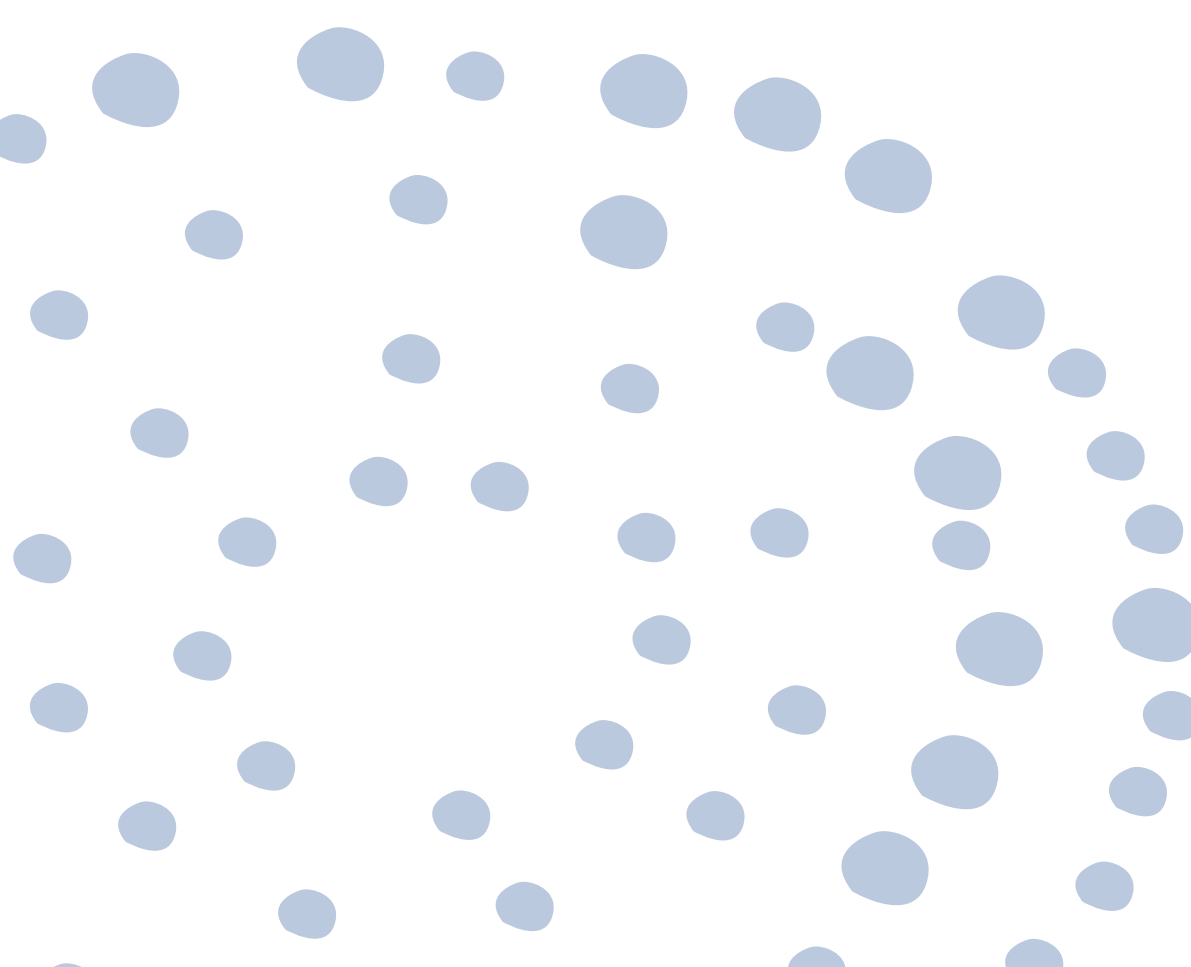


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UNIVERSITY OF
BIRMINGHAM

Windsor Street Gas Works, Birmingham
An Archaeological Watching Brief, 2008



Project No. 1744

**WINDSOR STREET GAS WORKS, BIRMINGHAM
AN ARCHAEOLOGICAL WATCHING BRIEF**

By Sam Hepburn and Chris Hewitson

For further information please contact:

Alex Jones (Director)
Birmingham Archaeology
The University of Birmingham
Edgbaston
Birmingham B15 2TT
Tel: 0121 414 5513
Fax: 0121 414 5516
E-Mail: BUFAU@bham.ac.uk
Web Address: <http://www.arch-ant.bham.ac.uk/bufau>

**WINDSOR STREET, ASTON, BIRMINGHAM
AN ARCHAEOLOGICAL WATCHING BRIEF**

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SUMMARY

Between May and June 2008 Birmingham Archaeology undertook an archaeological watching brief on the remains of three gasholders at the former Windsor Street Gasworks, Aston, Birmingham (NGR SP080881) on behalf of National Grid Property Ltd, ahead of remediation development (Planning Application number C/04997/07/FUL). The site lies to the north east of the Birmingham and Fazeley Canal. A watching brief was carried out on the remains of three gas holder tanks, and the surrounding area.

The Windsor Street Gasworks were opened in 1848 by the Birmingham Gas, Light & Coke Co, Ltd. as a replacement for their Gas Street works which had become outdated by that time. Expansion of the site in the 1880s saw the construction of a retort house, purification plant, and several new gasholders. The gasholders that form part of this archaeological watching brief date to the earliest phase of work in the 1850s. The company was taken over by Birmingham Corporation in 1870 following an act of parliament, and was later appropriated by the West Midlands Gas Board until production ceased in 1974. The site is currently being used as a carpark for the National Grid complex.

The interior of the tanks were recorded ahead of demolition. The area was opened up using a 360° excavator, down to the archaeology. A total of three gasholders were recorded of which two were known of prior to work commencing and a third was uncovered as part of the work. The foundations of several buildings were revealed on either side of the two tanks that correlate with known historical buildings mapped on the site. The area between the tanks was devoid of features, and the soil was heavily contaminated.

WINDSOR STREET GASWORKS, ASTON, BIRMINGHAM: AN ARCHAEOLOGICAL WATCHING BRIEF, 2008.

1 INTRODUCTION

In May to June 2008 Birmingham Archaeology carried out an archaeological watching brief on the remains of two gasholders at the former Windsor Street Gasworks, Aston, Birmingham (Fig. 1). The work was commissioned by National Grid Property Ltd. in advance of proposed remediation works (Planning Application Number SP080881).

This report outlines the results of the archaeological watching brief, which was prepared in accordance with the Institute of Field Archaeologists Standard and Guidance for Archaeological Watching Briefs (IFA 2001)

The programme of archaeological work conformed to a a Written Scheme of Investigation (Birmingham Archaeology 2008, Appendix 1) which was approved by the Local Planning Authority prior to implementation, in accordance with guidelines laid down in Planning Policy Guidance Note 16 (DoE 1990).

2 LOCATION AND GEOLOGY

The site is located off Windsor Street and Lord Street, Birmingham, to the east of Dartmouth Circus (A4540) and Aston Road (A38) interchange, and is centred on NGR SP 080881 (Fig. 2). Forming part of the National Grid Windsor Street complex, the site consists of a series of derelict (and now demolished) buildings. The remains of the former gasholders (Figs. 3 and 4) are located on the northern edge of the site running parallel to the line of the Birmingham and Fazeley Canal.

The present character of the site is a concrete covered surface, used as a car park, due to its proximity to the main entrance gate of the National Grid Ltd. complex on Windsor Street.

3 AIMS AND OBJECTIVES

The overall archaeological objective of the archaeological watching brief was to secure *preservation by record* (DoE 1990, PPG 16) of the deposits to be impacted by the proposed development.

The principle aim of the archaeological watching brief was to determine the character, extent, date, state of preservation, and the potential significance of any buried remains.

More specific aims were to:

- Visit the site following the emptying of the tar tank and the liquor tank- archaeologically recording these emptied tanks by photography, annotated plans and written description. This was carried out during a single visit when each tank was empty.
- Observation of excavation works in the vicinity of the tanks and recording any archaeological features by photography, drawing and written description.

- Compare the the archaeologically recorded features with background information on the Windsor Street gasworks itself and comparable sites.

4 METHODOLOGY

In general the work was carried out with due regard to the advice offered by the Institute of Field Archaeologists (2001).

Written Record

A written record of the interior of the gas holder tanks was compiled in the field on *pro forma* record sheets, noting details of building type, date(s), materials, plan, and elevations prior to demolition.

Drawn Record

The concrete and modern overburden was removed using a tracked 360° excavator, under direct archaeological observation, down to the top of the uppermost archaeological horizon. All walls were recorded onto a measured pre-existing survey plan which was then fully annotated.

Photographic Record

Written records and scale plans were supplemented by photographs using monochrome black and white and digital and colour slide photography.

Documentary Record

A search of all relevant and readily available published and non-published documentary sources, including historic maps and photographs, was carried out in the Local Studies Centre of Birmingham Central Library and the Library of the University of Birmingham.

5 ARCHAEOLOGICAL AND HISTORICAL CONTEXT

The History of Coal Gas Production

The earliest mention of gas production from coal occurred in 1688 when John Clayton mentioned experimentation with coal distillation to the Royal Society. In 1791 Phillipe Lebon took out a patent on a 'Thermolampe' that developed gas from wood (WLHC 346.1, 6). However, the first commercial use of gas was by William Murdoch whilst working for Boulton and Watt in 1792, who lit their premises in Redruth, Cornwall. He later lit their premises in Soho, Birmingham by the same technique (WLHC P363.63, 1-2). Initially the gas used was unpurified and was dirty so the technique did not take off. However, by 1812 the first gas company was established, the London Gas Light and Coke Company. By 1815 provincial companies were established with the first in the West Midlands being John Gostlings at the bottom of Gas Street, Birmingham established in 1819 (Shill 1996, 117). By 1882 there were 500 companies operating under a private act of parliament.

Coal gas was initially used solely as a means of street lighting and its success can be directly associated with the health improvement acts of the mid-19th century that sought to improve

sanitation but also improve street lighting. The invention of the electric light filament in 1887 brought about serious competition to gas light. However, the invention of the 'Upright Incandescent Burner' by Baron Von Welsbach meant that lighting continued to use gas for several years to come (WLHC P363.63, 5). By this time alternative uses for gas had been developed including cooking, heating, and boilers (WLHC 346.1, 7). The coal gas industry also produced several by-products which were extensively used in the chemical industry. The most plentiful was coke that sold at a higher price than the equivalent coal. Other products included tar, liquor and sulphur as well as a range of chemicals, the most notable being Benzole and Toluol, which were used for explosives in World War One.

The later history of the coal gas industry was defined by its nationalisation after World War Two. This led to the amalgamation of production and the closing of smaller inefficient sites. The discovery of natural gas in the North Sea in the 1960s led to the end of coal gas production in Britain.

The Production of Coal Gas

Coal Gas was produced by the distillation of coal. This was done by the heating of coal in retorts and the subsequent collection of the gas produced by a condenser. The retorts were long tubes into which the coal was placed and heated (WLHC 346.1, 10). William Murdoch initially used vertical, then inclined, and finally horizontal retorts. Horizontal retorts were long cast-iron tubes 18" or 24" in diameter, with a door at the end into which the coal was placed. These were set in beds of five, seven, or nine and were heated by coke-furnaces underneath. The horizontal retorts were 'charged' by hand either through shovelling or the use of a long iron scoop. This was done every six hours in rotation to ensure continuous production. The cast-iron retorts were later replaced by fired-clay retorts. Horizontal retorts continued to be used throughout the 19th century until they were eventually replaced by vertical retorts at the turn of the century that allowed continuous production of gas in each retort (WLHC 346.1, 11).

From the retorts the gas passed from cast-iron pipes through water which sealed the gas and helped remove the tar and liquor. The remainder of the tar and liquor was removed by a series of air-cooled pipes that acted as a condenser. The ammonia was removed by a washer of water sprays. Finally the gas passed through lime to remove hydrogen sulphide. Originally wet lime was used but proved difficult to dispose of, so dry; slaked lime was used until it was eventually replaced by iron-oxide in the 1870s.

From here the gas passed into the gas holders prior to redistribution for gas lighting. In the 19th century these were of a simple design, being a single bell (as opposed to the telescopic bells seen in modern gas holders) that overlay a pool of water sealing the gas (WLHC 346.1, 13).

A typical mid 19th-century gasworks would comprise a gas retort house with a series of outbuildings designed for the purification process. There would then be several gas holders close to the main buildings. Especially in the West Midlands, the typical location of the gasworks would be close to the canal network usually on an adjacent plot of land (as seen at the Windsor Street works). This allowed ease of distribution of coal in particular. Coal initially came from local sources but the poor quality of South Staffordshire coal meant that by the mid 19th-century gasworks looked further afield (Shill 1996, 117). The by-products from the industry may not have been sold locally and the canal allowed easy distribution. However, it was not uncommon to have a chemical plant associated with the gasworks (WLHC 346.1, 7).

The Windsor Street Works in the Context of Birmingham's Gas Industry

The early history of gas production in Britain is a story of entrepreneurial zeal and innovation, and competition. This was especially so in Birmingham; before 1875 Birmingham was supplied with coal gas from two gas companies, the Birmingham Gas Light & Coke Co. Ltd and the Birmingham & Staffordshire Gas Light Co. until an Act of Parliament in 1870 empowered local authorities to build gas works, water works, etc., the Birmingham Corporation chose instead to take over all existing works in its area. By 1875 they had managed to acquire both Birmingham gas companies.

One of the earliest gasworks in Birmingham were the Gas Street gasworks. Built in 1818 by John Gostling, an early investor in the gas industry, to supply street lighting for the Board of Birmingham Commissioners (Shill 2005, 48). The site was leased from the Governors of King Edward School and gas plant installed by Samuel Clegg, the first specialist gas engineer (Litherland 2001, 3). Clegg also installed the Retort House at the lower end of the site. The company was floated as a joint stock company called Birmingham Gas, Light and Coke Company in 1819. Shortly after, in 1822, the works was remodelled by Alexander Smith, the company's engineer, which included the construction of a new fireproof Retort House, and a third gas holder constructed on the site of the earlier Retort House. The works continued to grow as the demand for gas continued to rise during the 1830s and 1840s and the company built other gasworks in Birmingham, such as the gasworks at Fazeley Street, Aston in 1836, to cope with the demand. Production at Gas Street, using by then outdated equipment, ceased in 1850, but the gas holders remained in use until the private gas industry was taken over by the City Corporation in 1878.

The Development of the Windsor Street Works

The Windsor Street Works in Aston, which opened in 1848, were a replacement for the Gas Street works. Following its takeover by the Birmingham Corporation in 1870 Windsor Street underwent several phases of expansion and rebuilding, most notably in 1880 and 1887. Expansion in the early 1880s resulted in the construction of a retort house, purification plant, and several new gasholders on an adjacent 16 acre plot. By 1875. In fact the level of clearance was so significant that the existing retort house and gasholders were pulled down and replaced by a new carbonisation plant (Shill 2006, 66). Birmingham Co. was supplying 2,327.6 million cu ft of gas to provide mainly for Birmingham's street lighting; by 1911 they were supplying 7,693.6 million cu ft of gas a year to the city's homes, businesses, and industries.

The gasholders assessed during this archaeological watching brief date to the earliest part of the works on this site and are of a series of seven holders. Cartographic and drawn evidence helps provide an insight into the development of the Windsor Street site from its inception to the present day. The earliest cartographic representation of the gasworks at Windsor Street dates from 1855 (Fig. 5). This map delineates a gasworks located adjacent to the south of a canal in what appears to be a large undeveloped space surrounded by grid-iron street patterns to the south, east, and west, and by the canal to the north. The gasworks building itself is shown as an inverted 'L' -shape in plan. The next representation of the gasworks is an engineering plan of unknown date (Fig. 6), which shows ten gasometers on the site amongst other buildings and a canal basin. The 1884 map of the area (Fig. 7) shows the site following its expansion into the adjacent plot. A number of gasholders have been constructed and two large buildings occupied the northern quadrant of the gasworks site. Whilst this map delineates a period of expansion, the 1917 Ordnance Survey map depicts a period of contraction and

change on the site. A large number of the gasholders seen on the previous map have been removed and appear to have been subsumed into encroaching residential development. A number of smaller gasholders were constructed to the north of these whilst an array of buildings had been constructed in the southern quadrant of the site. A network of train/tram lines interspersed the works and were connected to an L&WNR goods station to the east. The site is shown clearly on a photograph from prior to the World War II (undated photograph from Birmingham City Archives, Plate 12) with the outlines of the gasholders still visible.

Other primary sources such as engineering plans and sections (Figs. 9 and 10) of the gasholders themselves give a fascinating insight into the imaginative engineering, construction, process flow, and alterations made to these intricate structures. Fig. 9, which is a proposed layout plan for one of the gasholders shows alterations made prior to the decommissioning of the structure. Whilst, Fig. 10 shows highly detailed engineering plans and sections of proposed extensions to the gasholders.

In the 20th century the Birmingham Corporation at the Windsor Street Works also made and sold gas meters. By 1919 another four ranges of vertical retorts were built, completely replacing the earlier horizontal retort system (Shill 2006, 65) in 1937 they built a purpose built three-storey office and repair shop that faced onto both Windsor Street and Lord Street. In 1949 the British gas industry was nationalised, and Windsor Street was taken over by the West Midlands Gas Board. The 1960s saw a decline in the coal carbonising industry, due to the discovery of sources of natural gas, Windsor Street was the last working coal gas works in Birmingham (ibid, 56), production ceased in February 1974. The site is currently awaiting remediation, and is presently being used as a carpark.

6 RESULTS

The main objective of the archaeological watching brief was to record the interiors of two 25m diameter gasholders before demolition, Gasholder 1 to the west of the site and Gasholder 2 to the east (Plate 1, Fig. 3). Both tanks had brick floor surfaces, with a series of concrete stanchions supporting a concrete slab ceiling. The concrete slab ceiling was part of the conversion of the area to a car park after the closure of the works in the 1970s.

Gasholder 1 had a brick-lined interior laid in English bond. The tank was 25.50m in diameter and survived to an approximate depth of c 4m below current ground level (Plate 2). The interior floor of the gasholder was laid in stretcher bond brick throughout (Plate 3). Above this the concrete slab roof was supported by a series of round concrete pillars. The roof and pillars were part of a 1960s conversion of the area to car park space. A number of interior features survived. These were three cast-iron vertical pipes (Plate 4) on the northern edge, a concrete constructed draw well on the north-western edge, and a rectangular plan structure with openings to allow access to the tar.

Gasholder 2 was concrete-lined, and had a brick step 1.60m from the edge of the wall, around the interior (Plate 5 and 7). It was likewise 25 to 26m in diameter and had an approximate depth of c 4m below the current ground level. It was likewise covered by a concrete slab roof supported by a series of concrete pillars on concrete bases. The floor surface had been concreted over in Gasholder 2. The interior of the gasholder was almost identical in plan to Gasholder 1 with the same distinct features of three cast-iron vertical pipes (Plate 6) on the northern edge, a concrete constructed draw well on the north-western edge, and a rectangular plan structure with openings to allow access to the tar.(see Fig. 3).

The remains of a further gasholder (Gasholder 3, Plate 11) were located to the west of Gasholder 1 below the remains of the brick foundations of three buildings (Buildings 1–3 below). The interior of the gasholder was subdivided by a series of two northwest to southeast walls between which was a brick arched roof. Contamination of the ground and safety concerns prevented detailed recording of the structure. The brick arch was presumed to support a previous floor surface overlying the gasholder. The gasholder was clearly disused by the time the series of three buildings (below) were constructed as these directly overlie the gasholder. The remainder of the rest of the gasholder appeared to abut or run beneath present day Windsor Street.

To the west of Gasholder 1 the brick foundations of three buildings were revealed (Plate 8). Building 1 was the smallest, aligned northwest – southeast and measured 5m x 2m. Six courses of red engineered brick (9ins x 4ins x 3ins) were visible. A 2.5m wide concrete surface was associated with the south east wall of this building (external), beneath this was a sub-circular concrete lined pit, 1.25m diameter, with a brick lined channel leading off it in a north westerly direction (Plate 9). The feature was filled with demolition rubble so its depth could not be determined.

Building 2 was 10m x 8m, foundations constructed out of red brick (9ins x 4ins x 3ins), with a 5m long wall northwest-southeast aligned, attached to the north-western wall of the building. Concrete surface 5.5m x 4m is associated with the outside of this house. This building has been truncated to the northeast by Building 3. Building 3 was 10.50m x 4m, with concrete beam foundations 0.80-1m wide. The building was aligned north-south, and comprised of two rooms. The buildings northeast and northwest extents ran under the edge of excavation. A modern water pipe ran east-west across site and cut through all three buildings.

To the east of Gasholder 2 the remains of two brick walls were observed, these formed no discernable structure, and were badly truncated by a series of concrete pillar bases.

7 CONCLUSIONS

The three gasholders uncovered during the present watching brief clearly relate to the earliest phase of the Windsor Street Gas Works that opened in 1848. The earliest plans and Ordnance Survey Plan of 1884 (Figs. 6 and 7) suggest that the Gas Works at this time consisted of a series of nine gasometers (although a tenth has appeared by the 1884 Ordnance Survey map), and a associated plant works south of the canal. The three gasholders discovered in the present watching brief represent the three northern holders of this array. They were of a smaller diameter than the four to the south suggesting that they were probably constructed slightly earlier. This chronology of increasing size can be seen in the later three holders to the east that survive to the present day (Plate 10) and are much larger in size.

The expansion of the works in the 1880s led to these gas retort holders becoming redundant and subsequently being replaced by the larger gasholders. However, a series of plans held by the National Grid (not illustrated due to private reference collection) suggest that by the turn of the 19th century the holders were still used but for a different capacity. Gasholder 1 is described as a relief holder and suggests it was only used during periods of peak capacity. Gasholder 2 is described as a tar and liquor tank and this may explain the concrete base that it is lined with. Gasholder 3 is redundant by this period. This would appear to date the map to the between 1910-20s as it depicts the offices and stores that first appear on the 3rd edition Ordnance Survey map (see below).

The 1917 OS map shows a building that could equate to Building 2 and the walls to the south of the tanks. Building 3 first appears on the 1920s map (Fig. 6), but has disappeared by the

1937 OS revision map, in its stead is Building 1. The maps indicate that this area was under constant remodelling, with the only constant being the two gas holder tanks.

The preservation of the gasholders was very good and an indication of the areas continued use as a gas works up until the 1970s. The recording and understanding of the gasholders represent an important and useful record in the continuing understanding of the gas industry in 19th century Birmingham. Previous knowledge had focused on the earlier period represented by the Gas Street Works, Birmingham (Linnane et al 1998, Bellavia 1999 and Litherland 2001) and the later works in Birmingham including the Windsor Street Works (Schill 2006). This work has covered the gap between the two eras.

8 ACKNOWLEDGEMENTS

The project was commissioned by Edmund Nuttal on behalf of National Grid Property Ltd. Thanks are due to Martin Phillips for his co-operation and assistance throughout the project. Thanks also go to Mike Hodder, who monitored the project on behalf of Birmingham City Council. Thanks are also due to the staff of the Birmingham City Archive and Central Library. The watching brief was undertaken by Mary Duncan, Samantha Hepburn, Chris Hewitson, and Phil Mann. Samantha Hepburn and Chris Hewitson produced the written report which was illustrated by Nigel Dodds and edited by Shane Kelleher and Chris Hewitson, who also managed the project for Birmingham Archaeology. Plate 12 is courtesy of the Birmingham City Archives.

9 SOURCES

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9.3 Cartographic Sources

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1884 Street Map of the Borough of Birmingham, Council Map.

1917 Ordnance Survey County Series 2nd Revision 1:2500 map.

1920 Alldays map of Greater Birmingham.

1937-1938 Ordnance Survey County Series 3rd Revision 1:2500 map.



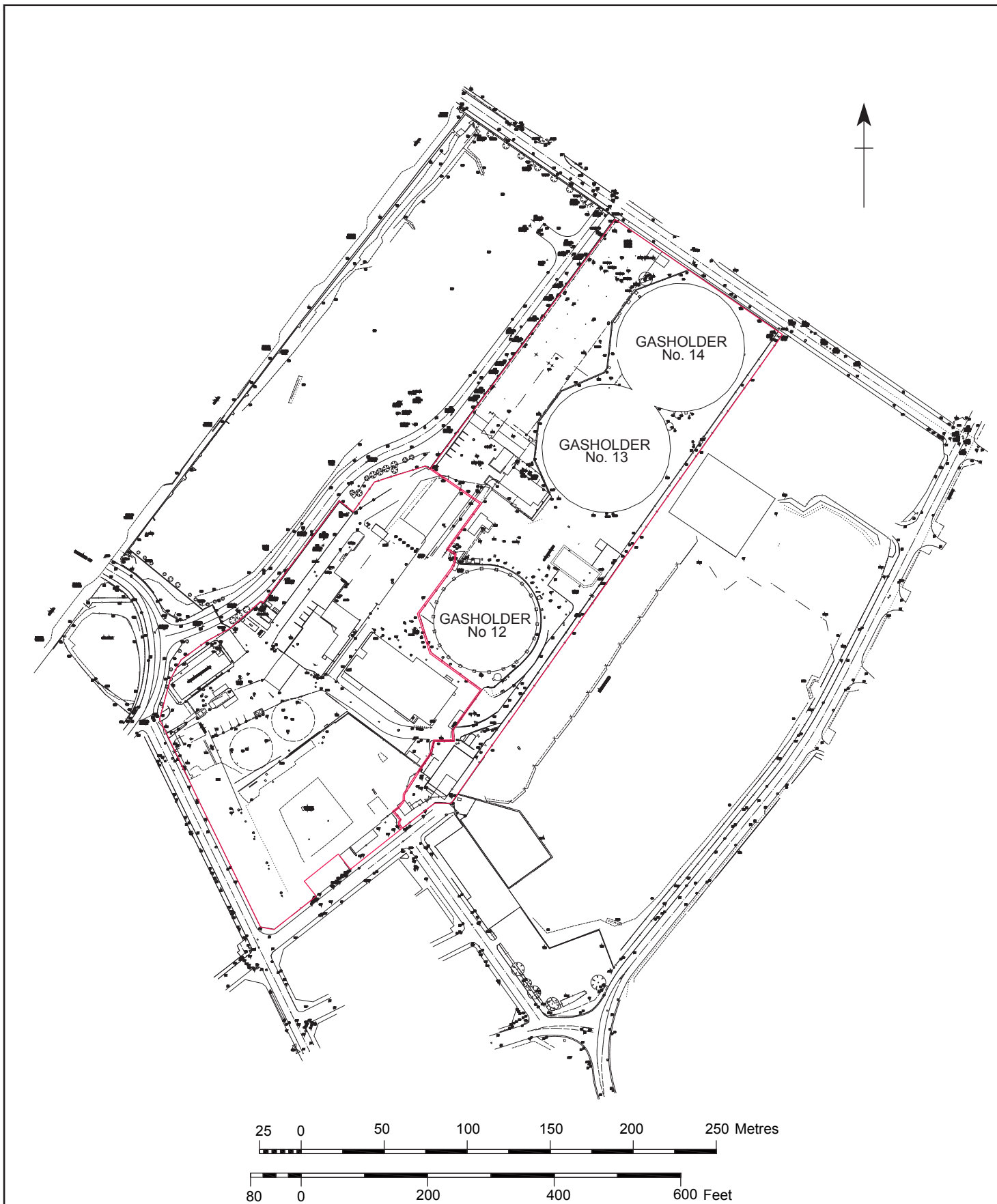
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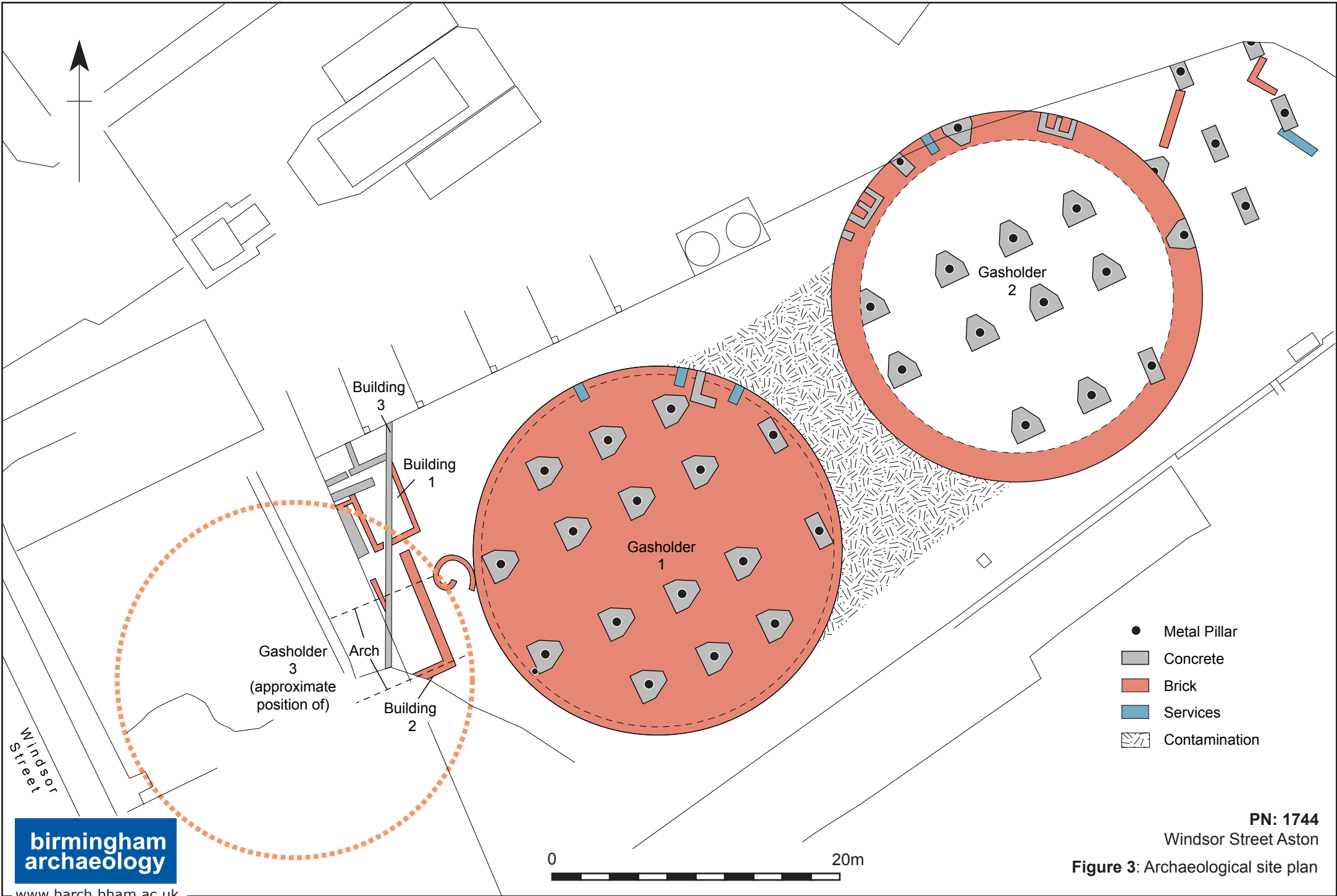
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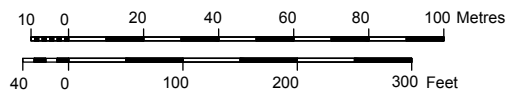
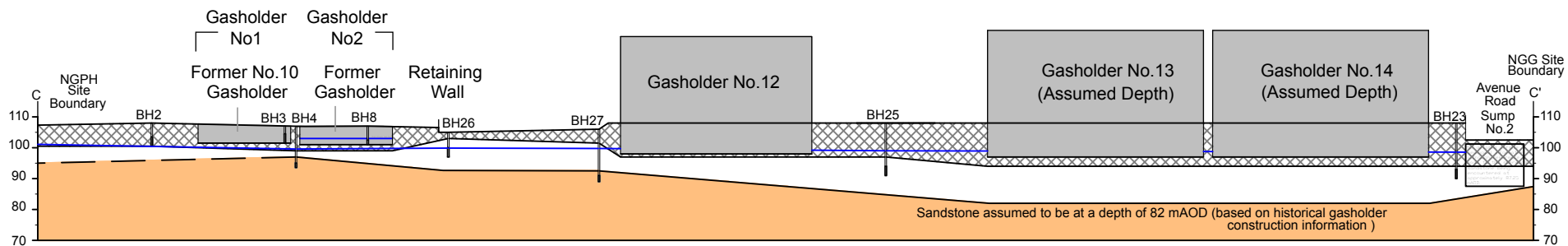
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Figure 1: Site Location

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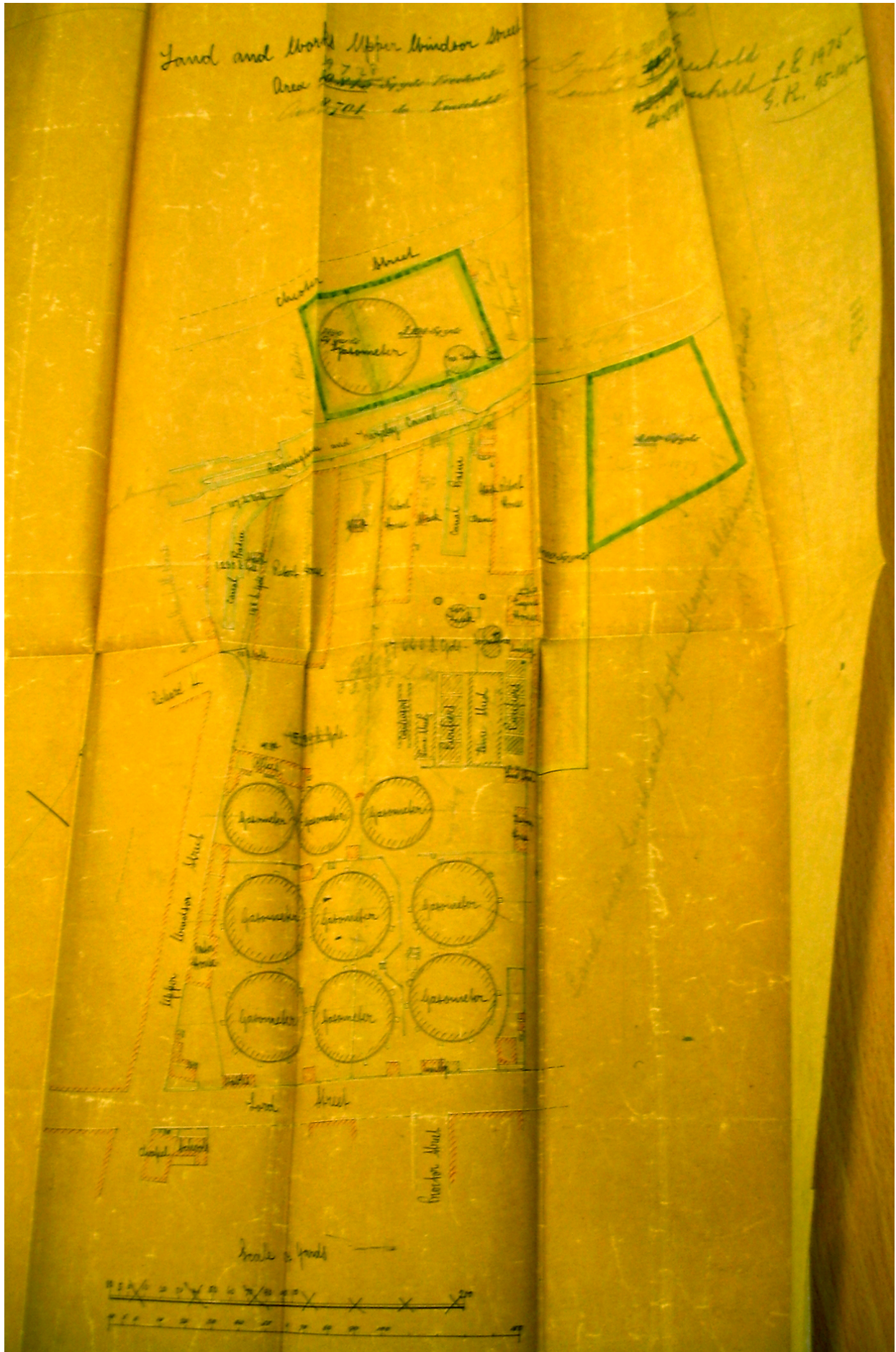


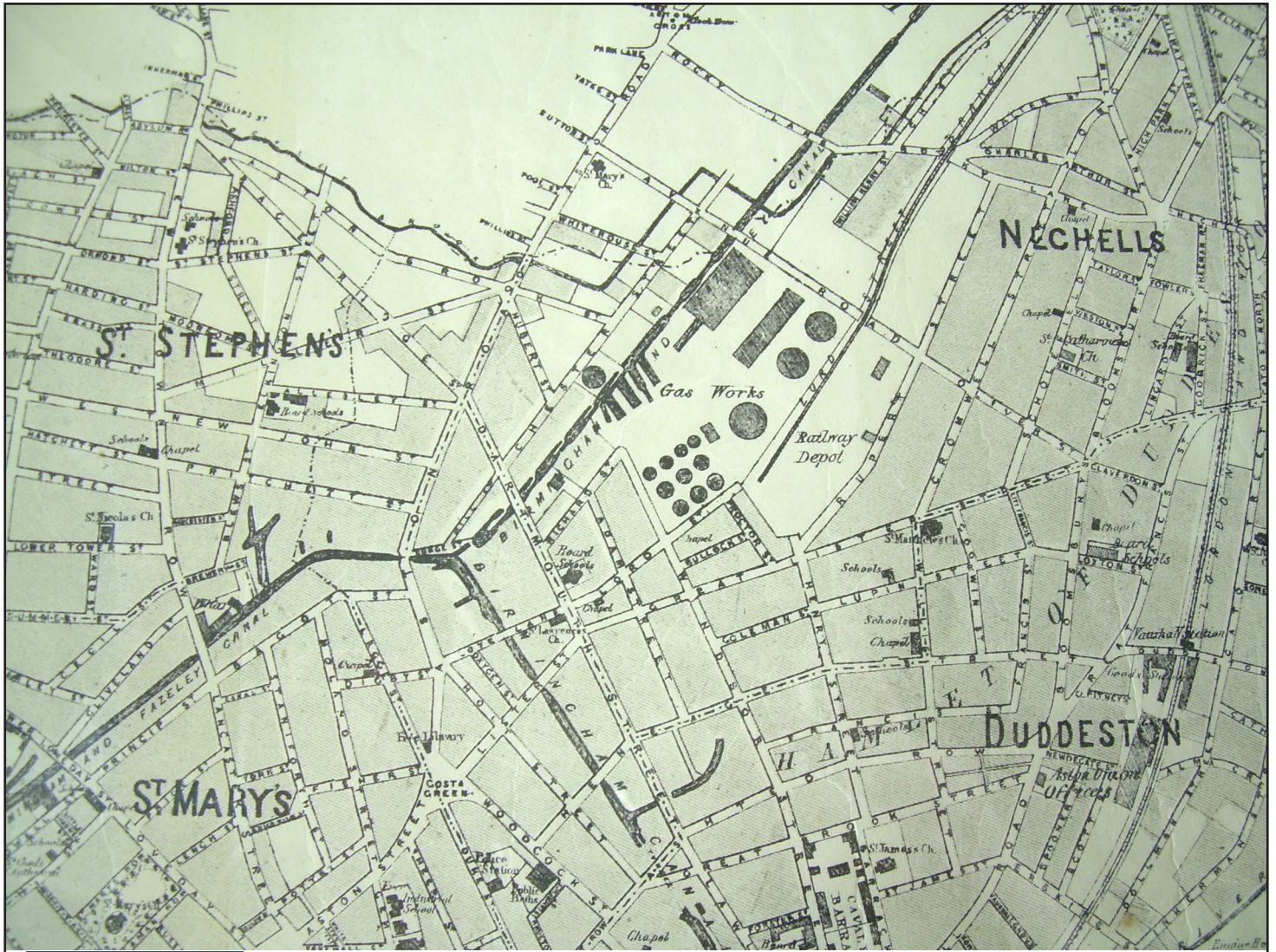


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Windsor Street Aston
Figure 5: 1855 Map





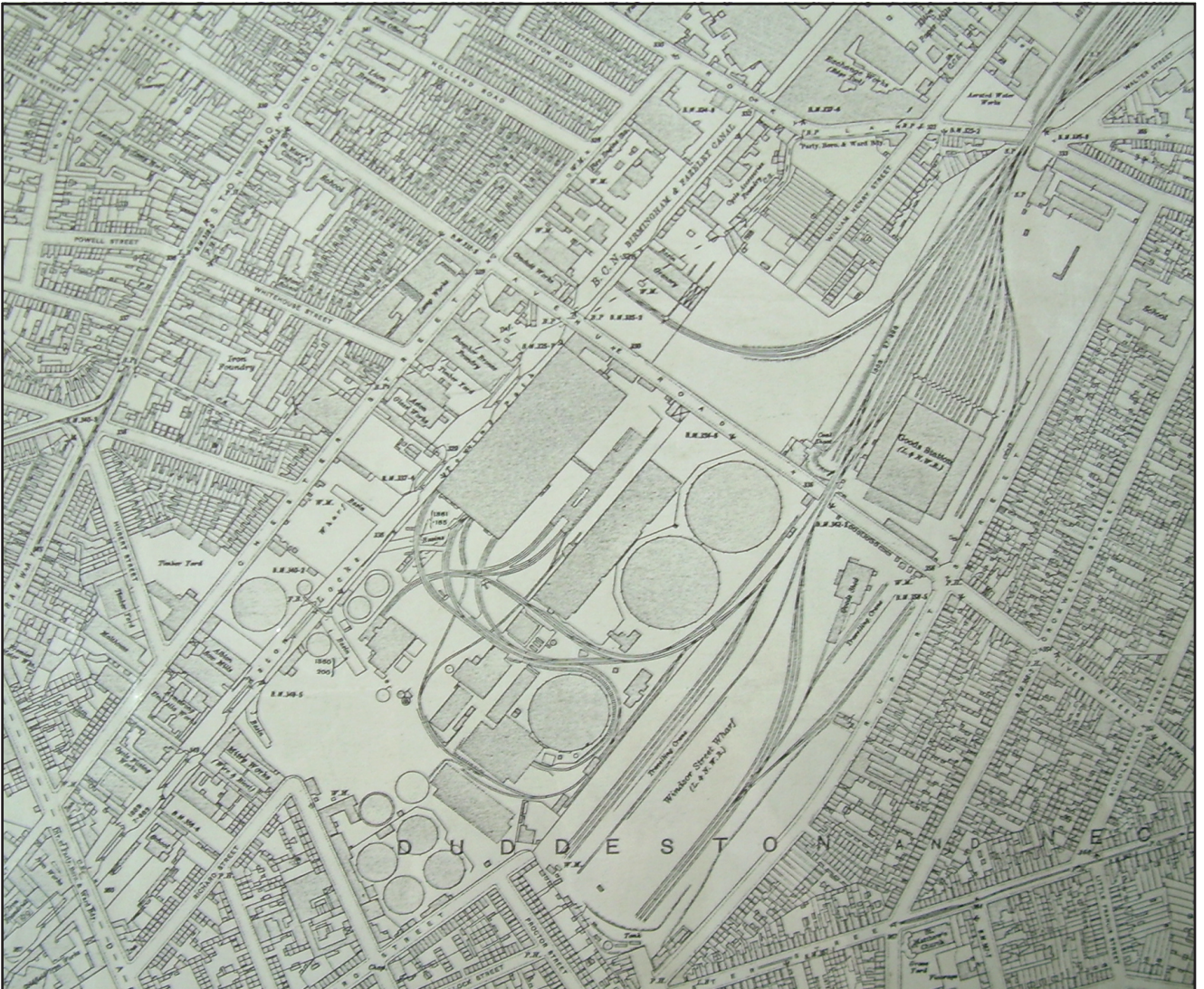
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Windsor Street Aston

Figure 7: 1884 map



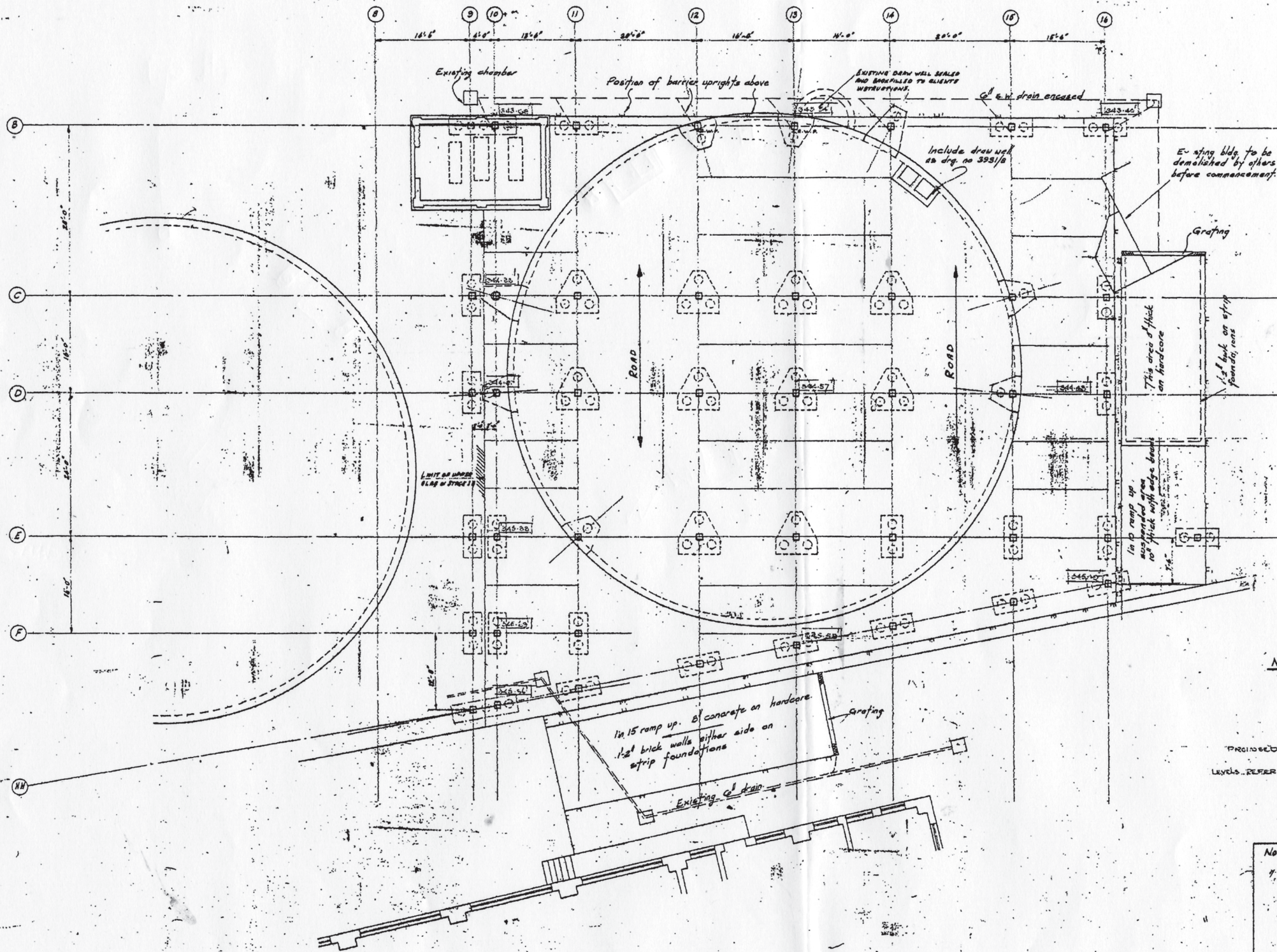
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Windsor Street Aston

Figure 8: O.S. map 1917



NOTE
STAGE 2

PARKING FOR 30 CARS ON BRIND FLOOR
PARKING FOR SIMILAR NUMBER OF HEAVY
VEHICLES ON UPPER FLOOR.

PROPOSED 3RD FLOOR LEVELS SHOWN THUS 100.00
LEVELS REFER TO DATUM ON MEDICAL ROOM STAIR 342.15.

NOTES
1. ALL DIMENSIONS SHOWN ARE BASED ON THE PLAN.

WEST-MIDLANDS GAS BOARD
CONSTRUCTIVE ENGINEERS DEPT.
DRAWING NUMBER 15 020404

REV.	DATE	REMARKS	BY
REVISIONS			
WEST-MIDLANDS GAS BOARD WINDSOR STREET			
CAR PARK STAGE 2 PROPOSED LAYOUT			
DRAWN	P.T.P.	SCALE	1/8" TO 1'-0"
TRACED		DRAWING No.	C3/360/1
CHECKED		DATE	17-10-63
ROBERT M. DOUGLAS (CONTRACTORS) LTD. 285 GEORGE ROAD, BIRMINGHAM			

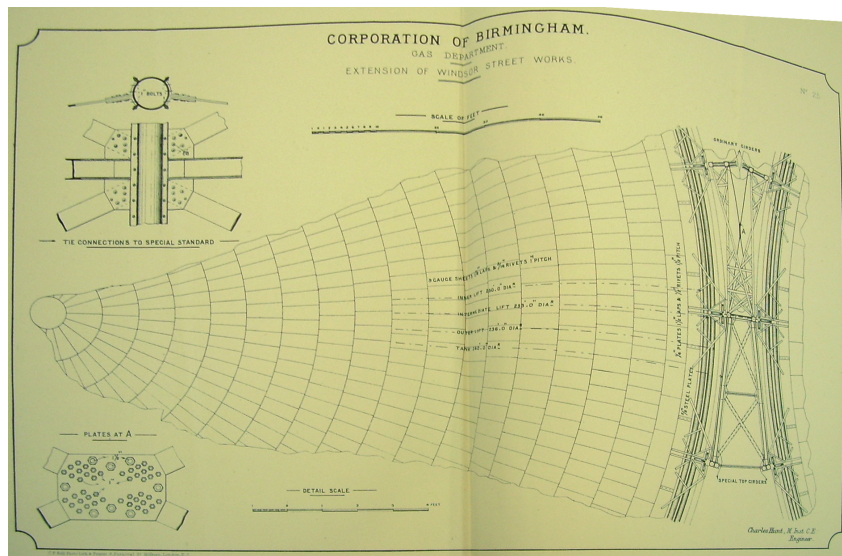
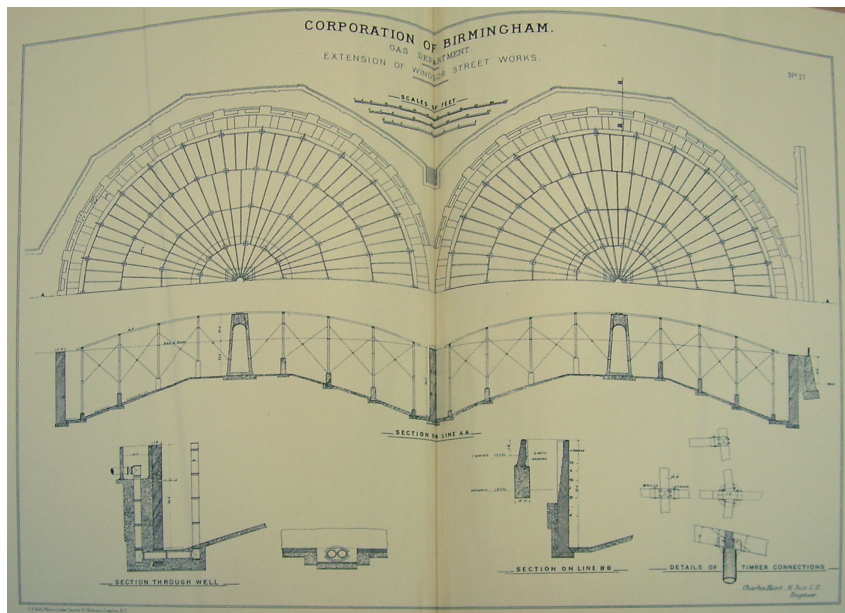
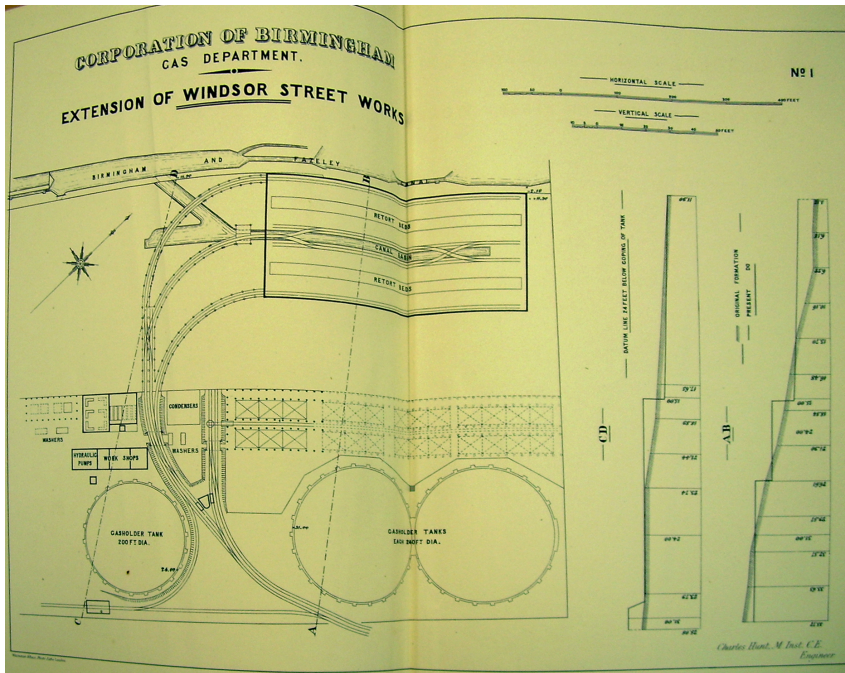




Plate 1



Plate 2

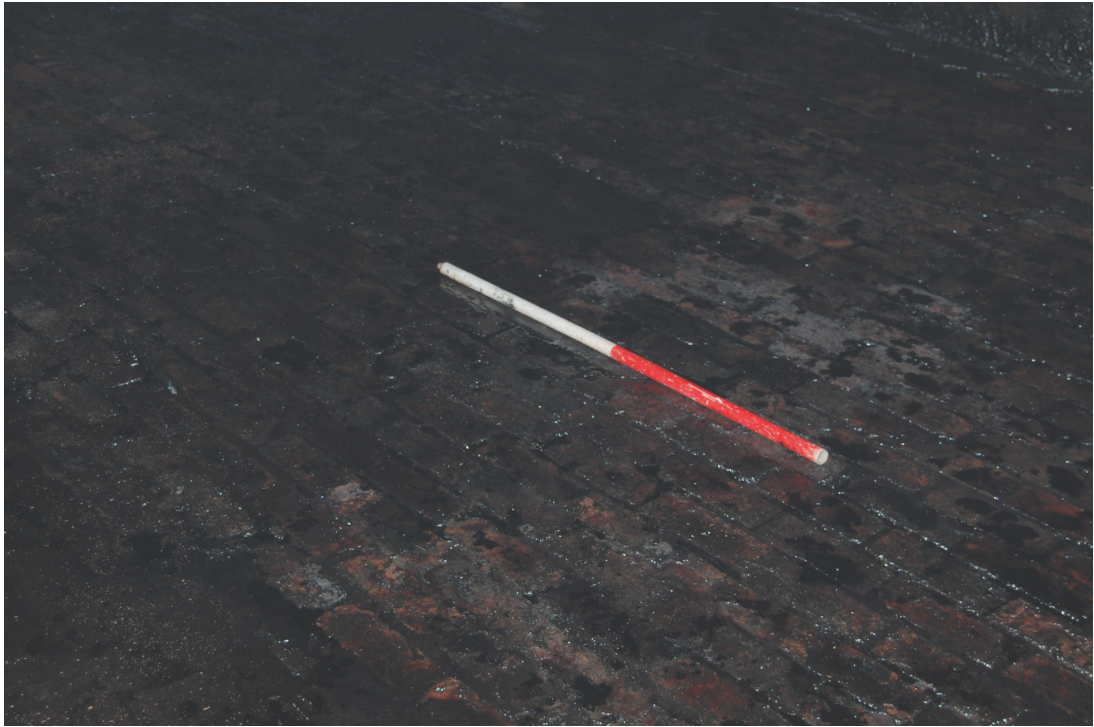


Plate 3



Plate 4



Plate 5



Plate 6



Plate 7



Plate 8



Plate 9



Plate 10



Plate 11



Plate 12

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL WATCHING BRIEF

PLANNING APPLICATION NUMBER C/04997/07/FUL

1.0: PLANNING BACKGROUND

A planning condition has been placed upon demolition and groundworks relating to planning consent (Planning Application number C/04997/07/FUL) for the redevelopment of the former Windsor Street gas works.

2.0: LOCATION

The site is located off Windsor Street and Lord Street to the east of the Dartmouth Circus (A4540) and Aston Road (A38) interchange. The site lies south of the line of the Birmingham and Fazeley Canal. The site consists of a series of derelict (and now demolished) buildings. The remains of the former gas tanks are located on the northern edge of the site running parallel to the line of the Birmingham and Fazeley Canal.

3.0: ARCHAEOLOGICAL BACKGROUND

The presence of the tanks and the gas works are known from historic maps and plans of the area and photographic records located within the Birmingham City Archives.

4.0: SPECIFIC REQUIREMENTS

The archaeological watching brief will be maintained on demolition and groundworks relating to the redevelopment and removal of a series of gas tanks located within the confines of the former gas works off Windsor Street. Specifically this will involve the following;

1. Visit following emptying of tar tank and liquor tank- recording emptied tanks by photography, annotated plans and written description. A single visit when each tank is empty.
2. Observation of excavation works in the vicinity of the tanks and recording any archaeological features by photography, drawing and written description. On-site presence during excavation works.
3. Preparation of a report on the archaeological recording accompanied by background information on the Windsor Street gasworks itself and comparable sites.

Monitoring will specifically occur at the following times;

- After the emptying and cleaning of the tar and liquor tanks.
- After the removal of the slab and reduction of the internal structures to investigate external structures

5.0: STAFFING

The project manager will be Chris Hewitson and the watching brief will be maintained by a suitably qualified member of staff.

A: AIMS

The general aims of an archaeological watching brief is to identify and record archaeological features and deposits uncovered during hand-cleaning of excavations in advance of construction or infrastructure projects, and to prepare a brief report summarising the findings.

B: METHODOLOGY

An experienced archaeologist will attend site to monitor construction groundworks, as required in the Design Brief.

Following the removal of the slab the machined surface will be inspected, and sufficient hand-cleaning will be undertaken to facilitate the definition of archaeological, or possible archaeological features and deposits.

Where it is safe to do so, the archaeologist will enter construction trenches for the purpose of undertaking hand-cleaning of the trench sides and base for the better definition of any archaeological features or deposits present. No excavation of archaeological features, other than hand-cleaning, would be undertaken. Where it is unsafe to enter deep trenches archaeological recording will be confined to photography and the completion of pre-printed pro-formas.

Should significant, or potentially significant groups of archaeological features be uncovered the Planning Archaeologist and Archaeological Consultant (if any) will be consulted immediately so that an alternative strategy for more detailed investigation can be devised, in consultation with the developer.

Human remains

No excavation of human remains would be undertaken until a Home Office Licence was obtained, and the Planning Archaeologist, the local Coroner, the Police, the Archaeological Consultant (if any) consulted.

Recording

Recording would be by means of pre-printed pro-formas for contexts and features, supplemented by plans (1:20 and 1:50 as appropriate) and sections (1:10 and 1:20 as appropriate), and 35mm monochrome print and colour slide photography.

Finds

Finds would be recovered by context would be washed, marked and bagged. Appropriate conservation work would be undertaken.

C: REPORT FORMAT

The archaeological watching brief report will comprise:

- Description of the development and archaeological background
- Details of the archaeological results, set within their context.
- Spot-dating of datable finds, and brief finds and environmental reports
- A discussion of the watching brief results.
- Plans showing the locations and extent of the development site subjected to the watching brief, supported by historic map extracts to place the watching brief results in the wider context.

- Simplified feature plans and sections, where applicable.
- A selection of colour photographs, where applicable.

D: PROFESSIONAL STANDARDS

- Birmingham Archaeology is a Registered Archaeological Organisation (RAO) with the Institute of Field Archaeologists (IFA)
- All Birmingham Archaeology staff will follow the Code of Conduct of the IFA at all times.
- The watching brief will be undertaken in accordance with the standards laid down in the 'Standard and Guidance for Archaeological Watching Briefs' (1999)
- The archaeological watching brief will follow the specific guidelines and requirements laid down in the Design Brief prepared by the relevant Planning Archaeologist, and the particular requirements set down in this document, which will be followed by all project staff. All variations will be agreed in advance with the relevant Planning Archaeologist and Archaeological Consultant (as appropriate).

E: HEALTH AND SAFETY

- A Risk Assessment will be undertaken before commencement of the archaeological watching brief.
- Birmingham Archaeology staff will follow the Health and safety guidelines contained in the Birmingham Archaeology Health and Safety Manual. This follows the requirements of the SCAUM Health and Safety Manual, and is approved by the Health and Safety Unit of the University of Birmingham.

F: PROGRAMME

The watching brief programme will follow that of the general contractor undertaking construction groundworks, with regular liaison between Birmingham Archaeology and the general contractor to ensure that regular archaeological attendance is maintained during the groundworks sufficient to ensure that the requirements of the Design Brief are fulfilled.

A suitable time allowance for hand-cleaning and recording of archaeological features and deposits should be made by the developer and their construction groundworkers. The archaeologist undertaking the watching brief will maintain regular liaison with the site manager/foreman to keep disruption of the construction programme to a minimum.