later Piccadilly) Station and the L&MR line at Ordsall Lane (Holt 1986, 114). Within the ground-investigation area, this line was carried on a brick-built viaduct, with a bridge across the Irwell, and a cast-iron bridge across Water Street, all of which are extant and form a Grade II listed building.
- 1.3.19 The latter half of the nineteenth century witnessed further developments and alterations to the railway system. At the Liverpool Road Station this included the expansion of the goods station involving the construction of several features which lie within the ground-investigation area. These include a brick and cast-iron viaduct, associated with two cast-iron and girder bridges crossing the Irwell and Water Street, which were constructed in the mid-1860s (OA North, Site 85; Plate 1). These extant structures form a Grade II listed building and they linked the former L&MR line, which by the mid-1860s was operated by the London and North Western Railway (LNWR), with the London and North Western bonded warehouse and the Great Western warehouse, now located within the MoSI (Fitzgerald 1980, 59). During the construction of this new link, the former 1837 arrival station (*Section 1.3.13*) was partly demolished and its lower portions subsumed into a brick-built viaduct between Water Street and the River Irwell. These viaduct arches were subsequently used for stabling, and portions of this stabling were partly recorded in 2004 (Gregory *et al* 2004).

- 1.3.20 These remains included timber stalls and a hay loft, in one viaduct arch, whilst stone post-pads and flooring were noted in the remaining viaduct arches (*ibid*). It was also during the latter part of the nineteenth century that the original 1830 brick-built viaduct (OA North, Site 80: Plate 1) was expanded on its southern side, which entailed the demolition of an earlier ramp and water cistern (*op cit*, Site 82). This extended section of viaduct is extant and linked to an animal ramp (*op cit*, Site 86; Plate 1), which is also extant and forms a Grade II listed building, running down from the viaduct parallel with Water Street.
- 1.3.21 Outside of the Liverpool Road Station area, within the Salford portion of the ground-investigation area, major alterations were made to the pre-existing system of railways through the construction of additional viaducts. Initially, this included the construction of a small extension to the 1838 viaduct (*op cit*, Site 112; Plate 1) and also an additional railway viaduct running between Salford Station and Victoria (*op cit*, Site 92; Plate 1). This viaduct opened in 1865 and was constructed by the Lancashire and Yorkshire Railway (L&YR), who by this date had subsumed the MB&B railway. The construction of this viaduct, which is extant and contains portions forming a Grade II Listed Building, also necessitated the reconstruction of Salford Station.
- 1.3.22 Following the construction of the 1865 viaduct, and the concomitant alteration to Salford Station, a major scheme of railway construction then occurred in the 1880s connected to the established of Exchange Station which opened in 1884 to the north-east of the ground-investigation area (Holt 1986, 134; OA North, Site 95). This station was built across the centre of Salford's historic core, and within the ground-investigation area it resulted in the extension of the 1844 railway viaduct (*Section 1.3.15*). This extension is extant and is largely constructed in brick, and is butted directly against the southern side of the pre-existing viaduct (*op cit*, Site 91).
- 1.3.23 Outside of the railway viaducts and former passenger stations, at Liverpool Road, Salford Central, and Exchange Station, the area between Irwell Street and Ordsall Lane also formed part of the Salford Goods Station in the latter half of the nineteenth century. This site was acquired by the MB&B railway in the mid-nineteenth century (Gray 1989, 76), and initially contained a wharf adjacent to the Manchester, Bolton, and Bury Canal. However, by the late nineteenth century the site had been considerably developed. A small portion of this former goods station lies within the ground-investigation area. Access to this area was further enhanced following the construction of Prince's Bridge in 1863 (OA North, Site 87). This bridge, which also falls within the ground-investigation area, allowed access between Water Street and East Ordsall Lane. During the late nineteenth-century historic mapping indicates that the goods station contained a series of buildings and ancillary structures. The major buildings included railway warehouses, goods sheds, whilst smaller buildings were positioned on Irwell Street and in the northern portion of the goods station. In addition, to serving the railway, the goods station was provisioned with a wharf, positioned adjacent to the River Irwell, which was also originally associated with a canal arm linking with the Manchester, Bury, and Bolton Canal.

1.3.24 ***Twentieth century:*** the pattern of mid- and late nineteenth-century development was largely retained into the twentieth century, and many of the nineteenth-century features, particularly the railway viaducts, still form important components of Salford's and Manchester's infrastructure. However, the twentieth century did witness the destruction of nineteenth-century buildings associated with the Salford Goods Station and the New Botany warehouse (*Section 1.3.10*).

---

## 2. METHODOLOGY

---

### 2.1 WATCHING BRIEF

- 2.1.1 The geo-technical investigations were monitored intermittently between the 17th March and the 30th June 2014. During this time 42 interventions were observed, which comprised 29 test pits, seven bore holes, three window samples, two cone-penetration pits, and one abandoned intervention (*Appendix 1*; Fig 2). The excavations were undertaken by sub-contractors nominated by the client and were observed by a suitably qualified and experienced OA North archaeologist. Excavations were conducted by a combination of both hand and hydraulically powered tracked mechanical excavator, equipped with a variety of buckets, as appropriate to the task in hand, as well as prevailing ground and safety conditions, and each intervention varied in size and depth.
- 2.1.2 The archaeological watching brief recorded the location, extent, and character of all surviving features and deposits of archaeological interest contained within those interventions subject to monitoring. All monitoring work was carried out in accordance with the relevant standards and procedures provided by the Institute for Archaeologists (IfA 2008a; 2008b; 2010) and their code of conduct, and also generally accepted best practice (English Heritage 2006).

### 2.2 FINDS

- 2.2.1 The recovery of finds and sampling programmes were carried out in accordance with industry best practice, following current IfA guidelines (IfA 2008c), and subject to expert advice, where required, in order to minimise deterioration. However, all finds were of modern date and consequently none were retained.

### 2.3 ARCHIVE

- 2.3.1 A full professional archive has been compiled in accordance with the current IfA (IfA 2008b) and English Heritage guidelines (English Heritage 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. A copy of this report will be forwarded to the Greater Manchester Historic Environment Record (GMHER).

---

## 3. RESULTS

---

### 3.1 INTRODUCTION

3.1.1 The geo-technical investigations consisted of a series of interventions located at various strategic points across the ground-investigation area (Fig 2). Some of the interventions were intended to provide information as to the extent and character of geological deposits, while others were positioned in order to establish the extent and depth of foundation deposits associated with existing structures, specifically the various nineteenth-century viaducts and bridges.

### 3.2 RESULTS

3.2.1 **Deposits:** most interventions consistently encountered overburden that primarily comprised either made-ground deposits or heavily disturbed and contaminated natural deposits of late post-medieval or modern origin (*Appendix 1*). The presence of late post-medieval pottery, clay tobacco pipe and whole or fragmented brick was observed in many of the deposits, but not otherwise retained. These deposits appear to result from the establishment and development of the rail infrastructure during the nineteenth century and specifically the construction of the various viaducts (Plate 2), bridges and associated areas, or subsequent modern landscaping and development.



Plate 2. View along the viaduct (OA North, Site 91), leading to Irwell Street



- 3.2.2 **Stone-sett surfaces:** a consistent feature of many of the test pits was the presence of a stone-sett surface (Plate 3), occurring at various depths and below variable deposits as described in *Appendix 1*. These surfaces were probably laid to facilitate access between the viaduct arches, although a cobbled surface observed in test pit G4WS06, located next to the River Irwell, was interpreted as a possible tow path.
- 3.2.3 Generally, the stone-sett surfaces almost certainly date to the late nineteenth and twentieth centuries, and are little archaeological interest. In most cases, the surfaces were laid on a thin levelling layer, which sealed the natural geology, with no indication of any buried remains of archaeological interest.



Plate 3. An example of the cobbled surfaces encountered across the site, from test pit G4HP07

- 3.2.4 **Structural remains:** a number of structural features, primarily comprising sections of handmade brick walling were recorded in several test pits (*Appendix 1*). Many of these structures could be related to the footings of the various upstanding viaducts and rail bridges (Plate 4). Indeed, the exposure and recording of the extent and depth of these footings formed a primary aim of the test pits excavated in close proximity to the upstanding structures.



Plate 4. An example of the stepped viaduct arch foundations exposed during test pitting, from pit G4FP06 between arch 13 and 14

- 3.2.5 In addition, several drainage features were recorded. These included soak-away drains in G4HP106 and G4HP114, and one or more culverts, constructed with handmade brick, bonded with a white lime mortar, exposed in test pits G4FP03 and G4HP119. It may be significant that one of these culverts lay at the site of a late eighteenth-century dye works (*Section 1.3.9*). However, its association with this site cannot be proven, and it more probably forms an element associated with the nineteenth-century viaducts that were constructed across this area, specifically that which dates to the mid-1860s (*Section 1.3.17*).
- 3.2.6 Other structural remains were recorded to the north of the Water Street viaducts, and to the south of Hampson Street. In TP03 these included the footings of a nineteenth-century wall that ran parallel with Hampson Street (Plate 5). This handmade brick wall was associated with Prince's Bridge and as such probably dates to *c* 1863 (*Section 1.3.20*). In addition to this wall, TP03 also revealed another brick and cobbled surface at a depth of 1.2m below present ground surface (Plate 5). This floor surface formed part of a small structure also defined within the context of the test pit by up to four separate wall sections (1-4), each constructed of handmade brick. Wall 1 was observed to be keyed into the retaining wall along Hampson Street and extend at 90° from it, while Wall 2 butted against Wall 1. Walls 3 and 4 extended between Walls 1 and 2 and ran parallel to one another, up to 0.65m apart, and the retaining wall. A further handmade brick wall, running parallel to the retaining wall along Hampson Street, was also identified to the west, in TP04.



Plate 5. The brick floor and associated walls in TP03. Walls 3 and 4 centre left

- 3.2.7 Consideration of historic mapping indicates that the remains from TP03 and TP04 formed elements of an L-shaped building that was constructed against the retaining wall of Prince's Bridge. This building is first depicted on the Ordnance Survey 10ft:1 mile map, published in 1891, though its handmade brick walling and association with the Prince's Bridge suggests that it might date to the 1860s or 1870s (Plate 6). Subsequent Ordnance Survey mapping indicates that this building survived into the twentieth century, and its handmade brick wall footings were also visible as surface features in 2004 (*cf* Gregory *et al* 2004, site 26).
- 3.2.8 Another wall, constructed of handmade brick, was located in TP05, which was positioned immediately north of the Water Street viaducts. This wall extended from a support column associated with the cast-iron bridge crossing the Irwell, which dates to the mid-1860s (*Section 1.3.17*), and is probably of similar date. To the south of this a modern red-brick and concrete structure was encountered in G4HP118, which lay beneath the mid-1860s viaduct.

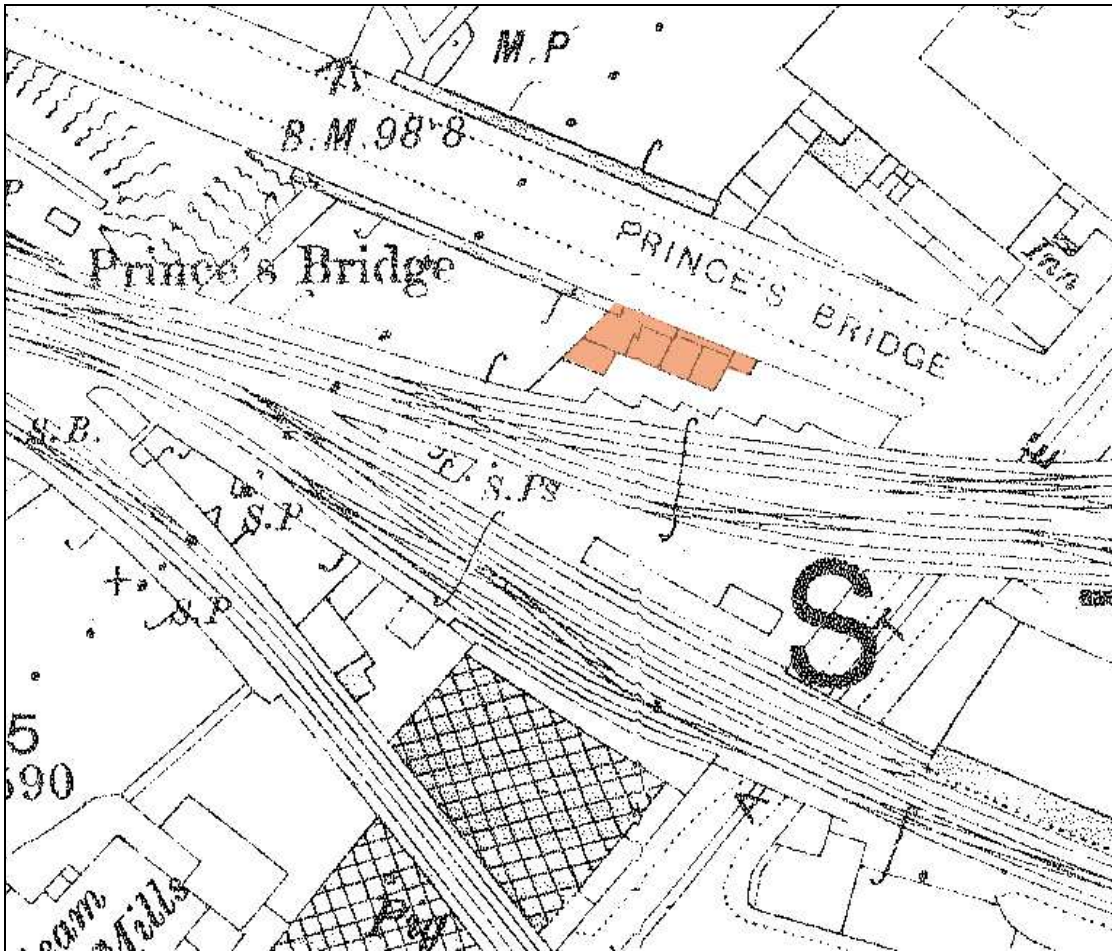


Plate 6: The L-shaped building (highlighted) as depicted on the Ordnance Survey 1:2500 map (Sheet CIV.10) of 1896

---

## 4. DISCUSSION AND RECOMMENDATIONS

---

- 4.1 ***Below-ground remains:*** it appears that the majority of the deposits and structural features encountered during the geo-technical investigations date to the nineteenth century. The deposits consisted primarily of made-ground deposits or disturbed natural associated with the construction of the various viaducts and rail bridges within the ground-investigation area, whilst the majority of structures related to the footings of individual viaduct arches and also included brick-built drains. As such, these remains provide further, albeit minor, constructional details of the specific railway viaducts and bridges that they are associated with. In addition to these, the remains of a building were observed to the north of the Water Street viaducts, which may be contemporary with the construction of Prince's Bridge in 1863. However, this building is considered to hold little archaeological significance.
- 4.2 Based upon the results of the watching brief, there are little or no significant archaeological deposits of interest across the ground-investigation area, beyond the upstanding listed elements of the rail infrastructure. It is therefore recommended that no further archaeological mitigation is merited, with regard to below-ground remains.
- 4.3 ***Listed buildings:*** the forthcoming works associated with the Ordsall Chord rail link will also necessitate modifications to several of the listed buildings contained within the ground-investigation area (*cf* Network Rail 2013). This works includes: fabric repairs and reinstatement to the 1830 Grade I listed masonry bridge (Listed Entry No. 1270603; *Section 1.3.12*); demolition of the mid-1860s Grade II listed iron-girder bridge spanning the River Irwell (Listed Entry No. 1391929; *Section 1.3.17*) and partial demolition of the associated mid-1860s Grade II listed brick-built viaduct (Listed Entry No. 1254829; *Section 1.3.17*); modifications and strengthening to parts of the 1830 Grade II listed viaduct, animal ramp, and later iron-girder bridge spanning Water Street (Listed Entry No. 1254726; *Sections 1.3.12 and 1.3.17*); widening of the Grade II listed MSJ&AR Viaduct, removal of the Water Street bridge, and slewing of the existing track on the bridge spanning the River Irwell (Listed Entry Nos. 1200837 and 1386189; *Section 1.3.16*); strengthening works and fabric repairs to the 1844 Grade II\* listed L&MR viaduct (Listed Entry No 1386162; *Section 1.3.15*); and works to the 1862 Grade II listed L&YR viaduct (Listed Entry No 1386160; *Section 1.3.18*).
- 4.4 Given the status of these structures, it is therefore recommended that the proposed work associated with these modifications should be monitored and recorded by a historic-building specialist, or engineer, with a particular expertise in historic-railway architecture.

---

## BIBLIOGRAPHY

---

### PRIMARY AND CARTOGRAPHIC SOURCES

#### *Cartographic Sources*

Ordnance Survey 10ft to 1mile First Edition map, Lancashire sheets CIV.6.11 and 6.14, surveyed 1888, published 1891

Ordnance Survey 1:2500 map, Lancashire Sheets CIV.10, surveyed 1888-9, published 1896

Ordnance Survey 1:2500 map, Lancashire Sheets CIV.10 and CIV.6, revised 1931 and 1932, published 1932 and 1933

British Geological Society (BGS), 2014 geological web based map accessed August 2014 (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

### SECONDARY SOURCES

Bryant, S, Morris, M, and Walker, JSF, 1986 *Roman Manchester: a frontier settlement*, Archaeology of Greater Manchester, **3**, Manchester

Conway, RS, MacInnes, J, and Brooke, GC, 1909 The Roman coins of Manchester, in FA Bruton (ed) *The Roman Fort at Manchester*, Manchester

Countryside Commission, 1998 *Countryside Character Volume 2: North West*, Cheltenham

English Heritage, 1991 Management of Archaeological Projects (MAP2), Swindon

English Heritage, 2006 *Management of Research Projects in the Historic Environment* (MoRPHE), Swindon

Fitzgerald, RS, 1980 *Liverpool Road Station, Manchester: an historical and architectural survey*, RCHM Sup Ser, **1**, Manchester

George, D, and Brumhead, D, 2002 The Mersey Irwell Navigation - The Old Quay at Manchester, in R McNeil and D George (eds), *The Heritage Atlas 4: Manchester - Archetype City of the Industrial Revolution*, Manchester, 22-4

Gray, E, 1989 Widening Horizons, in T Bergin, DN Pearce, and S Shaw (eds), *Salford: A City and its Past*, Salford, 63-86.

Gregory, RA, 2007 *Roman Manchester: the University of Manchester's Excavations within the Vicus 2001-5*, Oxford

Gregory, RA, Nevell, M, and Wilson, P, 2004 *Water Street Viaducts, Manchester: An Archaeological Assessment*, unpubl rep

Gregory, RA, and Bell, S, 2008 *The Pump House, Left Bank. Manchester: an archaeological excavation*, Unpubl rep

Hampson, CP, 1945 Some Notes on Ancient Defensive Posts, *Trans Lancashire Cheshire Antiq Soc*, **296**, 159-76

Holt, GO, 1986 *A Regional History of the Railways of Great Britain: The North-West* (revised by G Biddle), Newton Abbot

Institute for Archaeologists (IfA), 2008a *Standards and Guidance for Archaeological Watching Brief*, Reading

Institute for Archaeologists (IfA), 2008b *Standard and Guidance for the Creation, Preparation, Transfer and Deposition of Archaeological Archives*, Reading

Institute for Archaeologists (IfA), 2008c *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials*, Reading

Institute for Archaeologists, (IfA) 2010 *By law governing Area (national, regional, local) and Special Interest (other) Groups of the Institute*, Reading

Jones, GDB, and Grealey, S, 1973 *Roman Manchester*, Altrincham

Network Railway, 2013 *The Network Rail (Ordsall Chord) Order: list of consents, permissions and licences required under other enactments*, submitted to Manchester and Salford City Councils 16<sup>th</sup> September 2013

OA North, 2012 *Ordsall Chord, Manchester and Salford: Desk-based Assessment*, unpubl rep

Proctor, J, 2005 Deansgate in B C Burnham, Roman Britain in 2004, *Britannia*, **36**, 418-9

Thomas, RHG, 1980 *The Liverpool and Manchester Railway*, London

## APPENDIX 1: SUMMARY OF OBSERVED INTERVENTIONS

| Intervention Designation | Dimensions             | Method and condition of excavation   | Description of stratigraphy (measurements relate to thickness of deposit except where stated)  |
|--------------------------|------------------------|--|--|
| G4HP01                   | 1 x 1m<br>3m deep      | Test Pit.<br>Hand excavation   | >0.14m cobbled surface<br>>0.36m ashy dark brown sandy silt levelling deposit with red brick fragments<br>>0.5m pinky yellow re-deposited clay<br>>1m light brown sandy silty clay with red-brick fragments, post-med pottery + clay pipe (not retained)<br>Disturbed natural?<br>>1m light grey sandy clay with rounded pebbles and red brick fragments |
| G4HP04a                  | 2 x 2m<br>3.2m deep    | Test Pit.<br>Hand excavation, pit positioned inside viaduct arch 25                      | >0.14m cobbled surface<br>>3m medium brown sandy clay made-ground deposit<br>Red brick footings for viaduct arch at maximum depth  |
| G4HP04b                  | 1.5 x 1.5m<br>3m deep  | Test Pit.<br>Hand excavation, pit positioned outside of viaduct arch                     | >0.5m medium brown sandy silt topsoil with red brick fragments<br>>2m light brown silt sandy clay with red-brick footings for viaduct partially exposed at a depth of 2.7m<br>>0.5m Light brown silty sandy gravel natural?  |
| G4HP05                   | 2 x 2m<br>3m deep      | Test Pit.<br>Hand excavation   | >0.50m medium brown sandy silt topsoil with red-brick fragments<br>>2.5m light brown silty sandy clay possibly re-deposited<br>Red-brick footings of viaduct arch exposed 2m below ground surface (BGS), stepped construction  |
| G4HP06                   | 2 x 2m<br>2.1m deep    | Test Pit.<br>Machine excavation outside of arch 14                                       | >0.10m cobbled surface<br>>0.60m dark grey ashy levelling deposit<br>>0.90m light brown sandy silty clay made ground deposit<br>>0.40m medium to dark brown sandy clay made ground deposit<br>Red-brick footings of viaduct arch supported by a concrete foundation at a depth of 2.1m   |
| G4HP06a                  | 2 x 2m<br>5.5m deep    | Test Pit.<br>Machine excavation inside of arch 14  | >0.1m cobbled surface<br>>2m variable made ground deposit<br>Red-brick footings for viaduct arch stepping out in two directions at 1.5m BGS over a concrete-foundation deposit   |
| G4HP07                   | 1.7 x 2.25m<br>2m deep | Test pit.<br>Hand excavation   | >0.14m cobbled surface<br>>2m of sandy material with red-brick fragments<br>Red-brick stepped footings for viaduct? Seven courses in two skins on a concrete base occurring at 1.5m  |
| G4HP07c                  | 1 x 2m<br>2.8m deep    | Test Pit.<br>Machine excavation to 1m to insert shoring, hand excavation thereafter      | >0.3m medium brown sandy silt disturbed topsoil with red-brick and modern waste<br>Concrete pads >0.7m thick and various red-brick structures possibly associated with a soak away and/or the footings of the viaduct<br>>1.8m light brown sandy clay  |
| G4HP106                  | 2 x 1m<br>3.4m deep    | Test Pit.<br>Machine excavation to 1.5m, shoring inserted and hand excavation thereafter | >0.4m medium brown sandy silt topsoil with red-brick fragments<br>>0.9m light brown silty clay<br>>2.1m light brown grey silty clay<br>Red-brick footings for viaduct arch exposed at depth<br>Additional wall also observed, possibly relating to a soak away associated with the viaduct   |
| G4HP101                  | 7 x 1.30m<br>1.7m deep | Test Pit.<br>Hand excavation   | >0.14m modern tarmac surface (001)<br>>0.2m modern hardcore deposit (002)<br>Red-brick wall with black ash mortar (006) abutting red brick footings of viaduct arch (005)<br>>1m black clinker deposit (003)   |



| Intervention Designation | Dimensions               | Method and condition of excavation  | Description of stratigraphy (measurements relate to thickness of deposit except where stated)  |
|--------------------------|--------------------------|---|--|
|                          |                          |   | Concrete pad over a red brick culvert with white lime mortar (004)   |
| G4HP108                  | 2 x 1m<br>3.3m deep      | Test Pit.<br>Hand excavation?   | >0.3m medium brown sandy silt disturbed topsoil with red-brick and modern waste<br>>3m made-ground deposits<br>Red-brick footings for viaduct with additional red-brick and concrete structures  |
| G4HP113                  | 1 x 2m<br>4.15m deep     | Test Pit.<br>Machine excavation to 1.5m after which hand excavations continued to depth                 | >0.25m medium brown silty topsoil<br>>1m light brown sandy silt with red-brick fragments; made ground?<br>>2.5m light brown clayey sand with late post-med pot and clay pipe; made ground or disturbed natural<br>Red-brick footings of viaduct arch exposed in section at 3.75m extending to 4.15m  |
| G4HP114                  | 3.15 x 1.3m<br>4.4m deep | Initial test pit abandoned due to water ingress and side collapse. Second pit relocated along the arch? | >0.1m modern tarmac<br>>0.05m modern levelling deposit<br>>0.1m cobble surface<br>>2.5m light brown silty sand with red brick fragments<br>>1m light brown sandy clay with red brick fragments<br>>0.7m sandy deposit with river gravels probable disturbed natural heavily contaminated with possible diesel<br>Red-brick footings of viaduct arch extend to base of pit, additional wall running parallel to the viaduct within first sandy deposit. Possible soak away? |
| G4HP118                  | 1.77 x 1.3m<br>2.7m deep | Test Pit.<br>Hand excavation  | >0.8m modern concrete (001)<br>>2.7m sandy silt made ground (006) with red-brick fragments<br>Red-brick foundation of viaduct arch (002) stepping out each course over five courses (003) hand-made brick, additional red brick structure (004) over a concrete foundation (005)   |
| G4HP119                  | 1 x 1m<br>2.2m deep      | Test pit.<br>Hand excavation  | >0.15m cobbled surface<br>>0.30m rubble levelling deposit<br>> 1.75m silty sand made ground<br>Red-brick footings of viaduct arch stepping out at 1.85m BGS, ceramic pipe and a red-brick culvert at a depth of 0.5m and 0.7m respectively   |
| G4HP120                  | 1.5 x 1.5m<br>2m deep    | Test Pit.<br>Hand excavation  | >2m made-ground deposit of crushed CBM, sand, silt and clinker<br>Red-brick footings of viaduct arch stepping out over three courses at a depth of 1.5m<br>>0.2m sand continues beyond limit of excavation   |
| G4HP121                  | 1.5 x 1.5m<br>1.80m deep | Test Pit.<br>Hand excavation  | >1.8m mixed crushed CBM, clinker, silt and sand (001)<br>Red-brick footings of viaduct arch stepping out by three courses in one section (002) and by a single course in another section (003) both of handmade brick with white lime mortar. Stepped section starts at 1.6m continuing to 1.8m<br>Sandy clay deposit (004) at base of pit and footings  |
| G4FP02                   | 2 x 2m<br>4.2m deep      | Test Pit.<br>Hand excavation  | >0.3m modern debris and waste<br>>0.7m mixture of medium grey ash and medium brown sandy silt made ground<br>>0.5m light grey re-deposited clay<br>>2.6m reddish brown sand with a thin band of light grey clay >0.3m thick at the centre. Upper band contains red-brick fragments<br>Red-brick foundation structure relating to the viaduct at 4.1m BGS   |

| Intervention Designation                | Dimensions                | Method and condition of excavation  | Description of stratigraphy (measurements relate to thickness of deposit except where stated)   |
|---|---------------------------|---|---|
| G4FP03                                  | 1.4 x 1.4m<br>4.4m deep   | Test Pit.<br>Hand excavation to a depth of 1.7m machine slot cut to 3.5m with hand excavations thereafter | >0.5m medium brown sandy silt topsoil<br>>0.5m ashy levelling deposit with service pipe and trench cut at interface with topsoil<br>>1m medium brown sandy clay containing red brick fragments and a second service pipe and trench cut<br>>2.4m orange sandy clay probably disturbed<br>Red-brick foundation of viaduct recorded above river gravel deposits at a depth of 4.4m BGS  |
| G4FP03a                                 | 2 x 2m<br>4.6m deep       | Test Pit.<br>Hand excavation  | >0.1m stone and sand floor surface<br>>0.6m medium brown sandy silt with red brick fragments with a service trench containing a ceramic sewer pipe cut from its base<br>>0.3m medium grey clinker deposit cut through by sewer pipe<br>>2m medium brown sandy silt made ground deposit with red brick fragments<br>>1.6m orange sandy silty clay made-ground deposit<br>Red brick culvert appearing at 3m BGS<br>Base of viaduct arch occurs at 4.5m unstepped? |
| G4FP06a                                 | 0.5 x 0.5m<br>7.7m deep   | Test Pit.<br>Hand excavation to 1.2m deep then drilled to maximum depth. Pit inside viaduct arch          | >3m black ash and rubble made-ground deposit<br>>0.2m brick rubble layer?<br>>1m brown clay deposit<br>>3.5m grey sandy clay<br>reddish sandstone natural at 7.7m BGS   |
| G4FP06b                                 | 0.55 x 0.85m<br>7.2m deep | Test Pit.<br>Hand excavation to 1.2m deep then drilled to maximum depth. Pit outside viaduct arch.        | Original location abandoned due to cast-iron drain pipe<br>>1.6m Unspecified made-ground deposit<br>>1.6m BGS concrete foundation pad for red-brick stepped footings of viaduct<br>> 5.6m medium sandy silt deposit   |
| G4FP112                                 | 2 x 2m<br>4.4m deep       | Original location of test pit moved due to presence of modern manhole.                                    | >0.4m medium brown sandy silt topsoil<br>modern manhole and drainage pipes<br>>1m Medium grey brown silt made ground deposit with red brick fragments<br>>2m clayey sand possibly disturbed natural as contained clay pipe (not retained)<br>>0.2m sand layer<br>sandy gravel at base of test pit<br>Red-brick footings for viaduct arch extend to 2.8m   |
| G4FP122                                 | 3 x 1.6m<br>2m            | Test Pit.<br>Hand excavation  | >0.2m cobbled surface<br>>2m medium brown sandy silt with red brick fragments<br>Red-brick footings of viaduct arch, begins to step out at 1m BGS and steps out over six courses extending to depth of pit  |
| Unnumbered test pit, designated as TP01 | 1.4m x 0.8m<br>1.6m deep  | Test Pit.<br>Hand excavation  | >0.2m cobbled surface<br>>0.3m dark brown silty sand made ground deposit<br>>1.1m light brown clayey silty sand made ground?<br>Red-brick footings for retaining wall along Hampson Street, exposed in section at 1.15m BGS, stepping out one course at base at depth of 1.4m BGS   |
| Unnumbered test pit designated as TP02  | 2 x 0.6m<br>1.7m deep     | Test Pit.<br>Hand excavation  | >0.2m cobbled surface<br>>0.3m dark grey silty sand made ground deposit<br>>1.2m light grey brown clayey silty sand made ground deposit?<br>Red-brick footings of retaining wall along Hampson Street, stepping out at 1.5m BGS and extending to 1.7m   |

| Intervention Designation               | Dimensions   | Method and condition of excavation   | Description of stratigraphy (measurements relate to thickness of deposit except where stated)   |
|--|--|--|---|
| Unnumbered test pit designated as TP03 | 4.3m x 2.7m<br>1.9m deep                                 | Test Pit.<br>Hand excavation.  | >0.15m cobbled surface<br>>0.55m medium to dark grey brown sandy silt made ground deposit<br>>0.5m light brown clayey silty sand made-ground deposit<br>Red-brick footings of retaining wall along Hampson Street, red-brick and cobbled floor surface occurring at 1.2m BGS with four additional walls<br>Wall 01 keyed into retaining wall and extends from it at a 90° angle<br>Wall 2 butts against retaining wall and extends diagonally from it<br>Wall 3 runs parallel to retaining wall, approximately 2.5m from it, between Walls 1 and 2<br>Wall 4 runs parallel to Wall 3, approximately 0.65m further from retaining wall, all are handmade red brick |
| Unnumbered test pit designated as TP04 | 3 x 1m<br>3m deep  | Test Pit.<br>Hand excavation.  | >0.2m cobbled surface<br>>0.9m dark brown sandy silty made ground deposit<br>>2.2m medium brown sandy clay made ground deposit with red brick fragments<br>Red-brick footings for the retaining wall along Hampson Street with an additional wall running parallel to it approximately 0.3m away  |
| Unnumbered test pit designated as TP05 | 1.5 x 2.5m<br>2.6m deep                                  | Test Pit.<br>Hand excavation.  | >0.2m cobbled surface<br>>0.4m dark brown grey sandy silt<br>>2m light brown silty sand made-ground deposit<br>Sandstone foundation stone for the Iron Princes Bridge revealed as well as several red brick walls   |
| G4BH03                                 | 0.4 x 0.4m<br>1.20m                                      | Bore Hole.<br>Hand excavation to a depth of 1.2m after which drilling continued but was not observed | >0.5m medium brown sandy silt landscaped made ground<br>>0.7m light brown sandy silt with river gravels and red-brick fragments, disturbed natural or made ground   |
| G4BH05                                 | 0.4 x 0.4m<br>1.2m deep continuing to 6.3m               | Bore Hole.<br>Hand excavation to a depth of 1.2m after which drilling continued                      | >0.1m modern tarmac surface<br>>0.2m cobbled surface<br>>0.2m rubble levelling deposit<br>>4.6m light brown sandy silt with red brick fragments, made ground or disturbed natural<br>>1.2m degraded sandstone bedrock<br>solid sandstone encountered at a depth of 6.3m BGS   |
| G4BH06a                                | 0.3 x 0.4m<br>1.2m deep continuing to 4.5m               | Bore Hole.<br>Hand excavation to 1.2m after which drilling continued                                 | >0.2m cobbled surface<br>Red-brick structure observed, probably a drainage gully<br>>2.3m medium brown silty sand made-ground deposit<br>>1.2m void encountered, probably a culvert<br>solid sandstone encountered at a depth of 4.5m BGS   |
| G4BH08                                 | 0.4m x 0.4m<br>1.2m deep continuing to 8m                | Bore Hole.<br>Hand excavation to 1.2m after which drilling continued                                 | >0.1m modern tarmac surface<br>>0.5m modern hardcore levelling deposit<br>>0.1m light grey brown silt and red-brick rubble layer<br>>0.8m orange clay with stone inclusions, natural?<br>>2.5m medium brown silt<br>solid sandstone encountered at a depth of 8m BGS  |
| G4BH14                                 | 0.4 x 0.4m<br>1.2m deep continuing to depth              | Bore Hole.<br>Hand excavation to 1.2m after which drilling continued                                 | >0.15m medium brown silty sand topsoil deposit<br>>3.2m unspecified made-ground deposit<br>>unspecified thickness of natural clay   |
| G4BH15                                 | 0.65 x 0.5m<br>1.2m deep continuing to unspecified depth | Bore Hole.<br>Hand excavation to 1.2m after which drilling continued                                 | >0.1m cobbled surface<br>> unspecified depth of made ground<br>solid sandstone encountered at unspecified depth   |

| <b>Intervention Designation</b> | <b>Dimensions</b>                                | <b>Method and condition of excavation</b>   | <b>Description of stratigraphy (measurements relate to thickness of deposit except where stated)</b>  |
|---------------------------------|--|---|---|
| G4BH16                          | 0.4 x 0.4m<br>1.2m deep<br>continuing to<br>6m   | Bore Hole.<br>Hand excavation to<br>1.2m after which<br>drilling continued                                    | >0.1m cobbled surface<br>>0.6m clinker levelling deposit<br>>2.8m brown sandy silt with red-brick fragments,<br>made-ground deposit<br>>1.4m light brown sandy silty clay, natural?<br>>1m degraded sandstone<br>solid sandstone encountered at a depth of 6m BGS   |
| G4WS01                          | 0.4 x 0.4m<br>1.2m deep<br>continuing to<br>5.3m | Window Sample.<br>Hand excavation to<br>1.2m after which<br>drilling continued                                | >0.6m dark grey silty sand topsoil deposit with red<br>brick fragments<br>>0.3m brown silty sand<br>>1.1m grey silty sandy clay<br>>3.3m densely packed river gravel<br>solid sandstone encountered at a depth of 5.3m BGS  |
| G4WS06                          | 0.5 x 0.5m<br>1.2m deep<br>continuing to<br>1.8m | Window Sample.<br>Hand excavation to<br>1.2m after which<br>drilling continued                                | >0.2m sand deposit<br>>0.2m cobbled surface (possible tow path)<br>>0.2m sandy ash levelling deposit with red-bick<br>fragments<br>>1.2m sand deposit with gravel, natural?<br>Solid sandstone encountered at a depth of 1.80m BGS  |
| G4WS07                          | 0.9 x 0.3m<br>1.2m deep<br>continuing to<br>3.4m | Window Sample.<br>Hand excavation to<br>1.2m after which<br>drilling continued                                | >0.2m medium brown sandy silt made ground or<br>topsoil<br>>1.8m dark brown sandy silt with plastic, concrete<br>and red-brick fragments, made ground or heavily<br>disturbed natural<br>>1.2m densely packed river gravel<br>>0.2m degraded sandstone<br>solid sandstone encountered at a depth of 3.4m BGS    |
| G4CPT01                         | 0.4 x 0.4m<br>1.2m deep                          | Cone Penetration Pit.<br>Hand excavation to<br>1.2m after which<br>drilling continued but<br>was not observed | >1m dark grey silty gravels with red-brick fragments,<br>disturbed natural?<br>>0.2m sandy gravel natural?  |
| G4CPT02                         |  |   | Abandoned at first attempt and subsequently not<br>observed   |
| G4CPT03                         | 0.4 x 0.4m<br>1.2m deep<br>continuing to<br>9.6m | Cone Penetration Pit.<br>Hand excavation to<br>1.2m after which<br>drilling continued                         | >0.2m sandy silt topsoil<br>>0.2m light grey sandy silt with stone and red brick<br>fragments, made ground or disturbed natural?<br>>4.6m light grey gravelly silt with stone and red brick<br>fragments, disturbed natural?<br>>4.6m degraded sandstone<br>solid sandstone encountered at a depth of 9.60m BGS |

---

## ILLUSTRATIONS

---

### **LIST OF FIGURES**

Figure 1: Site location

Figure 2: Location of geo-technical test pits and bore holes

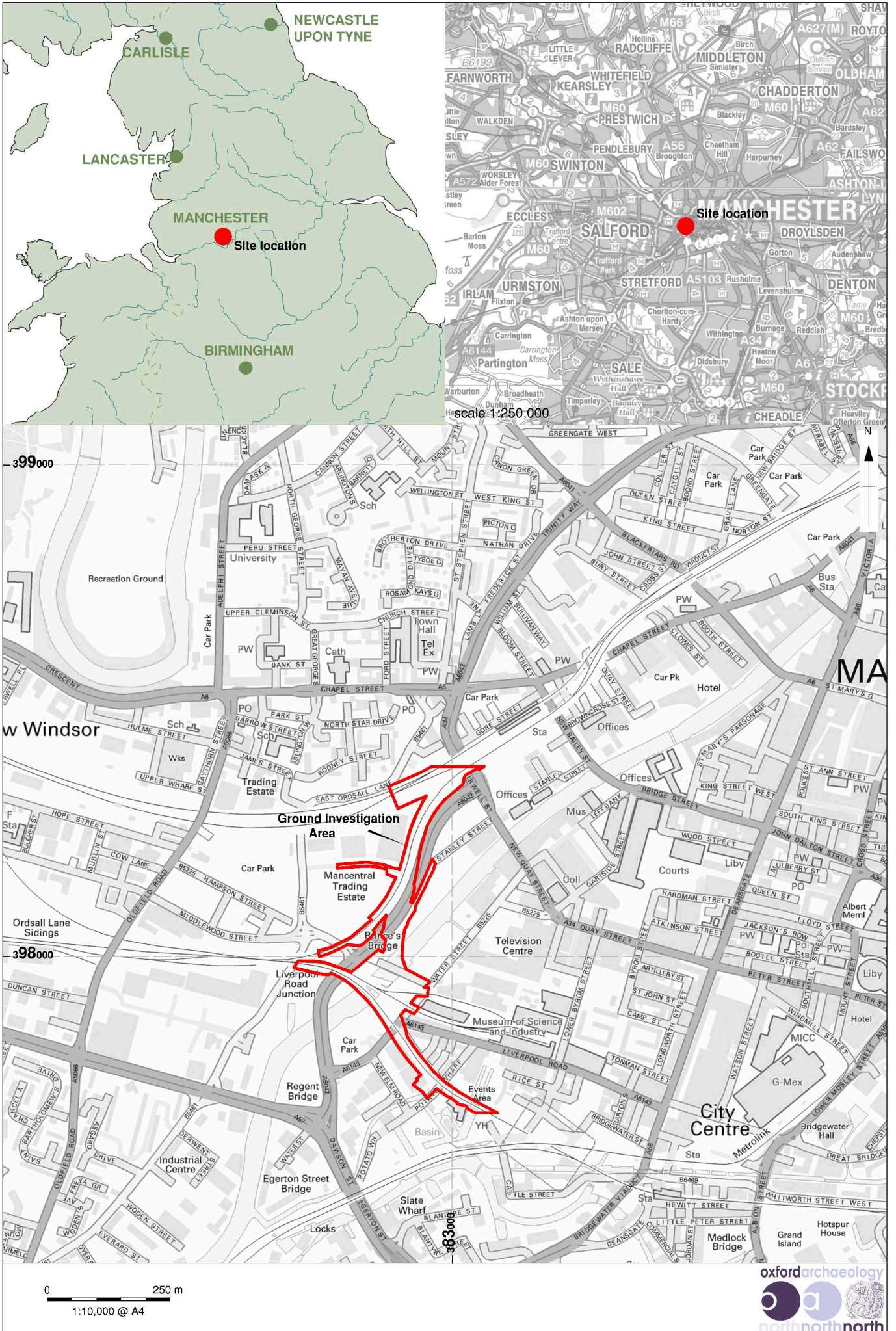


Figure 1: Site location

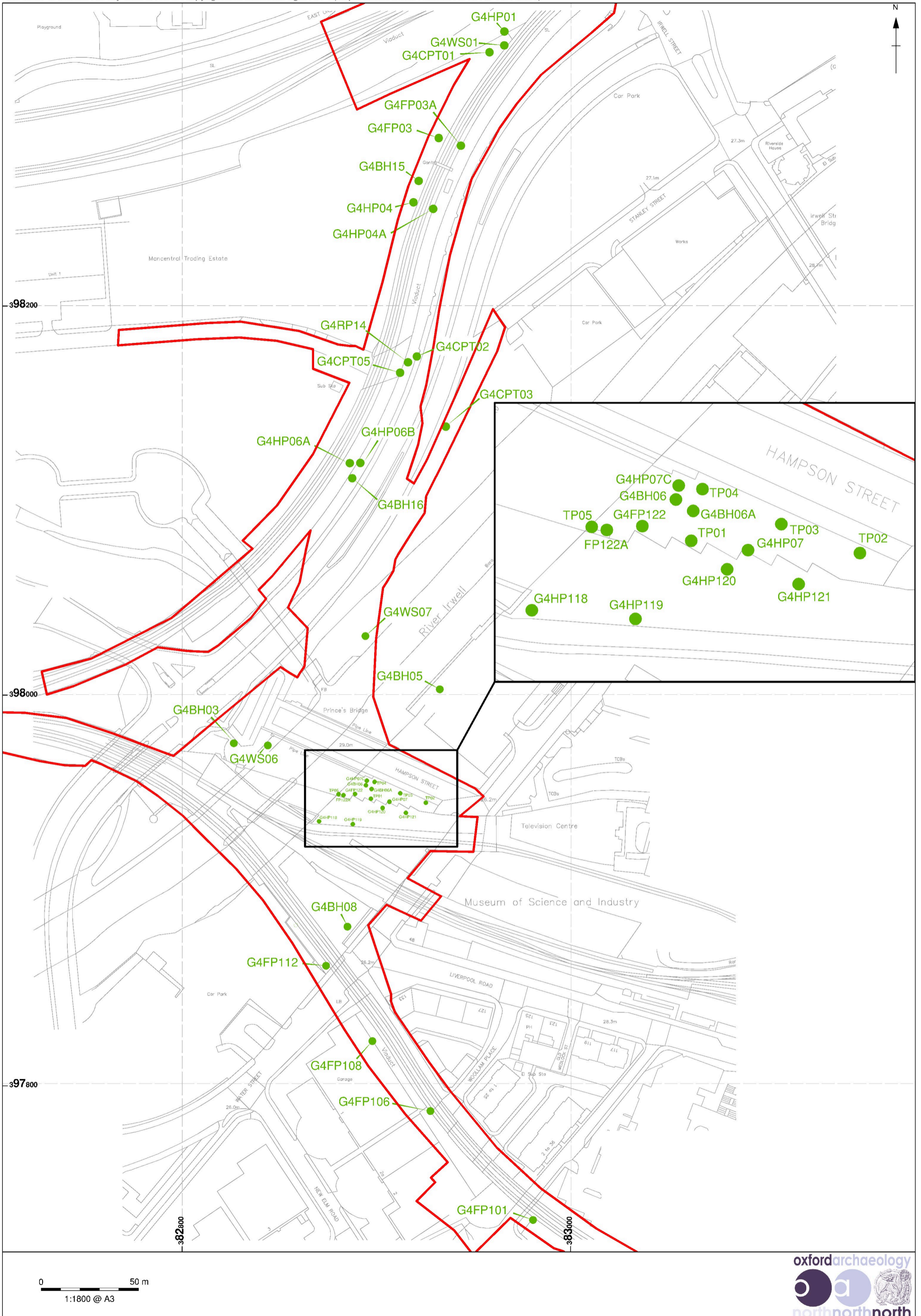


Figure 2: Ground investigation locations observed during the watching brief