

Gasholders Nos 4 & 5, Factory Lane, Croydon, London: Historic Building Recording Final Report

*AOC Project No: 23686_V
3rd August 2021*



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Gasholders Nos 4 & 5, Factory Lane, Croydon, London: Historic Building Recording Final Report

On Behalf of:	SGN 2 Woodstock Road Yarnton OX5 1NY
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SUMMARY

AOC Archaeology Group was commissioned by SGN to undertake an historic building survey of two redundant gasholders located at the SGN site on Factory Lane in Croydon, South London both prior to and during the demolition of the structures.

The Croydon Gasworks – formally known as the Waddon Gasworks – was established on the site to the immediate west of the present gasholder compound in 1866 – 1867. A period of expansion was started from the 1890s onwards spearheaded by Chief Engineer James W Helps, which saw the construction of Gasholder No 4 in 1895 (later rebuilt) and Gasholder No 5 in 1921. The gasworks, after becoming largely obsolete after the discovery of natural gas in the late 20th century, meant that all but Gasholders Nos 4 and 5 were demolished in the 1970s. The addition of a high-pressure works in 2020 together with the maintenance of existing pipework (such as for use with an intelligent pig) mean the once bustling site is still busy as a distribution centre.

Gasholder No 4 was originally constructed in 1895, a guide-framed holder built with four lifts and a nominal capacity of 3,828,000ft³ (108,397m³) with a below-ground tank constructed by Aird & Co. Between 1956 – 1958, the guide-framed holder was removed, but the original brick tank retained, and a new spiral-guided holder was built by J Dempster Ltd.

Gasholder No 5 was constructed in 1921 by Ashmore Benson & Co Ltd, the tank constructed by T Vale & Co. It is a variant of a 'Type 42' cylindrical shell design by gasholder pioneer George Livesey with his brother Frank. George Livesey also constructed Gasholders Nos 1 & No 2 on the site in the late 19th century (now demolished). Its distinguishing features are its slender standards and steam, trussed-beam crown rest frame.

1 INTRODUCTION

1.1 Project Background

1.1.1 AOC Archaeology Group was commissioned by SGN to undertake a survey of two redundant gasholders at the Factory Lane site in Croydon, South London. The work has been undertaken as part of a wider programme involving the decommissioning and dismantling of the remaining redundant gasholders in the UK operated by SGN. This report comprises the results of the Phase I works undertaken prior to demolition and the Phase II works undertaken during demolition of the structures.

1.2 Site Location

1.2.1 The two gasholders are situated within their own 6.88-acre compound accessed via Factory Lane and within a wider industrial and retail area. To the north of the site is Enterprise Close with several light industrial units and residential housing beyond this. To the east of the site is Factory Lane and the Factory Lane Reuse and Recycling Centre. To the south of the compound is the large Tesco Croydon CFC Distribution Centre and to the west is a railway line and, beyond this, a retail park including a large Sainsburys supermarket.

1.2.2 Gasholder No 4 is located to the south of Gasholder No 5 and is centred on NGR: TQ 31212 65907. Gasholder No 5 in the north side of the compound and is centred on NGR: TQ 31169 65975 (Figures 1 & 2).

1.3 Statutory Designations

1.3.1 The two gasholders on the site have no statutory designations and are not located in a conservation area.

2 OBJECTIVES

2.1 The objective of the historic building survey was to create a 'preservation by record' of the redundant gasholders and any other structures on the site related to their former operation, prior to and during their decommissioning and demolition through archival research, measured survey, written records and photographic survey.

3 METHODOLOGY

3.1 Introduction

3.1.1 The historic building recording has been undertaken to a methodology outlined by Montagu Evans (2016) as an Enhanced Level II survey for Gasholder No 5, which includes a general and detailed photographic record, written record and a detailed measured survey to produce a drawn ground plan, elevation, section and important feature details. For Gasholder No 4, a Basic Level II survey was required, which included a general and detailed photographic record and written record only. However, during demolition a timber crown support frame was uncovered within Gasholder No 4 believed to be contemporary with the original 1895 brick tank wall. A detailed measured survey was therefore carried out to the standards of an Enhanced Level II survey on the interior of Gasholder No 4. Methodology for the survey was guided by Historic England documents *Gasworks and Redundant Gasholders: Guidelines for their Evaluation and Recording* (2019) and *Understanding Historic Buildings: A Guide to Good Recording Practice* (2016).

3.2 Archive Research

3.2.1 A general map-regression exercise was undertaken to determine the general history and development of the site from its origins to the present day. All publicly accessible pre-Ordnance Survey and Ordnance Survey maps were viewed and a selection are included in Section 5.

3.2.2 The following archives were consulted to identify early/original archives and drawings of the former gasworks site and gasholders:

- Historic England Archives

- No records (drawn or photographic) of the gasholder are known to exist in these archives.
- National Archives at Kew
 - No records (drawn or photographic) of the gasholder are known to exist in these archives.
- National Monuments Record (Swindon)
 - No records (drawn or photographic) of the gasholder are known to exist in these archives.
- National Gas Archive, Warrington
 - Several archive plans, photographs and journal extracts, which are listed in Section 9.3 and illustrated in Section 5. A selection of these have been reproduced as Figures to illustrate the history of the gasworks and development and operation of the site and gasholders.

3.3 Photographic record

3.3.1 A general photographic survey was undertaken of the gasholders and ancillary gasworks buildings in colour digital using a digital SLR camera in both JPG and RAW format to a minimum 24-megapixel resolution. Photography was carried out between 16th–18th December 2020 for the Phase I survey, and on the 5th May and 7th July 2021 for the Phase II survey. In addition, detailed shots of features such as structural elements (standards and framework), pipework, stairs, guided rollers, knock-off switches, valves and other control equipment, etc, were also taken. A discreetly placed 1m or 2m ranging pole was placed in all shots where access and health and safety allowed for scale. A register of photographs was taken on site and can be found in Appendix 1, together with plans showing the location and direction of each photograph (Appendix 2). A selection of digital photographs has also been used as plates to illustrate this report (Plates 1–214).

3.4 Written record

3.4.1 A written survey was undertaken of the exterior of the gasholders and related operational buildings using AOC *pro forma* recording sheets with comment on condition, construction, features, fixtures and fittings, modern interventions, evidence for phasing and function and anything else pertinent to the historic record.

3.5 Measured Survey

3.5.1 The Phase I measured survey of Gasholder No 5 was undertaken between the 16th–18th December 2020. The Phase II measured survey of Gasholder No 4 interior was undertaken on the 5th May 2021 and the Phase II measured survey of Gasholder No 5 interior was undertaken on 7th July 2021. A detailed description of the measured survey methodology can be found in Appendix 3. From this data, detailed illustrations including 2D line drawings of the gasholders were created.

3.6 Health and Safety

3.5.1 AOC surveyors were always accompanied on site by a member of SGN or DSM Group. During the Phase II survey access was permitted within the tanks via the access ramps onto the dumpling. All laser scanning and photography was carried out from the dumpling top.

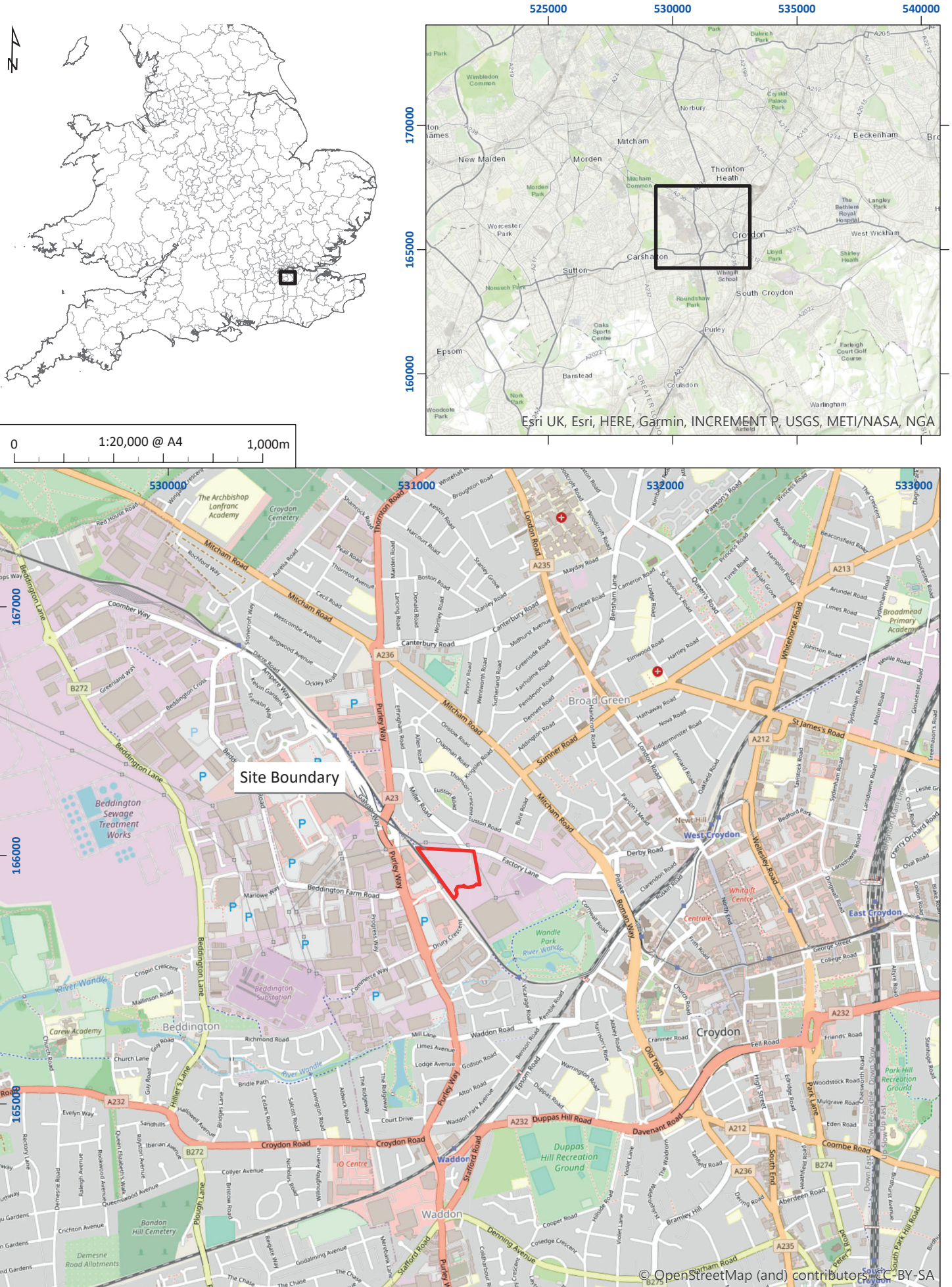


Figure 1: Site location plan

01/23686_V/REP/01/01



Figure 2: Detailed site plan showing outline of the development area

01/23686_V/REP/02/01

4 GASWORKS AND GASHOLDERS: AN INTRODUCTION

4.1 The Layout of a Typical 19th / 20th Century Gasworks

- 4.1.1 William Murdoch is credited with pioneering coal gas production. He first lit his house and office in Redruth using this method in 1792 and built the first small gasworks at the Soho Factory of Messrs Boulton and Watt in Smethwick in 1798 (Thomas 2010). Murdoch's philosophy was to build small gasworks that supported a single establishment, although as the 19th century progressed, larger gasworks were built across the UK to run lighting for multiple mills, factories, streets and eventually homes. Fredrich Winsor was key to the concept of centralised gasworks providing mains delivery to users across large areas. He established the Gas Light and Coke Company in 1812 which lit the cities of London and Westminster and the borough of Southwark. The by-products of gas manufacture became the first feedstocks for chemical, dye and motor fuel industries.
- 4.1.2 Thomas (2010) summarises the general running of a gasworks into several main structures as seen in Figure 3. Gas was produced in buildings called retort houses by heating coal in an oxygen-free environment to drive off volatile components, leaving coke as a residue. Multiple retorts (1) were built in benches and were originally horizontal, D-shaped, 10ft long, cast-iron structures. They were heated via the furnace (2) which was controlled by a team of stokers. As gas practices improved, methods in later years included inclined and vertical retorts which could be made of silica. The produced gas was passed from the retorts through water in the hydraulic main (3) to remove ammonia (Merriam 1913), then cooled in the condensers (4). Three types of condensers were common: atmospheric, annular and water tube, all of which worked to remove coal tars as they cooled the gas, draining it to a tar tank or well.

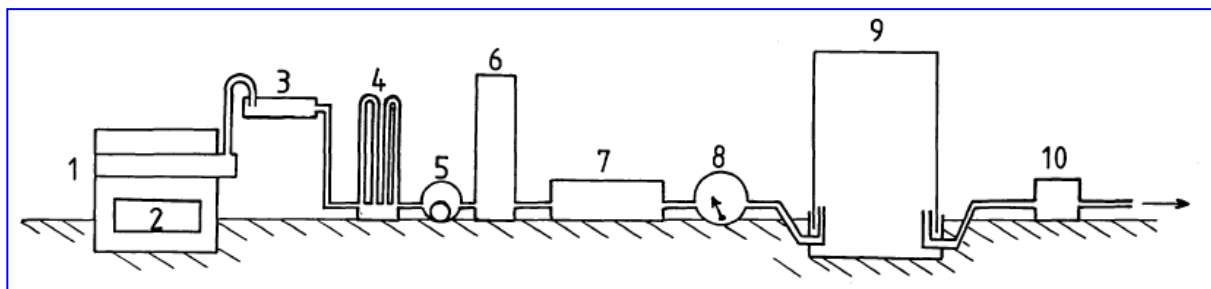


Figure 3: Schematic Layout of Gasworks.

1 Horizontal Retort; 2 Furnace; 3 Hydraulic Main, 4 Condenser; 5 Exhauster; 6 Scrubber; 7 Purifier; 8 Station Meter; 9 Gasholder and Water Tank; 10 Pressure Governor (after Cotterill 1980)

- 4.1.3 The quality of the gas produced during the gasification of coal varied, with the highest quality produced at the start of the process and the lowest quality at the end. The exhausters (5) were gas or steam driven pumps which controlled the movement of the gas from the retorts through to storage or use. The exhausters moderated the drawing of gas at different rates to keep the gas produced at the required standard.
- 4.1.4 Scrubbers (6) and washers removed ammonia and phenol from the gas via two different processes. Washers passed the gas through seals, perforated plates or weirs of liquor, and scrubber towers sprayed the gas with water as it moved up the tower, thereby dissolving the ammonium and phenol to form ammoniacal liquor. Combined washers and scrubbers were designed in later years. Purification of the gas to remove hydrogen sulphide and hydrogen cyanide was carried out in the purifiers (7) via the chemical process of precipitation. Originally lime was used in the process, although was superseded by iron ore which facilitated the production of iron ferricyanides and iron sulphides in the precipitation process to purify the gas. The lime and iron ore could be regenerated a couple of times before their concentrations of cyanide or sulphur were too high. After two or three uses the lime was referred to as 'foul' and was used as fertilizer; the oxide was referred to as 'spent' and was used as weedkiller. The purified gas was passed through a station meter (8) to monitor its quality and pressure before being stored in a gasholder (9). Larger gasworks had multiple gasholders which in later years held gas produced by different methods and at different pressures. Before going out to the local

grid the pressure of the gas was monitored and modified via a pressure governor (10) to ensure it was at the correct pressure for users.

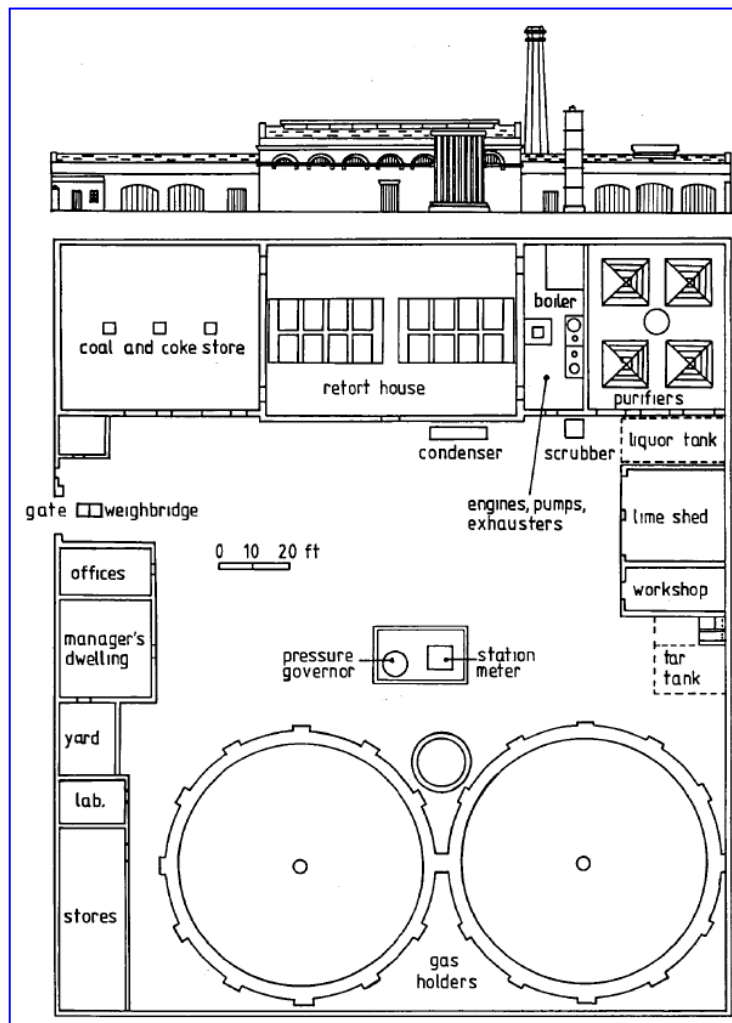


Figure 4: Typical medium-sized gasworks layout from the 1870s (after Newbigging 1879)

4.1.5 Underground tanks and wells stored tar and liquors produced in the different stages of the gasworks operations with liquor floating and tar sinking to the bottom. Solid tar was dug out when tanks were full, some stored above ground where it could be sent for refining elsewhere.

4.1.6 Other additional structures on a gasworks site included offices, workshops, dwellings, laboratories and stores as shown in Figure 4 above.

4.2 The Function and Anatomy of a Gasholder

4.2.1 Gasholders are used to store gas to meet the daily demands of the local area. Storage capacity in the 19th century was worked out as approximately equal to the maximum consumption on a winter's day of the local area using the gas (Tucker 2000, 7).

4.1.1 As detailed by Tucker (2000, 7–8) a gasholder is comprised of three main components: the tank, the bell and the guide-frame. The tank is the open-topped cylinder that houses the bell when it is empty of gas and can be built above or below ground. It is filled with water to provide a seal to stop gas escaping and sometimes has a rest frame built within it to support the crown of the bell when the holder is empty. The bell is the open-bottomed, sheet-metal cylinder which holds the gas. It rises and falls as the gas enters and exits the holder throughout the day. To economise on the depth of the tank some holders are telescopic, meaning the bell sides are split into sections known as lifts. The joint between each lift has a cup-and-grip water seal to stop

gas escaping; non-telescopic bells have only a single lift. As the bell rises and falls it is kept in place by guide rollers mounted on carriages on the top of each lift which run against rails on the guide-frame. The guide-frame is a circular structure comprising columns or standards which surround the tank. The columns or standards are connected by horizontal girders and sometimes diagonal bracing which together secure the bell and tank from strong winds.

- 4.1.2 After the change from burning coal for gas production to using natural gas, the use of gasholders became more automated. A set amount of gas was provisioned for each area daily, which would start entering the gasholder in the early hours of the morning. The gasholders would rise as they filled with gas until residents began using it during the morning peak period, when they would lower in height. The gasholders would then remain at relatively the same level of fullness for the entire day until the second peak period of around dinnertime when the level would drop again. The up and down movement of the bell was often controlled via an automated knock-off system. This involved a series of switches at different heights that were triggered by striker plates located on the bell top and sides. The triggering of knock-off switches either opened or closed the inlet and outlet valves of the bell to ensure that the bell never over-filled in times of low usage or completely emptied in times of high usage. The knock-off system includes a sunstock switch which is the highest located switch. This is activated when the valves are shut, but when the sun has heated up the bell, therefore causing the gas inside to expand and the bell to rise even further. When the sunstock is activated the valves are opened to push some of the gas into the mains, ensuring the bell does not overflow and risk a leak or explosion.

5 HISTORICAL BACKGROUND

5.1 Early History of the Future Gasworks Site at Croydon

- 5.1.1 The earliest documented record writes Croydon as 'Crogedene' and dates to approximately 1250 (Marot & Roy 2020). The name is a compound of 'croh' – saffron and 'denu' – valley. The Domesday Book of 1086 records a relatively large settlement at Croydon, in the hundred of Wallington and the county of Surrey, of 73 households and is recorded as being owned by the Archbishop of Canterbury but also Ralph and Restold; the tenant-in-chief is recorded as the Archbishop of Canterbury. The area records ploughland, meadows, woodland and a church (Anna Powel-Smith 2020).
- 5.1.2 Croydon became a market town by Royal Grant in 1276 which granted a market to be held every Friday, and its early development resulted from the Archbishop of Canterbury making the town the centre of management for the archiepiscopal estates in Surrey, Middlesex and Hertfordshire. By the 15th century, Croydon already had an old and new town. Several monarchs visited and stayed at the manor of Croydon, such as James I of Scotland in 1412 and Queen Elizabeth in 1573 (Malden 1912). The Manor of Waddon was formed of the ancient demesne of the Crown as a member of the Royal Manor of Bermondsey to the south of the future gasworks.
- 5.1.3 By the early 19th century, Croydon had developed along a broadly north/south road following the line of the London to Brighton roman road, Stanley's 1804 map identifying that the area was used for agriculture at this time (Figure 5). The Croydon Tithe Map of 1843 shows some changes in the wider landscape going into the first few decades of the 19th century, including more roads and fields incorporated into larger plots of land (Marot & Roy 2020; Figure 6).



Figure 5: Extract from Stanley's map, 1804, with the approximate position of the future present gasholder compound circled in red

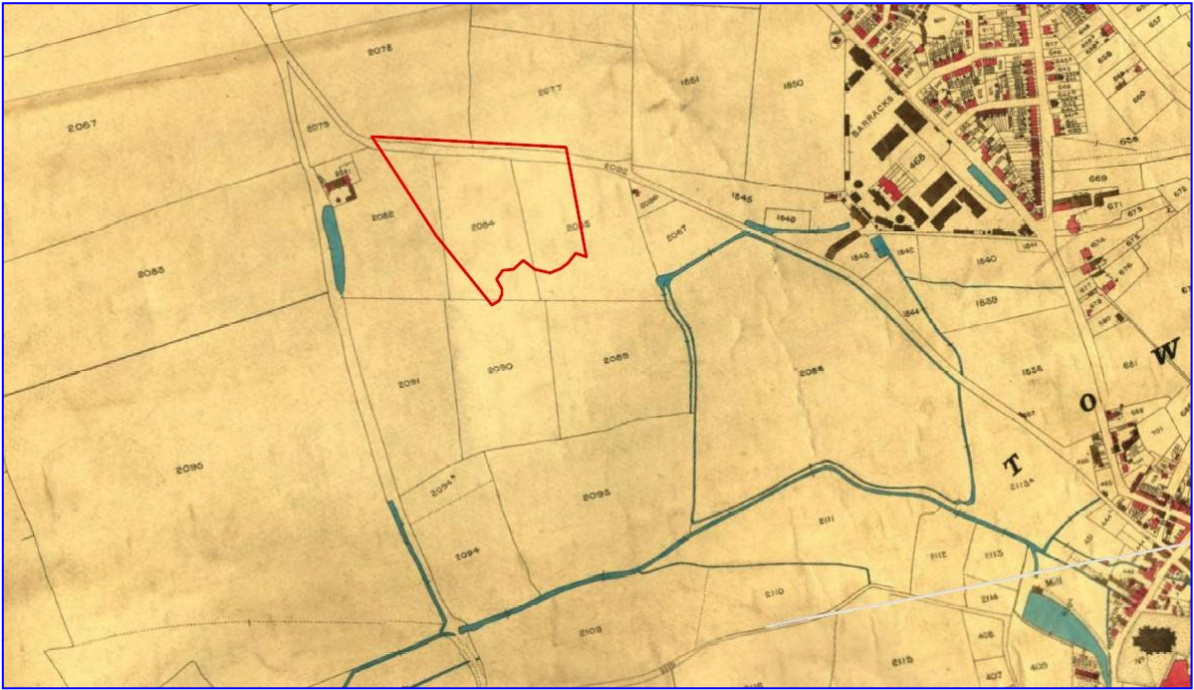


Figure 6: Extract from Tithing Map, 1843, with the outline of the future present gasholder compound outlined in red

5.2 The Establishment of Waddon Gasworks

- 5.2.1 In 1830, Messrs Barnard and Defries established a gasworks at Surrey Street in Croydon and subsequently sold them to Henry Overton for £1,000 who held the deeds to the company for 17 years (Journal of Gas Lighting and Water Supply 1903, 560). On 28th August 1846, a meeting of gas consumers was held, the outcome of which was the formation of The Croydon Commercial Gas and Coke Company with a capital of £20,000 in £5 shares (*ibid*). Mr Patton was appointed as the company's first manager in 1847 at a salary of £120 a year (*ibid*, 561). In the same year, an Act of Incorporation was obtained and the company was authorised to raise a loan and share capital of £26,600 (*ibid*). In 1860, a second Act of Incorporation allowed them to raise a further sum of £20,000 and in 1866 a third Act meant they could expand their supply and raise further share capital of £78,000 and £19,500 of loan capital (*ibid*). This allowed the company to establish the Waddon Works to the west of the present gasholder compound between 1866–1867.
- 5.2.2 The new Waddon Gasworks are depicted in the 1872 Ordnance Survey (OS) map adjacent to the London and Brighton South Coast Railway line (Figure 7). A large rectangular building, the retort house (No 1), is located to the east side of a smaller linear building and a small gasholder is located to the south corner of the plot. The retort house (No 1 Retort House) was constructed in 1866–1867 and was 164ft (50m) in length and 60ft (18.29) in width (Journal of Gas Lighting and Water Supply 1903, 559). It had oval-shaped retorts which were directly fired from the coal. Gasholder No 1 was constructed at the same time at a diameter of 44ft (13.41m) and nominal capacity of 44,000ft³ (1,246m³) (*ibid*, 561).
- 5.2.3 The fourth Act of Incorporation in 1877 allowed the company to raise further funds of £80,900 and in 1894, the company merged with Carshalton Gas Company (Journal of Gas Lighting and Water Supply 1903, 561). This meant that the capital of the company now stood at £330,000 and £45,000 of loan capital (*ibid*).

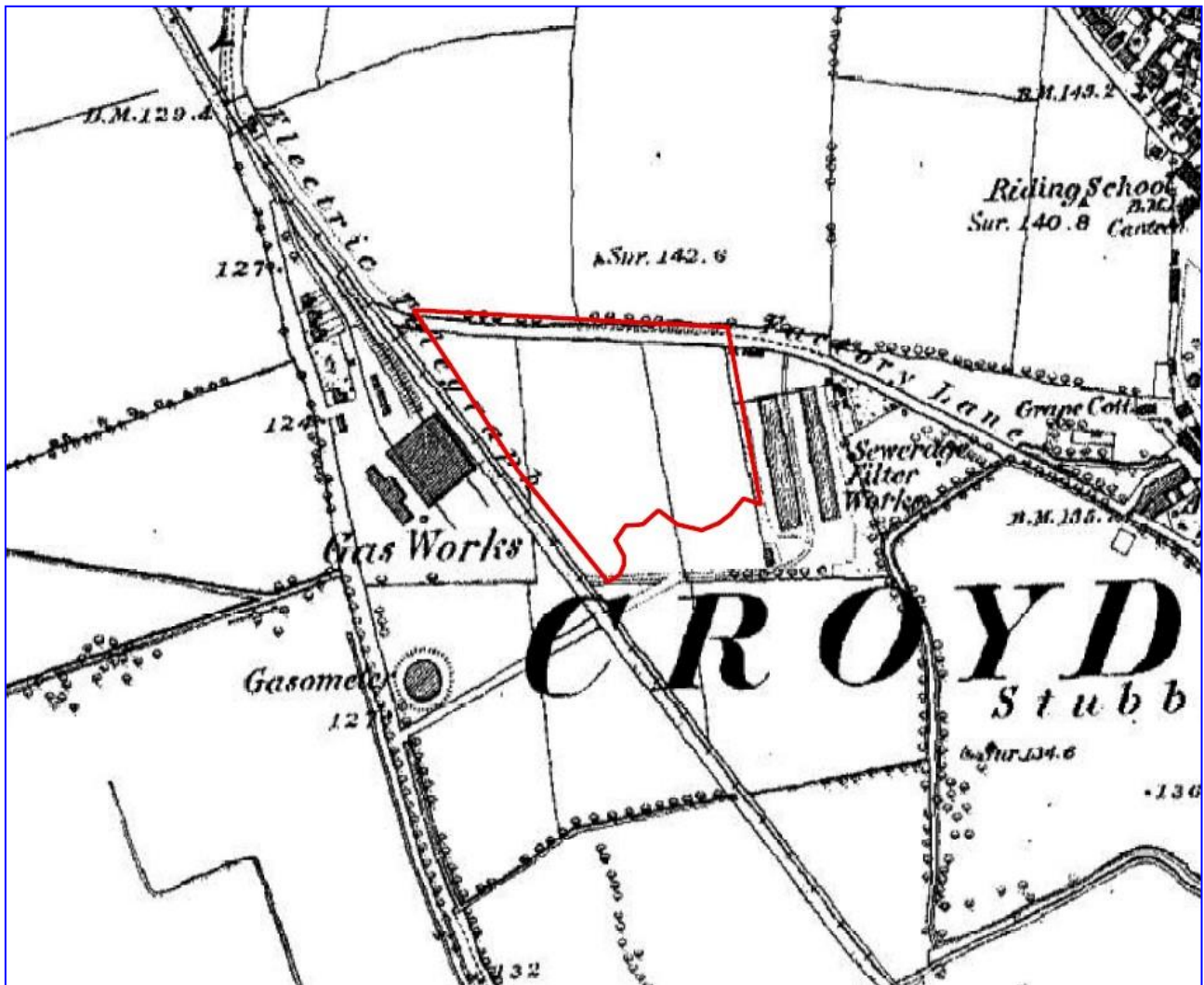


Figure 7: Extract from Ordnance Survey map, 1872, with the outline of the future present gasholder compound outlined in red and the 'new' gasworks located to the south-west
 Reproduced from Landmark Information Group © Ordnance Survey

5.3 Late 19th Century Expansion

5.3.1 The 1896 OS map shows that the gasworks expanded greatly during this period (Figure 8). The original gasholder (Gasholder No 1) is still depicted, and has been joined by two additional holders (Gasholders No 2 and No 3) to the north with a second retort house (No 2 Retort House) which was built in 1875. Other ancillary buildings, including a large linear building against the western boundary of the site, were also built as part of the expansion. No 2 Retort House was only slightly larger than No 1 Retort House at 168ft (51.21m) and the same width. Gasholder No 2 was constructed in 1879, with Gasholder No 3 added between 1891–1895 (Marot & Roy 2020, 15). The larger gasholder depicted to the east side of the gasworks in a new plot of land was built as Gasholder No 4 and was 195ft (60m) in diameter and 36ft (11.15m) in depth with a brick and puddle below-ground tank and a capacity of 3,000,000ft³ (84,950.54m³). It was built by Aird & Sons (Montagu Evans 2016, 2). This company had recently been reorganised after the death of co-founder Charles Lucas in 1895, with John Aird & Co focussing on railway and civil engineering and Aird & Sons focussing on water and gas contracts (Grace's Guide ud_a). The civil engineering branch of the company would later go on to construct the Aswan Low Dam, the first dam across the Nile in 1898 (*ibid*).

5.3.2 Much of the late 19th century and early 20th century expansion began in the early 1880s after James W Helps was employed as Chief Engineer with the Croydon Gas Company. Indeed, the expansion of the gasworks was celebrated in the Journal of Gas Lighting and Water Supply in 1902, which noted that:

'...retort-houses were diminutive in comparison to the later erection...the purifying plant was small, and would have an undignified appearance if seen today in juxtaposition with plant that now exists. The older gasholders, still apparently of everlasting strength, are not in the running in the matter of capacity with the holder [Gasholder No 4] put up some seven years since.' (Journal of Gas Lighting & Water Supply 1902, 932).

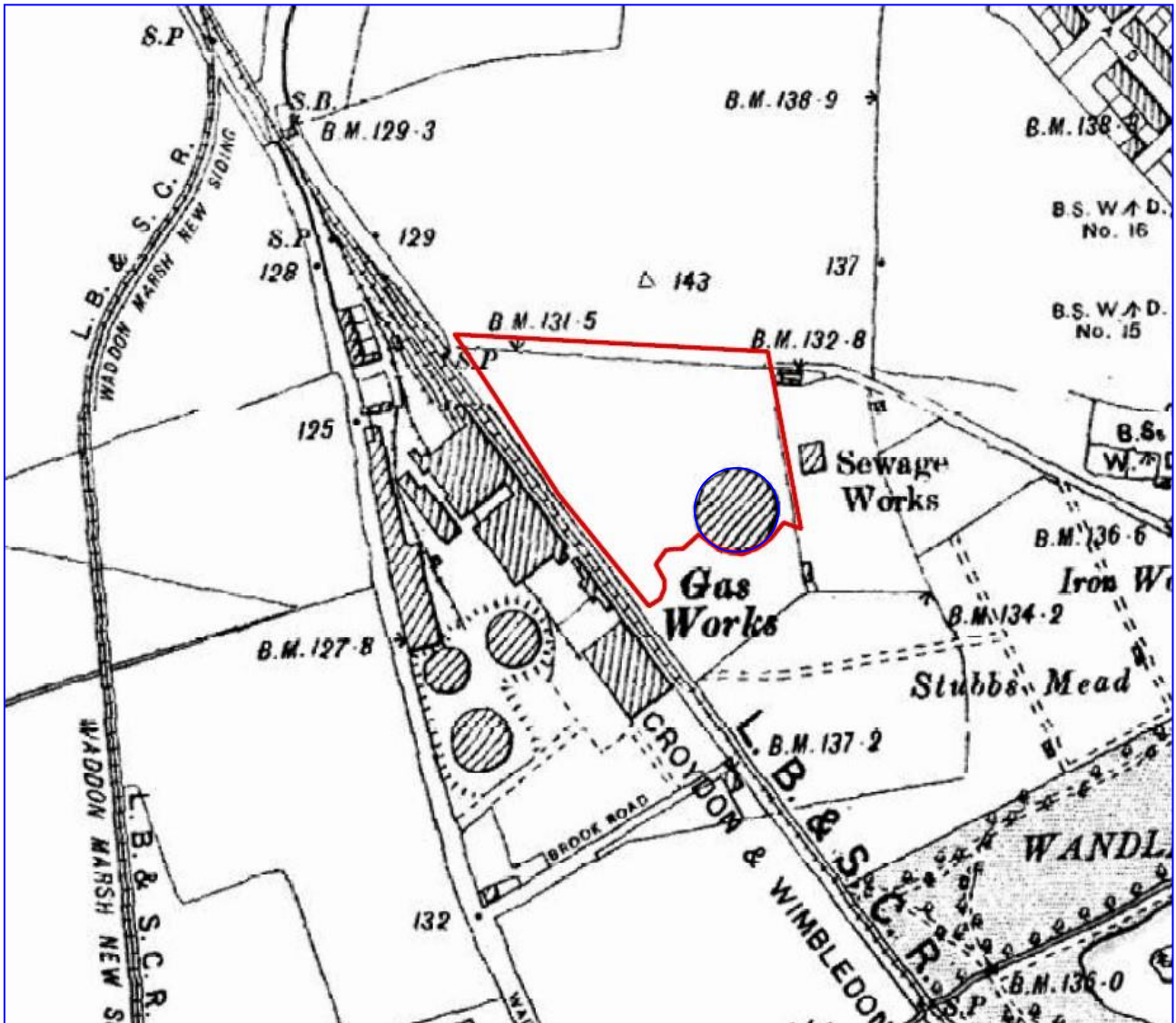


Figure 8: Extract from Ordnance Survey map, 1896, with the outline of the future present gasholder compound outlined in red and Gasholder No 4 circled in blue

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- 5.3.3 Additional expansions included the addition of a new lift to one of the earlier gasholders, a new washer scrubber, two tar and carbonic acid extractors, a station meter of 100,000ft³ capacity (which replaced two smaller ones) and new governors (Journal of Gas Lighting & Water Supply 1902, 932). Gasholder No 1, the first holder to be built on the site, was later used as a relief holder in connection with the carburetted water-gas plant (Journal of Gas Lighting and Water Supply 1910a, 789). In 1893, a '...fine stage-floor retort house, 196 feet [59.7m] in length and 72 feet [22m] wide, with a coal store 50 feet [15.24m] wide at the side...' was also constructed (*ibid*). This was No 3 Retort House which had a De Brouwer conveyor to carry away the coke drawn from the retorts to a cross-conveyor and elevator (Journal of Gas Lighting and Water Supply 1903, 559). Photographic plates and drawings of the new builds are included in the 1902 article showing the new boiler house, compressor house and water softening room sitting in front of the earlier (now demolished) 19th century guide-framed holders (Figure 9), the coke handling plant and retort benches (Figure 10) and the new elevated trolley lines and coke-hoppers (Figure 11). The reports on the new expansions noted that the

gasworks buildings had ‘good looking exteriors and interiors...’ noting that ‘...Refinement in appearance creeps in wherever it can be introduced.’ (Journal of Gas Lighting and Water Supply 1910a, 787). A later article in the same journal dating to 1910 also includes some photographic plates of the gasworks at this time, including a general view of the gasworks (Figure 12), a view from the top of No 2 Retort House, one of which shows Gasholder No 2 (Figures 13 & 14), the coal storage plant and electric crane with Gasholder No 2 in the background (Figure 15), the Compressor House interior (Figure 16) and the Sulphate House (Figure 17).

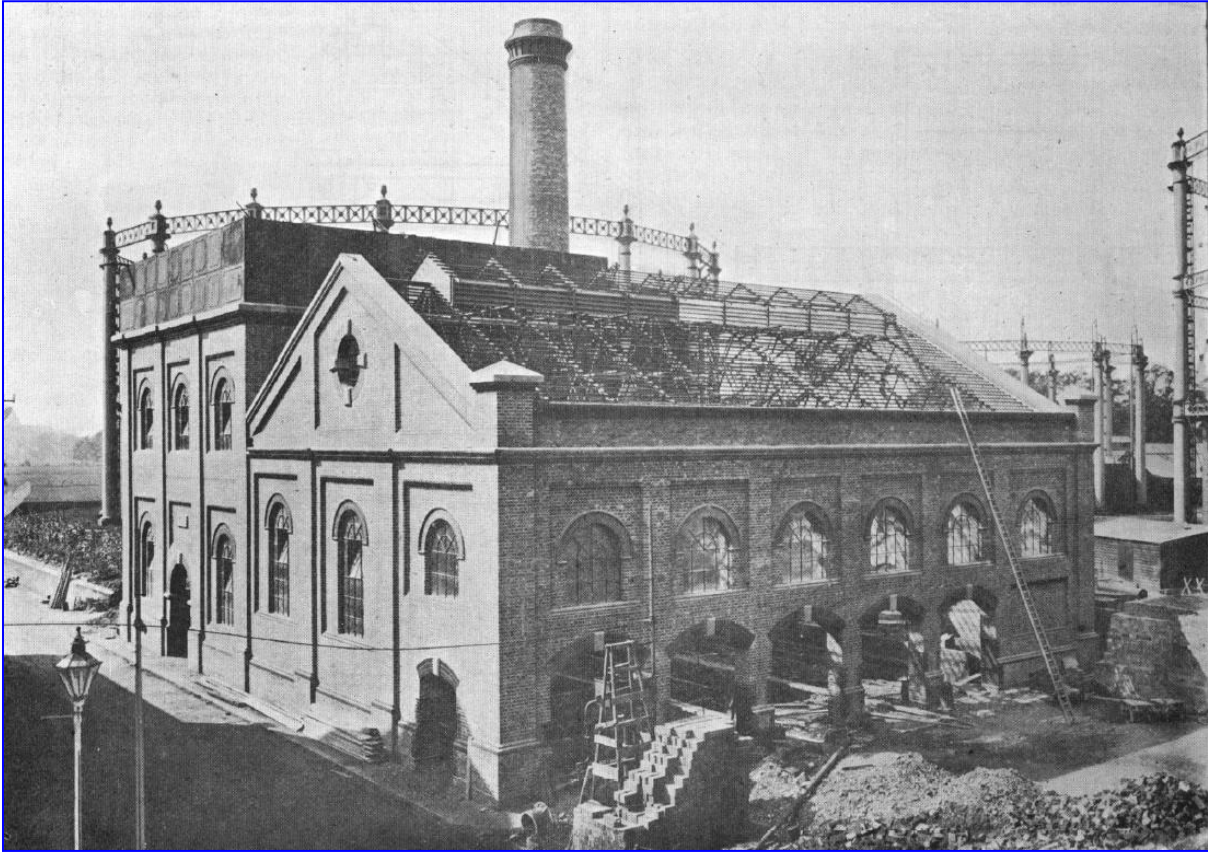


Figure 9: Archive photograph showing the Boiler House under construction with Gasholders Nos 1 and 2 in the background, 1902, after The Journal of Gas Lighting and Water Supply, 1902, 933 (NGA Ref: G7_1902_V80_P932)

- 5.3.4 In 1903, the Journal of Gas Lighting and Water Supply published another article on the Croydon Gasworks and provided a valuable layout plan of the gasworks and holders at the time (Figure 18). Sandwiched between Waddon Marsh Lane, Brook Road and the London to Brighton South Coast Railway line, the plan shows the layout and functions of the buildings on the site, including the those built under the Helps’ expansion programme. The three large retort houses were located against the boundary of the railway line for quick and easy rail access for the unloading of coal via both high-level and low-level sidings. There were two sets of sidings with one raised 14ft (4.27m) above the ground level in the retort house. Storage for 12,000 tons of coal was also available.

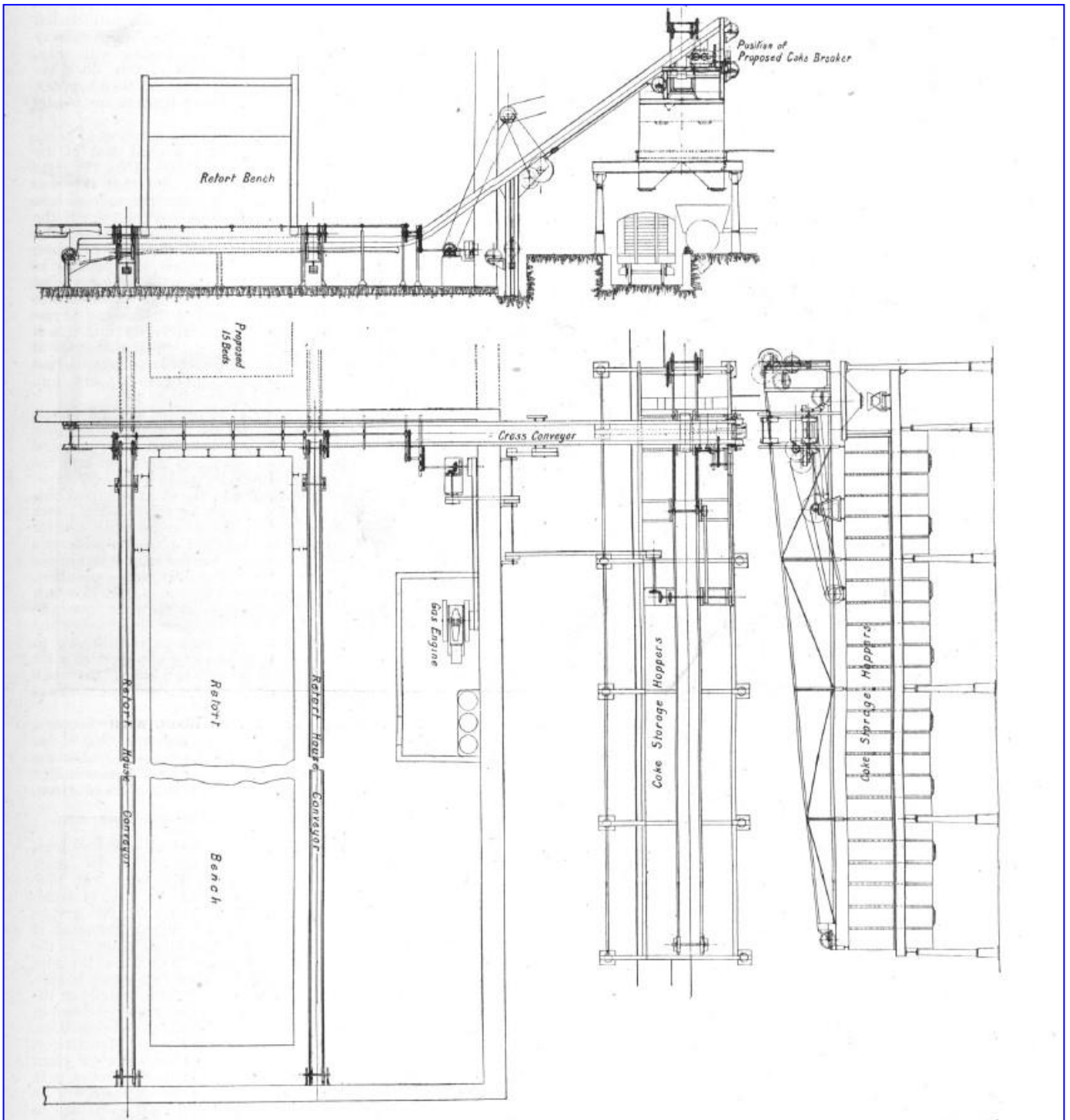


Figure 10: Archive graphic drawing showing the coke handling plant and operation and workings of the retort houses, 1902, after The Journal of Gas Lighting and Water Supply, 1902, 934 (NGA Ref: G7_1902_V80_P932)

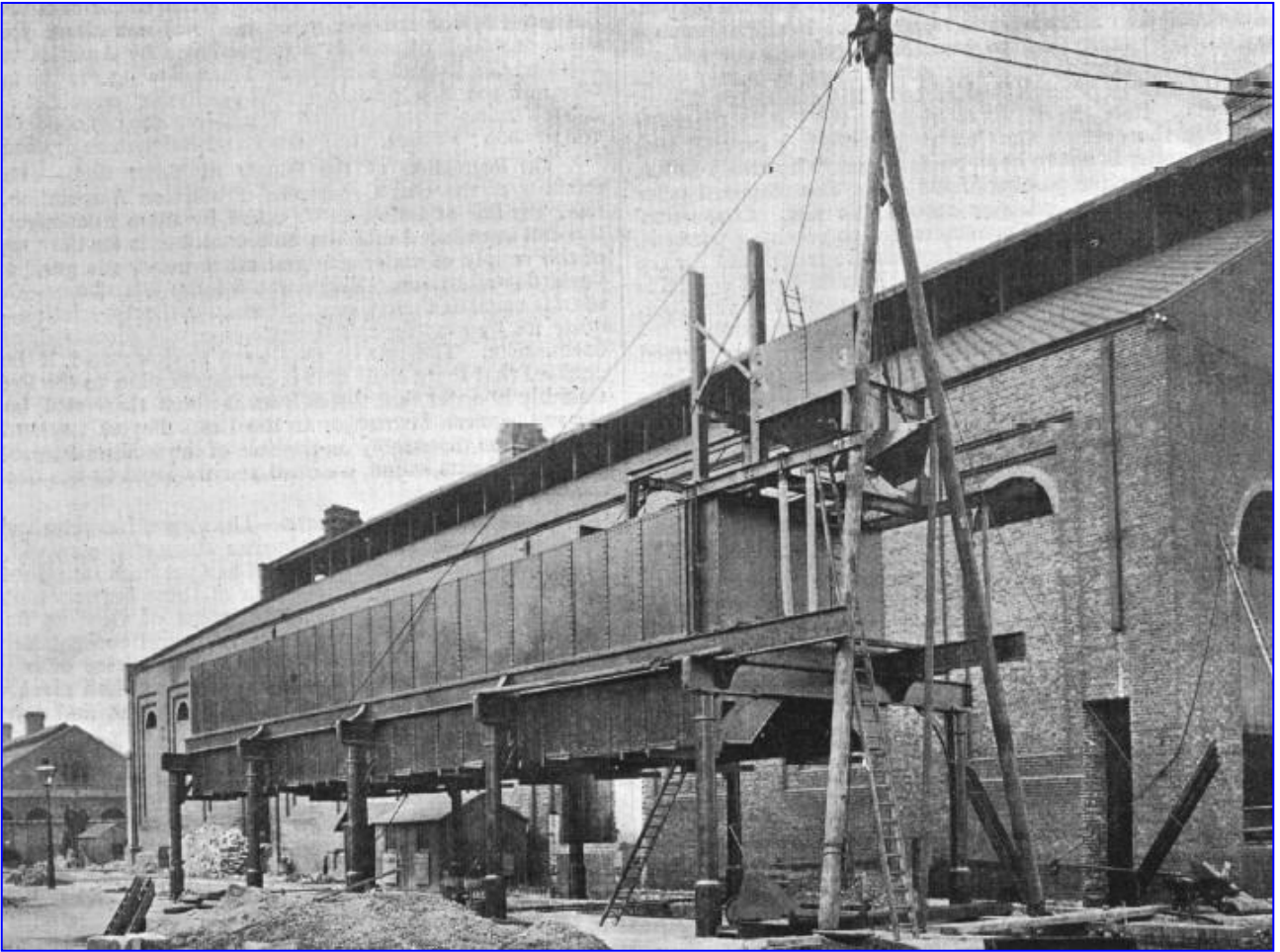


Figure 11: Archive photograph showing the coke hoppers and railway dock under construction, 1902, after The Journal of Gas Lighting and Water Supply 1902, 932 (NGA Ref: G7_1902_V80_P932)



Figure 12: Archive photograph of Croydon Gasworks, 1910, after The Journal of Gas Lighting and Water Supply 1910, 787 (NGA Ref: GJ_1910_V110_P787)

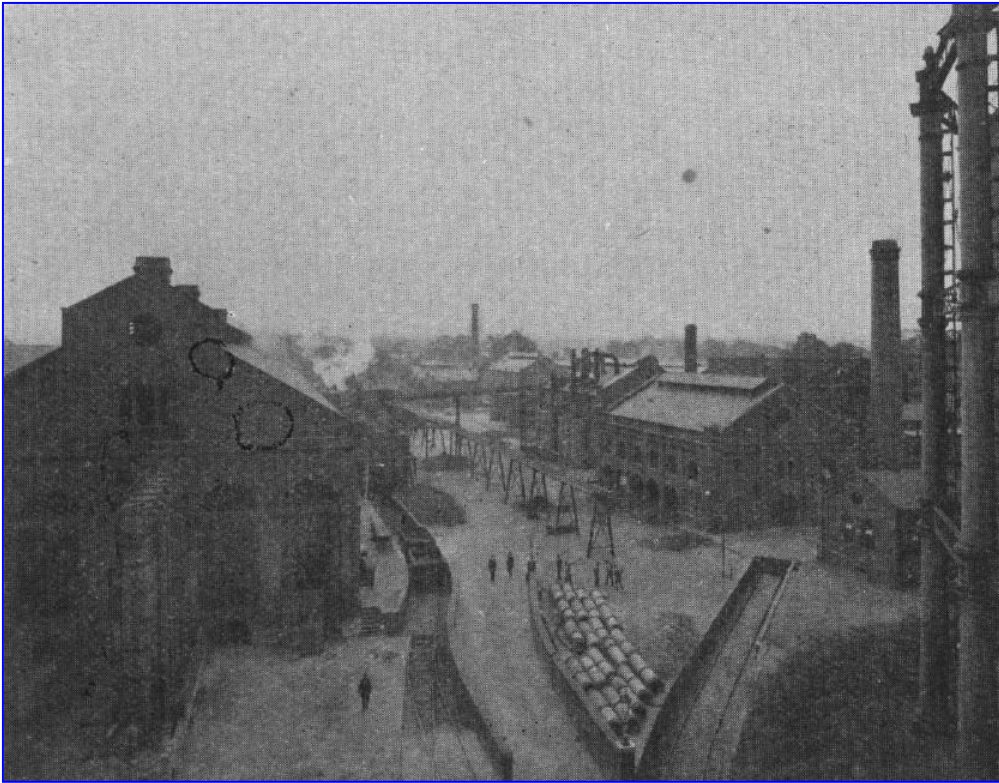


Figure 13: Archive photograph of Croydon Gasworks taken from No 2 Retort House showing Nos 3 and 4 Retort Houses and Coke Plants, 1910, after *The Journal of Gas Lighting and Water Supply* 1910, 788 (NGA Ref: GJ_1910_V110_P787)

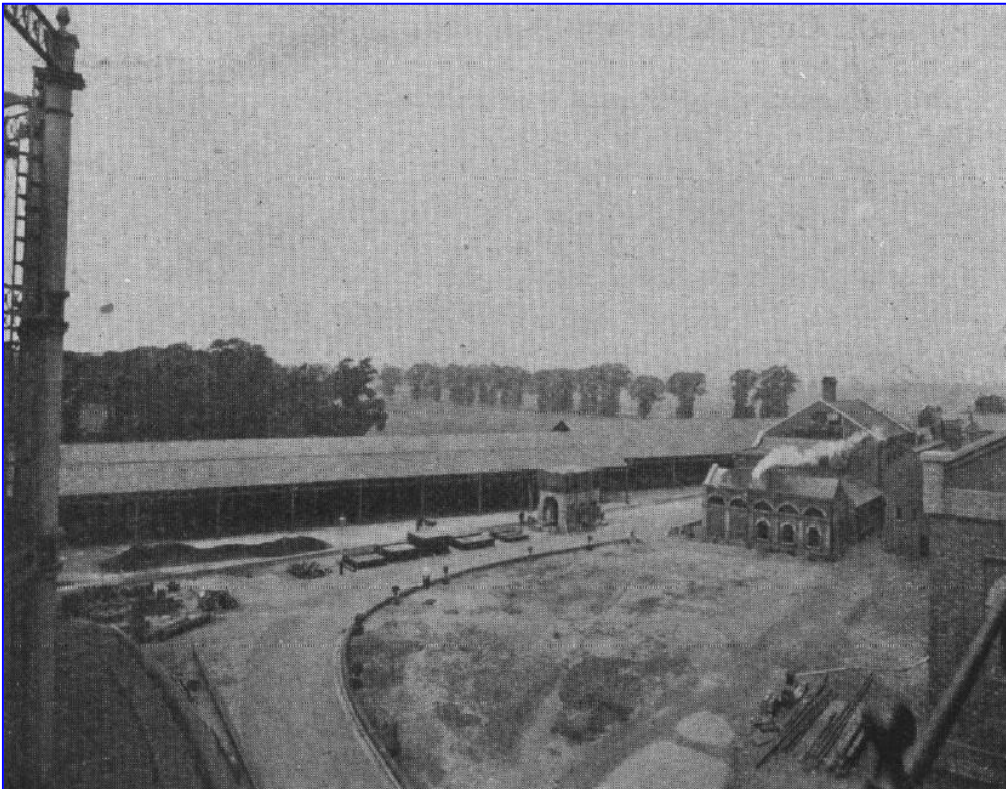


Figure 14: Archive photograph of Croydon Gasworks showing No 2 Retort House with Gasholder No 2 to the left, 1910, after *The Journal of Gas Lighting and Water Supply* 1910, 788 (NGA Ref: GJ_1910_V110_P787)

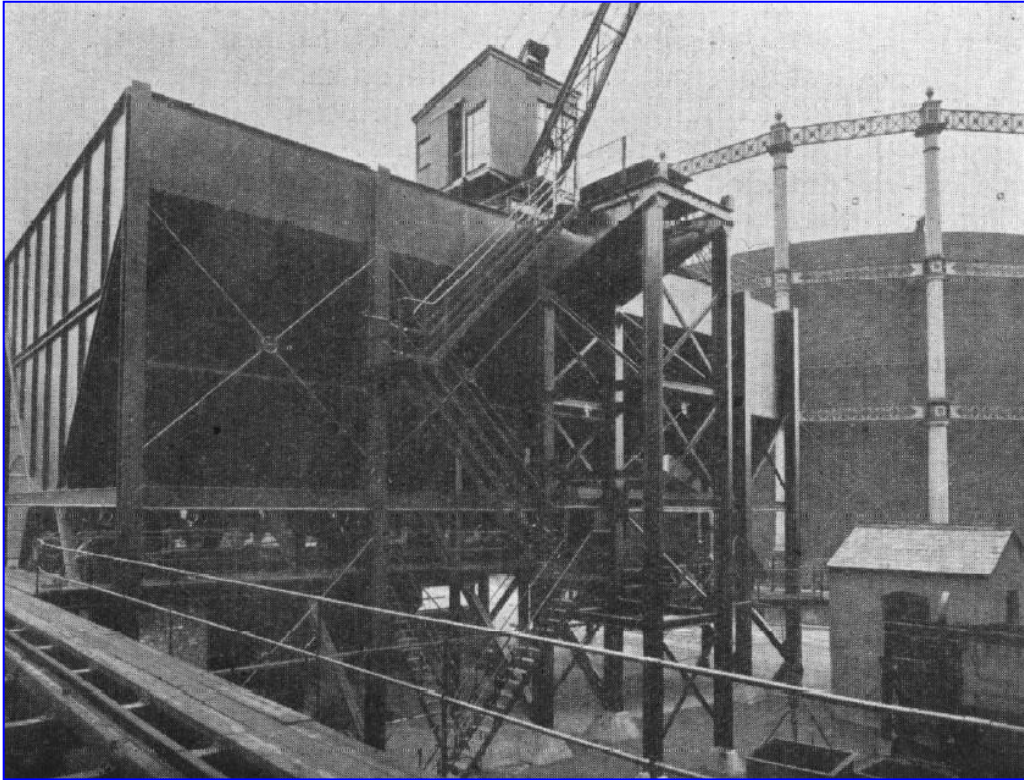


Figure 15: Archive photograph of Croydon Gasworks showing the coal storage plant and electric crane, 1910, after The Journal of Gas Lighting and Water Supply 1910, 788 (NGA Ref: GJ_1910_V110_P787)

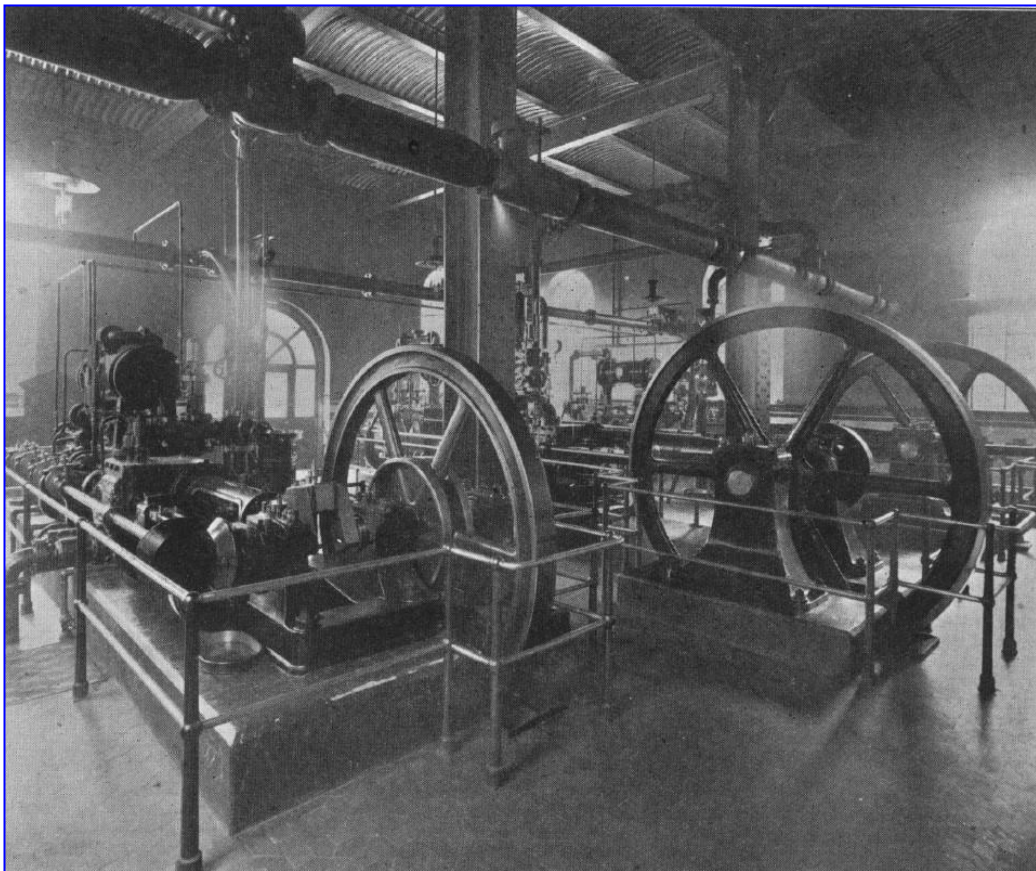


Figure 16: Archive photograph of Croydon Gasworks showing the interior of the Compressor House, 1910, after The Journal of Gas Lighting and Water Supply 1910, 789 (NGA Ref: GJ_1910_V110_P787)

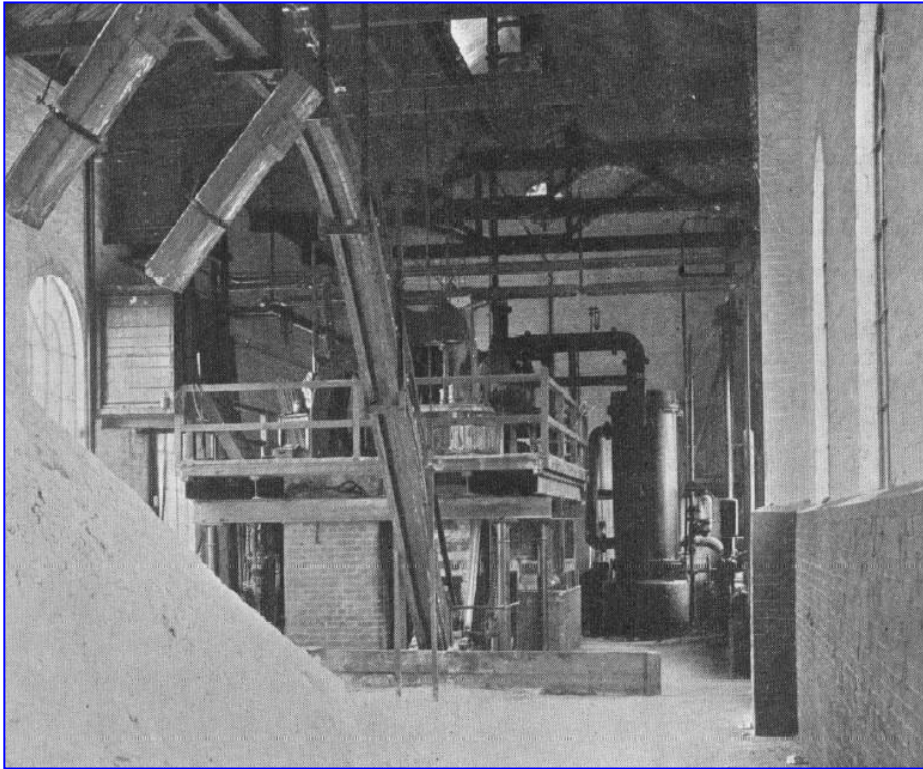


Figure 17: Archive photograph of Croydon Gasworks showing the interior of the Sulphate House, 1910, after The Journal of Gas Lighting and Water Supply 1910, 790 (NGA Ref: GJ_1910_V110_P787)

5.4 The Gasworks in the Early 20th Century

- 5.4.1 An Act of Parliament in 1904 authorised the change of name of the gasworks to the Croydon Gas Company and by 1906 the site covered 31 acres (Montagu Evans 2016, 2). The offices and showroom for the Works was located at Katherine Street approximately 1.5 miles to the south of the site (*ibid*). The 1914 OS map shows that there was further expansion of the gasworks to the south with several new buildings depicted to the SSE of the three 19th century gasholders (Figure 18). Gasholder No 4 is still depicted and the area to its east has also been further developed with the establishment of a Refuse Works and a new Electricity Works.
- 5.4.2 The 1933 OS map shows that there were some additional gasworks buildings constructed between the late 1910s and early 1930s (Figure 19). These included Gasholder No 5, built in 1921, located to the immediate north of Gasholder No 4. Construction on the gasholder was started in 1914, although the First World War delayed the build until 1919. The works now covered approximately 42 acres of land, which was reflected in the gas output at the time, which had increased from 592,977,000ft³ (16,791,239m³) in 1896 to 2,120,037,000ft³ (60,032,763m³) in 1922 (Journal of Gas Lighting and Water Supply 1922, 437). The company supplied gas to an area of 80 square miles and 300 miles of gas main, only half of which was built on by the early 1920s (*ibid*). The coal gas by this time was brought by steamer to the Thames and then by rail to the Works and from there connected to various railways sidings and the elevated railway into the coal stores (*ibid*). There was a total of 3,200 yards (2,926m) of single-track gauge railroad serving the Works (*ibid*).
- 5.4.3 Gasholder No 5 was built as a variant of a 'Type 42' gasholder and was designed by pioneering gas engineer George Livesey and his brother Frank. A late example of its type, the distinguishing feature of the guide frame was the slenderness of its standards and the absence of conventional horizontal girders. It was the largest holder to be built for Croydon Gasworks with a 226ft (68.8m) diameter and 207ft (63m) at its highest. It had four lifts and was built using 2,500 tons of steel. At the time of construction it was the largest holder built outside London in the country (Journal of Gas Lighting and Water Supply 1922, 438). The tank was built by Messrs Thomas Vale & Sons Ltd of Stourport and contained 8½ million gallons of water (*ibid*). Thomas Vale & Sons were established in 1869 and by the early 20th century specialised in building gasholder tanks and retort houses (Grace's Guides ud_c). The holder was built by Messrs Ashmore, Benson, Pease & Co Ltd of Stockton-

on-Tees (Journal of Gas Lighting and Water Supply 1922, 438). This company was created in the late 19th century and concentrated on civil engineering projects and issued a catalogue in 1888 for gasholders, scrubbers, condensers, purifiers, oil gas plants, gasworks fittings and gas supplies (Graces' Guide ud_d; Figure 20).

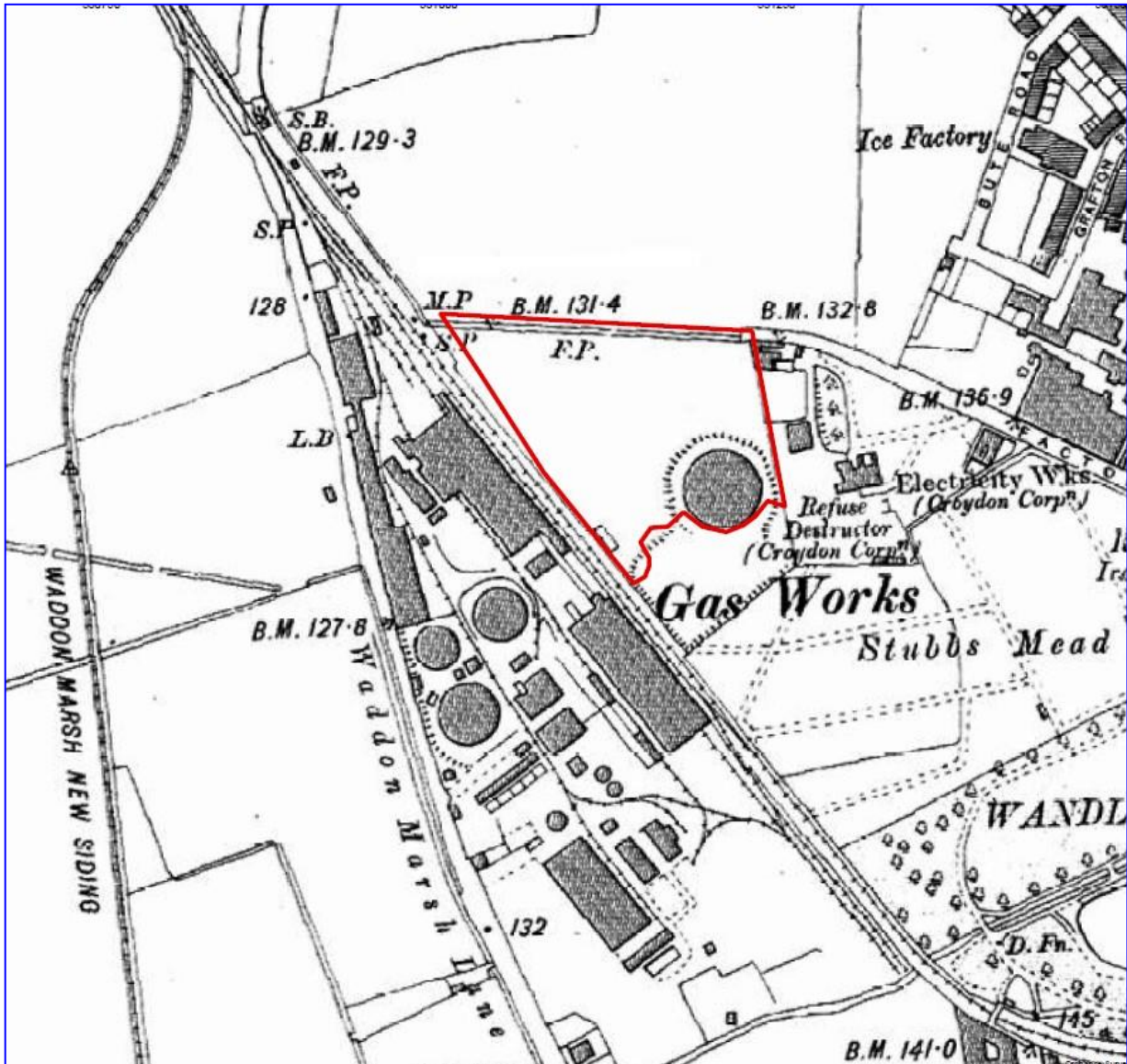


Figure 18: Extract from Ordnance Survey map, 1914, with the outline of the future present gasholder compound outlined in red. Reproduced from Landmark Information Group © Ordnance Survey

- 5.4.4 In 1929 the Croydon Gas Company acquired more land in Purley Way and stove repair shops, meter stores, a testing station and a garage were built (Montagu Evans 2016, 2). An aerial photograph of the gasworks site from ca. 1930 shows Gasholder No 5 dominating the skyline with Gasholder No 4 to its south (right) and the rest of the gasworks site, including all three smaller gasholders, to its west (left) (Figure 21).

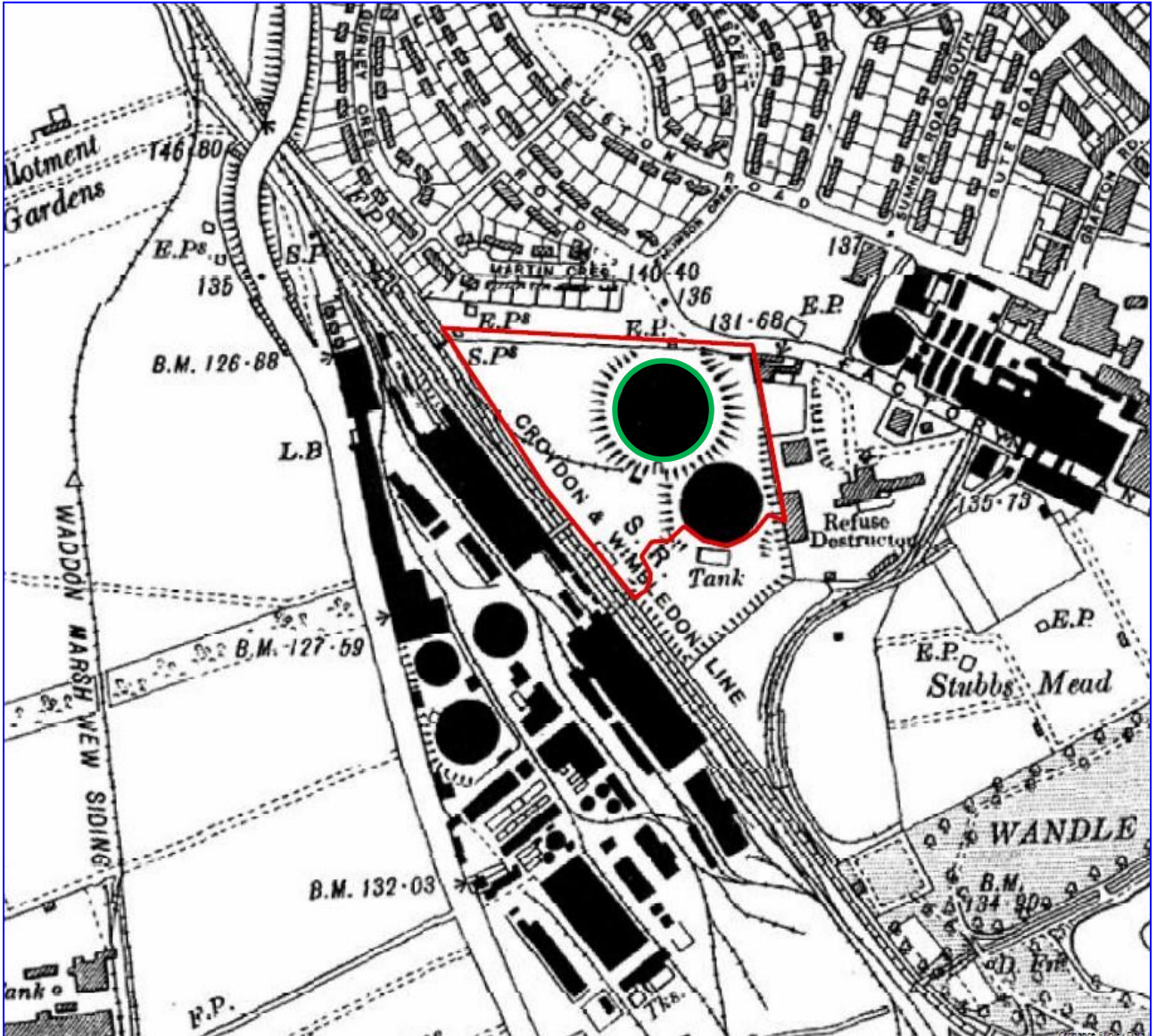


Figure 19: Extract from Ordnance Survey map, 1933, with the outline of the future present gasholder compound outlined in red and Gasholder No 5 (built in 1921) circled in green

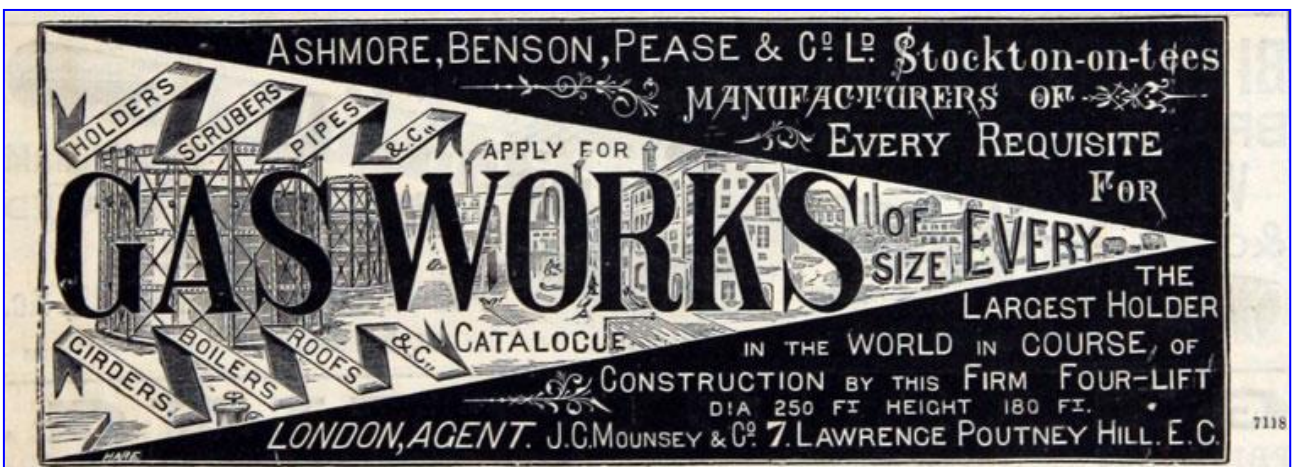


Figure 20: Advertisement for the services of Ashmore, Benson, Pease & Co Ltd, the builders of Gasholder No 5, 1888



Figure 21: Archive aerial photograph of the Croydon Gasworks, ca. 1930, showing Gasholders No 4 and 5 in operation in the centre with the gasworks to the west (left), including Gasholders Nos 1 – 3 (NGA Ref: SE/CRG/CRO/E/F/3)

- 5.4.5 The 1933 OS map depicts expansion of the immediate environs with large housing estates built to the north of the gasholder site. A new railway siding was also constructed between the Croydon and Wimbledon railway and Factory Lane.
- 5.4.6 Further expansion occurred in the late 1930s – early 1940s, specifically to the west of the site, as depicted in the 1949 OS map (Figure 22). Large buildings are shown to either side of Progress Way, which is now surrounded by modern light industrial units and shops. Two cooling towers were also constructed to the south of the present gasholder site, located to either side of the new railway siding.

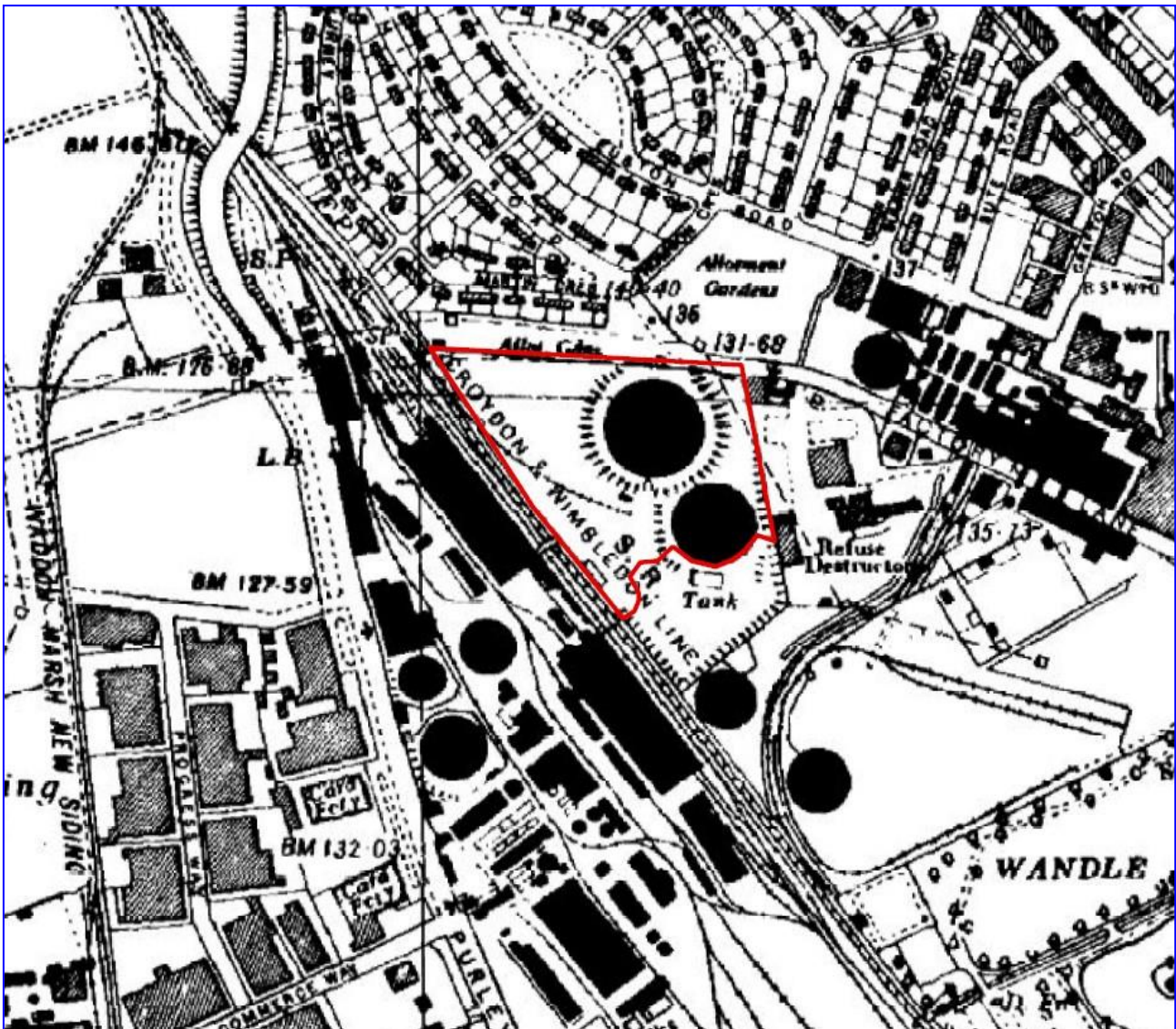


Figure 22: Extract from Ordnance Survey map, 1949, with the outline of the future present gasholder compound outlined in red

5.5 The Mid-20th century and the Replacement of Gasholder No 4

- 5.5.1 Between 1955–1958, a new spiral-guided holder was constructed after the demolition of the guide frame over the original 1890s below-ground tank of Gasholder No 4, built by R J Dempster Ltd (Montagu Evans (2016, 2). J Dempster Ltd was created in the 1880s by brothers Robert and John Dempster and by 1914 they had established themselves as chemical and gas plant manufacturers (Grace's Guide ud_b). Archive photographs located in the National Gas Archive show the 1890s guide frame of Gasholder No 4 being removed in preparation for the new spiral-guided tank (Figures 23 & 24).
- 5.5.2 Archive plans of the gasworks dating to 1965 have been located within the National Gas Archive which shows in detail many of the gasworks buildings and their functions (Figures 25 – 27). Another archive plan dating to 1964 also shows details of Gasholder No 4 and its associated fixtures, fittings, platforms, tanks and ladders (Figures 28 & 29).



Figure 23: Archive photograph showing the dismantling of the 1890s guide frame of Gasholder No 4, ca. 1954 (NGA Ref: SE/SEG/ES/CRG/E/F/3); Gasholder No 5 is in the background

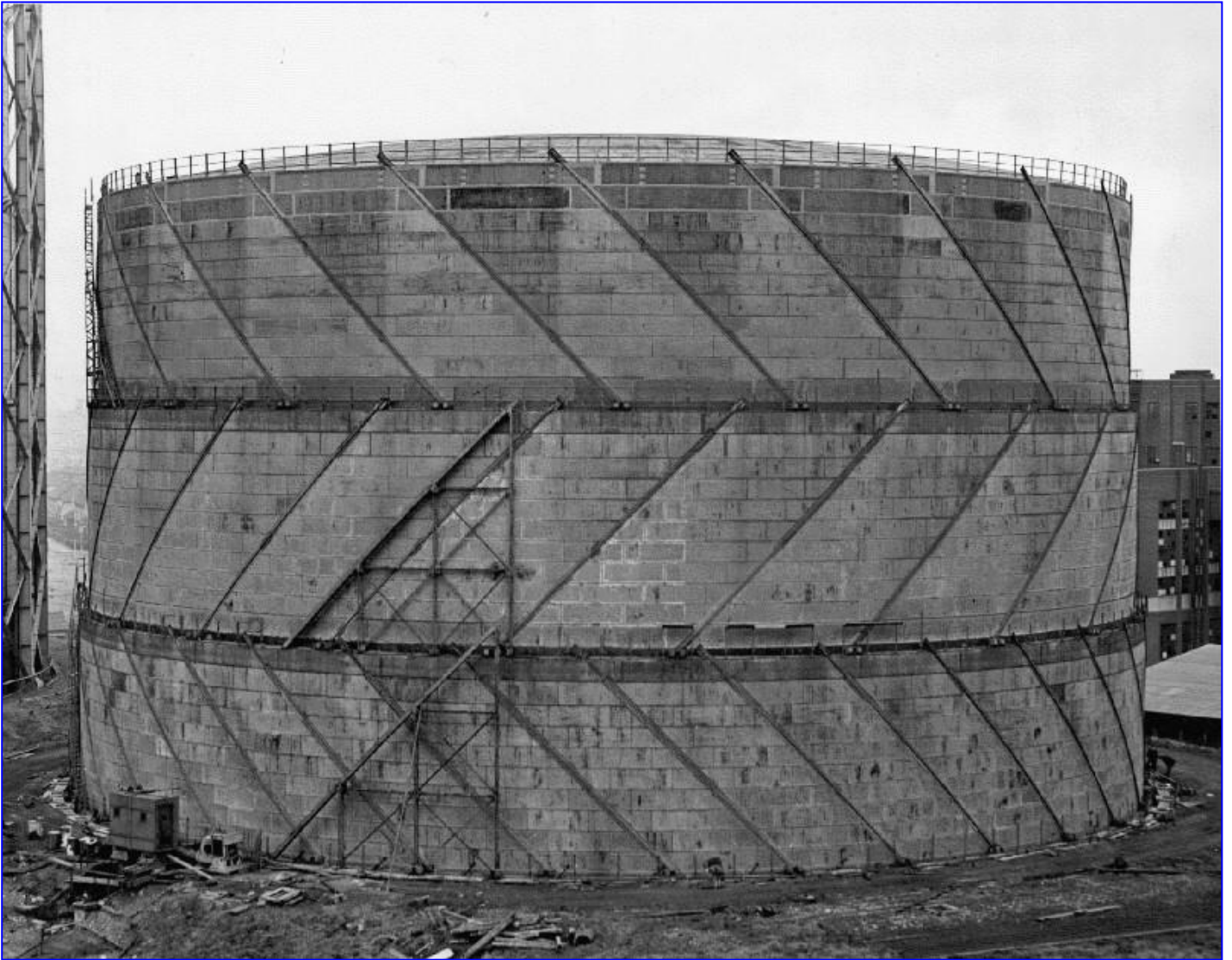


Figure 24: Archive photograph showing the construction of the new spiral-guided holder of Gasholder No 4, ca. 1954 (NGA Ref: SE/SEG/ES/CRG/E/F/3); the original 1890s tank was retained

5.6 The Late 20th Century and the Removal of the Gasworks

- 5.6.1 By the 1970s, the emergence of natural gas meant that large gasworks sites such as Croydon Gasworks became obsolete, and thus most of the gasworks buildings and all gasholders, with the exception of Gasholders Nos 4 and 5, were demolished.
- 5.6.2 The 1983 OS map shows the site after these demolitions, which left the gasworks site an open wasteland prime for development (Figure 30). It is now occupied by out-of-town retail outlets, including the large Sainsburys supermarket.

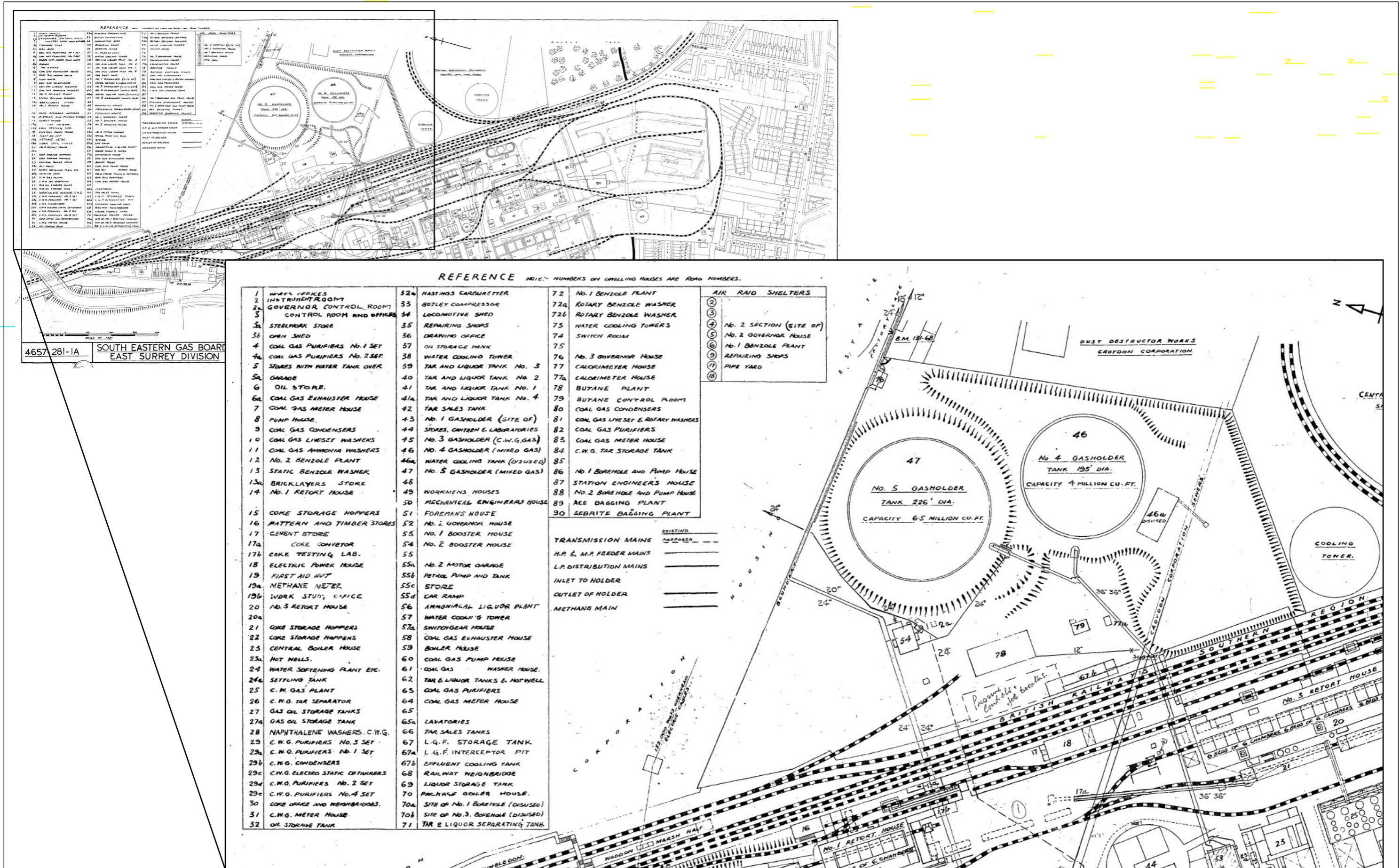


Figure 25: Archive Plan of Croydon Gasworks, 1965 (NGA Ref: SE_CRD_CRG_E_E_1)

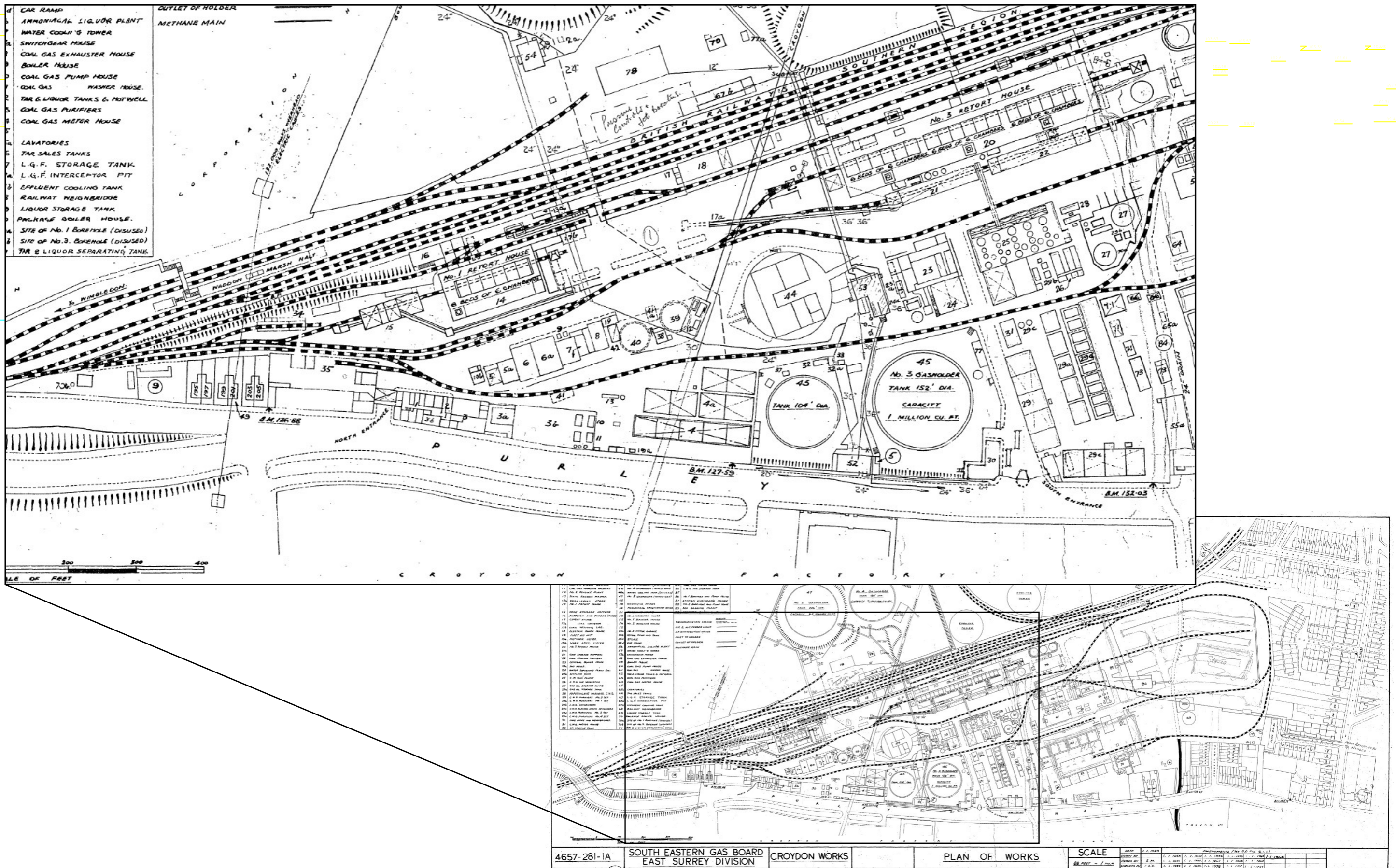


Figure 26: Archive Plan of Croydon Gasworks, 1965 (NGA Ref: SE_CRD_CRG_E_E_1) - for key see Figure 25

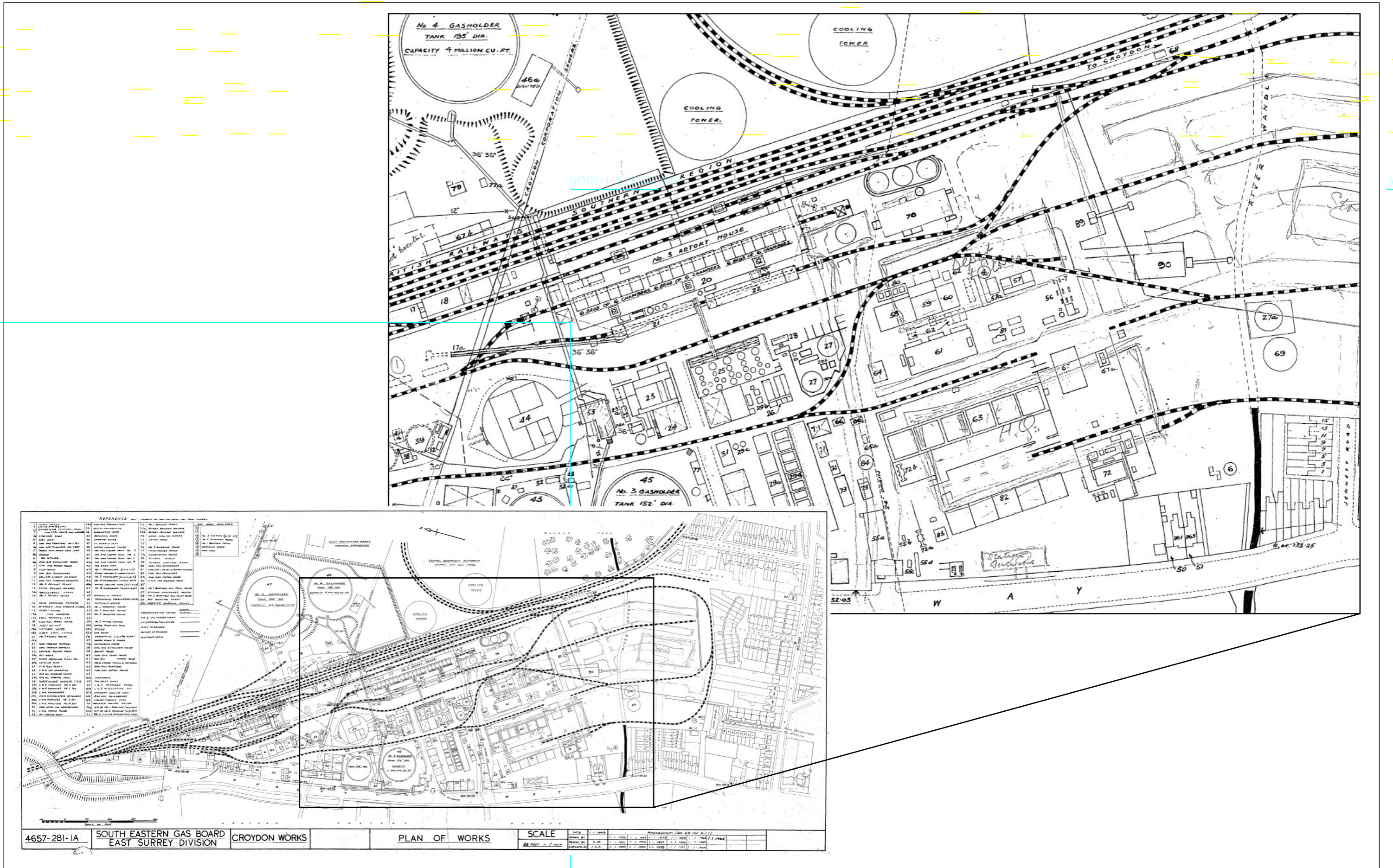


Figure 27: Archive Plan of Croydon Gasworks, 1965 (NGA Ref: SE_CRD_CRG_E_E_1) - for key see Figure 25

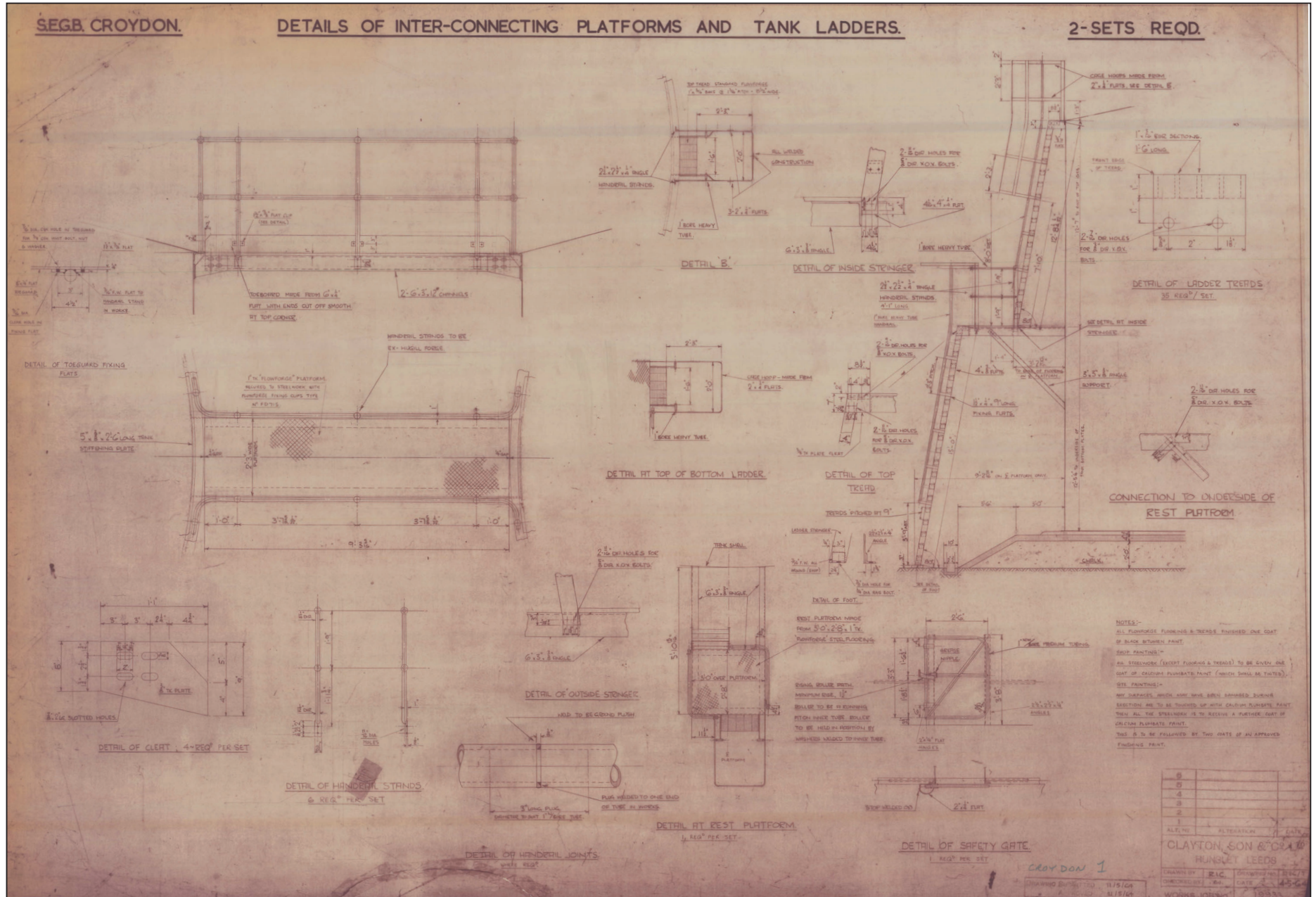


Figure 28: Archive Plan of Connecting Platforms and Tank Ladders for Gasholder No 4, 1964 (NGA Ref: SE_CRD_E_T_11)

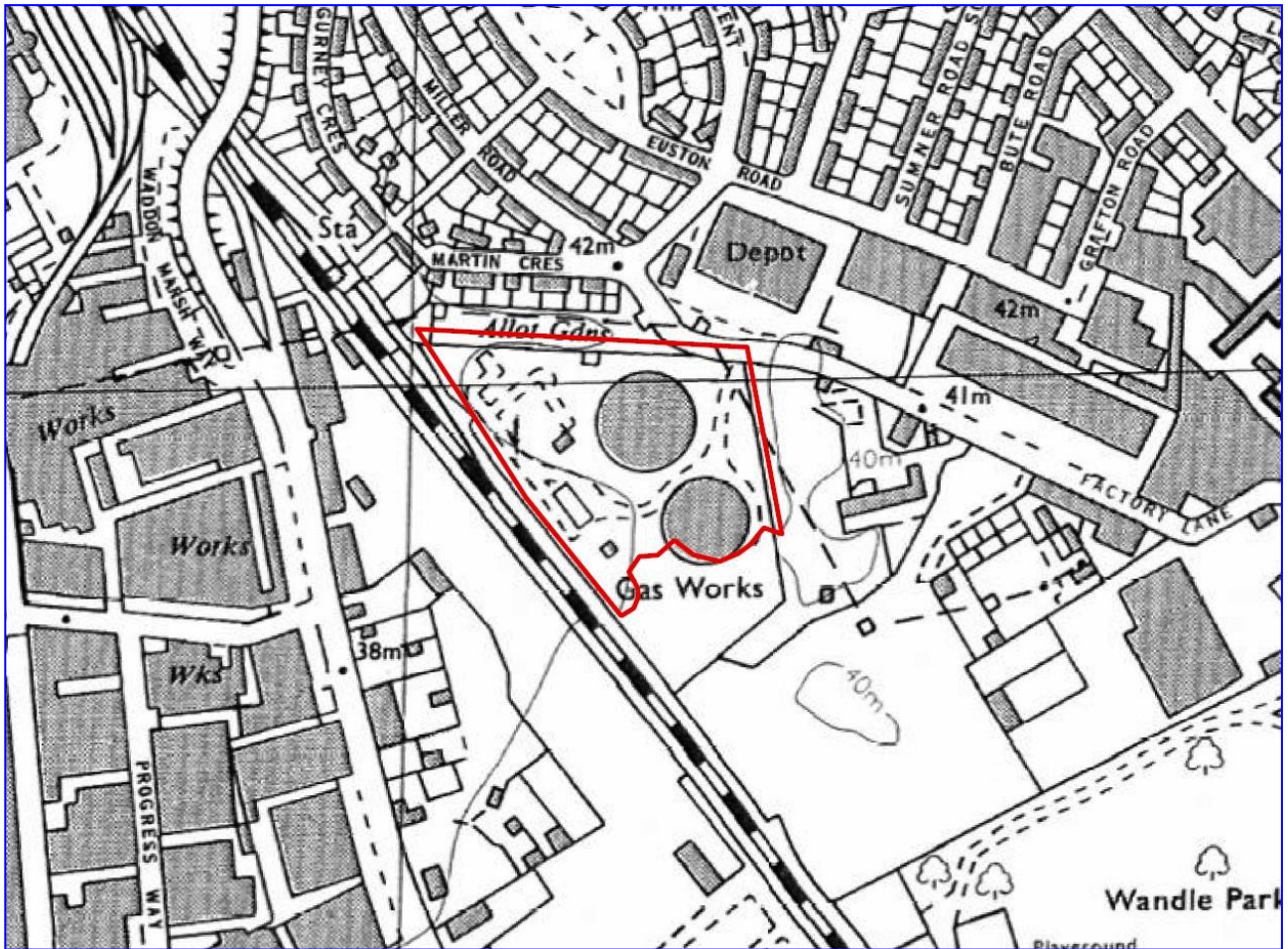


Figure 30: Extract from Ordnance Survey map, 1983 with the outline gasholder compound outlined in red, and showing the gasworks largely demolished and new industrial units built in the immediate vicinity

6 RESULTS: THE GASWORKS SITE

6.1 Location

6.1.1 The SGN compound on Factory Lane, Croydon is located within an urban setting of light industrial works to the south-east, a retail park to the south-west and residential land to the north (Plates 1 & 2). The site is not prominent in the landscape except for Gasholder No 5 which is visible from all directions (Plates 3 & 4). The south-east side of the site is bordered by the Beckenham to Wimbledon Tramline and the Wadden Marsh tramstop has a dramatic backdrop of Gasholder No 5 (Plates 5 & 6).

6.2 Site layout

6.2.1 The site is accessed from Factory Lane at the north-east corner of the compound via a security-controlled gate (Plate 7). The ground rises steeply to the south and the site road divides to the south-east and south-west at the apex of the hill (Figure 31). The south-east route provides access to the Whitetower Energy Croydon Plant which is situated to the south-east of the site (Plate 8). The south-west route has another gated entrance to access the site between Gasholder No 4 in the south-east corner of the site and Gasholder No 5 in the centre of the north side of the site (Plate 9).

6.1.1 The road curves round to the west passing an area of structures in the south side of the site and another area of structures in the centre of the site to the south of Gasholder No 5 (Plates 10 & 11). During the Phase I survey in December 2020 high-pressure lines construction work was in progress. The centre of the site had construction huts and car parking, and the high-pressure works were partially operational and partially under construction to the west of the centre of the site (Plates 12 & 13). Several additional areas of ground had been stripped for potential construction or storage zones across the site (Plate 14).

6.1.2 Above ground pipework and several valve pits were present along the south-west and north-west boundary lines (Plate 15).

7 RESULTS: GASHOLDER NO 4

7.1 Introduction

7.1.1 Gasholder No 4 is a four-lift, spiral-guided holder which is situated in the south-east corner of the site (Figure 32; Plates 16 & 17). It was originally built in the 1890s as a frame-guided holder but was reconstructed in the late 1950s by J Dempster Ltd with a spiral-guided design. It has a nominal capacity of approximately 4,000,000ft³ (113,000m³).

7.1.2 The holder is located within a fenced compound with a padlocked pedestrian access gate on the west side. The ground surrounding the tank is flat to the fence. Beyond the fence, on the east side of the compound the ground slopes down to the site road whereas on all other sides the ground is flat.

7.2 The Tank

7.2.1 The Tank Wall

Gasholder No 4 has a below-ground brick tank measuring 59.5m in diameter and 11.8m in depth (Plate 18). The tank is original to the 1890 frame-guided design with the exception of the top few courses of bricks which were replaced and capped with concrete blocks when it was converted to a spiral-guided holder (Plate 19). The uneven line of new bricks at the top of the tank wall shows the location of the original standards and vertical guide rails. There were 22 standards and associated guide rails on the original gasholder and an additional guide rail between each pair of neighbouring standards. The original guide rails were bolted to metal plates that were built into the tank wall and were still *in situ* during the survey (Plate 20; Figure 33).

7.2.2 The Dumpling

The base of the tank slopes up in the centre to form a flat-topped dumpling with an 18° slope and a rise of 6.4m (Figures 34 and 36). The dumpling is finished with a layer of concrete with large stone inclusions and is assumed to have undisturbed ground material beneath. A gap of 2.5m is present between the outer edge of the dumpling and the base of the tank wall. Set within this gap are concrete blocks, which the lift grips rested when the bell was down (Plate 21).

7.2.3 The Crown Rest Frame

A crown rest frame is situated on the dumpling. It is comprised of a domed frame formed of short timber planks supported by vertical timber posts (Plate 22). The timber frame matches the dome shape of the steel-sheeted crown, thereby evenly supporting the crown when the bell is down.

The crown rest structure has a square-sectioned, vertical timber post at its centre surrounded by seven rings of vertical timber posts which increase in number as you move out towards the tank wall (Figures 34–36). The rings have been numbered 1–7 from the centre outwards for clarity. Ring 1 has eleven vertical square-sectioned posts that are connected to their neighbouring posts via two levels of nailed, cross-bracing struts (Plate 23). Rings 2 and 3 each have twenty-two vertical posts which stand alone in ring 2 although are connected via a single level of cross-bracing planks in ring 3 (Plate 24). Rings 4–6 all have thirty-three standalone vertical posts. Ring 7 also has thirty-three vertical posts although here there is a single level of steel bars acting as a brace between neighbouring posts with an additional half level of timber planks cross-bracing above (Plate 25).

The vertical posts of ring 1 are set into steep-sided concrete mounds securing them to the dumpling (Plate 26). The mounds are sub-circular in plan measuring approximately 1.5m in diameter and 0.5m in height. They are loosely formed with large stone inclusions and a rough consistency matching the concrete surface of the dumpling. The central post is also set within an uneven concrete mound measuring approximately 3.5m in diameter and 1m high. Ring 1 and the central post account for the only vertical posts situated on the flat-top of the dumpling. Rings 2–7 are set within square concrete blocks measuring approximately 0.8m in plan at their base and 0.45m in plan on top (Plate 27). The concrete used is a slightly higher grade than on the bases of ring 1 with smaller stone inclusions and higher percentage of cement to act as a much better support for the posts on the steep dumpling slope. For additional support the concrete blocks of different rings are connected via concrete linears on the dumpling slope (Plate 28). To account for

the increase in vertical timber posts in the outer rings, the concrete linears alternate between a single line and a forked line (Figure 34).

The tops of the vertical posts have all been shaped to a point which slot into an iron fixture above (Plate 29; Figures 34 and 36). The fixtures are cross-shaped to each support four short timber planks of the dome frame above (Figure 35). The central vertical post fits into a cylindrical iron fixture above it from which eleven timber planks radiate like the spokes of a wheel (Plate 30). Timber planks set perpendicularly between the spokes form rings of the dome frame. There are thirteen rings to the frame which increase in size moving outwards from the centre of the tank. To support the more widely-spaced vertical posts and increasing sized rings, every alternate spoke ends at the vertical post of ring 3 and is replaced by two spokes. Additional rigidity is added to the dome via pairs of crossed, flat iron bars attached to the top side of the spokes (Plate 31).

The planks of the dome rings have small timber chocks nailed to their sides which protrude just above the top of the timber rings (Plate 32). When the bell is fully down the crown therefore rests on the chocks rather than the timber rings. This would also avoid the crown fusing to the support frame in extreme weather conditions.

Some of the timbers of the crown rest frame displaced during demolition were seen to have letters and numbers carved into them, suggesting they were fitted together on site using a plan (Plate 33). A carved set of initials and possible date was also seen (Plate 34).

7.3 The Bell

7.3.1 The Lifts

Now removed, the telescopic bell was comprised of four lifts – to be referred to from the interior working outwards as the crown, top, middle and bottom lifts – which were raised and lowered in a helical fashion via pairs of tangential rollers gripping the guide rails (Plate 35). The guide rails were I-shaped with one cross bar of the 'I' attached to the tank side, and the other set into grooves in the rollers. The rails were set at a 45° angle, allowing the rollers to raise the bell up in either a clockwise or anti-clockwise direction. The crown and middle lift were raised in a clockwise direction and the top and bottom lifts were raised in an anti-clockwise direction, then vice versa as they lower. The helical guide rails were riveted to the outside of the lift walls which were constructed of riveted steel sheets (Plate 36). The pairs of tangential guide rollers were bolted to the lift tops or, in the case of the bottom lift, bolted to a steel bracket that was attached to the top of the tank (Plates 37 & 38). The steel brackets were in turn bolted to vertical steel supports below that were attached to the inner face of the tank wall (Plate 39).

The crown lift wall was strengthened via I-shaped, rolled steel stanchions bolted to its interior. The stanchions were topped with an almost triangular bracket that rests in the top curb interior (Plate 40). A steel sheet was riveted to the crown and the side of the brackets facing into the structure (Plate 41). The sheet marked the edge of the crown rest frame and may be situated there to help support the crown at the highly pressurised point of the top curb.

The lifts were connected when the bell was raised via square cup and grips. The square grips were viewed in section during the demolition works, although the cups were not seen in section (Plate 42). Short lengths of pipe were situated at the base of the crown lift wall interior acting as an overflow for water stored in the cup between the crown and top lifts (Plate 43).

Four above-ground helical guide rails existed as part of triangular guide rail and stair structures which were bolted to the lift tops (Plate 44). On the south-west side of the holder there was a stair and guide rail structure attached to the ground and middle lifts to assist in raising the top and bottom lifts. On the north-west side of the holder there were stair and guide rail structures attached to the bottom and top lifts to assist in raising the middle and crown lifts. The guide rail was attached to the interior of the stairs where it was gripped by pair of tangential rollers on the neighbouring lift top (Plate 45).

Access onto the lift tops was via the stair and guide rail structure attached to the ground on the south-west side of the structure. A padlocked gate was situated at the foot of the stairs and grated panels covered the surrounding area to restrict access (Plate 46). A gap in the handrail of the bottom lift existed in line with the base of the stair when the bell was down. As the bell raised this gap was used to access the bottom lift from any height on the stair as a handrail only existed on the exterior of the stair, whilst the interior side was open. The handrails of all four lifts were cut during decommissioning works on the north-

west and south-west sides of the holder to allow easy access onto the crown (Plate 47). While the holder was in use each stair would be ascended in turn to access the lift tops to reach the next stair and the next gap in the handrails to finally access the crown.

As with the walls of the lifts, the tops of the lifts were constructed of steel sheets which are riveted together via additional overlying sheets (Plate 48). The lift tops had regularly-spaced brackets which secured a rubber hose in place and vent points were added here as part of the decommissioning works.

7.3.2 *The Crown*

Now completely removed, the crown was constructed of trapezoidal, steel sheets riveted together to form a dome with a rise of 3.4m (Plate 49). The sheets were arranged in eight rings of vertically-aligned sheets, with a central circular sheet, and three rings of horizontally-aligned sheets at the outside of the crown (Plate 50). At the top curb there were more rows of rivets and the rivets were larger than those on the rest of the crown. Also, the two outermost rings of horizontally aligned crown sheets had additional sheets overlying each joint. These three design features strengthened the top curb which was the most highly pressured point of the structure.

Three crown vents were present on the outside of the crown with two in the centre and one on the north-west side (Plates 51–52). During the Phase II works, a pipe was noted still attached to the vent within the tank to the ESE side of the crown centre (Plate 53). Other features on the crown included a glycol pot for monitoring the gas pressure within the holder and two cotter plates marking inspection points to view the gas inlet and outlet pipes, which were removed to 'air' the holder during decommissioning works (Plates 54 & 55).

7.4 **The Gas Inlet and Outlet Pipes**

7.4.1 The gas inlet and outlet pipes entered the holder on the WSW side where they were housed in their own fenced-off area. At the time of the Phase I survey this area was overgrown and inaccessible (Plate 56).

7.4.2 Within the tank the pipes were also situated on the WSW side of the holder near the outer edge of the tank emerging from the dumpling slope. The pipes were 0.95m wide and comprised of short cylindrical lengths riveted together with a single visible bolted flange joint (Plate 57). The pipes were set within the dumpling and were otherwise unsupported.

7.5 **Other Fixtures and Fittings**

7.5.1 *Knock-Off Switches*

Three electrical knock-off switches were present on the gasholder. A low knock-off was situated on the north-west side and a high knock-off and sunstock were situated on the south-east side (Plates 58–60). A striker arm was situated on the north-west side, however the associated knock-off switch was no longer present (Plate 61). On the south-west side of the holder a displaced striker arm was present on the crown (Plate 62).

7.5.2 *Electrical Fixtures and Fittings*

Automated electrical systems existed on the holder related to the tank and cup-and-grip water levels and the anti-freeze system. The systems were comprised of rubber hoses which were either covering electrical cables or carrying a water supply to the necessary area. Swan neck and cage fixtures ensured that the hoses did not tangle as the bell was raised and lowered (Plate 63). Also present were electrical panel boxes and float switches (Plates 64–66).

7.5.3 *Pipework*

Pipework used to maintain the oil-film level in the tank was situated on the north-west side of the holder (Plate 67). Additional pipework was present on the west side of the holder that may have been related to the gas inlet and outlet operations (Plate 68).

Within the tank were four narrow pipes attached to vertical posts of the crown rest frame which were noted as part of the Phase II works (Plate 69; Figure 34). Their functions are unidentified. On the WSW

side of the structure two of the pipes were located aligned with the slope of the dumping and were secured in place by uneven concrete mounds (Plate 70).

7.5.4 *Interceptor Tanks*

To the south-west of the holder was a chambered interceptor tank (Plate 71). On the south-west side of the tank was an overflow pipe that discharged water that joined the interceptor tank via a partially-submerged pipe (Plate 72). To the east of the interceptor tank was a water monitoring borehole, possibly to check the interceptor tank was not leaking into the surrounding earth (Plate 73).

7.5.5 *Unidentified equipment*

To the south and west of the gas inlet and outlet area were two pieces of unidentified electrical machinery (Plate 74).

7.6 **Condition**

7.6.1 Gasholder No 4 has been out of operation for some years and the crown is suffering badly from rust (Plate 75).

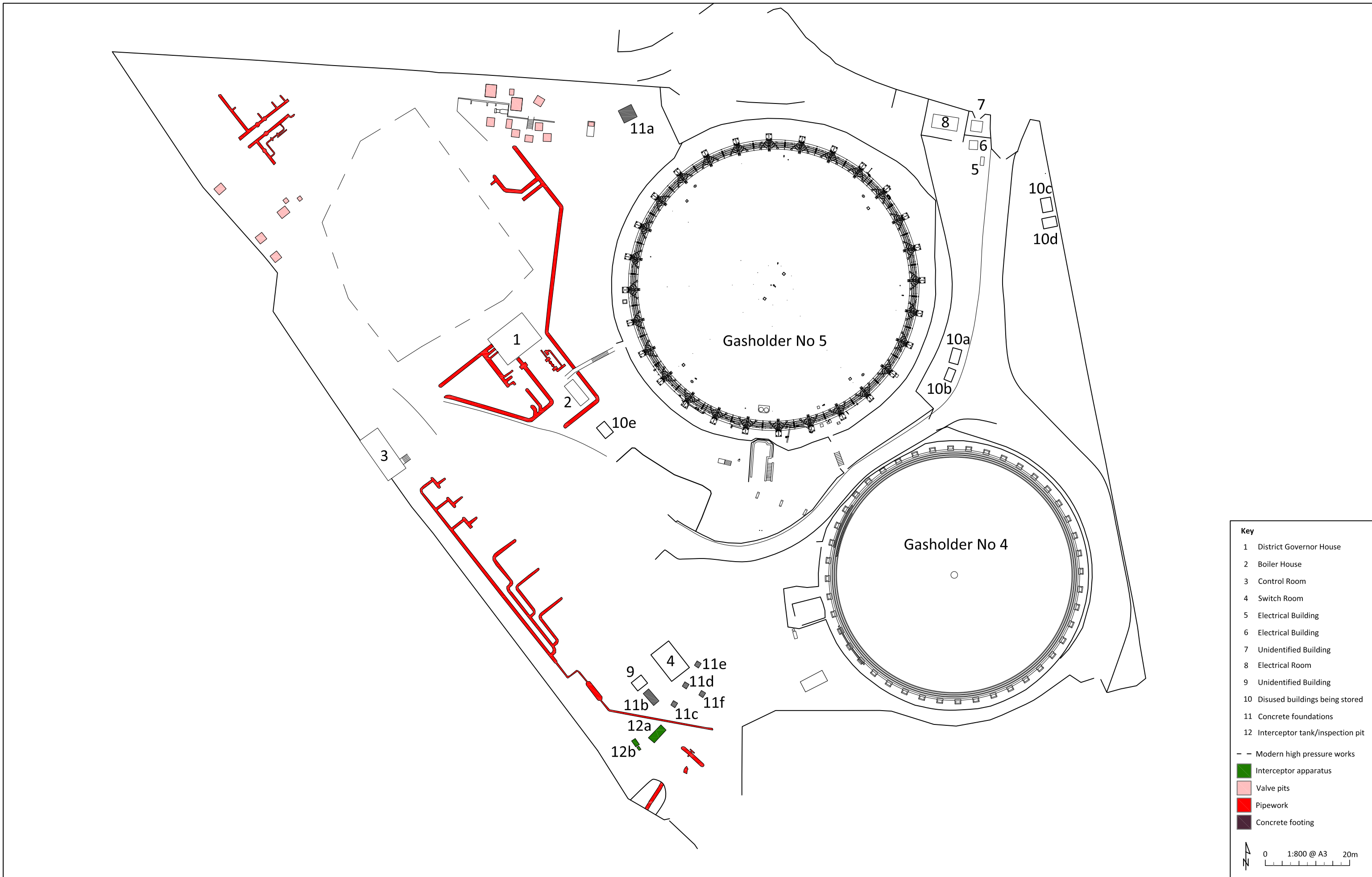


Figure 31: Detailed site plan of gasholder compound and ancillary buildings

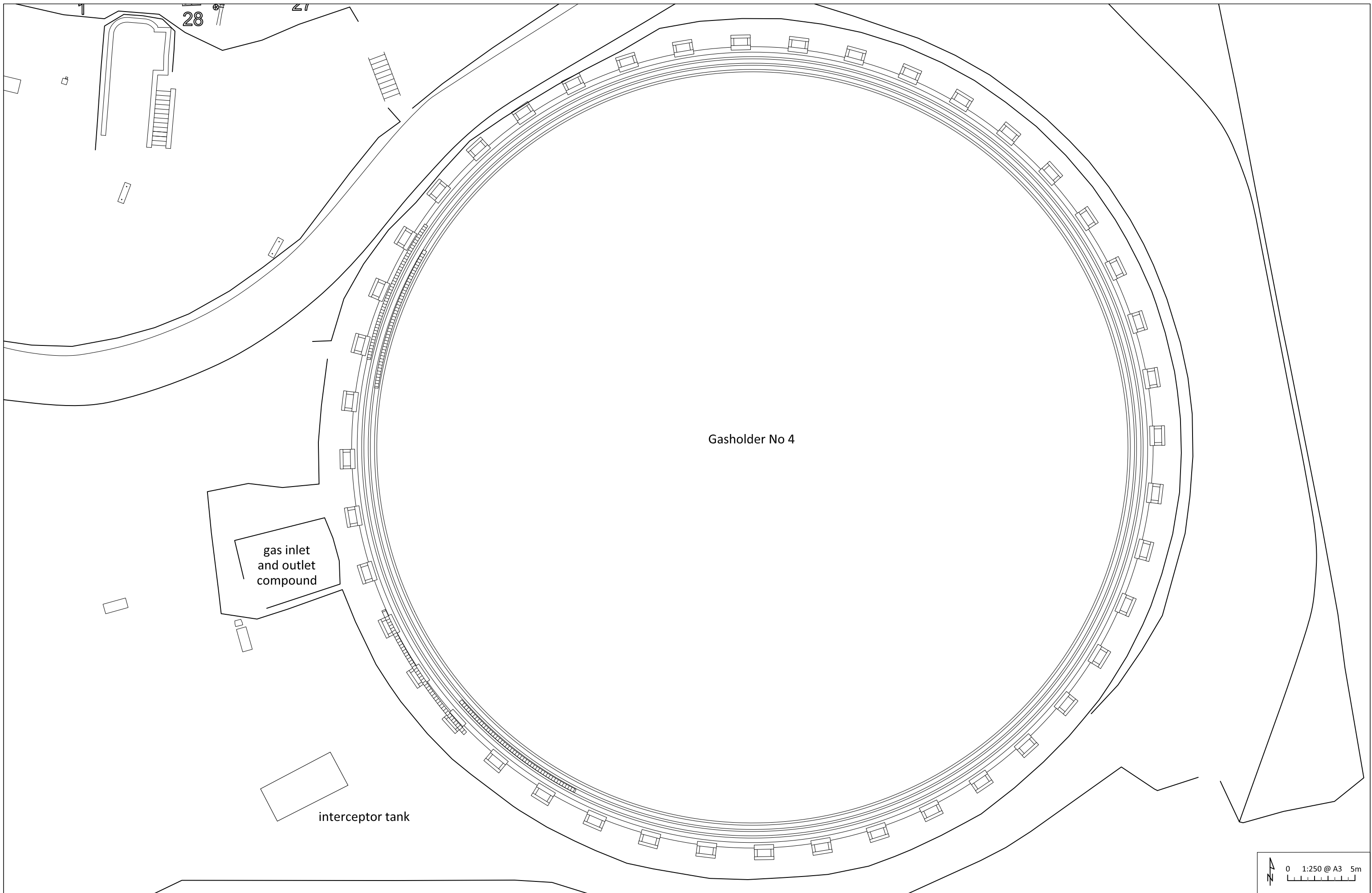


Figure 32: Gasholder No 4, simple ground plan

0 1:250 @ A3 5m

01/23686_V/REP/32/01

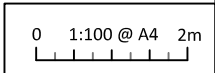
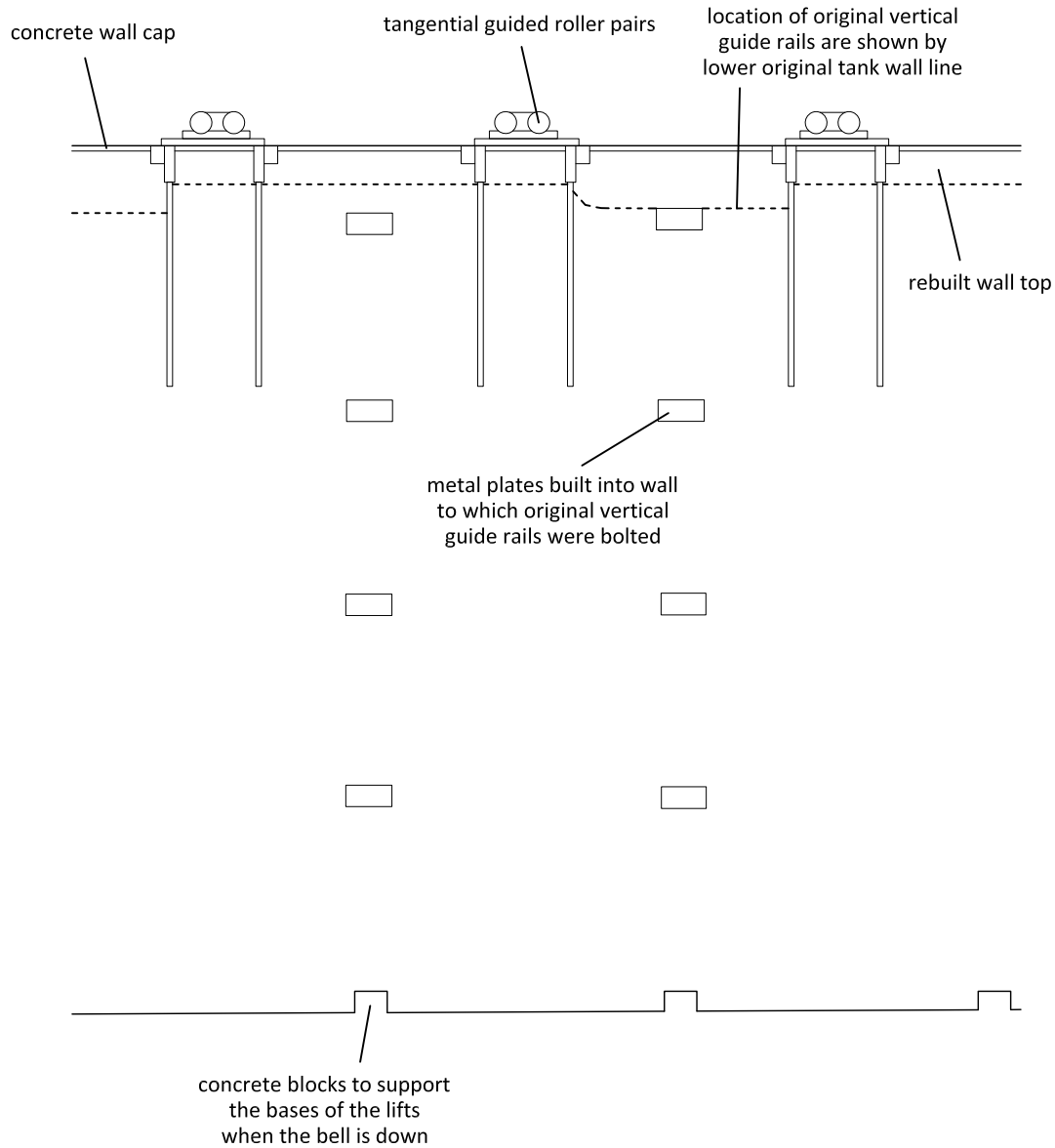


Figure 33: Gasholder No 4, north-facing tank wall elevation sample

01/23686_V/REP/33/01

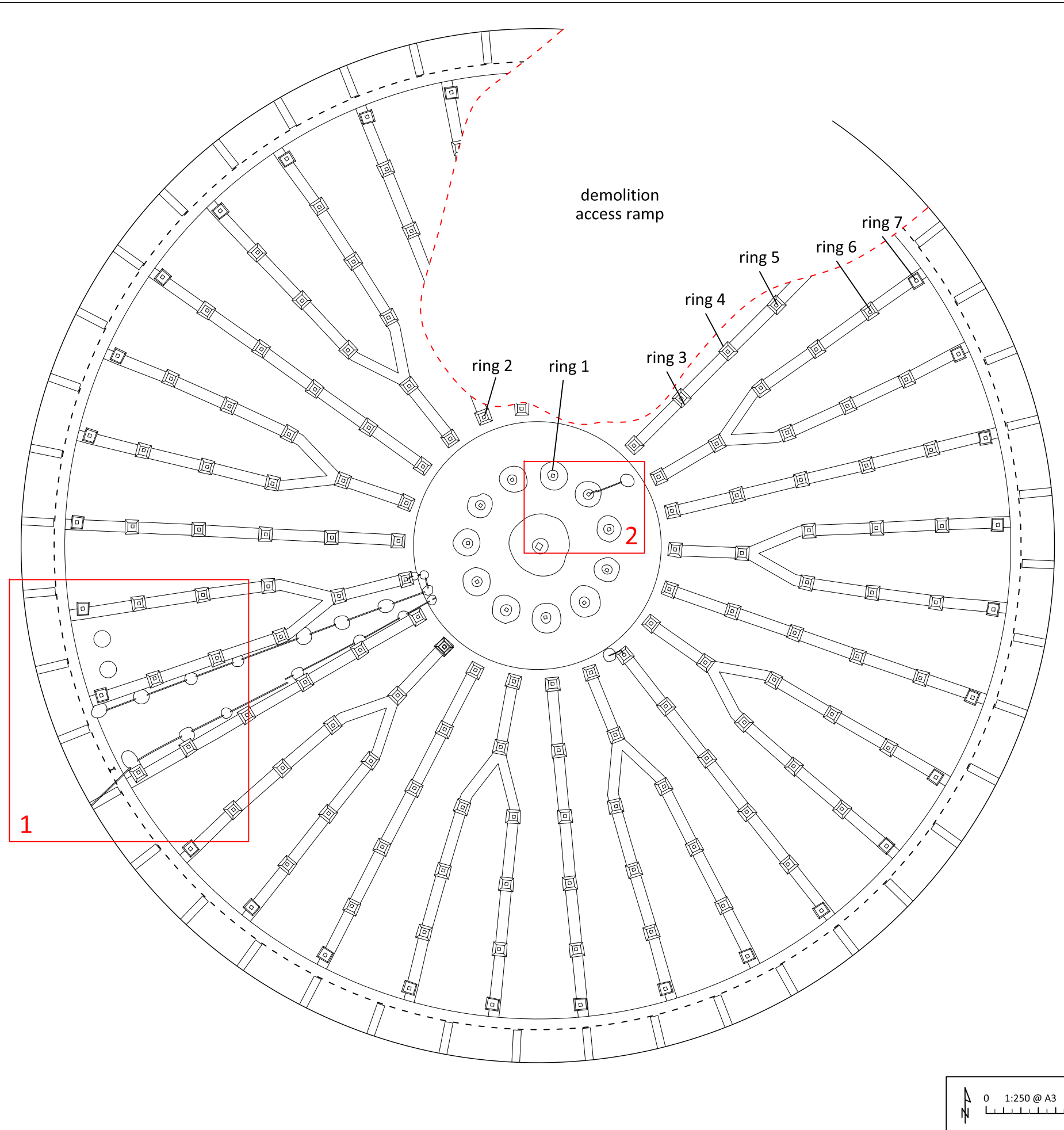
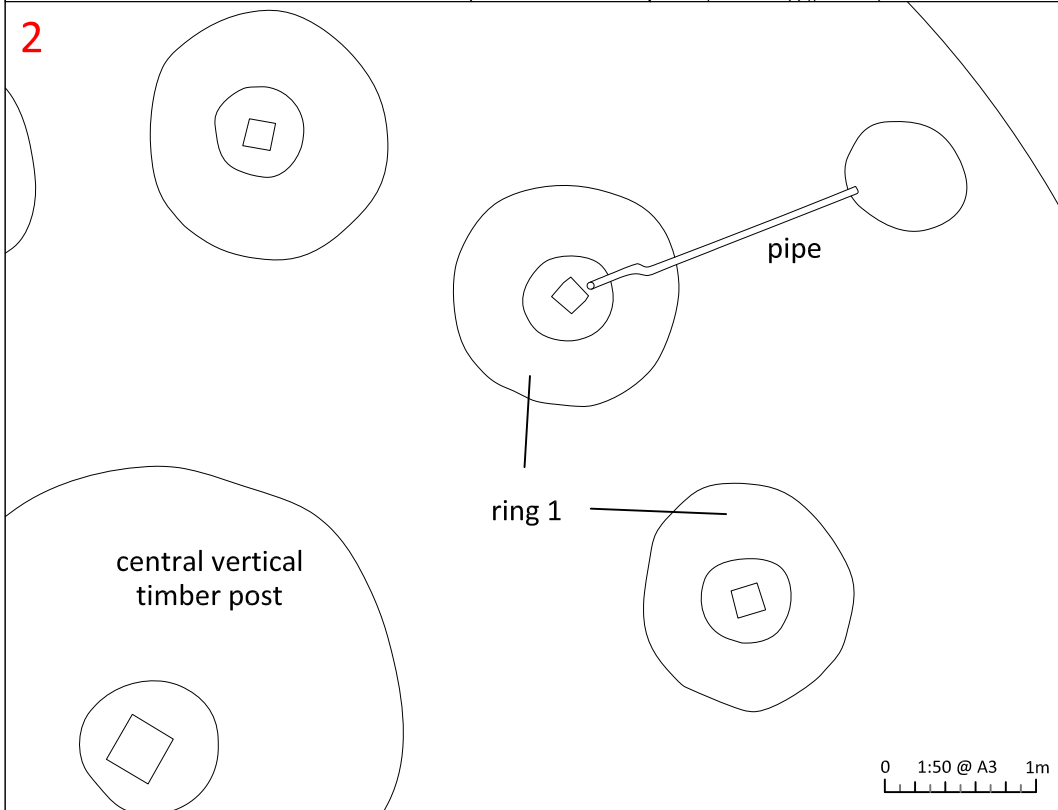
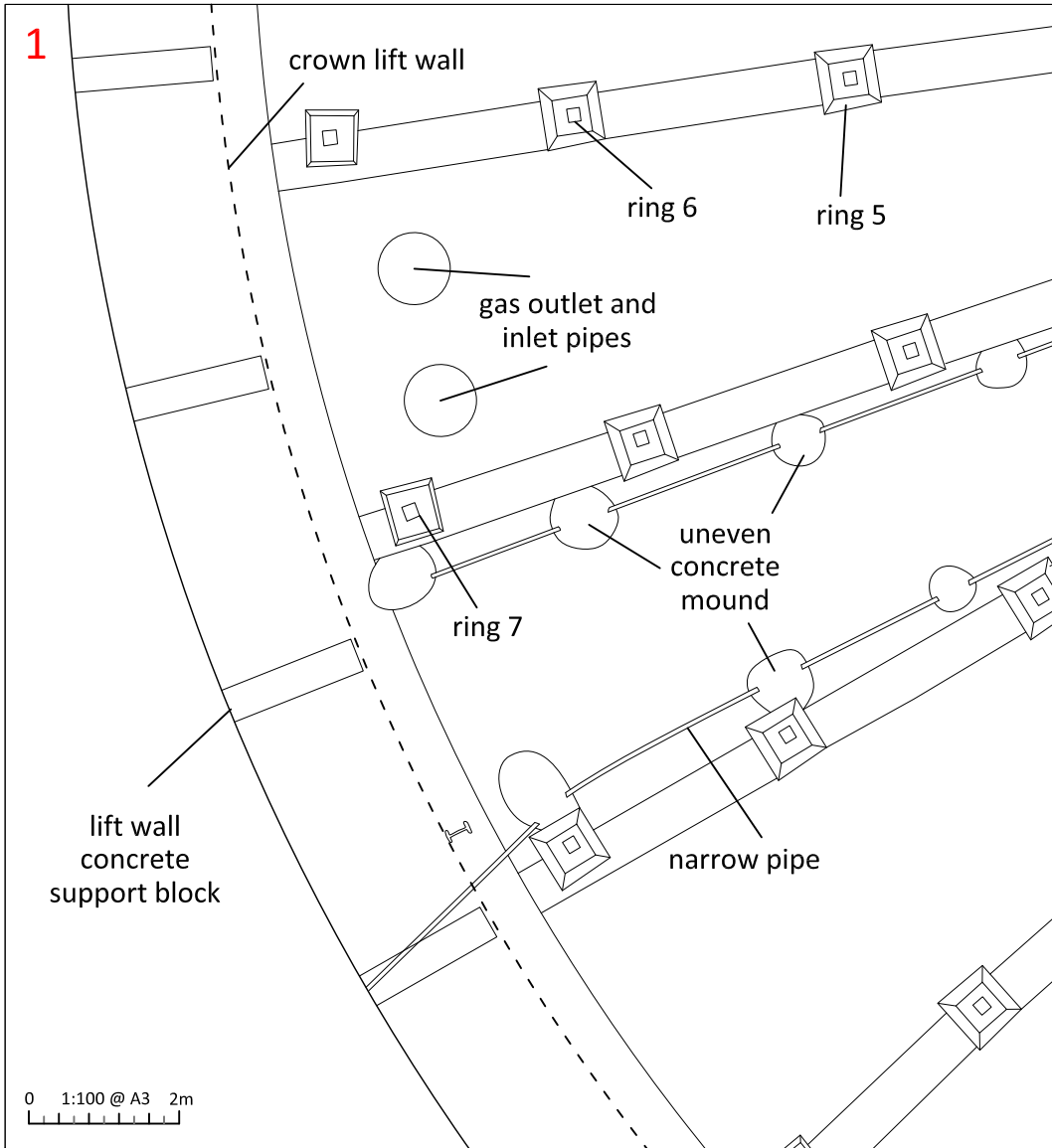


Figure 34: Gasholder No 4, below ground plan of the dumping and crown rest frame

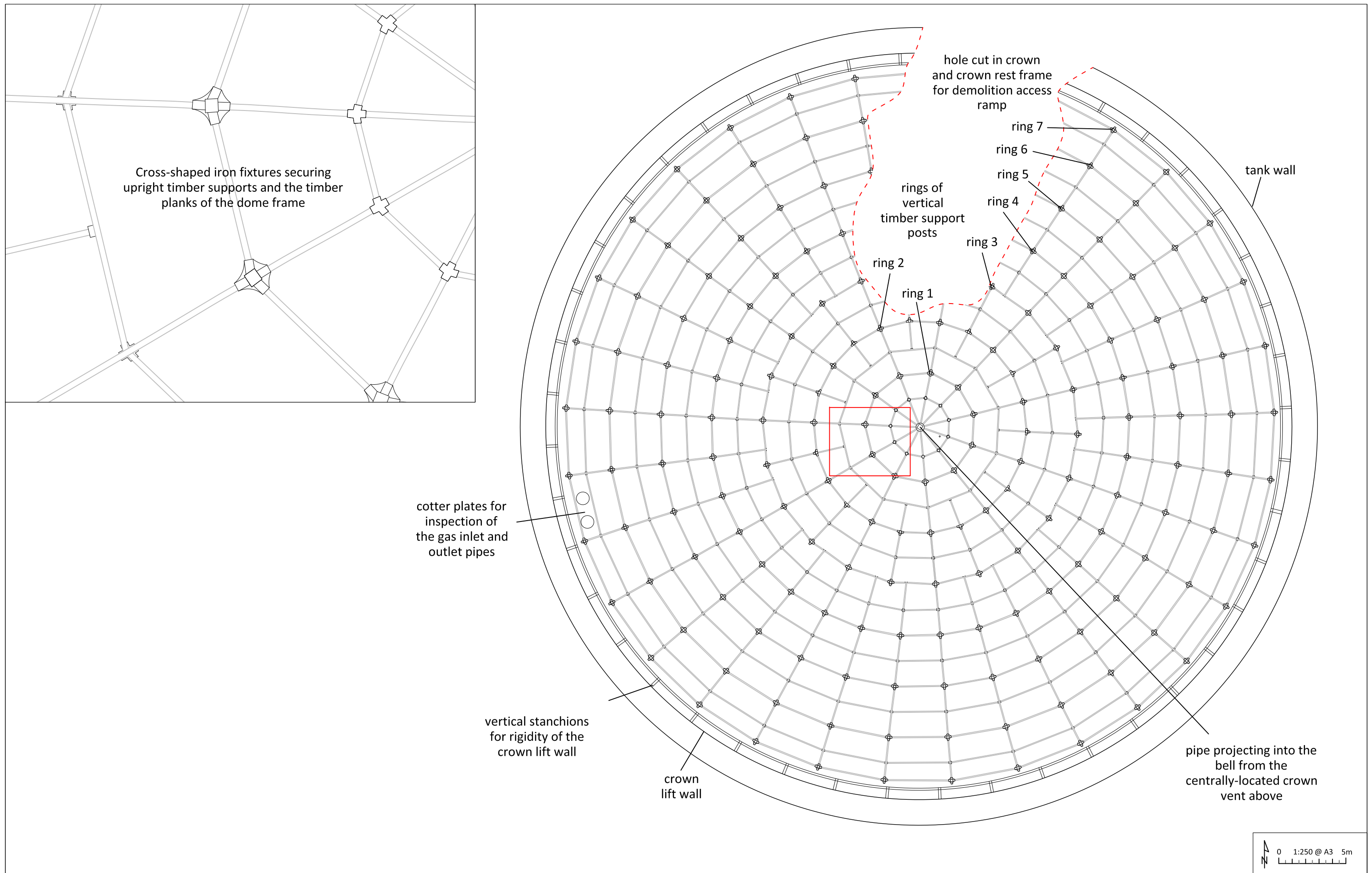
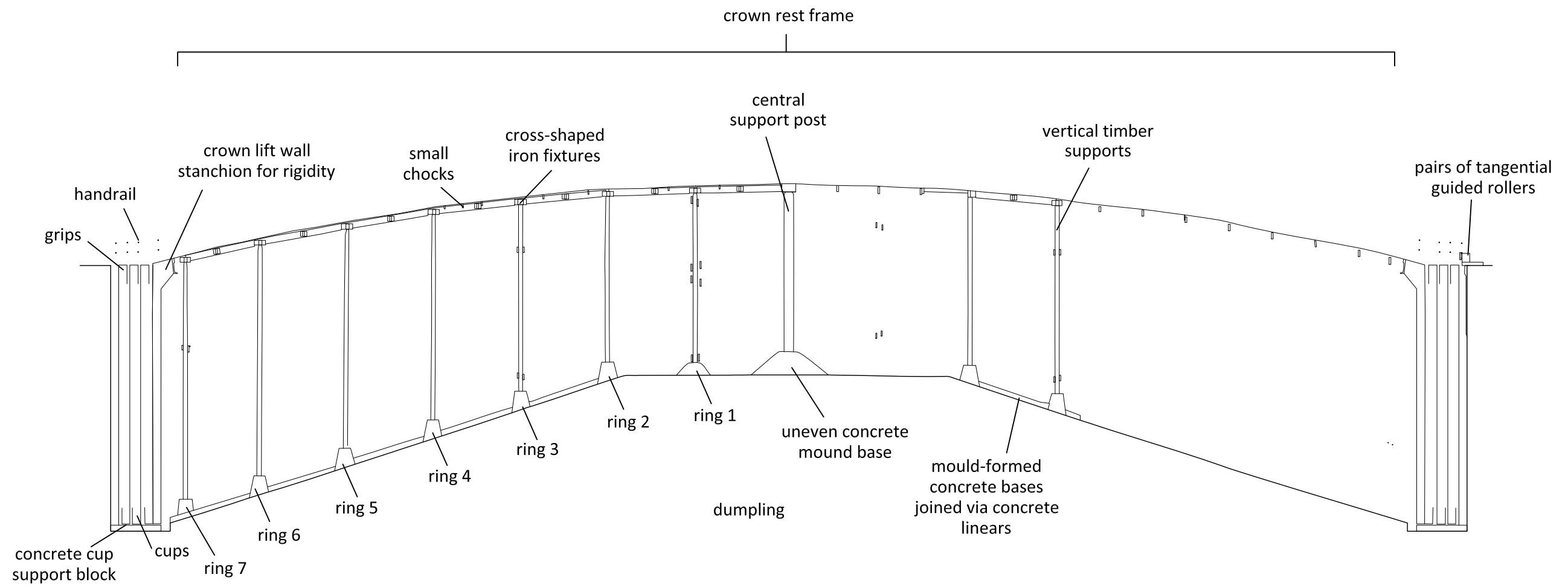


Figure 35: Gasholder No 4, detailed plan of crown rest frame, from beneath



0 1:200 @ A3 5m

Figure 36: Gasholder No 4, south-facing section

8 RESULTS: GASHOLDER NO 5

8.1 Introduction

8.1.1 Gasholder No 5 is a four-lift, frame-guided variant of the Type 42 cylindrical shell designed by Livesey and constructed in 1921 (Plate 76). It is situated in the centre of the north side of the site (Figure 31).

8.2 The Tank

8.2.1 *The Tank Wall and Surround*

The ground around Gasholder No 5 is built up into a mound which covers the circular, red brick-built below-ground tank (Plates 77 & 78). The tank has a larger, blue brick capping and a hardcore covering the ground surrounding the brickwork, which is damaged in places (Plate 79). The internal diameter of the tank is 69m (Figure 37). During the Phase II survey the depth was measured at 13.4m although there was some residual water in the base of the tank meaning it may be deeper (Figure 41).

Metal fixtures are built within the tank wall to which guide rails are bolted beneath the standards and in the centre of each bay between neighbouring standards (Plates 80 & 81).

8.2.2 *The Dumpling*

The base of the tank slopes up in the centre to form a dumpling with a 36° slope and rise of 5m (Plate 82; Figure 41). The 48m-wide dumpling top appears to be flat although there is a further 2° slope leading to an additional central rise of 0.8m (Figure 38). The dumpling is finished with a relatively smooth layer of concrete, with small stone inclusions, and is assumed to have undisturbed ground material beneath. The dumpling has visible cracks in its top.

Due to the level of water present at the base of the tank during the Phase II survey the exact extent of the dumpling is unrecorded.

8.2.3 *The Crown Rest Frame*

A crown rest frame is situated on the dumpling. It is comprised of a domed frame formed of flat steel bars supported by vertical I-section steel posts (Plate 83). The steel domed frame matches the dome shape of the steel-sheeted crown, thereby evenly supporting the crown when the bell is down.

The crown rest structure has two rings of twenty-eight vertical, I-shaped section, rolled-steel stanchion supports. The inner ring is situated in the centre of the dumpling and has a diameter of approximately 17m. The vertical supports are 1.4m apart and connected to their neighbouring posts via flat, steel bars bolted in a latticework pattern (Plate 84). The outer ring of supports is situated on the sloped side of the dumpling and has a diameter of approximately 52m (Figures 38 & 39). The stanchions are 5.8m apart and connected to their neighbouring posts via two levels of bolted, flat steel bar cross-bracing (Plate 85).

All the support posts are fixed to the dumpling surface via a steep-sided concrete footing block. The concrete blocks of the inner ring measure approximately 1.3m at their base and 0.9m to the top (Figure 38; Plate 86). The support posts of both rings are riveted at their base via trapezoidal flange plates with angle cleats which are in turn riveted to a square, steel sheet bolted to the concrete footing (Plate 87). The concrete blocks supporting the outer ring of vertical stanchions are sloped on the base to follow the slope of the dumpling side while providing a flat surface for the stanchions to sit (Plate 88).

The two rings of vertical stanchions support a domed frame on which the crown rests when the bell is down (Figures 38 & 41). At the centre of the domed frame is a steel ring to which fourteen T-section steel bars are riveted and radiate out like the spokes of a wheel (Plate 89). Additional T-section steel bars are riveted perpendicularly between the spokes to form irregular rings. There are thirteen rings to the frame which increase in size moving outwards from the centre of the tank. After the third ring there are an additional three spokes added between each neighbouring pair of the original eleven spokes, to support the widening gaps between them. Additional rigidity is added to the dome frame via trussed beams beneath each of the spokes (Plate 90; Figure 41). The beams are bolted to the vertical supports beneath and to the outer edge of the dome frame (Plate 91). Additional trussing is also present between the beams (Plate 92).

Six circular cast-iron fixtures were present in the dumpling during the survey and another suspected beneath the demolition access ramp (Plate 93). One is located centrally and the other six are spaced around

the inner ring of crown rest frame supports. Additional bolts and other irregular iron fixtures are set within the centre of the dumpling which are assumed to be related (Figure 38). These may once have attached to the crown rest frame giving additional support. One of the circular fixtures appears to have sunk into the dumpling, although it is possible that the dumpling has been resurfaced after the fixture fell into disrepair (Plate 94).

8.3 The Guide Frame

- 8.3.1 Now demolished, Gasholder No 5 had a variant of the Type 42 cylindrical shell guide frame designed by Livesey. It had 28 standards arranged clockwise starting from the south side (Figure 37). Only standard 1 was marked via a spray-painted number at its base (Plate 95). The standards were of solid I-shaped construction comprised of steel sheets riveted together with a flared base that was bolted to a concrete foundation with two 12cm diameter bolts on each side (Plates 96–98). The exterior, flared side of the standards had an additional riveted 2m high plate at the base and flange plates bolted every 7.5m connecting the exterior lengths of steel sheet (Plates 99 & 100).
- 8.3.2 Neighbouring standards were secured together via diagonal, T-section, cross-bracing struts connected to standards via gusset plates riveted to either the interior side, exterior side or middle of the standards (Plates 101–103). Seven pairs of bracing struts formed a cross shape between each neighbouring set of standards with the struts facing alternatively inwards or outwards at the same horizontal level between the next set of neighbouring standards (Plate 104; Figure 40). The struts were joined centrally by a riveted, hexagonal plate (Plate 105).
- 8.3.3 The top of the guide frame had cross-bracing bars between projecting lengths at the top of each standard to aid rigidity against wind (Plate 106).
- 8.3.4 Access to the top of the guide frame was via two sets of seven ladders situated between standards 4 and 5, and 18 and 19 (Plate 107). The ladders each had safety cage hoops surrounding them on three sides so the lift tops could be accessed via the open side when the bell was raised with a small platform where each ladder connects with the one above. The base of the ladders were cut off for safety reasons after the holder was decommissioned, although the original base ladder and safety cage hoop design is represented in Figure 28.

8.4 The Bell

8.4.1 *Guide Rollers*

The telescopic bell was divided into four lifts which were each topped with guide rollers and carriages at each standard (Figure 41; Plate 108). The carriages of the crown, top and middle lifts had single rollers that slotted into the vertical guide rails on the interior side of the standards. They also had dual rollers that were situated to either side of the vertical guide rail so the rail was gripped on three sides by the three rollers. The rollers were mounted on carriages that were comprised of mirror-image steel sheets which were semi-circular design and riveted together using cross braces. The carriages were bolted to the lift tops at their base as well as via splayed arms to either side (Plate 109). The guide roller of the bottom lift was singular and was bolted to the interior wall of the bottom lift (Plate 110).

8.4.2 *The Lifts*

The lifts were constructed of riveted steel sheets with square cup-and-grips (Plates 111 & 112). The exterior sides of the lift walls had rolled steel stanchions bolted to them for increased rigidity, which were then bolted to the lift tops (Plate 113). On the interior side of the crown lift wall there were two types of vertical supports, a semi-circular in section column made of steel sheets riveted together, and a latticework steel column (Plate 114). There were holes in the top and bottom of the column which, together with the latticework column design, allowed the water in the tank to easily run out of the structures as the bell was raised (Plate 115). Both types of verticals were topped with triangular-shaped brackets which added additional support to the top curb (Plate 116). A steel sheet was riveted to the crown and the side of the triangular brackets facing into the structure (Plate 117). The sheet may be situated there to help support the crown at the highly pressurised point of the top curb.

Several areas of bolts forming a pattern were located on the north side of the crown lift wall interior during the Phase II works (Plate 118). The bolts may have marked the location of a previous fixture that has since been removed or an area of repair that had been added to the outer face of the wall.

Two cotter plates were present on the north and WSW sides of the base of the crown lift wall, which were assumed to have been for access during construction and maintenance works. Several pipes related to the water levels in the cups were also present at the base of the wall (Plate 119).

The holder was oil-filmed so there were regular oil wells on the lift tops and in some places glass windows which were presumed to be for viewing within the cup and grips (Plates 120 & 121). The safety handrails on the lift tops were continuous around the holder except for the only access platform onto the crown which is situated between standards 4 and 5, and between standards 26 and 27 where they have been cut during the dewatering works (Plates 122 and 123).

8.4.3 *The Crown*

Now removed, the crown was constructed of trapezoidal and rectangular steel sheets riveted together to form a dome with a rise of 5.5m (Figures 37 & 41; Plate 124). They were arranged in seventeen rings of vertically-aligned sheets, with a central circular sheet, and four rings of horizontally-aligned sheets at the outside of the crown. At the top curb there were larger sized rivets than those on the other rings and there are also additional lines of rivets. The two outermost rings had additional sheets overlying each joint (Plate 125). These design features strengthened the top curb which was the most highly pressured point of the structure.

Crown vents were present in the centre of the crown and near the top curb in several places (Plates 126 & 127). The central crown vent had a pipe connected to it on the interior of the bell, noted during the Phase II works (Plate 128).

A glycol pot for measuring the gas pressure within the holder was present on the SSE side of the crown (Plate 129).

Several cotter plates were present across the crown include on the south edge where there were two which were used to inspect the gas inlet and outlet pipes (Plate 130).

The crown also had several holes cut into it and purge points which were added during the decommissioning works (Plate 131). The crown had many areas of repair across it including welded sheets of various sizes and small bolted circles (Plates 132 & 133).

8.5 **The Gas Outlet and Inlet Pipes**

8.5.1 The gas inlet and outlet pipes were situated on the south of the holder as shown by the previously mentioned cotter plates. To the direct south of the holder was a horseshoe-shaped brick-walled area housing various pipework some of which was presumed to be linked to the inlet and outlet (Figure 31; Plates 134 & 135).

8.5.2 Within the tank the pipes were also situated on the south side of the holder near the outer edge of the tank, as noted during the Phase II works. The visible areas of pipe were 0.95m wide comprised of rolled steel, cylindrical lengths riveted together in pairs with bolted flange joints connecting the pairs (Figure 38; Plate 136). The pipes were set within the dumpling and were supported via four steel bars bolted to the sides of the pipes and the dumpling.

8.5.3 The inspection cotters plates previously mentioned were visible from within the tank along with a D-shaped surround riveted to the crown (Figure 39; Plate 137). The surround may have helped support the crown at a highly pressured point.

8.6 **Other Fixtures and Fittings**

8.6.1 *Knock-Off Switches*

Five electrical knock-off switches were present on the gasholder. A low, high and sunstock knock-off was situated on the south-west side between standards 2 and 3 (Plates 138 & 139). An extra high and an extra low knock-off were also situated on the north-east side of the holder between standards 17 and 18 (Plate 140). The striker arms for the low and extra low knock-off switches were still attached to the handrails on the lift tops.

8.6.2 *Electrical Fixtures and Fittings*

Automated electrical systems existed on the holder related to the water levels in the tank and cup-and-grips, and the anti-freeze system. The systems were comprised of rubber hoses which were either covering electrical cables or carrying a water supply to the necessary area. Swan neck and cage fixtures ensured that the hoses did not tangle as the bell raised and lowered. Electrical panel boxes and float switches were also present (Plates 141–143). The rubber hoses and swan necks were only on the south-west side of the holder, however the electrical boxes were scattered across the holder (Plates 144 & 145).

8.6.3 *Pipework*

Pipework used to maintain the oil-film level in the tank was situated on the south-west side of the holder between standards 25 and 26 (Plate 146). A large water pipe to maintain tank water levels was present on the south of the holder between standard 27 and 28 (Plate 147). Additional pipework was present on the south side of the holder between standards 1 and 2 that may have been related to the gas inlet and outlet operations (Plate 148). There were two possible water discharge points between standards 4 and 5, and 25 and 26 (Plates 149 & 150). A valve pit was also present between standards 6 and 7 (Plate 151). Many of the standards have disused hooks to their base on the external side which may have supported pipework previously (Plate 152).

8.6.4 *Top Up Pump*

To the south of the gasholder there is an electronically-controlled top-up pump hut (Plates 153 & 154).

8.6.5 *Other structures*

To the south-east of Gasholder No 5 there are several concrete settings of equipment that are presumed to be related to the holder operation, that have been cut off (Plates 155–157).

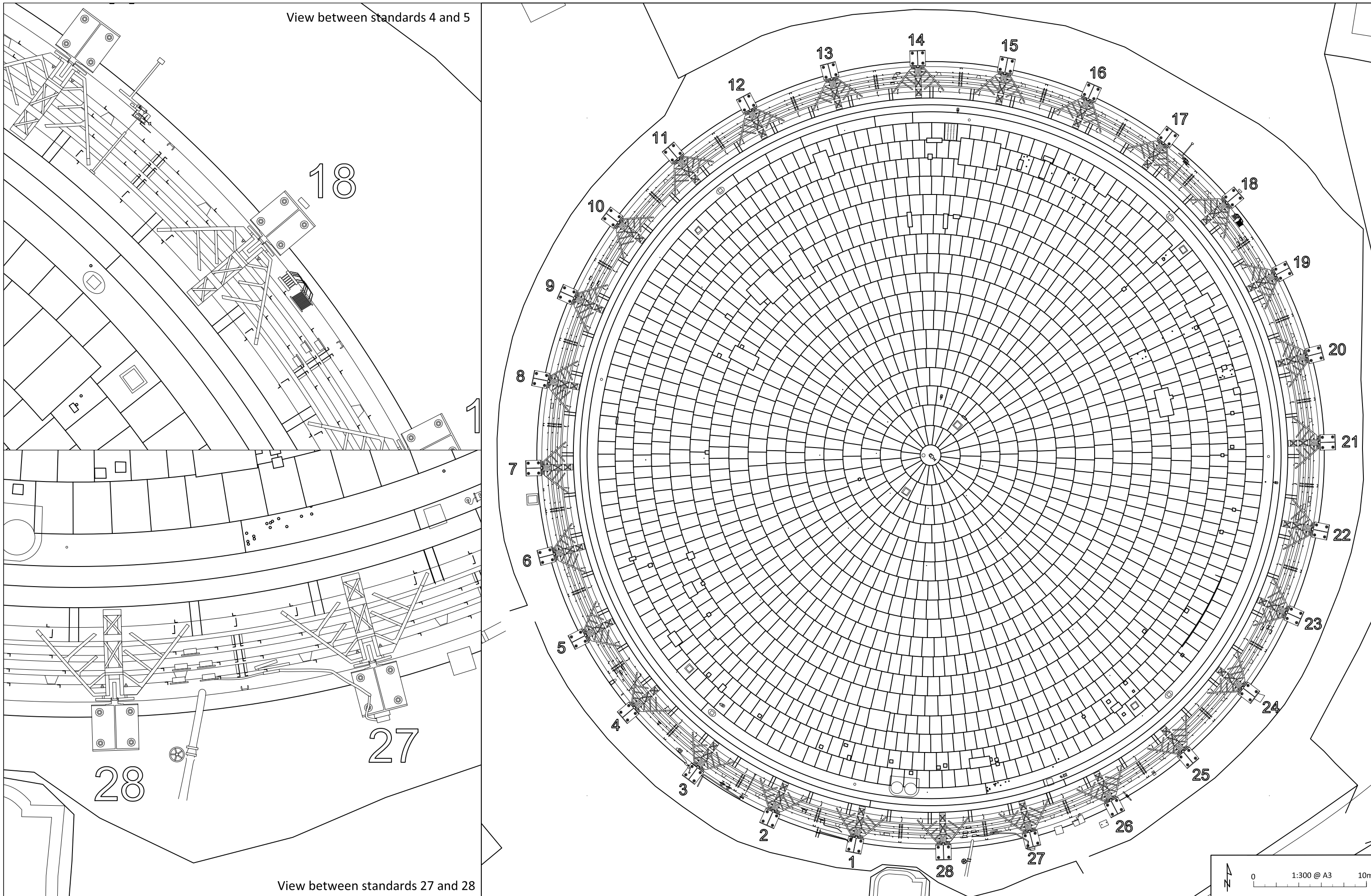


Figure 37: Gasholder No 5, detailed ground plan

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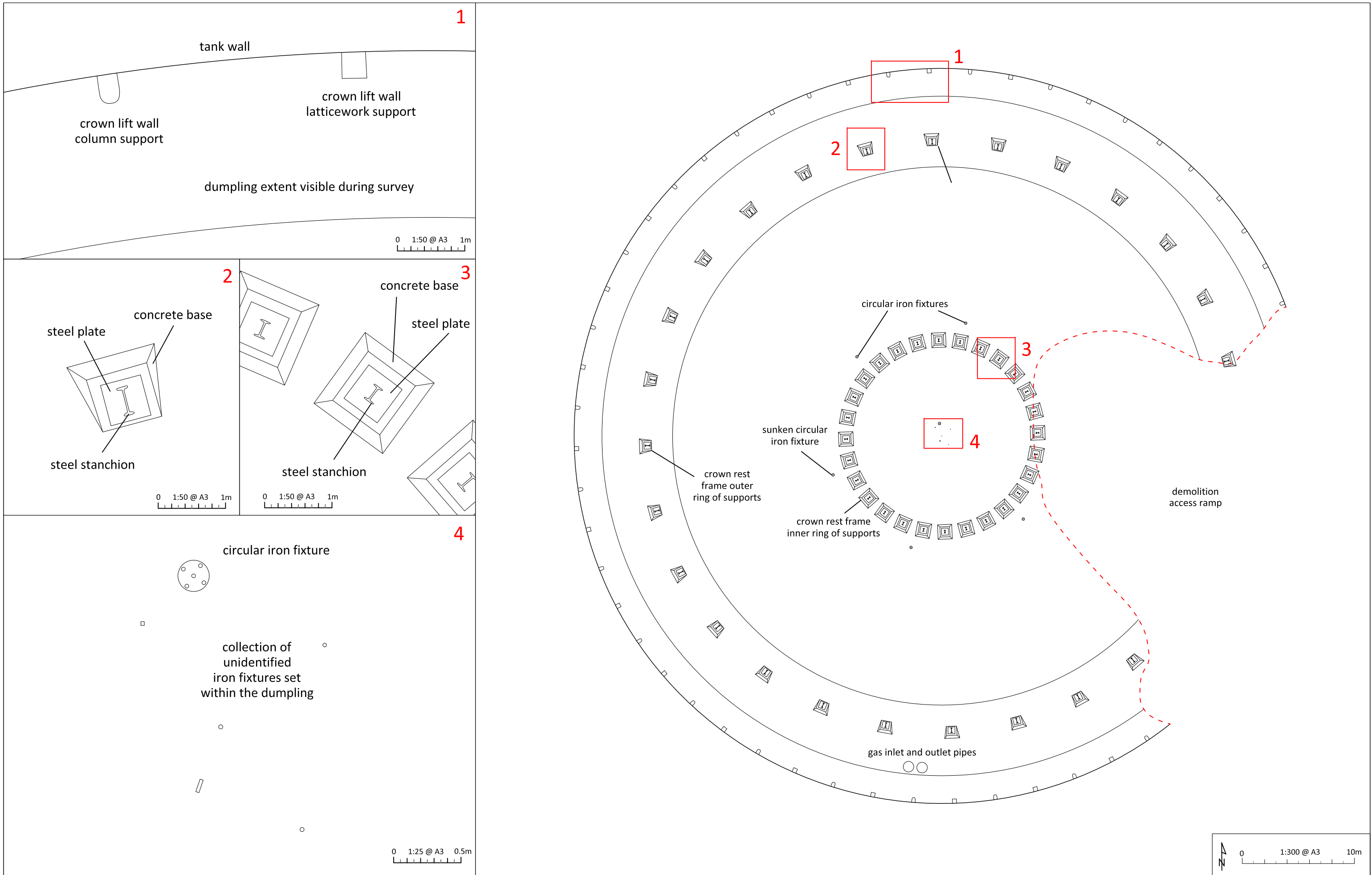


Figure 38: Gasholder No 5, detailed below ground tank dumping plan

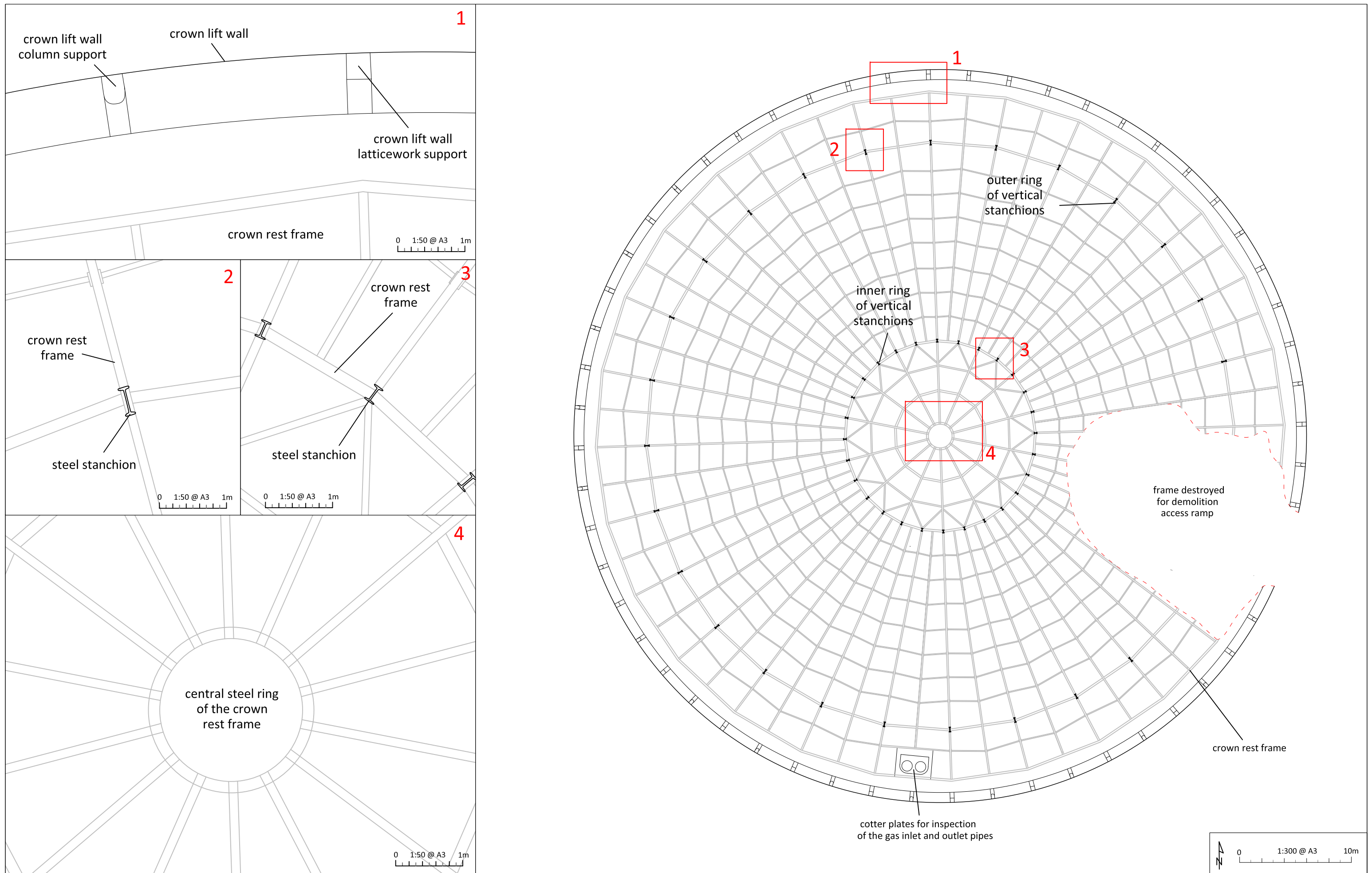
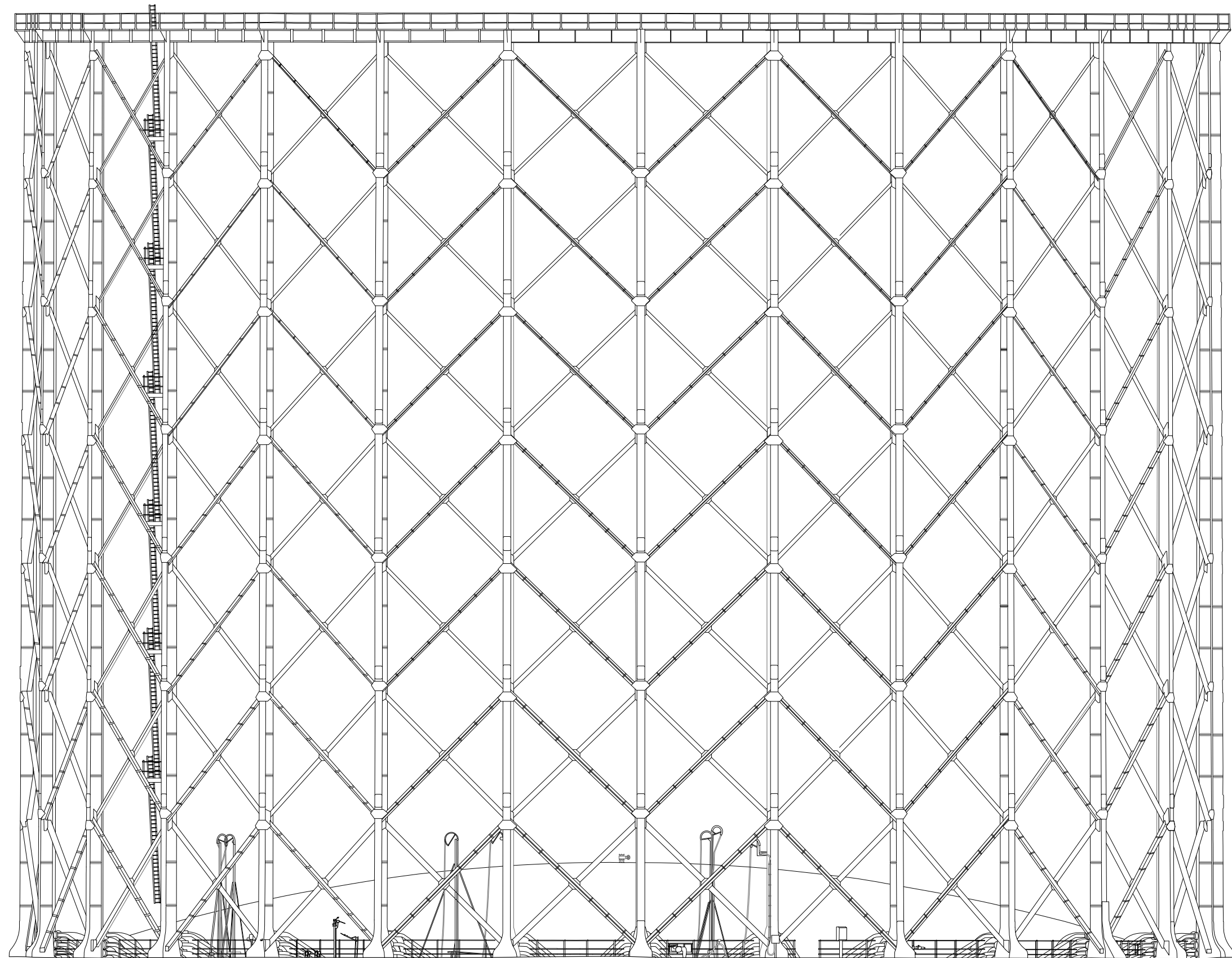


Figure 39: Gasholder No 5, detailed plan of crown rest frame, from beneath

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Figure 40: Gasholder No 5, south elevation

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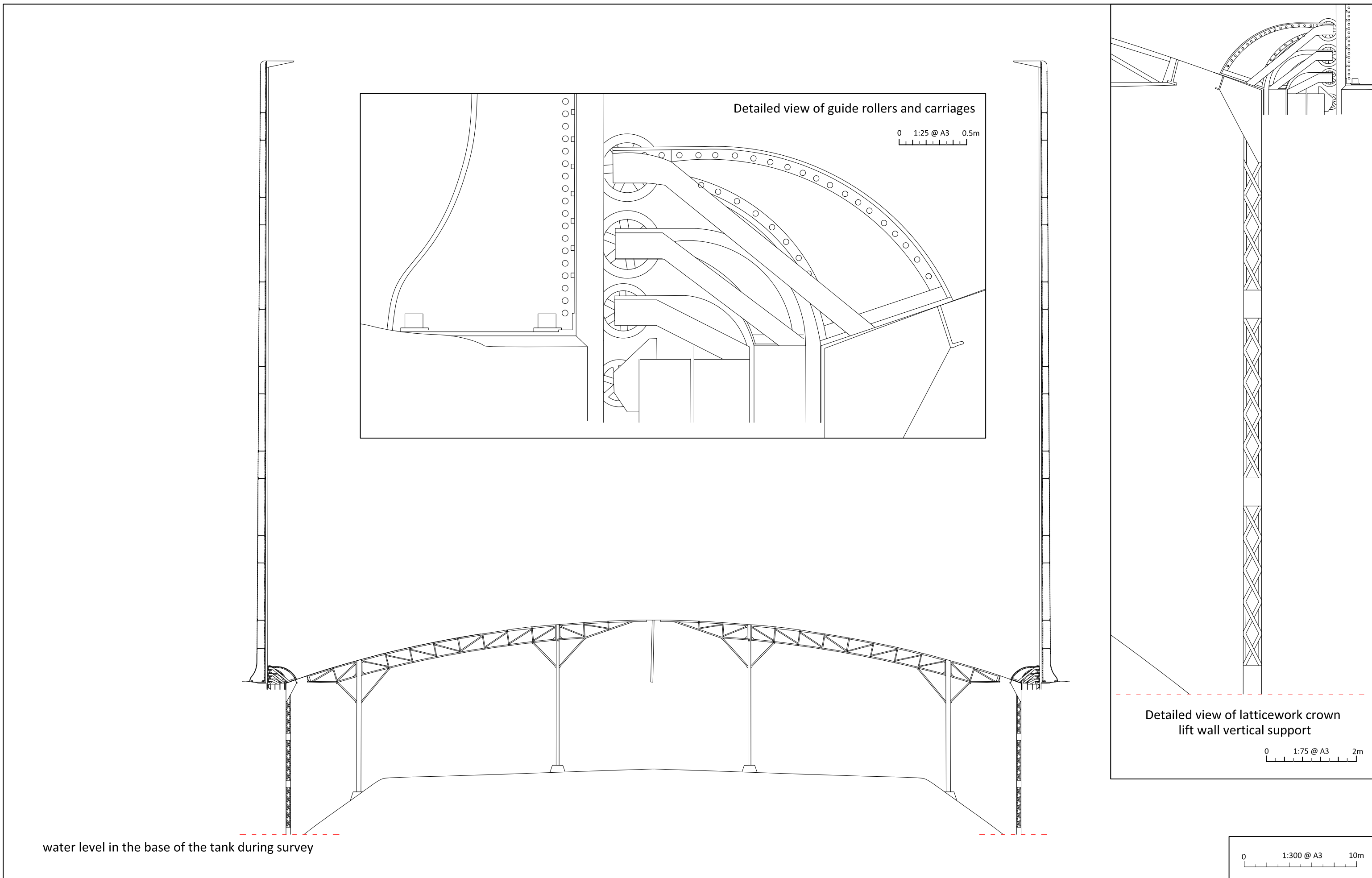


Figure 41: Gasholder No 5, south-facing section

9 RESULTS: ADDITIONAL STRUCTURES

9.1 Introduction

9.1.1 There are many other structures within the site compound in addition to the two gasholders which serve as monitoring stations, electrical rooms, boiler houses, control rooms, pipework and associated valve pits; they were all likely added the 1960s/70s when the original gasworks buildings were demolished and remote monitoring became the norm for gasholder sites throughout the UK.

9.1.2 The structures have been labelled as Structures 1–11 along with pipework and valve pits on Figure 31 and are described briefly below. They were recorded as part of the Phase I works.

9.2 Structure 1: District Governor House

9.2.1 The District Governor House is situated in the centre of the site (Plate 158). It measures 10.3m x 7.7m in a NE-SW orientation and is constructed of steel sheets. The equipment within is mostly Bryan Donkin made, and used to filter and modify the pressure of the gas before it is sent out to the district (Plates 159 & 160). At the time of the Phase I survey some of the equipment was not in use and had been blanked (Plate 161). The floor is concrete and there are some sections of steel sheeting on the floor which are removeable to access the pipework beneath (Plate 162). The building also has a wall of pressure monitoring devices related to boosters on the holders (Plate 163).

9.3 Structure 2: Boiler House

9.3.1 To the south-east of Structure 1 is the Boiler House (Plate 164). It measures 6.1m x 2.1m in a north-west/south-east alignment. It is constructed of steel sheets set in a concrete foundation. The building houses two boilers, a pressurisation unit, heat monitoring units and switches controlling heat pumps (Plates 165–167). Above ground pipework is present between the Boiler House and the District Governor House connecting the two to ensure the temperature of the gas is correct before being sent out to the district (Plate 168).

9.4 Structure 3: Control Room

9.4.1 The Control Room is situated in the centre of the south-west boundary. It is a red brick building measuring 11.7m x 5.2m in a north-west/south-east alignment. It is raised up with concrete steps allowing entry at the south end of the north-east elevation (Plate 169). The interior has an entrance hall, toilet and two working rooms (Plate 170). The central room has monitoring and control panels related to the movement and storage of gas in the holders and the fogger system (Plates 171 & 172).

9.5 Structure 4: Switch Room

9.5.1 The Switch Room is situated in the south of the site. It is a red brick building measuring 8m x 5.3m in a north-west/south-east alignment. The south-west side has two entrances, a single door at the north end and double doors at the south end (Plate 173). There is a grated window acting as a vent in the centre of the north-east elevation; a painted patch at the north end of the same elevation suggests there was once a small additional abutting structure here that has since been removed (Plate 174). The building houses a booster motor and instrumentation panels related to Gasholder Nos 4 & 5 heating systems (Plates 175–177).

9.6 Structures 5 & 6: Electrical Rooms

9.6.1 To the west of the site entrance are two Electrical Rooms constructed of steel panels on concrete foundations which contain electrical panels. Structure 5 measures 2.1m x 2m in an east/west alignment with a single entrance door on the east side (Plate 178). It contains electrical control panels (Plate 179). Structure 6 measures 2m x 0.9m in a north/south orientation (Plate 180). The interior of Structure 6 was not accessed during the survey.

9.7 Structure 7: Unidentified building

9.7.1 To the north of Structures 5 & 6 is a steel-panelled building measuring 2.7m x 2.6m in an west/west orientation (Plate 181). It was not accessed during the survey.

9.8 Structure 8: Electrical Building

9.8.1 To the west of Structure 7 is a steel-sheeted building measuring 6.1m x 3.2m in a WNW/ESE orientation (Plate 182). It has a single entrance door on the west wall and contains electrical control panels (Plate 183).

9.9 Structure 9: Unidentified Building

9.9.1 To the south of Structure 4 is an unidentified building of steel sheet construction on a concrete foundation (Plate 184). It measures 3m x 2.5m in a north-east/south-west orientation. A single entrance door is present on the south-west elevation. The interior was not accessed during the survey.

9.10 Structures 10a-e: Disused Governor Houses

9.10.1 There are five buildings on the site that are disused governor houses (Plates 185–187). They are being stored on the site and have never been in use in their present locations.

9.11 Structures 11a-f: Concrete footings

9.11.1 A concrete footing (Structure 11a) measuring 3.2m² in the north of the site and another in the south (Structure 11b) measuring 3.8m x 1.7m in a north-west/south-east orientation, may be footings for previous buildings on site (Plate 188). To the north-east of Structure 11b there are four smaller 1.3m² concrete footings (11c-f) which may be settings for previous machinery (Plate 189).

9.12 Above Ground Pipework

9.12.1 There are large sections of above-ground pipework on the site. In the centre of the site to the north-west of the District Governor House some old grey pipework meets the new green pipework, which was installed in 2020 as part of the high-pressure works (Plates 190). In the west corner of the site the above-ground pipework contains entry points for an intelligent pig to be put into the system to check the pipes are clear from blockages, general debris and damage (Plates 191 & 192). These sections of pipe contain AUDCO valves, Cameron Ball valves and air operated valves (Plates 193–196). The pipework was mostly made by General Descales Co Ltd of Worksop (Plate 197).

9.12.2 On the south-west boundary of the site there is a large area of above-ground pipework (Plate 198). There is also a short length of wide above-ground pipework to the south of structure 4 (Plate 199). During the Phase I survey, some below-ground pipework was also exposed to the south of this area in advance of replacement (Plates 200 & 201). It connects to pipework outside the boundary of the survey that was also being replaced (Plate 202). There was a long length of above-ground pipework in this same area outside the survey boundary (Plate 203).

9.13 Valve Pits

9.13.1 Two areas of valve pits exist on the site, one in the west corner and one in the centre of the north side. There are ten valve pits in the north of the site which are split over two levels (Plate 204). The pits of the higher levels have pipework emerging from the ground that has now been blanked along with a larger section of pipe which are all housed in a brick-walled area (Plate 205). The remains of a previous pit which has been filled in at the higher level are just visible (Plate 206). The pits are either brick or concrete-walled with access ladders built into the walls (Plate 207). A variety of valve types are present on the pipework including Cameron ball valves (Plate 208). Several sections of pipework have been blanked (Plate 209). The pits all have steel rain covers and contain only one pipe section, except for one on the south-east boundary which has two crossing sections of pipe (Plates 210 & 211).

9.14 Interceptor tank

9.14.1 In the south of the site there is an interceptor tank and a holder discharge sample point (Plates 212–214). This interceptor tank may have been for Gasholder No 5 as there is not one close to the holder itself. The

sample point may be just for this interceptor tank or it may also be linked to the Gasholder No 4 interceptor tank so both discharge waters are checked in the same place as there is no other sample point on site. The interceptor tank measures 4.1m x 1.9m in a north-east/south-west orientation and is brick-built with a concrete cap and manhole covers to view within each chamber. The sample point is below ground with brick walls.



Plate 1: General view of Factory Lane Recycling centre to the east of the site, from the west



Plate 2: General view of the retail park to the south-west of the site, from the north-east



Plate 3: General view of the site from Martin Crescent to the north-west, from the WNW



Plate 4: General view of the site from the junction of Purley Way and Trafalgar Way, from the WSW



Plate 5: General view of the Beckenham to Wimbledon tramline bordering the south-west side of the site, from the north-west



Plate 6: General view of Waddon Marsh tramstop with the dramatic backdrop of Gasholder No 5, from the south-west



Plate 7: General view of the compound entrance on Factory Lane, from the north-east



Plate 8: General view of the entrance to Whitetower Energy Croydon Plant in the south-east corner of the site, from the NNW



Plate 9: General view of the site road with gate entry between Gasholders Nos 4 and 5, from the north-east



Plate 10: General view of structures on the south-west site boundary, from the ENE



Plate 11: General view of structures in the centre of the site to the south of Gasholder No 5, from the south-east



Plate 12: General view of 2020 high-pressure construction huts and car parking areas, from the NNW



Plate 13: General view of modern high-pressure works, from the north-west



Plate 14: General view of recently cleared ground in the centre of the site possibly for construction work or storage, from the south-east



Plate 15: General view of pipework in parallel alignment with the south-west site boundary, from the north



Plate 16: Gasholder No 4, general view of the north side, from the WNW



Plate 17: Gasholder No 4, general view of spiral guide rail structures on the north-west side of the holder, from the WSW



Plate 18: Gasholder No 4, general view of the tank during demolition, from the north-west



Plate 19: Gasholder No 4, detail view of replaced brick courses at the top of the tank and newer tangential guide roller pair additions, from the NNW

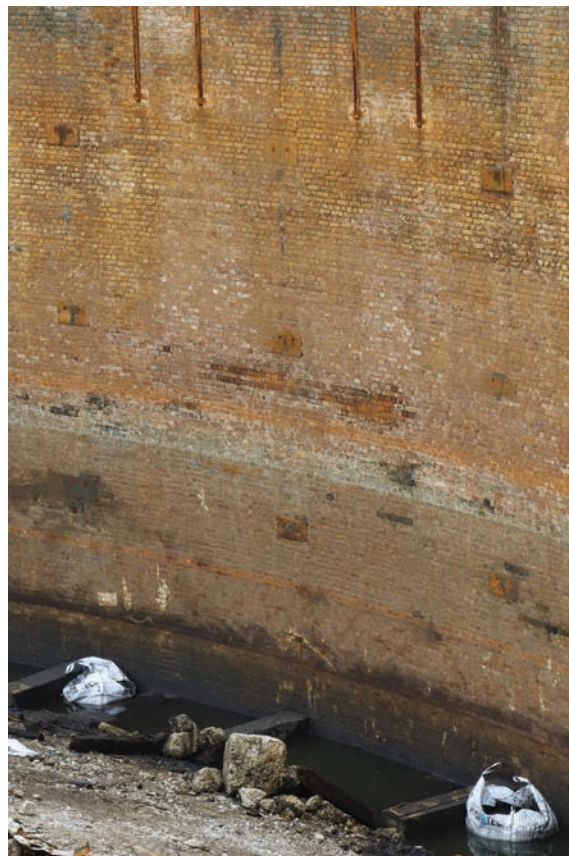


Plate 20: Gasholder No 4, detail view of the metal plates built into the brick tank wall for the original vertical guide rails, from the WNW



Plate 21: Gasholder No 4, detail view of the concrete blocks supporting the lift grips, from the WNW



Plate 22: Gasholder No 4, general view of the crown support frame, from the WNW



Plate 23: Gasholder No 4, general view of the central post, ring 1 and ring 2, from the NNE

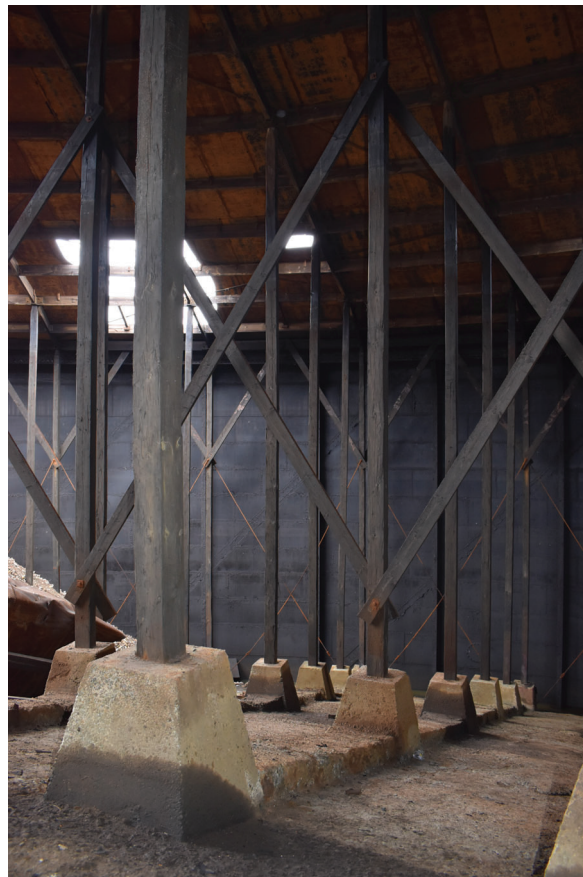


Plate 24: Gasholder No 4, general view of vertical timber post rings 2-7, from the WSW



Plate 25: Gasholder No 4, general view of the iron bar and timber plank cross-bracing between vertical posts of ring 7, from the ENE



Plate 26: Gasholder No 4, general view of the uneven concrete mounds supporting the posts of ring 1, from the SSE



Plate 27: Gasholder No 4, detail view of concrete block base of ring 2, from the WNW



Plate 28: Gasholder No 4, general view of the lines of concrete connecting the concrete block bases of the vertical posts of rings 2–7, from the NNW



Plate 29: Gasholder No 4, detail view of pointed post tops slotted into cross-shaped fixtures, from the south-east



Plate 30: Gasholder No 4, detail view of central vertical post, cylindrical fixture and eleven timber spokes of the crown support frame, from the NNE



Plate 31: Gasholder No 4, detail view of additional spoke and iron cross-bracing in the timber dome of the crown support frame, from the south-west



Plate 32: Gasholder No 4, detail view of timber chocks supporting the crown, from the WNW



Plate 33: Gasholder No 4, detail view of carved letter and number on a timber associated with building the crown rest frame, not in situ



Plate 34: Gasholder No 4, detail view of possible initials and date carved into a displaced timber of the crown rest frame, not in situ



Plate 35: Gasholder No 4, detail view of pairs of tangential guide rollers bolted to the ground and lift tops, from the NNE



Plate 36: Gasholder No 4, detail view of the outer wall of the bottom lift showing riveted steel sheet construction and helical guide rail, from the NNW

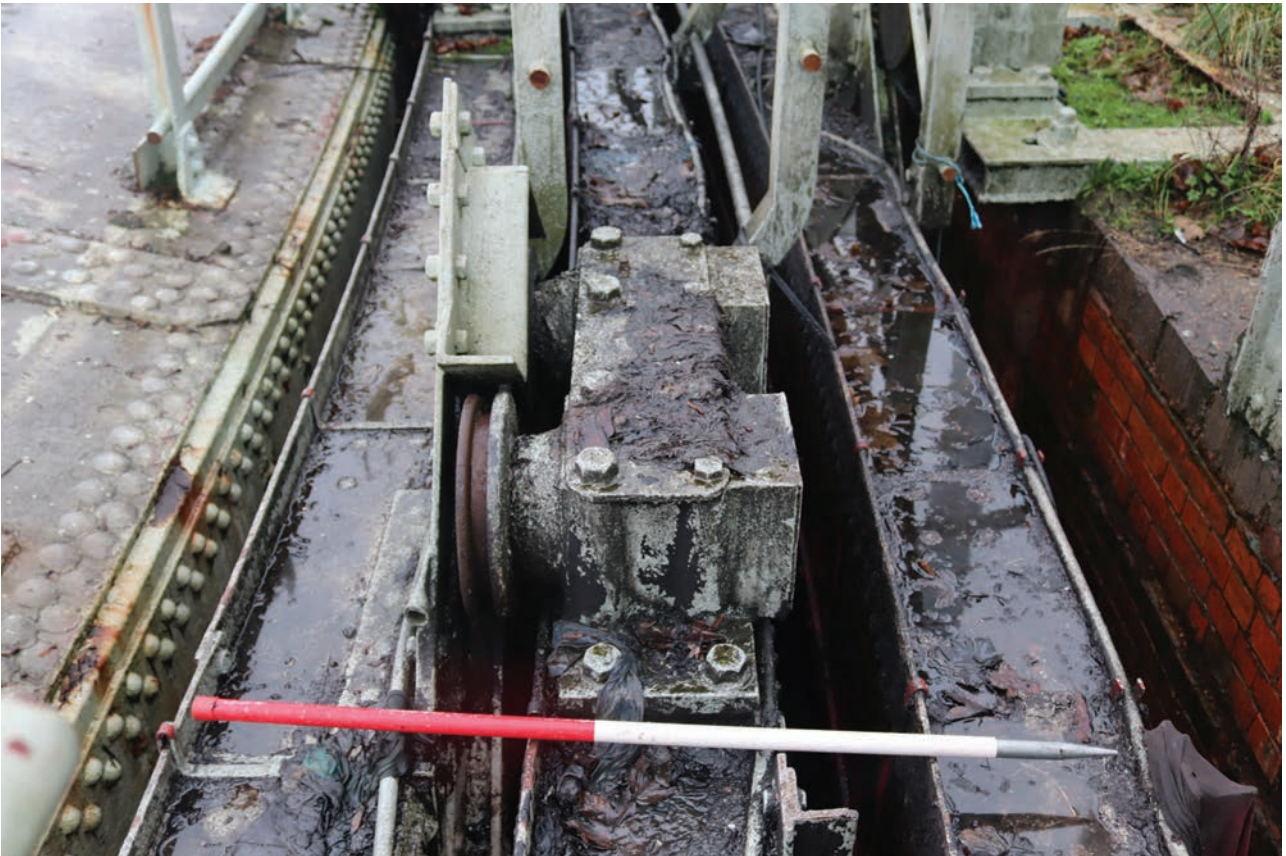


Plate 37: Gasholder No 4, detail view of the tangential guide roller pairs bolted to the lift tops, from the NNW



Plate 38: Gasholder No 4, detail view of steel structure supporting the bottom lift guide rollers, from the WSW



Plate 39: Gasholder No 4, detail view of vertical supports beneath the bottom lift guide rail structure, from the NNW



Plate 40: Gasholder No 4, detail view of bracket topping stanchion on the crown lift wall interior, from the east



Plate 41: Gasholder No 4, detail view of steel sheet supporting the top curb of the bell, from the south-east



Plate 42: Gasholder No 4, detail view of square grips in section during demolition, from the east



Plate 43: Gasholder No 4, detail view of grip water overflow pipes, from the west



Plate 44: Gasholder No 4, general view of the guide rail and stair structures on the south-west side of the holder, from the east



Plate 45: Gasholder No 4, detail view of the tangential rollers gripping the guide rail on the interior of the stair structure, from the SSW



Plate 46: Gasholder No 4, detail view of the padlocked grated gate at the base of the outermost guide rail and stair structure with gap in the handrail of the bottom lift allowing access onto the bottom lift, from the NNW



Plate 47: Gasholder No 4, detail view of handrails cut during decommissioning works for clear access onto the crown, from the north-west



Plate 48: Gasholder No 4, detail view of the lift tops showing riveted plates, rubber tubing clipped into place and decommissioning vent points, from the south-west



Plate 49: Gasholder No 4, detail view of the crown showing riveted, steel sheets with larger rivets and additional plates covering joints at the top curb, from the north



Plate 50: Gasholder No 4, general view of the top of the crown showing central circular steel sheet, crown vents and purge points, from the SSW



Plate 51: Gasholder No 4, detail view of the crown vent to the south-west of the centre of the crown, from the west



Plate 52: Gasholder No 4, detail view of the crown vent on the north-west side of the holder, from the WSW



Plate 53: Gasholder No 4, detail view of the pipe beneath the crown vent just south-east of the centre of the crown, from the NNE



Plate 54: Gasholder No 4, detail view of the glycol pot on the north-west side of the holder and the rubber hose entering the bell, from the south-west



Plate 55: Gasholder No 4, detail view of the two removed cotter plates presumed to be inspection points for the gas inlet and outlet pipes, from the WSW



Plate 56: Gasholder No 4, general view of overgrown gas inlet and outlet fenced area, from the west



Plate 57: Gasholder No 4, detail view of the gas inlet and outlet pipes, from the ENE



Plate 58: Gasholder No 4, detail view of low knock-off switch on the north-west side of the holder, from the west



Plate 59: Gasholder No 4, detail view of high knock-off switch located on the south-east side of the holder, from the SSE



Plate 60: Gasholder No 4, detail view of sunstock knock-off switch located on the south-east side of the holder, from the SSE



Plate 61: Gasholder No 4, detail view of striker arm with no associated knock-off switch located on the north-west side of the holder, from the west



Plate 62: Gasholder No 4, detail view of displaced striker arm on the south-east side of the holder, from the SW



Plate 63: Gasholder No 4, detail view of rubber hose supported by cage and swan neck fixtures, from the SSW



Plate 64: Gasholder No 4, detail view of electrical boxes attached to the handrails, from the ESE



Plate 65: Gasholder No 4, detail view of the anti-freeze tank level cable change box, from the south-east

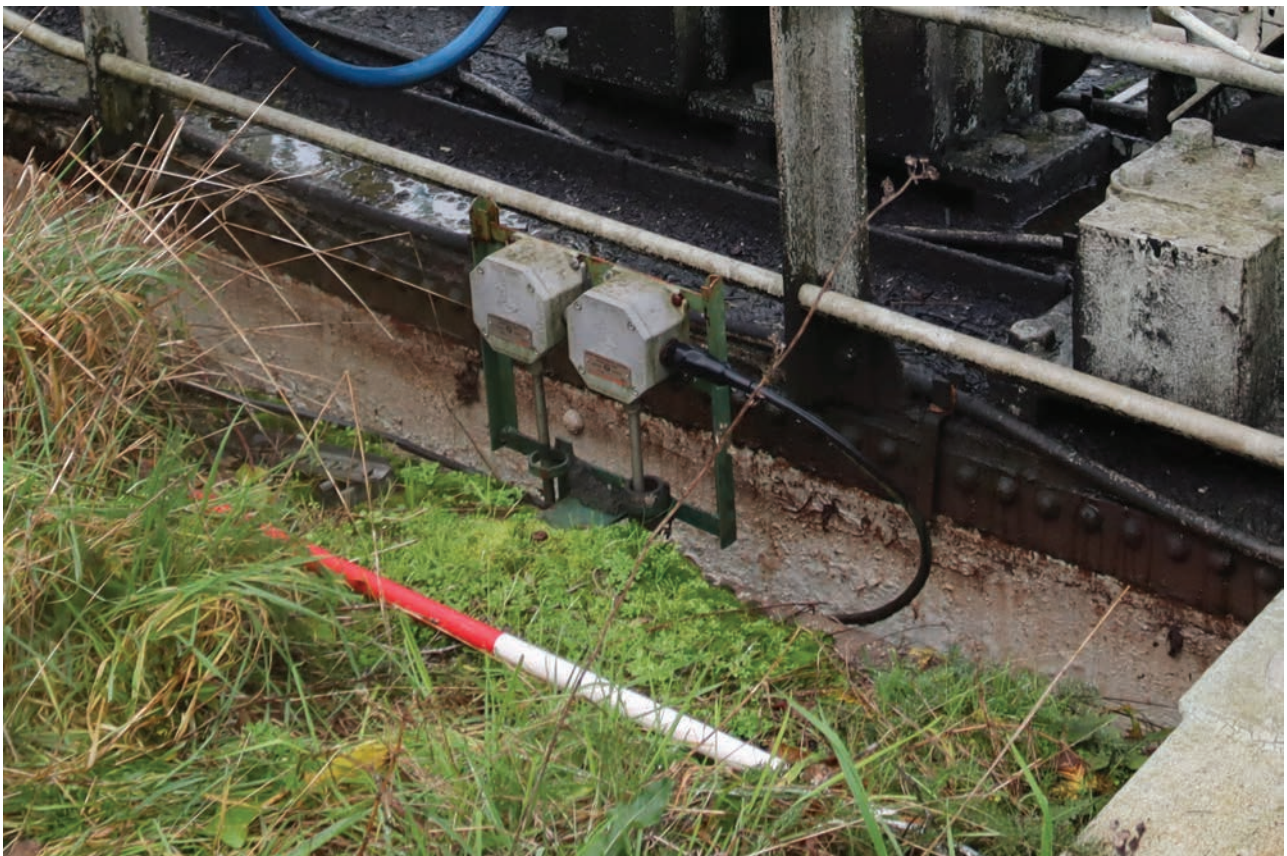


Plate 66: Gasholder No 4, detail view of float sensor monitoring the tank water level, from the south



Plate 67: Gasholder No 4, detail view of oil maintenance pipe, from the WSW



Plate 68: Gasholder No 4, detail view of pipework situated on the west side of the holder, from the WSW



Plate 69: Gasholder No 4, detail view of narrow pipe attached to a vertical post of the crown support frame, from the north-west



Plate 70: Gasholder No 4, detail view of two narrow pipes secured to the dumpling via concrete mounds, from the ENE



Plate 71: Gasholder No 4, detail view of interceptor tank, from the north-east



Plate 72: Gasholder No 4, detail view of overflow pipe discharge point, from the SSE



Plate 73: Gasholder No 4, detail view of water monitoring borehole with interceptor tank in the background, from the east



Plate 74: Gasholder No 4, detail view of unidentified electrical machinery within a brick setting, from the west



Plate 75: Gasholder No 4, detail view of poor condition rusting crown, from the south-east



Plate 76: Gasholder No 5, general view of the north side, from the north



Plate 77: Gasholder No 5, general view of ground sloping up around the east side of the holder, from the SSE



Plate 78: Gasholder No 5, detail view of the red brick tank wall, from the south



Plate 79: Gasholder No 5, detail view of blue brick tank wall cap and surrounding damaged hardcore, from the SSE



Plate 80: Gasholder No 5, detail view of guide rail set within the tank wall beneath standard 8, from the south



Plate 81: Gasholder No 5, detail view of guide rail set within the tank wall between neighbouring standards, from the WSW



Plate 82: Gasholder No 5, general view of the steep dumping slope, from the SSE



Plate 83: Gasholder No 5, general view of the tank interior showing vertical supports and dome of the crown support frame, from the NNW



Plate 84: Gasholder No 5, general view of crown rest frame inner ring of steel supports with bracing latticework, from the SSE

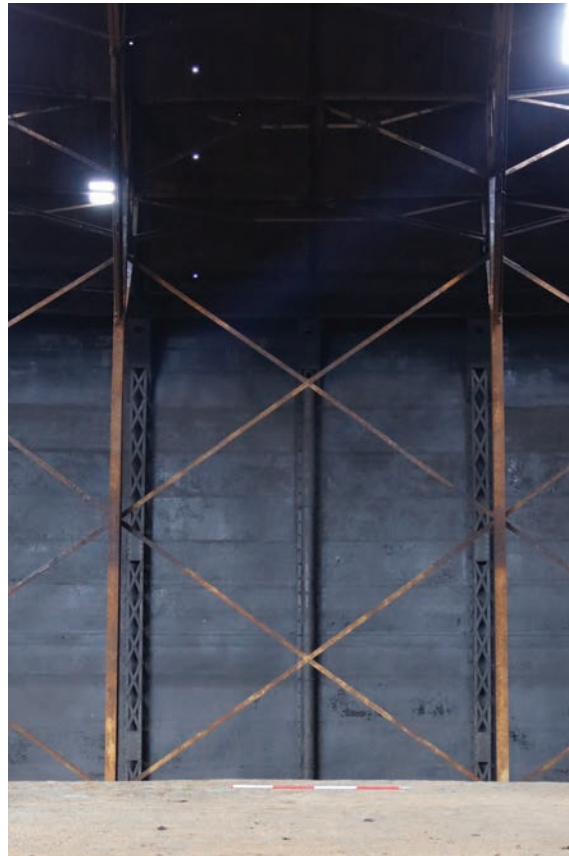


Plate 85: Gasholder No 5, detail view of cross-bracing between stanchions of the outer ring of crown rest frame supports, from the ENE



Plate 86: Gasholder No 5, general view of the concrete blocks beneath the vertical supports of the crown rest frame, from the north-east



Plate 87: Gasholder No 5, detail view of the joint between the vertical steel support and concrete block beneath of the crown rest frame, from the north-east



Plate 88: Gasholder No 5, detail view of the angled concrete blocks beneath the outer ring of steel supports of the crown rest frame, from the north-east



Plate 89: Gasholder No 5, general view of the centre of the crown rest frame dome with ring and spoke design, from the NNW



Plate 90: Gasholder No 5, general view of trussed beams supporting the dome crown rest frame, from the south-east



Plate 91: Gasholder No 5, general view of the multi-directional trussing of the crown support frame, from the north-east



Plate 92: Gasholder No 5, detail view of the trussed ring at the outer edge of the crown rest frame, from the south-west



Plate 93: Gasholder No 5, general view of disused iron fixtures set within the centre of the dumpling, from the NNW



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Plate 95: Gasholder No 5, detail view of standard 1 base east side showing spray-painted number, from the east



Plate 96: Gasholder No 5, detail view of solid standard design of standard 5, from the ENE



Plate 97: Gasholder No 5, detail view of concrete foundation that standard 8 is bolted to at the base, from the south-west



Plate 98: Gasholder No 5, detail view of 12cm diameter bolt at the base of standard 22, from the north



Plate 99: Gasholder No 5, detail view of the riveted rectangular plate on the exterior side of standard 5, from the NW



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Plate 103: Gasholder No 5, detail view of diagonal struts attached to the interior side of standards 6 and 7 via gusset plates, from the ENE



Plate 104: Gasholder No 5, detail view of T-shaped diagonal strut pair facing opposite directions, from the ENE



Plate 105: Gasholder No 5, detail view of hexagonal plate riveted at the centre of each strut, from the south



Plate 106: Gasholder No 5, detail view of cross tie bars to steady the top of the frame in high wind, from the north



Plate 107: Gasholder No 5, detail view of set of ladders situated between standards 18 and 19, from the WNW



Plate 108: Gasholder No 5, detail view of the four guide rollers and carriages attached to the lifts at each standard, from the east



Plate 109: Gasholder No 5, detail view of the roller carriages with cross braces and splaying arms at standard 11, from the south-east



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Plate 117: Gasholder No 5, detail view of the steel sheet riveted to the crown and triangular brackets adding rigidity to the top curb, from the south-west



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Plate 119: Gasholder No 5, detail view of cotter plate and water regulating grip pipe at the base of the top lift wall interior, from the WSW

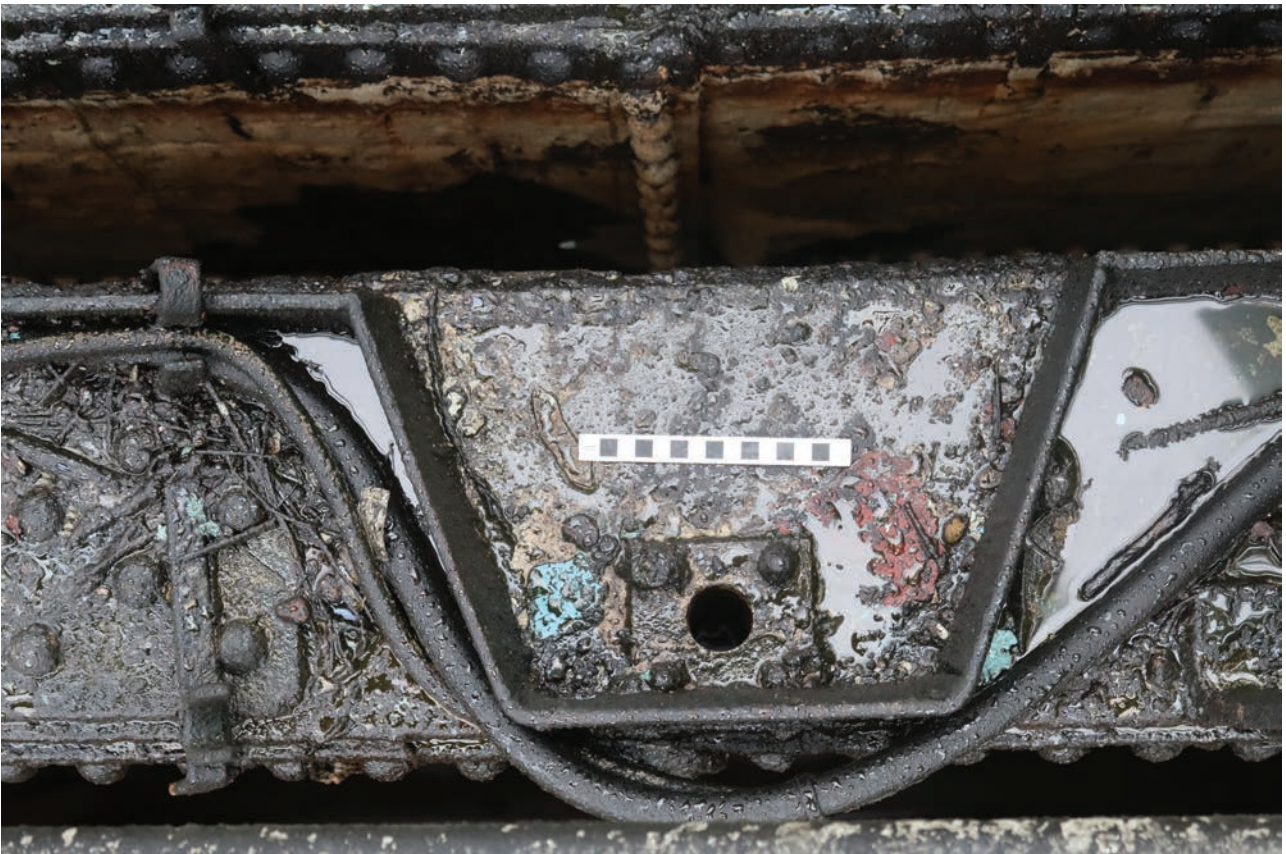


Plate 120: Gasholder No 5, detail view of oil well, from the ESE



Plate 121: Gasholder No 5, detail view of cup-and-grip viewing window, from the east



Plate 122: Gasholder No 5, detail view of platform access onto the crown between standards 4 and 5, from the NNE



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Plate 124: Gasholder No 5, detail view of rectangular riveted sheets of the crown, from the west



Plate 125: Gasholder No 5, detail view of larger rivets and additional sheeting over joints at the curb, from the NNW



Plate 126: Gasholder No 5, detail view of the centre of the crown showing circular steel sheet and crown vent, from the west



Plate 127: Gasholder No 5, detail view of crown vent and cotter plate on the south-west edge of the crown, from the south-west



Plate 128: Gasholder No 5, detail view of pipe within the bell connected to the central crown vent on the exterior, from the north

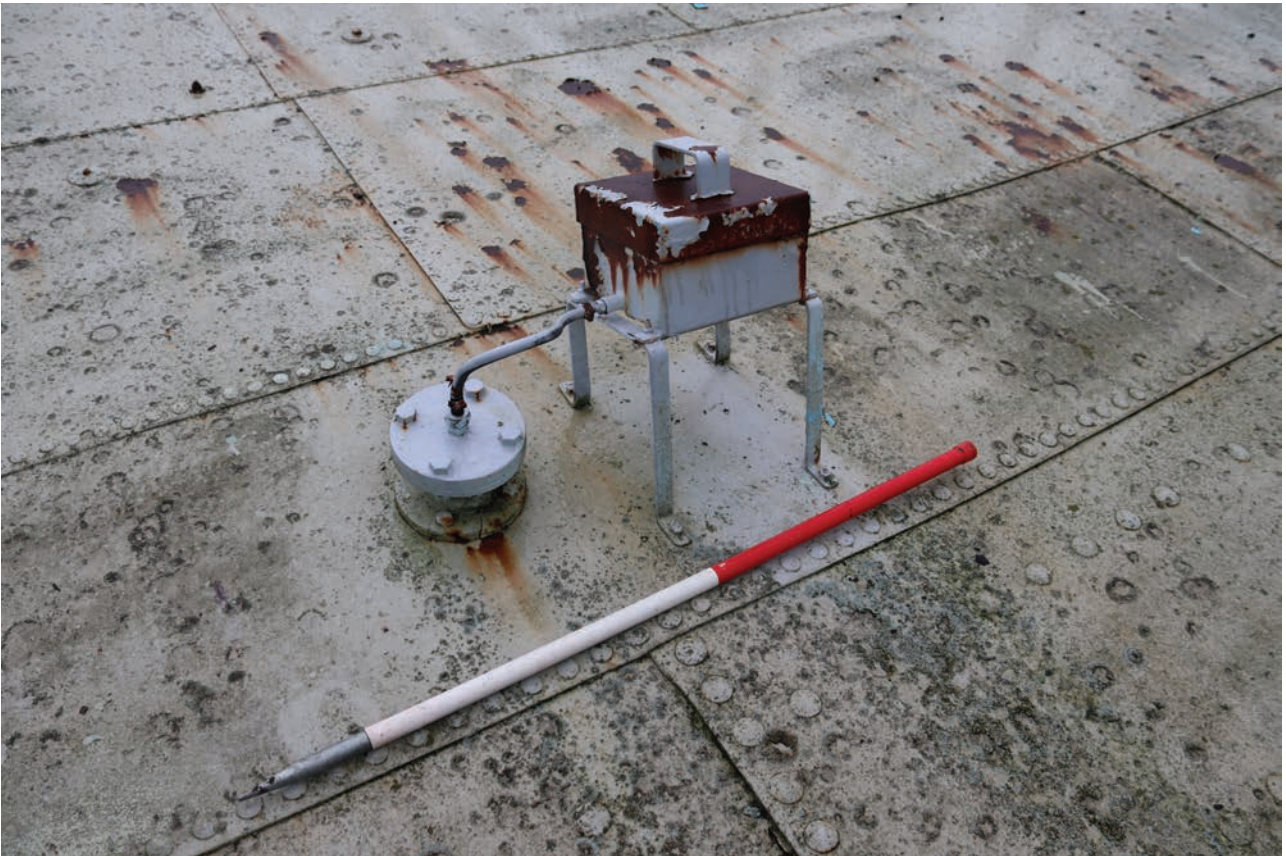


Plate 129: Gasholder No 5, detail view of the glycol pot on the south edge of the crown, from the SSW

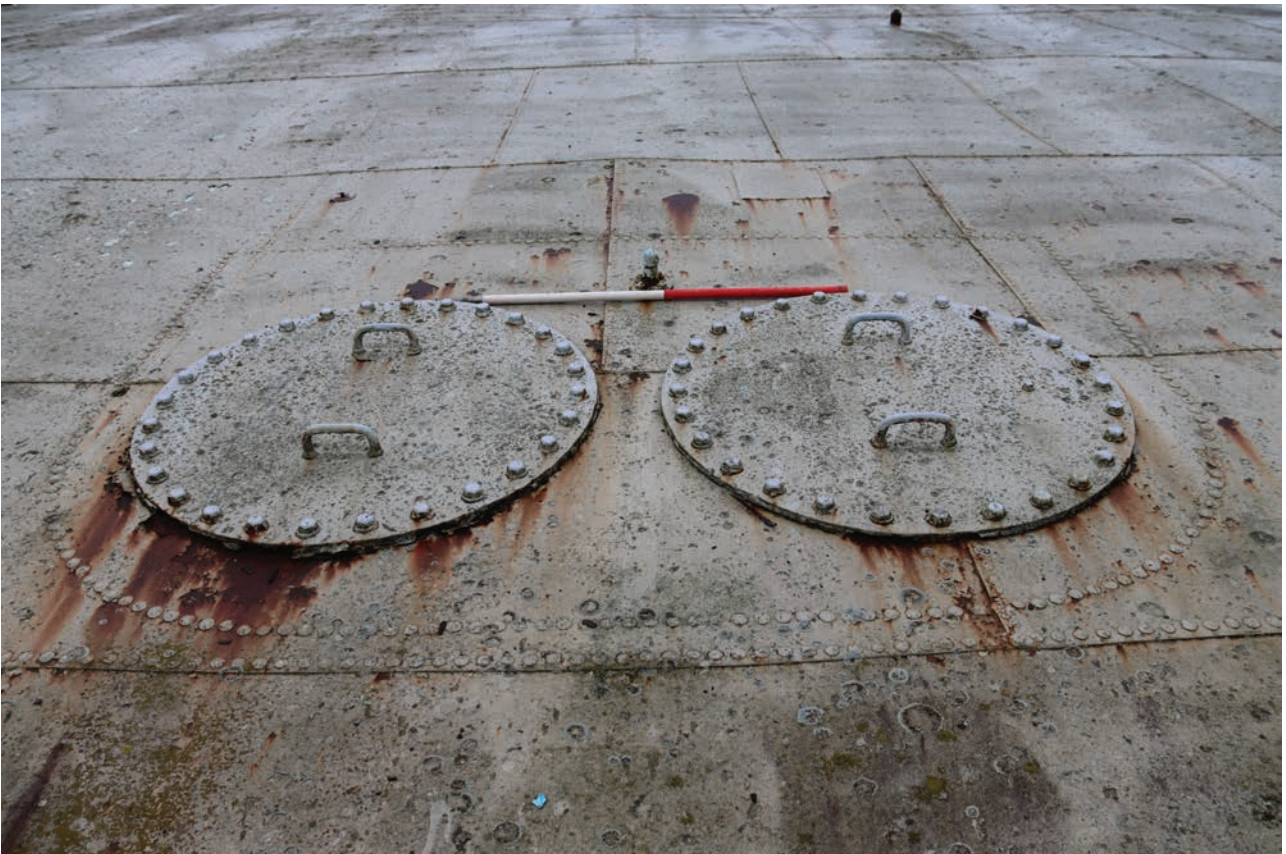


Plate 130: Gasholder No 5, detail view of the dual cotter plates used to inspect the gas inlet and outlet, from the south



Plate 131: Gasholder No 5, detail view of holes and purge points added to the crown during decommissioning works, from the south-east



Plate 132: Gasholder No 5, detail view of different sheet repairs, from the east



Plate 133: Gasholder No 5, detail view of small bolted circle repairs, from the SSW



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Plate 141: Gasholder No 5, detail view of swan neck fixture situated between standards 3 and 4, from the north



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Plate 145: Gasholder No 5, detail view of electrical boxes related to automated systems situated between standards 9 and 10, from the east



Plate 146: Gasholder No 5, detail view of oil pipe on the east side of standard 26, from the ENE



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Plate 148: Gasholder No 5, detail view of pipework presumed related to the gas inlet and outlet, from the ESE



Plate 149: Gasholder No 5, detail view of possible water discharge point between standards 4 and 5, from the east



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Plate 157: Gasholder No 5, detail view of cut-off steel bars, from the north



Plate 158: Structure 1, general view of District Governor House, from the east



Plate 159: Structure 1, general view of equipment within the District Governor House, from the NNE

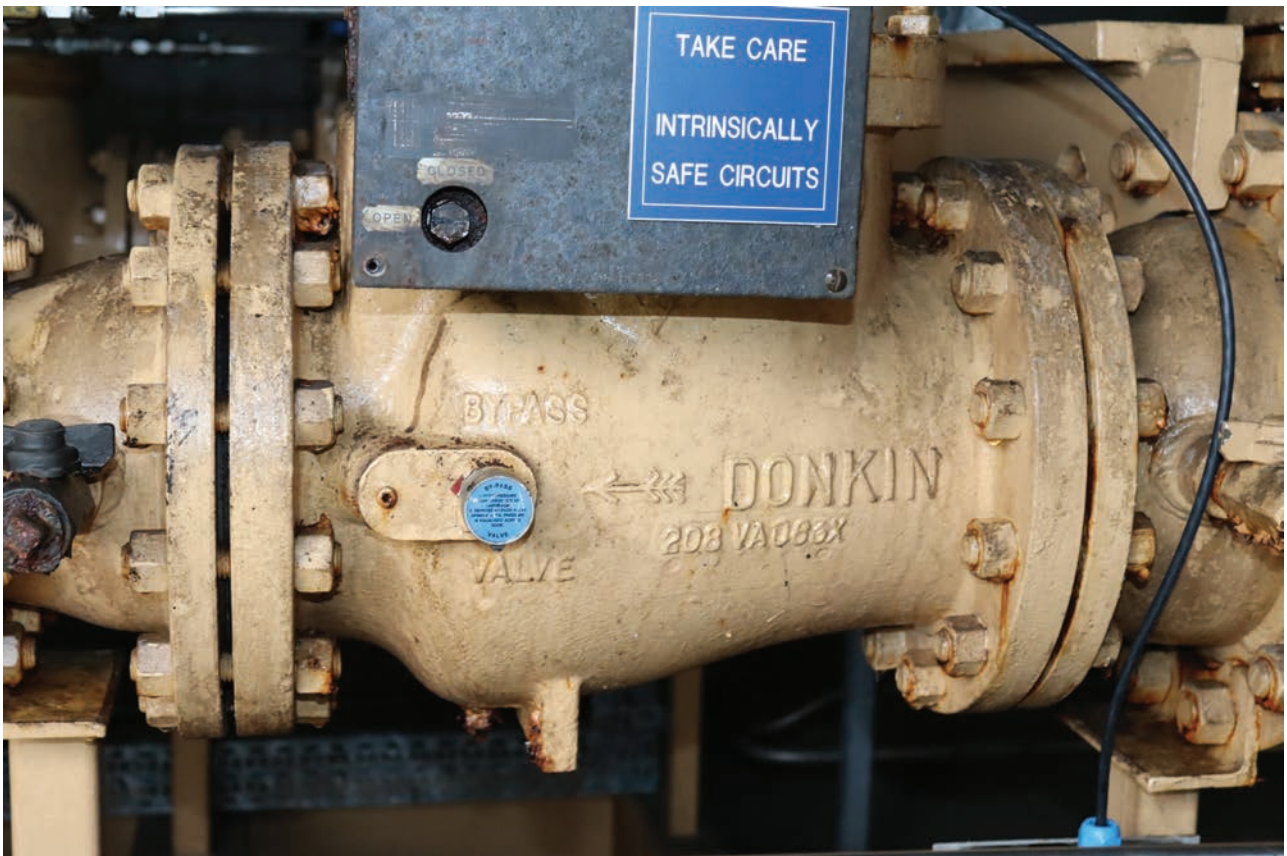


Plate 160: Structure 1, detail view of Bryan Donkin maker's mark, from the SSE



Plate 161: Structure 1, blanked pipework within the District Governor House, from the north-east



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Plate 178: Structure 5, general view of the exterior of the Electrical Room, from the south-east



Plate 179: Structure 5, general view of the interior of the Electrical Room, from the ESE



Plate 180: Structure 6, general view of the exterior of the Electrical Room, from the south



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Plate 182: Structure 8, general view of the electrical building, from the south



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Plate 184: Structure 9, general view of unidentified building, from the south



Plate 185: Structures 10a & 10b, general view of disused governor house, from the south



Plate 186: Structures 10c and 10d, general view of disused governor houses, from the north-west



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Plate 190: Pipework, general view of old grey pipework meeting new green pipework to the north of the high-pressure works, from the east



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Plate 193: Pipework, general view of AUDCO valve, from the north-west



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Plate 195: Pipework, detail view of Cameron maker's mark on the ball valve, from the south-east



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Plate 197: Pipework, detail view of General Descalles Co Ltd maker's mark, from the ENE



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Plate 199: Pipework, detail view of above ground pipework to the south of structure 4, from the WNW



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Plate 209: Valve pits, detail view of blanked pipe, from the WNW



Plate 210: Valve pits, detail view of steel rain covers, from the north-west



Plate 211: Valve pits, detail view of pits with two pipes, from the north-west



Plate 212: Interceptor tank, general view, from the south-east



Plate 213: Interceptor tank, general view, from the south-east



Plate 214: Interceptor tank, detail view, from the south-east

10 DISCUSSION

- 10.1 Gasholder No 4 is a later 1950s spiral-guided holder which was rebuilt using the earlier 1890s brick, below-ground tank. The original holder was frame-guided and the metal plates to which the vertical guide rails were fixed to the tank are still in place. A crown rest frame in a spiral-guided holder is unusual as the later dates of the spiral-designs usually favoured a steel, trussed frame with single, central supporting pier. It is unclear whether the timber crown rest frame within the tank is original or was rebuilt when the holder was converted to a spiral design.
- 10.2 The 1950s spiral-guided holder is generally a typical example of its type with four lifts raised using pairs of tangential guide rollers and helical guide rails. Similar spiral-guided examples exist all over Britain although they are mostly built with above-ground tanks for example Gasholder No 2 at Redhill, Surrey (Hudson 2019). The reuse of the original tank explains why Gasholder No 4 was not built with an above-ground tank.
- 10.3 Gasholder No 5 is a late example of its type, with the pinnacle of guide-framed holders dating between 1880s–1910s and spiral-guided holders becoming more popular in the 1920s when the holder at Greenwich was built. It is similar in size to three of the largest holders in Britain including Gasholder No 1 at Greenwich, London, and Gasholders Nos 1 and 2 at Provan, Glasgow (Sproat *et al* 2019 & Hudson *et al* 2021). Its large scale required cross bracing between the standards and additional cross bracing at the top to add rigidity to the structure and support it during high winds. The variant Livesey's Type 42 guide frame design is a late example of this type, although it perhaps provided a more rigid structure to such a large holder. Cross-bracing bars projecting into the guide-frame interior at the top of the structure provide additional protection from high winds.
- 10.4 The large size of the Gasholder No 5 tank and bell was required to supply gas to the ever-increasing population of Croydon and beyond. Within the tank the steel, trussed-beam crown rest frame is an unusual design within only two supporting rings of rolled-steel stanchions. The similar-sized holders at Greenwich and Provan in Glasgow both had multiple rings of timber supports. Gasholder No 1 at Greenwich was built in 1888 and had a trussed dome with mostly vertical uprights, with one ring of diagonal uprights. Gasholders Nos 1 and 2 at Provan were built in 1902 and had a partially trussed-dome supported by vertical and diagonal uprights in all the supporting rings. Smaller gasholders of a similar period and later holders of a larger size more commonly had a trussed-beam frame fixed to the crown with single supporting pier such as Gasholder No 3 at St Marys Cray, Kent and the aforementioned Gasholder No 2 at Redhill, Surrey (Hudson *et al* 2020). The design at Croydon seems to have found a balance between the two types of design, with the extra support of a whole rest frame kept to an economic price and lightweight construction due to the use of steel in a trussed-beam design. The steel stanchions are also more durable than timber posts as at the time of manufacture the gasworks may have expected the holder to have been used for longer than its actual 90-year lifespan.
- 10.5 From the 1970s, Gasholders Nos 4 and 5 were run using an automated system of gas filling and emptying. Automation was also used to regulate water within the tank and cup-and-grips to keep the gas from escaping, and to keep the water from freezing. Control over the system would have been remotely from the Boiler House, Switch Room and Control Room on site rather than at the holders themselves.
- 10.6 Both holders were engineered to fit their task clearly with design features such as additional steel sheets overlying joints at high-pressure points, telescopic lifts allowing for larger storage of gas and steel frame designs showing their evolution from earlier, less successful holder designs.
- 10.7 Safety was a priority on site with handrails built on the lift tops during the 1990s and remote automation systems allowing for less need to go onto the holder. The areas of repair to the crown of Gasholder No 5 show that the system was well maintained.

11 CONCLUSIONS

- 11.1 The Factory Lane site was once bustling with gas production providing town gas across the south-east of England. The site has developed over time from production of town gas to storage of natural gas, and now the distribution of natural gas from the mains to the district using the 2020 high-pressure works. After originally being farmland, the site has become amalgamated in the expanding town of Croydon now surrounded by light industrial, retail and residential areas.
- 11.2 Gasholders Nos 4 and 5 have been central to the use of the site from the original building of Gasholder No 4 in 1895 through to their decommissioning in the early 2000s.
- 11.3 Gasholder No 4 is a spiral-guided holder with four lifts which utilized the below ground brick-built tank of the original 1890s frame-guided holder in its place. It has a timber crown rest frame set on a concrete-covered dumpling.
- 11.4 Gasholder No 5 is a four-lift, frame-guided holder of a variant on Livesey's Type 42 design which is a late example for its 1921 date of construction. The holder was one of the largest in the UK throughout its lifespan with its telescopic lift design and steel construction creating a sturdy, although more economic and lightweight construction style than that of earlier holders. This is especially reflected in its steel, trussed-beam crown rest frame design.

12 REFERENCES

12.1 Bibliographical references

Cotterill M S 1981 'The Development of Scottish Gas Technology 1917-1914: Inspiration and Motivation' in *Industrial Archaeology Review*, Vol. 5, Number 1, p19 – 40. Oxford University Press.

Grace's Guide ud_a *Sir John Aird & Co.* https://www.gracesguide.co.uk/Sir_John_Aird_and_Co, Accessed 5th January, 2021

Grace's Guide ud_b *R and J Dempster.* https://www.gracesguide.co.uk/R_and_J_Dempster, Accessed 5th January, 2021

Grace's Guide ud_c *Thomas Vale and Sons.* https://www.gracesguide.co.uk/Thomas_Vale_and_Sons, Accessed 6th January 2021

Grace's Guide ud_d *Ashmore, Benson, Pease & Co.* https://www.gracesguide.co.uk/Ashmore,_Benson,_Pease_and_Co#cite_note-3, Accessed 6th January 2021

Hudson, G & Wright, P 2020 Gasholders Nos 3–5, Sevenoaks Way, Orpington, London Borough of Bromley, Kent: Historic Building Recording Final Report *Unpublished Grey Literature Report*

Historic England 2016 *Understanding Historic Buildings: A Guide to Good Recording Practice.* <https://content.historicengland.org.uk/images-books/publications/understanding-historic-buildings/heag099-understanding-historic-buildings.pdf/>, Accessed 5th January, 2021

Historic England 2019 *Gasworks and Redundant Gasholders: Guidelines for their Evaluation and Recording.* Historic England: Swindon

Hudson, 2019 Gasholder Nos 1 & 2, Hooley Lane, Redhill, Surrey: Historic Building Recording Phase II Report *Unpublished Grey Literature Report*

Journal of Gas Lighting and Water Supply 1902 'Meeting the Demands of the Times at Croydon', in *The Journal of Gas Lighting and Water Supply*, 7th October 1902, pp 932 – 936

Journal of Gas Lighting and Water Supply 1903 'The Croydon Gasworks: Their Present and Past', in *The Journal of Gas Lighting and Water Supply*, 1st September 1903, pp 559 – 561

Journal of Gas Lighting and Water Supply 1910a 'A Glance Around the Gasworks', in *The Journal of Gas Lighting and Water Supply*, 21st June 1910, pp 787 – 790

Journal of Gas Lighting and Water Supply 1910b 'At the Croydon Gasworks', in *The Journal of Gas Lighting and Water Supply*, 11th October 1910, pp 108 - 109

Journal of Gas Lighting and Water Supply 1911 'At the Waddon (Croydon) Gas-Works', in *The Journal of Gas Lighting and Water Supply*, 9th February 1911, pp 318 – 319

Journal of Gas Lighting and Water Supply 1928 'London and Southern District Junior Gas Association: Visit to the Works of the Croydon Gas Company', in *The Journal of Gas Lighting and Water Supply*, 18th January 1928, p 140

Journal of Gas Lighting and Water Supply 1928 'London and Southern District Junior Gas Association: Visit to the Waddon Works of the Croydon Gas Company, in *The Journal of Gas Lighting and Water Supply*, 15th November 1922, pp 437 – 439

Malden, 1912. 'Croydon: Introduction and Croydon Palace', in *A History of the County of Surrey: Volume 4*, pp. 205 – 218, <http://www.british-history.ac.uk/vch/surrey/vol4/pp205-217>, Accessed 17th December, 2020.

Marot, A & Roy, L 2020 *Factory Lane Gasholder Site, Croydon: Archaeological Desk-Based Assessment*. Grey literature report for SGN.

Meade, A 1921 (2nd Edition) *Modern Gasworks Practice*. Ben Brothers Ltd: London, Chapter XIX 'The Storage of Gas', pp 621-688

Merriam Co, G & C 1913 *Webster's Revised Unabridged Dictionary*.

Montagu Evans 2016 *0536 – Factory Lane, Croydon*. Extract from SGN Portfolio Heritage Appraisal.

Newbigging, T 1879 *King's Treatise on the Science and Practise of the Manufacture and Distribution of Coal Gas (1878–1882)*.

Powell-Smith, A 2020 *Open Domesday*. <https://opendomesday.org/place/TQ3265/croydon/>, Accessed 17th December 2020

Sproat, D 2019 SGN Gasholder Heritage Review: Blackwall Lane, Greenwich: Historic Building Recording Report Phase I & II Final Report *Unpublished Grey Literature Report*

Thomas, R 2014 *The History and Operation of Gasworks (Manufactured Gas Plants) in Britain*.

Tucker, M T 2000 *London Gasholders Survey: The Development of the Gasholder in London in the Later Nineteenth Century. Part A: General*. Grey Literature Report for Historic England/English Heritage

12.2 Cartographic references

Roberts, W 1838. Plan of the Parish of Croydon in the County of Surrey, Surveyed in 1838

Ordnance Survey 1872. Surrey XIV (includes: Croydon St John the Baptist.) Surveyed: 1867 to 1868, Published: 1872

Ordnance Survey 1898. OS Surrey XIV.SW Revised: 1894 to 1895, Published: 1898

Ordnance Survey 1914. Surrey XIV.NW (includes: Beddington; Croydon St John the Baptist; Mitcham.) Revised: 1910 to 1911 Published: 1914

Ordnance Survey 1914. Surrey XIV.SW (includes: Beddington; Croydon St John the Baptist. Revised: 1911 Published: 1914

Ordnance Survey 1935. OS County Series 1933-1935: 1:2500

Ordnance Survey 1946. Surrey XIV.SW (includes: Beddington; Croydon St John the Baptist.) Revised: 1938 Published: ca. 1946

Ordnance Survey 1946. Surrey XIV.NW (includes: Beddington; Croydon St John the Baptist; Mitcham.) Revised: 1938 Published: 1946

Ordnance Survey 1954. London/TQ 3065NE Surveyed: 1953, Published: 1954

Ordnance Survey 1954. London/TQ 3066SE Surveyed: 1953, Published: 1954

Ordnance Survey 1957. OS 1:25,000 TQ36, Surveyed: 1938-1955, Published: 1957

Ordnance Survey 1974. OS Plan 1960-1974 1:1250

Ordnance Survey 1993. OS Plan 1:10000

Ordnance Survey 1984-1991. OS Plan 1984-1991, 1:10, 000

12.3 National Gas Archive Records

<i>Ref_No</i>	<i>Title</i>	<i>Description</i>	<i>Date</i>
GJ/1902_80/932	Croydon - brief history, description, photographs	Croydon - brief history, description, photographs	1902
GJ/1903_83/559	Croydon - history, site plan	Croydon - history, site plan	1903
GJ/1907_100/623	Croydon, Waddon Marsh Ln - description, description of changes to works, site plan, photographs, diagrams	Croydon, Waddon Marsh Ln - description, description of changes to works, site plan, photographs, diagrams	1907
GJ/1910_110/787	Waddon gasworks, Croydon - description, photographs (inc general view)	Waddon gasworks, Croydon - description, photographs (inc general view)	1910
GJ/1910_112/108	Croydon - photographs (inc general view)	Croydon - photographs (inc general view)	1910
GJ/1915_129/318	Croydon - description of visit	Croydon - description of visit	1915
GJ/1922_160/437	Croydon, Waddon gasworks - description of visit	Croydon, Waddon gasworks - description of visit	1922
GJ/1928_181/140	Croydon GC - history, description	Croydon GC - history, description	1928
SE/CRG/CRO/E/F/1	Photographs of Croydon Wadden Gasworks	See items	n.d.
SE/CRG/CRO/E/F/2	Photographs Around Croydon Site	Including coal tipping, stores building, interior of machine shop, construction of new retort house, and aerial photograph of works. [6 items; g00232, g00233, g002334, g00235, g00237, g00241]	1932 - 1954
SE/CRG/CRO/E/F/3	Photographs Of Croydon Site	Including entrance and frontage of the William Cash workshops, interior and exterior of retort house, railway sidings, interior of workshops and sports pavilion etc. [19 items]	1930 - 1932
SE/CRG/CRO/E/T/14	Croydon- General Arrangement Of Retort House And Coke Plant	Croydon, Waddon Works. General arrangement of No.3 retort house and coke plant. Shows coal store, water gas plant.	1932
SE/CRG/CRO/E/T/17	Croydon- Plan Of Proposed Chambers	Plan showing proposed installation of intermittent vertical chambers at Waddon works. Shows liquor tank, tark and liquor pumps and coal stores.	1942

SE/CRG/CRO/E/T/35	Croydon- Plan Of Benzole Plant	Croydon Benzole Plant. Finely detailed sectional plan of plant.	1932
SE/CRG/CRO/E/T/39	Croydon- Drawing Of W-D System For Proposed Chambers	Croydon Works. Coloured drawing of W-D system for proposed intermittent vertical chambers. Shows retort house, coke wharf, coke hoppers and future coke wharf, chambers and conveyor.	1948
SE/SEG/AAQ/DA/E/E/3/8	Plan Of Croydon - Wadden Works	detailed plan showing holders, buildings with key.	01/01/1949
SE/SEG/ES/CRG/E/E/1	Croydon- Plan Of Gas Works	Croydon gas works, Purley Way. Detailed plan showing holders with capacities, cooling towers, retort house, tar and liquor tanks and many buildings - detailed key.	n.d.
SE/SEG/ES/CRG/E/E/2	Croydon- Plan Of Works	Croydon gas works, Purley Way. Detailed plan showing holders with capacities, cooling towers, retort house, tar and liquor tanks, power house, control room, water treatment plant and many buildings - detailed key.	1967 - 1968
SE/SEG/ES/CRG/E/E/3	Croydon- Plan Of Works	Croydon works. Plan showing arrangement of gas main from boosters to governor house. Sows oil tank, air raid shelter, laboratory, canteen, railway and prev holder structure.	1936 - 1966
SE/SEG/ES/CRG/E/E/4	Croydon - Plan Of Works	Croydon, Purley Way. Plan showing site of William Cash workshops of Croydon Gas Co. Details petrol pump, caustic tanks, incinerator, hydrant, boiler house and gas company railway siding.	1933
SE/SEG/ES/CRG/E/E/5	Croydon- Plan Of Works	Croydon Works. Plan showing underground storage tanks, diesel tanks, water tanks, drains, pig trap, valves and mains.	1980
SE/SEG/ES/CRG/E/E/6	Croydon- Plan Of Works	Croydon gas works, Purley Way. Detailed plan showing holders with capacities, cooling towers, proposed petrol storage, many buildings - detailed key.	1979
SE/SEG/ES/CRG/E/E/7	Croydon- Site Plan Of Petrol Installation	Croydon gas works, Purley Way. Site plan of petrol installation - details underground tanks and water tanks.	1980
SE/SEG/ES/CRG/E/E/8	Croydon- Site Survey Plan Of Gas Works	Croydon gas works, Purley Way, Jennett Road. Site survey plan showing buildings, pump house, petrol tanks, water tanks and man holes.	1986
SE/SEG/ES/CRG/E/E/9	Croydon- Detailed Plan Of Gas Works	Croydon gas works, Purley Way. Detailed plan showing holders with capacities, cooling towers, retort	1967 - 1968

		house, LDF tanks, reforming plant - detailed key.	
SE/SEG/ES/CRG/E/E/10	Croydon- Detailed Plan Of Reforming Plant	Croydon Works No1 Reforming Plant. Detailed plan showing Benzole tank, gas oil storage tank, test station and mains.	1967
SE/SEG/ES/CRG/E/E/11	Croydon- Plan Of Works	Plan of Waddon Works - Purley Way, plan showing holder with capacities, retort houses, coal stores ,previous structures, sewers. Detailed key.	n.d.
SE/SEG/ES/CRG/E/E/12	Croydon- Arrangement Of Mains	Plan of Waddon Works arrangement of 24inch main from outlet of new boosters to existing tee for crawley main.	1953
SE/SEG/ES/CRG/E/F/1	Photographs - Demolition Of Croydon Reforming Plant	7 items	1967-1977
SE/SEG/ES/CRG/E/F/2	Photographs Around Croydon Site	None	n.d.
SE/SEG/ES/CRG/E/F/3	Photographs: Demolition Of Column Guided Gasholder No 4, And Replacement Spiral Guided Holder At Croydon	8 items; g00243,g00244, g00245, g00246, g00247.	1954 - 1958
SE/SEG/ES/CRG/E/F/4	Photographs Of Croydon Site	Including coke plant, exterior and interior of booster house, and construction of retort house by W-D; [g00236, g00238 - g00239, g00242].	1952 - 1958
SE/SEG/ES/CRG/E/T/1	Croydon- Plan Of Proposed Coke Plant	Croydon, Waddon works. Plan of proposed coke plant - Sheet 1. [6082-1a-6D]. Shows retort house, conveyor, coal gas plant, coal store and buildings.	1950
SE/SEG/ES/CRG/E/T/2	Croydon- Plan Of Proposed Coke Plant Elevation	Croydon, Waddon works. Elevations of proposed coke plant- Sheet 2. [6083-1a-6D]	1950
SE/SEG/ES/CRG/E/T/3	Croydon- Site Plan Of Proposed Coke Screening And Storage Plant	Croydon. Site plan of proposed coke screening and storage plant. [5955-1a-6D]. Shows retort house, coke wharf, proposed sidings and existing footings.	1949
SE/SEG/ES/CRG/E/T/4	Croydon- Plan And Cross Sections Of Proposed Coke Screening And Storage Plant	Croydon. Cross sections and part plan of proposed coke screening and storage plant. [5954-1a-6D]	1949
SE/SEG/ES/CRG/E/T/8	Elevations Of Coke Bunker At Croydon. [3514/2]	Elevations Of Coke Bunker At Croydon. [3514/2]	1951
SE/SEG/ES/CRG/E/T/11	Croydon- Drawing of Interconnecting Platforms and Tabk Ladders	Drawing showing details of Inter-connecting platforms & Tank ladders at Croydon	1964
SE/SEG/ES/CRG/E/T/12	Croydon- Drawing of Storage Tanks	Drawing showing fittings for Storage Tanks at Croydon	1964
SE/SEG/ES/CRG/E/T/13	Croydon- Drawing of Storage Tanks	Drawing showing the key plan of Storage Tanks at Croydon	1964
SE/SEG/ES/CRG/E/T/14	Croydon- Drawing of Steam Coils and Steam Coil fittings	Drawing showing Coils and Steam Coil fittings for 1- Tank at Croydon	1964

SE/SEG/ES/CRG/E/T/15	Croydon- Drawing of Storage Tank	Drawing showing the key plan of Storage Tanks at Croydon	1964
SE/SEG/ES/CRG/E/T/16	Croydon- Drawing of Water Storage Tank	Drawing showing fittings for Water Storage tank at Croydon	1964
SE/SEG/ES/CRG/E/T/17	Croydon- Drawing of Staircase for Water Storage Tank	Drawing showing Staircase for Water Storage Tank at Croydon	1964
SE/SEG/ES/CRG/E/T/18	Croydon- Drawing of Water Storage Tank	Drawings showing Water storage tank at Croydon	1964
SE/SEG/ES/CRG/E/T/19	Croydon- Drawing of Water Storage Tank	Drawings showing Water storage tank at Croydon	1964

**Gasholders Nos 4 & 5, Factory Lane, Croydon:
Historic Building Recording Final Report**

APPENDICES

APPENDIX 1: PHOTOGRAPHIC RECORD

<i>Photo No.</i>	<i>Structure</i>	<i>Description</i>	<i>Taken from</i>	<i>Date</i>
FLC_001	Site	General view of the site from the junction of Purley Way and Trafalgar Way	WSW	16/12/2020
FLC_002	Site	General view of the site from Purley Way	W	16/12/2020
FLC_003	Site	General view of the tramway bordering the west of the site	SSE	16/12/2020
FLC_004	Site	General view of the tramway bordering the west of the site	NNW	16/12/2020
FLC_005	Site	General view of the site from the tramway bordering the west of the site	W	16/12/2020
FLC_006	Site	General view of the site from Martin Crescent	WNW	16/12/2020
FLC_007	Site	General view of the site from the junction of Miller Road and Thomson Crescent	N	16/12/2020
FLC_008	Gasholder No 5	General view of the north-east side of the gasholder from Factory Lane	E	16/12/2020
FLC_009	Gasholder No 5	General view of the east side of the gasholder from Factory Lane	NE	16/12/2020
FLC_010	Site entrance	General view of the site entrance on Factory Lane	NE	16/12/2020
FLC_011	Gas supply building	General view of the gas supply building to the west of the site entrance	NE	16/12/2020
FLC_012	Security building	General view of the building from Factory Lane	NE	16/12/2020
FLC_013	Boundary Wall	General view of brick boundary wall to the west of the site entrance	SE	16/12/2020
FLC_014	Main Electrical Intake Switchroom	General view of the building exterior	ESE	16/12/2020
FLC_015	Main Electrical Intake Switchroom	General view of the building interior with electrical switch boxes	ESE	16/12/2020
FLC_016	Modern electrical building	General view of the building exterior	S	16/12/2020
FLC_017	Gasholder No 5	General view of the holder east side	E	16/12/2020
FLC_018	Site / Manhole	General view of cleared ground with manhole cover to the east of the site entrance	SW	16/12/2020
FLC_019	Site	General view of the cleared ground to the east of the entrance road	SSW	16/12/2020
FLC_020	Site / Site road	General view of the entrance road, with entrance gates in the background	S	16/12/2020
FLC_021	Site	General view of the overgrown steep slope between the site road and Gasholder No 5	SSE	16/12/2020
FLC_022	Stores	General view of two abandoned store buildings	SE	16/12/2020
FLC_023	Site road	General view of the site road with gate entry between Gasholders Nos 4 and 5	NE	16/12/2020
FLC_024	Site road	General view of the site road when viewed from the site entrance	N	16/12/2020
FLC_025	Stores	General view of two abandoned storage buildings between the site road and the eastern site boundary	W	16/12/2020
FLC_026	Site / Manholes	General view of grassy area with several manhole covers close to the eastern site boundary	SSW	16/12/2020
FLC_027	Site / Manholes	General view of grassy area with several manhole covers close to the eastern site boundary	WSW	16/12/2020
FLC_028	Site	General view of the land on the eastern edge of the site used for temporary storage	SSW	16/12/2020
FLC_029	Site road	General view of the site road along the eastern site boundary	NNW	16/12/2020
FLC_030	Site / Manholes	General view of manhole cover between the site road and eastern site boundary	NW	16/12/2020
FLC_031	Site / Site road /	General view along the eastern fork of site road with various	SSE	16/12/2020

	Manholes	manhole covers along its western edge, and the built-up grass bank bordering the east side of Gasholder No 4		
FLC_032	Site / Gates	General view of the entry gates into the Croydon plant (left) and the south-east area of the SGN site (right)	NNW	16/12/2020
FLC_033	Site / Manhole	General view of the manhole cover in the south-east corner of the site	NNE	16/12/2020
FLC_034	Gasholder Nos 4 & 5	General view of the south-east sides of Gasholder No 4 (foreground) and Gasholder No 5 (background)	SE	16/12/2020
FLC_035	Site	General view of footway between Gasholder No 4 and the site south boundary	ENE	16/12/2020
FLC_036	Site	General view of the grassy area to the south-west of Gasholder No 4	E	16/12/2020
FLC_037	Site	General view of footway between Gasholder No 4 and the site south boundary	W	16/12/2020
FLC_038	Site / Boreholes	General view of the grassy area to the south-west of Gasholder No 4 with several boreholes	E	16/12/2020
FLC_039	Site / Boreholes?	General view of several shallow pits to the south-west of Gasholder No 4 presumed to be failed borehole attempts	E	16/12/2020
FLC_040	Gasholder No 4 interceptor tank	General view of the submerged tank with access manholes on the top	ENE	16/12/2020
FLC_041	Site	General view of the southern area of the site	ENE	16/12/2020
FLC_042	Site	General view of the cleared ground to the west of Gasholder No 4	SE	16/12/2020
FLC_043	Gasholder No 4 in/outlet / Gasholder No 5	General view of the inlet and outlets gated area situated on the west side of Gasholder No 4, with Gasholder No 5 in the background	S	16/12/2020
FLC_044	Gasholder No 5	General view of the south side of Gasholder No 5	S	16/12/2020
FLC_045	Site	General view of the recycling plant to the west of the site	SW	16/12/2020
FLC_046-058	Gasholder No 4	Panorama from the centre of Gasholder No 4	Clock-wise from SSW	16/12/2020
FLC_059	Gasholder No 4	General view of the crown showing rivetted iron panels, crown vent and line of drilled holes	SE	16/12/2020
FLC_060	Gasholder No 5	General view of the south-east side of Gasholder No 5	SSW	16/12/2020
FLC_061	Gasholder No 5	General view of the south side of Gasholder No 5	SW	16/12/2020
FLC_062	Gasholder No 4	General view of the north side of Gasholder No 4	WNW	16/12/2020
FLC_063	Gasholder No 4	General view of the west side of Gasholder No 4	NNW	16/12/2020
FLC_064	Gasholder No 4	General view of the north-west side of Gasholder No 4	NW	16/12/2020
FLC_065-078	Panorama from Gasholder No 5	Panorama from the centre of Gasholder No 5	Clock-wise from S	16/12/2020
FLC_079	Gasholder No 5 tank	Detail view of below-ground brick tank with overflow pipework	ENE	16/12/2020
FLC_080	Gasholder No 5 roller carriages	General view of the four guide wheels and associated carriages set within a guide rail on the interior of a standard	E	16/12/2020
FLC_081	Gasholder No 5	General view of the crown and guide frame showing ladder access up the north side of the guide frame	S	16/12/2020
FLC_082	Site / Manholes	General view of grass covered ground with various manhole covers on the south side of Gasholder No 5	ESE	16/12/2020
FLC_083	Gasholder No 5 knock-off switches	General view of three knock-off switches on the south-east side of the tank	S	16/12/2020
FLC_084	Gasholder No 5 lifts	General view across the top curb of the crown, three lift tops and top of the tank and ground level	SW	16/12/2020
FLC_085	Gasholder No 5 overflow	Detail view of below ground pipework associated with the tank water on the south side of the holder	W	16/12/2020
FLC_086	Site / sunken ground	General view of sunken area to the south-west of Gasholder No 5	SE	16/12/2020

FLC_087	Site	General view of the grass-covered ground between Gasholder No 5 and the western site boundary	S	16/12/2020
FLC_088	Site / cable route	General view of concrete covered cable root between Gasholder No 5 and the western site boundary	NE	16/12/2020
FLC_089	Site / sunken ground	General view of the grass-covered ground between Gasholder No 5 and the north-west site boundary, including sunken area to the left of the foreground ranging rod	SW	16/12/2020
FLC_090	Site	General view of poorly preserved concrete covered ground surrounding Gasholder No 5	WSW	16/12/2020
FLC_091	Gasholder No 5 / cable route	General view of radio cables going from the exterior of the northern standard of Gasholder No 5 underground	ENE	16/12/2020
FLC_092	Gasholder No 5 / cable route	General view of the exterior of the northern standard of Gasholder No 5 showing cable route to radio aerials	ENE	16/12/2020
FLC_093	Site / radio building	General view of the presumed radio building connected to radio aerials on the north side of Gasholder No 5, situated outside the north site boundary	SE	16/12/2020
FLC_094	Gasholder No 5	General view of Gasholder No 5 showing cross-brace design guide frame as a variant of the Type 42 Livesey design	ENE	16/12/2020
FLC_095	Site	General view of the ground to the east of Gasholder No 5 with slight built gravel bank	NNW	16/12/2020
FLC_096	Site / Manhole	General view of ground on the east of Gasholder No 5 with manhole	SSE	16/12/2020
FLC_097	Site	General view of grass-covered ground between two fences situated between Gasholder No 5 and the site road	SE	16/12/2020
FLC_098	Site / cable route	General view of concrete block covered cable route on the east side of Gasholder No 5	NNW	16/12/2020
FLC_099	Site / sunken ground	General view of grass-covered ground between the south-east side of Gasholder No 5 and the site road	NE	16/12/2020
FLC_100	Site / Gasholder No 5	General view of the grass-covered built bank on the south-east side of Gasholder No 5	WSW	16/12/2020
FLC_101	Site	General view of overgrown ground on the south of Gasholder No 5 with metal-sheet covered pit	NE	16/12/2020
FLC_102	Site	General view of grass-covered ground to the south of Gasholder No 5 with concrete and metal features	N	16/12/2020
FLC_103	Site	General view of grass-covered ground to the south of Gasholder No 5 with concrete and metal features	NW	16/12/2020
FLC_104	Site / Gasholder No 5 in/outlet	General view of land to the south of Gasholder No 5 used for storage and Gasholder No 5 inlet and outlet (background)	W	16/12/2020
FLC_105	Holder discharge sample point	General view of pit used to check the discharged water from the holders holder	SE	16/12/2020
FLC_106	Holder discharge sample point / interceptor tank / pipework / site	General view of southern corner of the site with features from left to right: interceptor tank, above ground pipework, exposed below-ground pipework, holder discharge sample point, excavation area with exposed pipework and disused site pedestrian exit. Croydon plant visible in the background with steep-built bank separating the two sites	NW	16/12/2020
FLC_107	Pipework	General view of above-ground pipework timber-banked pit housing exposed below-ground pipework	WNW	16/12/2020
FLC_108	Pipework	General view of timber-banked pit housing exposed below-ground pipework	N	16/12/2020
FLC_109	Pipework / made ground	General view of excavation area in the south corner of the site with exposed pipework and visible line of previous made-ground	NW	16/12/2020
FLC_110	Site	General view of steep 2m high bank separating the site with Croydon Plant to the east	W	16/12/2020
FLC_111	Gasholder No 5	General view of the south side of Gasholder No 5	SW	16/12/2020
FLC_112	Interceptor tank	General view of brick-built and concrete-capped interceptor	S	16/12/2020

		tank with four inspection manholes		
FLC_113	Site / concrete blocks	General view of open ground in the south of the site with concrete blocks and dewatering apparatus	W	16/12/2020
FLC_114	Site / concrete blocks	General view of concrete block settings	SW	16/12/2020
FLC_115	Site / concrete blocks / electrical switch room / unidentified building	General view of area in the south of the site showing concrete block settings in the ground, red-brick electrical switch room and unidentified fibreglass building	SE	16/12/2020
FLC_116	Concrete block / unidentified building	General view of unidentified fibreglass building and rectangular concrete block setting in the ground	E	16/12/2020
FLC_117	Electrical switch room	General view of red-brick electrical switch room	W	16/12/2020
FLC_118	Electrical switch room	General view of electrical switch room interior with instrument panels	S	16/12/2020
FLC_119	Electrical switch room	General view of electrical switch room interior with instrument panels	WNW	16/12/2020
FLC_120	Pipework	General view of above-ground pipework on the south-west boundary of the site, and concrete block setting	NE	16/12/2020
FLC_121	Pipework	General view of above-ground pipework on the south-west boundary of the site, and concrete block setting	SE	16/12/2020
FLC_122	Site	General view of central area of the site with made ground and gravel covered areas and works huts	S	16/12/2020
FLC_123	Site	General view of cleared ground to the south-west of Gasholder No 4	NE	16/12/2020
FLC_124	Site / site road	General view central area of the site with works huts, site road and parking	E	16/12/2020
FLC_125	Gasholder No 4 in/outlets	General view of fenced area containing Gasholder No 4s inlet and outlet pipework	WNW	16/12/2020
FLC_126	Gasholder No 4	General view of stair structures on the west side of Gasholder No 4	WSW	16/12/2020
FLC_127	Gasholder No 4	General view of grass-covered area with concrete block setting on the west side of Gasholder No 4	NE	16/12/2020
FLC_128	Site road	General view of the site road situated between Gasholders Nos 4 and 5	SSW	16/12/2020
FLC_129	Site	General view of temporary works huts and car parking area in the centre of the site	N	16/12/2020
FLC_130	Site	General view of car parking area in the centre of the site with steep grass-covered bank leading up to Gasholder No 5 to the north	W	16/12/2020
FLC_131	Governor houses / Boiler house	General view of pipework and buildings in the centre of the site	SE	16/12/2020
FLC_132	Pipework	General view of above-ground pipework on the south-west site boundary	N	16/12/2020
FLC_133	Control room	General view of red-brick control room on the south-west boundary of the site	ENE	16/12/2020
FLC_134	Control room	General view of entrance area and toilet at the south-east end of the building	NE	16/12/2020
FLC_135	Control room	General view of switch panels in the central room	ESE	16/12/2020
FLC_136	Control room	General view of switch panels in the central room	WNW	16/12/2020
FLC_137	District governor house	General view of district governor house in the centre of the site	WSW	16/12/2020
FLC_138	Site / pipework / district governor house	General view of the central area of the site	NE	16/12/2020
FLC_139	High- pressure gas works	General view of modern high-pressure gasworks buildings and pipework to the west of the centre of the site	E	16/12/2020
FLC_140	High- pressure gas works / pipework	General view of the area to the west of the centre of the site with historic above-ground pipework and modern high-pressure gas buildings	SE	16/12/2020
FLC_141	Site / pipework	General view of cleared ground on the north boundary of the site	S	16/12/2020

FLC_142	Site / concrete base / pipework	General view of cleared area at the north boundary of the site with cleared ground, single concrete base and pipework	E	16/12/2020
FLC_143	Valve pits	General view of raised level valve pits on the western boundary of the site	E	16/12/2020
FLC_144	Valve pits	General view of valve pits in the western side of the site and raised platform on the western boundary	ESE	16/12/2020
FLC_145	Valve pits / pipework	General view of valve pits and pipework building into brick wall structure in the west area of the site	S	16/12/2020
FLC_146	High- pressure gas works	General view of the high-pressure gas works to the west of the centre of the site	NW	16/12/2020
FLC_147	Pipework	General view of above ground pipework at the north-west corner of the site	E	16/12/2020
FLC_148	Site	General view of the north-western corner of the site	ESE	16/12/2020
FLC_149	Site	General view of raised bank and pipework in the north-west corner of the site	NW	16/12/2020
FLC_150	Site / manholes	General view of various manholes at the north end of the south-west boundary of the site	NNW	16/12/2020
FLC_151	Site	General view of the tramway bordering the south-west side of the site	N	16/12/2020
FLC_152	Valve pits	General view of two metal-panel covered valve pits on the south-west boundary of the site	NNW	16/12/2020
FLC_153	Valve pit	General view into brick-built valve pit, showing ladder and single ladder step entries, Cameron ball valve, manual control wheel and pipework	ENE	16/12/2020
FLC_154	Valve pits	General view of brick-built, metal-panel covered valve pits	WSW	16/12/2020
FLC_155	Site	General view of cleared ground being used for storage near the south-west boundary of the site	NNW	16/12/2020
FLC_156	Site	General view of cleared ground along the south-west boundary of the site with steep bank leading to higher ground to the east, and disused pedestrian gate on the fence	NNW	16/12/2020
FLC_157	Valve pits	General view of area of valve pits and brick-work structures	SSE	16/12/2020
FLC_158	Valve pit	General view of possible infilled valve pit	ENE	16/12/2020
FLC_159	Site	General view of cleared area of land in the centre of the north boundary with built-up bank	W	16/12/2020
FLC_160	Site	General view of cleared area of land near the centre of the north boundary of the site showing three different site ground levels	NNW	16/12/2020
FLC_161	District governor house	General view of the exterior	ESE	16/12/2020
FLC_162	Site / Boiler house	General view of the boiler house exterior and steps leading to Gasholder No 5 in the centre of the site	WSW	16/12/2020
FLC_163	Boiler house	General view of the exterior	WNW	16/12/2020
FLC_164	Boiler house	General view of the interior showing two boilers and associated pipework	NNW	16/12/2020
FLC_165	Heat exchange	General view of disused heat exchange apparatus	WNW	16/12/2020
FLC_166	District governor house	General view of district governor instrumentation with regulars, pilots, gate valve and pipework	SSE	16/12/2020
FLC_167	Site	General view of temporary site works huts and car parking in the centre of the site	N	16/12/2020
FLC_168	Site	General view of steep grass-covered bank on the south side of Gasholder No 5	NNW	16/12/2020
FLC_169	Site / manhole	General view of manhole and concrete block set within the ground on the south side of Gasholder No 5	NNW	16/12/2020
FLC_170	Holder discharge sample point	General view of open pit and safety fencing	N	16/12/2020
FLC_171	Holder discharge sample point	Detail view of sign	SW	16/12/2020
FLC_172	Holder discharge sample	General view of brick pit, safety fencing and manhole cover	SE	16/12/2020

	point			
FLC_173	Pipework	General view	W	16/12/2020
FLC_174	Pipework pit	General view of timber shoring supporting the pit sides	N	16/12/2020
FLC_175	Site	General view of slope on the south boundary of the site, during survey it was being used as plant access for the pipelaying	WNW	16/12/2020
FLC_176	Whitetower Energy Croydon Plant	General view of buildings including tall chimney	W	16/12/2020
FLC_177	Site	Panorama from south to north-west of the site and surrounding land 1	NNW	16/12/2020
FLC_178	Site	Panorama from south to north-west of the site and surrounding land 2	NE	16/12/2020
FLC_179	Site	Panorama from south to north-west of the site and surrounding land 3	ENE	16/12/2020
FLC_180	Site	Panorama from south to north-west of the site and surrounding land 4	ESE	16/12/2020
FLC_181	Site	Panorama from south to north-west of the site and surrounding land 5	SE	16/12/2020
FLC_182	Site	Panorama from south to north-west of the site and surrounding land 6	S	16/12/2020
FLC_183	District governor house	General view of pipework and valves	E	16/12/2020
FLC_184	District governor house	General view of pipework and base of gate valve and pressure reducing governors	SSE	16/12/2020
FLC_185	District governor house	Detail view of pipe section showing bypass valve button, and embossed Donkin maker's mark and part serial number	SSE	16/12/2020
FLC_186	District governor house	General view of pipework, gate valves and pressure reducing governors	ENE	16/12/2020
FLC_187	District governor house	General view of pipework, gate valves and pressure reducing governors	NNE	16/12/2020
FLC_188	District governor house	General view of blanked pipework with gate valve at either end	NE	16/12/2020
FLC_189	District governor house	Detail view of blanked pipework with on/off valve switches	NNE	16/12/2020
FLC_190	District governor house	Detail view of remains of flow rate monitoring devices	ENE	16/12/2020
FLC_191	District governor house	General view of wall of pressure monitoring devices	NNE	16/12/2020
FLC_192	District governor house	Detail view of district pressure monitoring and control devices	ENE	16/12/2020
FLC_193	District governor house	Detail view of booster pressure control device and low district pressure start diaphragm	ENE	16/12/2020
FLC_194	District governor house	Detail view of Nos 1 and 2 jet booster on devices	ENE	16/12/2020
FLC_195	District governor house	Detail view of boosting increase and decrease monitoring devices	ENE	16/12/2020
FLC_196	District governor house	Detail view of grate access to underfloor pipework and controls	ENE	16/12/2020
FLC_197	Boiler house	General view of the north-west interior wall showing control and monitoring panels	SSE	16/12/2020
FLC_198	Boiler house	Detail view of pressurisation unit	WSW	16/12/2020
FLC_199	Boiler house	Detail view of Boiler 2 sign	WSW	16/12/2020
FLC_200	Boiler house	Detail view of on/off switches for heating pumps, boiler isolators and gas valve isolators	W	16/12/2020
FLC_201	Boiler house	Detail view of lagged pipework with heating gauges, open/shut valve and pump systems	W	16/12/2020
FLC_202	Pipework	General view of above ground pipework with safety fencing on its north-east side	NNE	16/12/2020
FLC_203	Valve pit	General view	WNW	16/12/2020
FLC_204	Valve pit	General view showing flooded pit	SSW	16/12/2020
FLC_205	Valve pit	General view showing pipe and valve	WNW	16/12/2020
FLC_206	Valve pit	General view showing pipe and valve	WNW	16/12/2020
FLC_207	Valve pit	General view showing pipe and valve	SSW	16/12/2020
FLC_208	Valve pit	General view showing blanked pipe	WNW	16/12/2020
FLC_209	Other structures	General view of instrumentation panel	SSW	16/12/2020

FLC_210	Pipework	General view of different gauges of pipe and valves	NW	16/12/2020
FLC_211	Pipework	Detail view of air operated valve	WSW	16/12/2020
FLC_212	Pipework	Detail view of CAMERON maker's mark and serial number on the top of the Cameron ball valve	SE	16/12/2020
FLC_213	Pipework	Detail view of AUDCO valve	NE	16/12/2020
FLC_214	Pipework	General view	NE	16/12/2020
FLC_215	Pipework	Detail view of GENERAL DESCALING CO LTD makers mark and operating instructions sign	NNW	16/12/2020
FLC_216	Pipework	Detail view of GENERAL DESCALING CO LTD makers mark and operating instructions sign	NNW	16/12/2020
FLC_217	Pipework	Detail view of valve open/shut switch	NNW	16/12/2020
FLC_218	Pipework	Detail view of embossed GENERAL DESCALING CO LTD WORKSOP ENGLAND maker's mark	ENE	16/12/2020
FLC_219	Pipework	Detail view of embossed GENERAL DESCALING CO LTD WORKSOP ENGLAND maker's mark	ENE	16/12/2020
FLC_220	Pipework	General view of entry point for intelligent pig	ENE	16/12/2020
FLC_221	Pipework	Detail view of AUDCO ENGLAND STEEL maker's mark and part serial number	SE	16/12/2020
FLC_222	Pipework	General view of AUDCO valve with open/shut control wheel	SE	16/12/2020
FLC_223	Pipework	General view of pipework with Cameron ball valves	E	16/12/2020
FLC_224	Pipework	Detail view of AUDCO valve open/shut switch	E	16/12/2020
FLC_225	Pipework	Detail view of AUDCO valve open/shut switch	NE	16/12/2020
FLC_226	Valve pit	General view showing pipe with Cameron ball valve	SW	16/12/2020
FLC_227	Valve pit	Detail view of Cameron ball valve	NE	16/12/2020
FLC_228	Valve pit	General view showing cover	N	16/12/2020
FLC_229	Valve pit	General view	N	16/12/2020
FLC_230	Valve pit	Detail view of narrow pipework emerging from concrete pit walls	NW	16/12/2020
FLC_231	Valve pit	Detail view of junction box	NW	16/12/2020
FLC_232	Valve pit	General view	NW	16/12/2020
FLC_233	Valve pit	General view showing curved pipe	NE	16/12/2020
FLC_234	Valve pit	General view showing pipework with Cameron ball valve and entry ladder within brick-built pit	SW	16/12/2020
FLC_235	Valve pit	Detail view of Cameron ball valve with maker's mark	S	16/12/2020
FLC_236	Valve pit	Detail view of entry ladder	SE	16/12/2020
FLC_237	Valve pit	Detail view of single entry ladder steps	SW	16/12/2020
FLC_238	Valve pit	General view	N	16/12/2020
FLC_239	Valve pit	Detail view of Cameron ball valve	NNE	16/12/2020
FLC_240	Valve pit	Detail view of outlet pressure instrumentation	NNE	16/12/2020
FLC_241	Valve pit	Detail view of iron bar step ladder embedded in the brick pit wall	NW	16/12/2020
FLC_242	Valve pit	General view of brick-built pit	SSW	16/12/2020
FLC_243	Valve pit	General view of brick-built pit showing blanked pipework	SSE	16/12/2020
FLC_244	Valve pit	Detail view of iron ladder embedded in brick pit wall and different base levels used for drainage	ESE	16/12/2020
FLC_245	Pipework	General view of above ground blanked pipe set within a brick - walled zone	ESE	16/12/2020
FLC_246	Pipework	General view of above ground blanked pipe set within a brick - walled zone	ESE	16/12/2020
FLC_247	Valve pits	General view of three valve pits with covers	NE	16/12/2020
FLC_248	Pipework	General view of above ground pipework	ENE	16/12/2020
FLC_249	Pipework	Detail view of Cameron ball valve	SW	16/12/2020
FLC_250	Pipework	Detail view of HP gas pipeline marker sign	WNW	16/12/2020
FLC_251	Security building	General view of interior east side	W	18/12/2020
FLC_252	Security building	General view of interior north wall with instrumentation panels	SE	18/12/2020
FLC_253	Security building	Detail view of Security Building Manufacturing Company Ltd sign	ESE	18/12/2020

FLC_254	Security building	Detail view of steel cable surround	N	18/12/2020
FLC_255	Security building	General view of exterior west wall	N	18/12/2020
FLC_256	Security building	General view of area to the south of the building	E	18/12/2020
FLC_257	Security building	General view of the exterior east wall	NE	18/12/2020
FLC_258	Gas supply building	General view of the exterior north and west walls	NW	18/12/2020
FLC_259	Electrical switch room	General view of the exterior north-east and north-west walls	N	18/12/2020
FLC_260	Electrical switch room	Detail view of exterior north corner showing brick wall construction, vent and various fixtures in the wall and concrete slab walkway around the base of the building	NW	18/12/2020
FLC_261	Unidentified building	General view of south-east and south-west exterior walls	S	18/12/2020
FLC_262	Site / Unidentified building	General view of concrete walkway	NE	18/12/2020
FLC_263	Electrical switch room	General view of monitoring and control panels	SW	18/12/2020
FLC_264	Electrical switch room	Detail view of monitoring and control panels	SW	18/12/2020
FLC_265	Electrical switch room	Detail view of monitoring and control panels	SW	18/12/2020
FLC_266	Electrical switch room	Detail view of monitoring and control panels	SW	18/12/2020
FLC_267	Electrical switch room	General view of booster motor	NW	18/12/2020
FLC_268	Site	General view of the open area to the south of the electrical switch room showing concrete settings	W	18/12/2020
FLC_269	Disused governor house	General view of exterior south-east and south-west walls	SSW	18/12/2020
FLC_270	Disused governor house	General view of empty interior showing lack of floor which allows the building to be overlain on pipework and governors that need protecting from the elements	SW	18/12/2020
FLC_271	Boundary wall	Detail view of remnants of adjoining structure	SSE	18/12/2020
FLC_272	Boundary wall	General view of brick and concrete wall	W	18/12/2020
FLC_273	Boundary wall	Detail view of concrete capped west end	WSW	18/12/2020
FLC_274	Pipework	Detail view of blanked pipework that was in the process of being replaced during the Phase I survey	SE	18/12/2020
FLC_275	Pipework	General view of above ground pipework	NW	18/12/2020
FLC_276	Site	General view of construction works in progress during the Phase I survey	NW	18/12/2020
FLC_277	Pipework	General view of above ground pipework	SE	18/12/2020
FLC_278	Site	General view of the site from outside the south-west boundary wall showing Gasholder No 5 framework and neighbouring Energy Plant chimney	S	18/12/2020
FLC_279	Pipework	Detail view of flange joint and supporting steel structure	S	18/12/2020
FLC_280	Pipework	General view showing cable ladder above the top pipe	SSE	18/12/2020
FLC_281	Boundary wall	Detail view of short stretch of brick and concrete boundary wall with inset pipe section	W	18/12/2020
FLC_282	Site	General view of the site from outside the south-west boundary wall showing Gasholder No 5 framework and neighbouring Energy Plant chimney	S	18/12/2020
FLC_283	Pipework	General view of above ground pipework with large bend appearing to have gone around something at some point	SE	18/12/2020
FLC_284	Pipework	General view of above ground pipework with various gauges of pipe and valves	S	18/12/2020
FLC_285	Site	General view of construction area live during Phase I survey	NW	18/12/2020
FLC_286	Site / Gasholder No 5	General view of the site showing proximity of Waddon Marsh tramstop to the south-west site boundary	SW	18/12/2020
FLC_287	Site / Gasholder No 5	General view of the site showing proximity of Waddon Marsh tramstop to the south-west site boundary	SW	18/12/2020
FLC_288	Site / Gasholder No 5	General view of the site showing proximity of tramlines to the south-west site boundary	SW	18/12/2020
FLC_289	Site	General view of the south-west boundary of the site showing built up bank and two lots of steel fencing	WNW	18/12/2020
FLC_290	Gasholder No 5	Detail view of the east side base of standard 1	E	17/12/2020
FLC_291	Gasholder No 5	Detail view of the west side base of standard 1	W	17/12/2020

FLC_292	Gasholder No 5	General view between standards 1 and 2	W	17/12/2020
FLC_293	Gasholder No 5	Detail view of pipework	S	17/12/2020
FLC_294	Gasholder No 5	Detail view of pipework	ESE	17/12/2020
FLC_295	Gasholder No 5	Detail view of the east side base of standard 2	SE	17/12/2020
FLC_296	Gasholder No 5	Detail view of the hook at the base of standard 2	S	17/12/2020
FLC_297	Gasholder No 5	General view between standards 2 and 3	SSE	17/12/2020
FLC_298	Gasholder No 5	Detail view of low knock-off switch and associated striker rod	SSW	17/12/2020
FLC_299	Gasholder No 5	Detail view of high knock-off switch (blue) and sunstock switch (yellow)	SSW	17/12/2020
FLC_300	Gasholder No 5	General view of high knock-off switch (blue) and sunstock switch (yellow)	W	17/12/2020
FLC_301	Gasholder No 5	General view between standards 3 and 4	S	17/12/2020
FLC_302	Gasholder No 5	Detail view of junction box	SSW	17/12/2020
FLC_303	Gasholder No 5	General view of various electronics	WNW	17/12/2020
FLC_304	Gasholder No 5	Detail view of the west side of standard 3 showing cable/pipe going up to swan neck	NW	17/12/2020
FLC_305	Gasholder No 5	Detail view of bolted and riveted joints, flange plate and gusset plate	S	17/12/2020
FLC_306	Gasholder No 5	General view of ladder attached to the guide frame to the north-west side of standard 4	SW	17/12/2020
FLC_307	Gasholder No 5	Detail view of access onto crown to the north-west of standard 4	SW	17/12/2020
FLC_308	Gasholder No 5	Detail view of pipe fixture set within the tank wall	SSE	17/12/2020
FLC_309	Gasholder No 5	Detail view of pipe fixture set within the tank wall	SSE	17/12/2020
FLC_310	Gasholder No 5	Detail view of pipe fixture set within the tank wall	SSE	17/12/2020
FLC_311	Gasholder No 5	Detail view of fixtures set in the top of the tank wall	SSE	17/12/2020
FLC_312	Gasholder No 5	Detail view of the south-west and north-west sides of the base of standard 5	NW	17/12/2020
FLC_313	Gasholder No 5	Detail view of flange plate on the exterior south-west base of standard 5	WSW	17/12/2020
FLC_314	Gasholder No 5	General view of the guide frame interior between standards 16 and 21	WSW	17/12/2020
FLC_315	Gasholder No 5	General view of the tops of the lifts between standards 5 and 6	W	17/12/2020
FLC_316	Gasholder No 5	Detail view of the tops of the lifts between standards 5 and 6 showing bolted and riveting construction	W	17/12/2020
FLC_317	Gasholder No 5	Detail view of valve put between standards 6 and 7	S	17/12/2020
FLC_318	Gasholder No 5	Detail view of the north and west sides of the base of standard 7	NW	17/12/2020
FLC_319	Gasholder No 5	Detail view of the guide rails set within the tank wall beneath standard 8	S	17/12/2020
FLC_320	Gasholder No 5	Detail view of glass viewing window into the bottom lift	SW	17/12/2020
FLC_321	Gasholder No 5	General view of crown	W	18/12/2020
FLC_322	Gasholder No 5	Detail view of the south and west sides of the base of standard 8 showing concrete ground setting	SW	18/12/2020
FLC_323	Gasholder No 5	Detail view of bolted fixture	WNW	18/12/2020
FLC_324	Gasholder No 5	General view of lift tops and handrails between standards 8 and 9	SSW	18/12/2020
FLC_325	Gasholder No 5	General view of electrical through boxes	E	18/12/2020
FLC_326	Gasholder No 5	General view of lift tops and handrails between standards 10 and 11	ENE	18/12/2020
FLC_327	Gasholder No 5	Detail view of the north-east and south-east sides of the guide roller carriages at standard 11	ESE	18/12/2020
FLC_328	Gasholder No 5	Detail view of the south-east sides of the guide roller carriages at standard 11	SE	18/12/2020
FLC_329	Gasholder No 5	Detail view of the north-east sides of the guide roller carriages at standard 11	ENE	18/12/2020
FLC_330	Gasholder No 5	Detail view of the north-east side of the guide rollers at	ENE	18/12/2020

		standard 11		
FLC_331	Gasholder No 5	Detail view of the north-west side of standard 12 showing rivets, flange plate and gusset plate	NNW	18/12/2020
FLC_332	Gasholder No 5	General view of the north-west side of standard 12	NNW	18/12/2020
FLC_333	Gasholder No 5	Detail view of the north-west side base of standard 12 showing rivets	NNW	18/12/2020
FLC_334	Gasholder No 5	Detail view of the north-west side base of standard 12 showing rivets	NNW	18/12/2020
FLC_335	Gasholder No 5	Detail view of guide rail set bolted to the tank interior	WSW	18/12/2020
FLC_336	Gasholder No 5	Detail view of the west side of the guide rollers at standard 13	WSW	18/12/2020
FLC_337	Gasholder No 5	Detail view of the west side of the bottom guide roller at standard 13	WSW	18/12/2020
FLC_338	Gasholder No 5	General view of the crown	NNW	18/12/2020
FLC_339	Gasholder No 5	General view of the interior of the guide frame between standards 15 and 21	WNW	18/12/2020
FLC_340	Gasholder No 5	Detail view of the top of the guide frame between standards 26 and 32	N	18/12/2020
FLC_341	Gasholder No 5	General view of the interior of the guide frame between standards 24 and 4	N	18/12/2020
FLC_342	Gasholder No 5	General view of through boxes to the west side of standard 14	NW	18/12/2020
FLC_343	Gasholder No 5	Detail view of tank wall showing brick construction with concrete cap	S	18/12/2020
FLC_344	Gasholder No 5	Detail view of riveted panel bottom tank wall	W	18/12/2020
FLC_345	Gasholder No 5	Detail view of bolted guide rail and bottom roller support construction	W	18/12/2020
FLC_346	Gasholder No 5	Detail view of guide rail attached to the tank wall, bolted lift top and riveted sheet bottom lift wall construction	E	18/12/2020
FLC_347	Gasholder No 5	General view of the lift tops between standards 14 and 15	NW	18/12/2020
FLC_348	Gasholder No 5	General view of the crown showing various fixtures	NW	18/12/2020
FLC_349	Gasholder No 5	Detail view of bolted joint of standard 15 and diagonal girder	NE	18/12/2020
FLC_350	Gasholder No 5	Detail view of bolted joint of standard 15 and diagonal girder	ESE	18/12/2020
FLC_351	Gasholder No 5	Detail view of bolted joint of standard 15 and diagonal girder	NE	18/12/2020
FLC_352	Gasholder No 5	Detail view of bolted joint of standard 16 and diagonal girder	NW	18/12/2020
FLC_353	Gasholder No 5	Detail view of bolted joint of standard 16 and diagonal girder	WNW	18/12/2020
FLC_354	Gasholder No 5	General view between standards 16 and 17	E	18/12/2020
FLC_355	Gasholder No 5	Detail view of the tank top showing brickwork and remnants of painted concrete capping	WNW	18/12/2020
FLC_356	Gasholder No 5	General view between standards 17 and 18	E	18/12/2020
FLC_357	Gasholder No 5	General view of knock-off switches and striker rod	ENE	18/12/2020
FLC_358	Gasholder No 5	General view of knock-off switches and electrical box	NNE	18/12/2020
FLC_359	Gasholder No 5	Detail view of electrical box	NNE	18/12/2020
FLC_360	Gasholder No 5	General view of extra high (purple) and extra low (red) knock-off switches with striker rod for extra low knock-off	NNE	18/12/2020
FLC_361	Gasholder No 5	Detail view of HAWKE CABLE GLANDS LTD signage on extra low knock-off switch	NNE	18/12/2020
FLC_362	Gasholder No 5	Detail view of extra high knock-off switch	NNE	18/12/2020
FLC_363	Gasholder No 5	Detail view of extra high knock-off electrical box	NNE	18/12/2020
FLC_364	Gasholder No 5	Detail view of the north-east and south-east side of the base of standard 18, with aerial cable housing affixed to the north-east side	ESE	18/12/2020
FLC_365	Gasholder No 5	Detail view of the guide frame ladder attached to the south-east side of standard 18	ESE	18/12/2020
FLC_366	Gasholder No 5	General view of the guide frame ladder attached to the guide frame and south-east side of standard 18	ESE	18/12/2020
FLC_367	Gasholder No 5	Detail view of the south-east side base of standard 18	ESE	18/12/2020
FLC_368	Gasholder No 5	Detail view of the south-east side of standard 18 showing rivet and bolt construction	ESE	18/12/2020

FLC_369	Gasholder No 5	Detail view of the south-east side of standard 18 showing rivet and bolt construction with attached cross brace girder	ESE	18/12/2020
FLC_370	Gasholder No 5	Detail view of the guide frame ladder attached to the south-east side of standard 18	NE	18/12/2020
FLC_371	Gasholder No 5	Detail view of cable housing covering gusset plate and flange plate on standard 18	NE	18/12/2020
FLC_372	Gasholder No 5	Detail view of cable housing covering gusset plate and flange plate on standard 18	NE	18/12/2020
FLC_373	Gasholder No 5	Detail view of cable housing covering gusset plate and flange plate and cross brace joint with standard 18	ESE	18/12/2020
FLC_374	Gasholder No 5	General view of standard 18 showing cable housing and guide frame ladder to the south-east	ESE	18/12/2020
FLC_375	Gasholder No 5	General view of the upper half of standard 18 showing cable reaching aerials on the top of the guide frame	ENE	18/12/2020
FLC_376	Gasholder No 5	General view of guide-frame ladder situated between standards 18 and 19	ENE	18/12/2020
FLC_377	Gasholder No 5	Detail view of narrow pipe attached to the north side of standard 19 and crossing the guide frame to standard 18	NE	18/12/2020
FLC_378	Gasholder No 5	General view of guide frame between standards 18 and 19 showing disconnected pipe going between the two	SW	18/12/2020
FLC_379	Gasholder No 5	Detail view of narrow pipe affixed to the guide frame approximately halfway up the guide frame between standards 18 and 19	SW	18/12/2020
FLC_380	Gasholder No 5	General view of through boxes between standards 18 and 19	SSW	18/12/2020
FLC_381	Gasholder No 5	Detail view of brick-built tank and surrounding concrete hard-core ground in disrepair	SSE	18/12/2020
FLC_382	Gasholder No 5	Detail view of the top curb showing rivets and flange plate	NNW	18/12/2020
FLC_383	Gasholder No 5	Detail view of the top curb showing rivets, flange plate and riveted wall of the top wall of the bell	NNW	18/12/2020
FLC_384	Gasholder No 5	Detail view of the top curb and top of the top lift showing rivets, flange plate, riveted wall of the top wall of the bell, bolted construction of the lift and hose	NNW	18/12/2020
FLC_385	Gasholder No 5	Detail view of the lift tops between standards 20 and 21 showing heating tapes and cable/tube settings	NNW	18/12/2020
FLC_386	Gasholder No 5	Detail view of crown vent situated between standards 20 and 21	NE	18/12/2020
FLC_387	Gasholder No 5	Detail view of middle and bottom lift tops between standards 20 and 21 showing vent tubes added during decommissioning works	N	18/12/2020
FLC_388	Gasholder No 5	Detail view of glass viewing windows situated to the north side of standard 22	E	18/12/2020
FLC_389	Gasholder No 5	Detail view of riveted sheet wall to the outside of the bottom lift between standards 21 and 22	E	18/12/2020
FLC_390	Gasholder No 5	Detail view of bolt on the base of standard 22	N	18/12/2020
FLC_391	Gasholder No 5	Detail view of riveted sheet construction on the outside wall of the bottom lift between standards 22 and 23	ESE	18/12/2020
FLC_392	Gasholder No 5	Detail view of oil well on the bottom lift between standards 22 and 23	ESE	18/12/2020
FLC_393	Gasholder No 5	Detail view of hook on the east side of standard 23	ESE	18/12/2020
FLC_394	Gasholder No 5	General view of lift tops between standards 23 and 24	ENE	18/12/2020
FLC_395	Gasholder No 5	General view of swan necks between standards 27 and 4	ENE	18/12/2020
FLC_396	Gasholder No 5	Detail view of the base of standard 24 showing cable housing	SSE	18/12/2020
FLC_397	Gasholder No 5	Detail view of the middle of the south-east and south-west sides of standard 24	SSE	18/12/2020
FLC_398	Gasholder No 5	General view of the top half of standard 24 south-east and south-west sides	SSE	18/12/2020
FLC_399	Gasholder No 5	General view of the south-east side of standard 24 showing	SE	18/12/2020

		cable housing		
FLC_400	Gasholder No 5	General view of the lift tops between standards 24 and 25	ENE	18/12/2020
FLC_401	Gasholder No 5	Detail view of lift tops between standards 24 and 25 showing oil well, bolted and riveted construction and cable settings	ENE	18/12/2020
FLC_402	Gasholder No 5	General view of the interior of the guide frame between standards 1 and 7 showing ladder between standards 4 and 5	E	18/12/2020
FLC_403	Gasholder No 5	Detail view of swan necks and base of guide frame ladder between standards 3 and 5	E	18/12/2020
FLC_404	Gasholder No 5	General view of the interior of the guide frame between standards 15 and 22 showing ladder between standards 18 and 19	S	18/12/2020
FLC_405	Gasholder No 5	Detail view of ladder and pipe halfway up the guide frame between standards 18 and 19	S	18/12/2020
FLC_406	Gasholder No 5	General view of crown showing cotter plate	SE	18/12/2020
FLC_407	Gasholder No 5	General view of overflow pipe between standards 25 and 26	ENE	18/12/2020
FLC_408	Gasholder No 5	Detail view of overflow pipe between standards 25 and 26	NNW	18/12/2020
FLC_409	Gasholder No 5	General view of oil service pipe	ENE	18/12/2020
FLC_410	Gasholder No 5	Detail view of oil service pipe	ENE	18/12/2020
FLC_411	Gasholder No 5	General view of lift tops between standards 25 and 26 showing overflow point in the top of the tank wall	S	18/12/2020
FLC_412	Gasholder No 5	Detail view of bolted stanchion construction of the lift tops to add rigidity to the lift walls, between standards 25 and 26	SE	18/12/2020
FLC_413	Gasholder No 5	Detail view of bolted stanchion construction of the lift tops to add rigidity to the lift walls, between standards 25 and 26	SE	18/12/2020
FLC_414	Gasholder No 5	General view of the guide frame exterior between standards 25 and 26 showing a metal fixture near the top	S	18/12/2020
FLC_415	Gasholder No 5	General view of the lower third of the south-west side of standard 25	SW	18/12/2020
FLC_416	Gasholder No 5	Detail view of the south-west side of the base of standard 25	SW	18/12/2020
FLC_417	Gasholder No 5	Detail view of the north-east side of the base of standard 26	ENE	18/12/2020
FLC_418	Gasholder No 5	General view between standards 26 and 27 showing handrails cut for water draining procedure	SSW	18/12/2020
FLC_419	Gasholder No 5	Detail view of cable going into the tank from the	ENE	18/12/2020
FLC_420	Gasholder No 5	General view of demolition water drainage works having cut the handrails between standards 26 and 27	SSE	18/12/2020
FLC_421	Gasholder No 5	Detail view of the east and south sides of the base of standard 27 showing position of antifreeze tank level cable change box	SE	18/12/2020
FLC_422	Gasholder No 5	Detail view of antifreeze tank level cable change box	SSE	18/12/2020
FLC_423	Gasholder No 5	General view of antifreeze tank level cable change box	SSE	18/12/2020
FLC_424	Gasholder No 5	Detail view of guide frame between standards 27 and 28 showing central joint of diagonal bracing girders	SW	18/12/2020
FLC_425	Gasholder No 5	General view of tank top-up above ground pipework	WSW	18/12/2020
FLC_426	Gasholder No 5	General view of pipework and electrical boxes	SW	18/12/2020
FLC_427	Gasholder No 5	General view of two cotter plates related to the gas inlet and outlets	S	18/12/2020
FLC_428	Gasholder No 5	Detail view of guide rollers at standard 1	E	18/12/2020
FLC_429	Gasholder No 5	Detail view of guide rail attached to the tank wall going into the tank	ENE	18/12/2020
FLC_430	Gasholder No 5	Detail view of guide rail attached to the tank wall going into the tank	ENE	18/12/2020
FLC_431	Gasholder No 5	Detail view of float device monitoring the tank water level	W	18/12/2020
FLC_432	Gasholder No 5	Detail view of float device monitoring the tank water level	SE	18/12/2020
FLC_433	Gasholder No 5	Detail view of float device monitoring the tank water level	SE	18/12/2020
FLC_434	Gasholder No 5	Detail view of electrical boxes related to float devices monitoring the water levels within the cup and grips	S	18/12/2020
FLC_435	Gasholder No 5	General view between standards 28 and 1 showing water float device monitoring apparatus	SW	18/12/2020

FLC_436	Gasholder No 5	Detail view of guide frame	E	18/12/2020
FLC_437	Gasholder No 5	Detail view of guide frame	E	18/12/2020
FLC_438	Gasholder No 5	General view of the centre of the crown showing riveted sheet construction, crown vent and aeration holes cut during decommissioning works	NE	18/12/2020
FLC_439	Gasholder No 5	Detail of central crown vent	E	18/12/2020
FLC_440	Gasholder No 5	Detail of HOLMES embossed makers mark on the central crown vent	NW	18/12/2020
FLC_441	Gasholder No 5	Detail view of open/shut wheel on central crown vent	SE	18/12/2020
FLC_442	Gasholder No 5	General view of crown showing riveted sheet construction and decommissioning vent points	ENE	18/12/2020
FLC_443	Gasholder No 5	Detail view of central crown vent and bolted circular fixture	W	18/12/2020
FLC_444	Gasholder No 5	General view of the top of the crown showing riveted sheet construction, crown vents, areas of repair and decommissioning vent points	NNE	18/12/2020
FLC_445	Gasholder No 5	Detail view of cotter plate and crown vent on the south-west side of the crown	SW	18/12/2020
FLC_446	Gasholder No 5	Detail view of circular bolted fixture on the south side of the crown	SSW	18/12/2020
FLC_447	Gasholder No 5	Detail view of two cotter plates on the south side of the crown related to the gas inlet and outlet pipes	S	18/12/2020
FLC_448	Gasholder No 5	Detail view of the crown showing rivets larger at the outer edge of the crown with additional flange plates at the top curb of the bell	W	18/12/2020
FLC_449	Gasholder No 5	Detail view of multiple circular repair patches on the crown	SSW	18/12/2020
FLC_450	Gasholder No 5	Detail view of glycol pot on the south side of the crown	SSW	18/12/2020
FLC_451	Gasholder No 5	Detail view of break in handrails and hole in crown from dewatering works	ENE	18/12/2020
FLC_452	Gasholder No 5	General view of south-east side of crown showing square hole and cylindrical vents cut to aerate the bell during the decommissioning works	SE	18/12/2020
FLC_453	Gasholder No 5	Detail view of cotter plate on the south-east side of the crown	SE	18/12/2020
FLC_454	Gasholder No 5	Detail view of crown vent on the east side of the crown	SSE	18/12/2020
FLC_455	Gasholder No 5	Detail view of circular bolted fixture on the east side of the crown	SSE	18/12/2020
FLC_456	Gasholder No 5	General view of the east side of the crown showing areas of rust and circular repair patches	ENE	18/12/2020
FLC_457	Gasholder No 5	Detail view of cotter plate on the north-east side of the crown	NE	18/12/2020
FLC_458	Gasholder No 5	General view of the north side of the crown showing large repair patches and circular bolted fixture	E	18/12/2020
FLC_459	Gasholder No 5	Detail view of cotter plate on the north-west side of the crown	NW	18/12/2020
FLC_460	Gasholder No 5	Detail view of cotter plate and crown vent on the south-west side of the crown	W	18/12/2020
FLC_461	Gasholder No 5	Detail view of overflow pipe between standards 4 and 5	E	18/12/2020
FLC_462	Gasholder No 5	General view of swan necks between standards 1 and 2, and 27 and 28	NNW	18/12/2020
FLC_463	Gasholder No 5	General view of swan necks between standards 3 and 4	N	18/12/2020
FLC_464	Gasholder No 5	General view between standards 4 and 5 showing access platform onto the crown	NNE	18/12/2020
FLC_465	Gasholder No 5	Detail view of gusset plate attaching diagonal cross braces to standard 5	ENE	18/12/2020
FLC_466	Gasholder No 5	Detail view of diagonal cross braces attached to standard 5	WSW	18/12/2020
FLC_467	Gasholder No 5	Detail view of diagonal cross braces attached to standard 5	W	18/12/2020
FLC_468	Gasholder No 5	Detail view of diagonal cross braces attached to standard 5	SSW	18/12/2020
FLC_469	Gasholder No 5	Detail view of diagonal cross braces attached to standard 5	SSE	18/12/2020
FLC_470	Gasholder No 5	General view of top up pump housing and brick step access	SE	18/12/2020
FLC_471	Gasholder No 5	Detail view of top up pump housing	SE	18/12/2020

FLC_472	Gasholder No 5	Detail view of top up pump	S	18/12/2020
FLC_473	Gasholder No 5	General view of top up pump housing	SW	18/12/2020
FLC_474	Gasholder No 5	Detail view of top up pump sign	S	18/12/2020
FLC_475	Gasholder No 5	Detail view of previous concrete and steel fixture	SW	18/12/2020
FLC_476	Gasholder No 5	General view of pipework set within a horseshoe shaped brick-walled area	S	18/12/2020
FLC_477	Gasholder No 5	Detail view of tall pipework within a horseshoe shaped brick-walled area	SE	18/12/2020
FLC_478	Gasholder No 5	Detail view of pipework and diaphragm valves within a horseshoe shaped brick-walled area	S	18/12/2020
FLC_479	Gasholder No 5	General view of pipework within horse-shaped brick-walled area	SE	18/12/2020
FLC_480	Gasholder No 5	General view of area to the south of Gasholder No 5 showing horseshoe-shaped brick-walled area containing pipework related to the holder, brick step access up to the gasholder and concrete block with cut off iron bars in the foreground	S	18/12/2020
FLC_481	Gasholder No 5	Detail view of concrete block with cut off iron vertical bars	N	18/12/2020
FLC_482	Gasholder No 5	Detail view of detached hollow iron bar fixtures		18/12/2020
FLC_483	Gasholder No 5	Detail view of concrete block with cut off iron vertical bars		18/12/2020
FLC_484	Gasholder No 5	Detail view of concrete block with cut off iron vertical bars	W	18/12/2020
FLC_485	Gasholder No 5	Detail view of steel handrail bolted to the brick stairs to the south of Gasholder No 5	SE	18/12/2020
FLC_486	Gasholder No 4	General view of two guide rails and ladders on the north-west side of Gasholder No 4	SW	18/12/2020
FLC_487	Gasholder No 4	General view of the crown – panorama 1	WSW	18/12/2020
FLC_488	Gasholder No 4	General view of the crown – panorama 2	W	18/12/2020
FLC_489	Gasholder No 4	General view of the crown – panorama 3	NW	18/12/2020
FLC_490	Gasholder No 4	General view of the crown – panorama 4	NNW	18/12/2020
FLC_491	Gasholder No 4	General view of the two guide rails and ladders on the south-west side of Gasholder No 4	NNW	18/12/2020
FLC_492	Gasholder No 4	Detail view of crown valve on the west side of the crown	WSW	18/12/2020
FLC_493	Gasholder No 4	Detail view of outer middle lift guide rail and stair showing platform on exterior west side	SSW	18/12/2020
FLC_494	Gasholder No 4	Detail view of bottom lift tangential rollers structure on the west side of Gasholder No 4	WSW	18/12/2020
FLC_495	Gasholder No 4	General view of lift tops and tangential roller pairs beneath the west side stair structure	SW	18/12/2020
FLC_496	Gasholder No 4	Detail view of pipe used to maintain oil levels within the oil-filmed tank	SW	18/12/2020
FLC_497	Gasholder No 4	Detail view of pipe used to maintain oil levels within the oil-filmed tank	SW	18/12/2020
FLC_498	Gasholder No 4	Detail view of gap in handrails cut during decommissioning works	NW	18/12/2020
FLC_499	Gasholder No 4	Detail view of lift tops on the north-west side of the holder showing rubber tubing held in place by steel brackets	NW	18/12/2020
FLC_500	Gasholder No 4	Detail view of lift tops on the north-west side of the holder showing vent points added during decommissioning works	WNW	18/12/2020
FLC_501	Gasholder No 4	Detail view of the north-west side of the holder showing knock-off striker arm, glycol pot and electrical boxes	SW	18/12/2020
FLC_502	Gasholder No 4	Detail view of glycol pot and rubber tubing leading into the bell on the north-west side of the crown	SW	18/12/2020
FLC_503	Gasholder No 4	Detail view of lift tops showing riveted flange plate	SW	18/12/2020
FLC_504	Gasholder No 4	Detail view of the outer wall of the bottom lift showing riveted steel sheet design and diagonal guide rail and disconnected fixture with rubber tubing going down into the tank within a steel pipe length	WSW	18/12/2020
FLC_505	Gasholder No 4	Detail view of large striker arm on the north-west side of the	W	18/12/2020

		holder		
FLC_506	Gasholder No 4	Detail view of purple and red striker plate affixed to the tank wall on the north-west side of the holder	WNW	18/12/2020
FLC_507	Gasholder No 4	General view of the north side of the holder showing lift tops, had rails and pairs of tangential rollers	WNW	18/12/2020
FLC_508	Gasholder No 4	Detail view of bottom and middle lift pairs of tangential rollers on the NNW of the holder	W	18/12/2020
FLC_509	Gasholder No 4	Detail view of concrete slab surround capping the top of the tank with bolts showing the setting of a previous fixture	ENE	18/12/2020
FLC_510	Gasholder No 4	General view of the north-west side of the holder showing hand rails, crown and above ground guide rail structures	NE	18/12/2020
FLC_511	Gasholder No 4	General view of the north-east side of the holder	WNW	18/12/2020
FLC_512	Gasholder No 4	Detail view of pairs of tangential rollers on the north side of the structure	NNE	18/12/2020
FLC_513	Gasholder No 4	Detail view of a pair of tangential rollers	E	18/12/2020
FLC_514	Gasholder No 4	General view of the lift tops and tangential rollers	E	18/12/2020
FLC_515	Gasholder No 4	General view of the north-east side of the holder	NW	18/12/2020
FLC_516	Gasholder No 4	Detail view of the outer wall of the bottom lift showing riveted steel sheet construction and diagonal guide rail	NW	18/12/2020
FLC_517	Gasholder No 4	Detail view of the crown showing riveted steel sheets and additional flange plates at the outer edge	N	18/12/2020
FLC_518	Gasholder No 4	General view of the east side of the holder	NNW	18/12/2020
FLC_519	Gasholder No 4	Detail view of the outer wall of the bottom lift showing riveted steel sheet construction and diagonal guide rail	NNW	18/12/2020
FLC_520	Gasholder No 4	Detail view of the concrete slab construction on the top of the tank wall and hardcore ground surrounding the holder	SSE	18/12/2020
FLC_521	Gasholder No 4	General view of the east side of the holder showing electrical boxes attached to the handrails	NNW	18/12/2020
FLC_522	Gasholder No 4	General view east side of the crown – panorama 1	NNE	18/12/2020
FLC_523	Gasholder No 4	General view east side of the crown – panorama 2	NE	18/12/2020
FLC_524	Gasholder No 4	General view east side of the crown – panorama 3	ENE	18/12/2020
FLC_525	Gasholder No 4	General view east side of the crown – panorama 4	E	18/12/2020
FLC_526	Gasholder No 4	General view east side of the crown – panorama 5	ESE	18/12/2020
FLC_527	Gasholder No 4	General view east side of the crown – panorama 6	SSE	18/12/2020
FLC_528	Gasholder No 4	Detail view of electrical boxes attached to the handrails on the east side of the holder	ESE	18/12/2020
FLC_529	Gasholder No 4	General view of the east side of the holder	SSE	18/12/2020
FLC_530	Gasholder No 4	Detail view of the lift tops showing a bolted repair patch	ESE	18/12/2020
FLC_531	Gasholder No 4	Detail view of anti-freeze tank level cable change box and cut-off swan neck	ENE	18/12/2020
FLC_532	Gasholder No 4	Detail view of anti-freeze tank level cable change box	SE	18/12/2020
FLC_533	Gasholder No 4	General view of rubber tubing and swan necks on the south-east side of the holder	SW	18/12/2020
FLC_534	Gasholder No 4	General view of sunstock and high knock-off switches on the south-east side of the holder	ENE	18/12/2020
FLC_535	Gasholder No 4	Detail view of sunstock knock-off switch	SSE	18/12/2020
FLC_536	Gasholder No 4	Detail view of high knock-off switch	SSE	18/12/2020
FLC_537	Gasholder No 4	Detail view of hardcore ground surrounding the tank	ENE	18/12/2020
FLC_538	Gasholder No 4	Detail view of displaced striker plate related to the knock-off switches	SW	18/12/2020
FLC_539	Gasholder No 4	Detail view of old guide rails affixed beneath the 1954 pairs of tangential rollers	E	18/12/2020
FLC_540	Gasholder No 4	General view of the lift tops and pairs of tangential guide rollers on the south side of the holder	ESE	18/12/2020
FLC_541	Gasholder No 4	Detail view of two pairs of tangential rollers related to the bottom and middle lifts going in different directions	SE	18/12/2020
FLC_542	Gasholder Nos 4 & 5	General view of the south-east side of Gasholder No 5 and the	SE	18/12/2020

		south-west side of the crown of Gasholder No 4		
FLC_543	Gasholder No 4	General view of the guide rails and stairs on the south-west side of the holder	E	18/12/2020
FLC_544	Gasholder No 4	Detail view of the low level platform on the middle lift guide rail and stair structure on the south-west side of the holder	SSE	18/12/2020
FLC_545	Gasholder No 4	General view of the electrical boxes on the SSW side of the holder	SW	18/12/2020
FLC_546	Gasholder No 4	Detail view of the guide rail and stairs structures on the south-west side of the holder	ESE	18/12/2020
FLC_547	Gasholder No 4	Detail view of fixtures and fittings beneath the south-west middle lift stair showing raised rubber tubing, electrical boxes and tank float switch	S	18/12/2020
FLC_548	Gasholder No 4	Detail view of tank float switch	SE	18/12/2020
FLC_549	Gasholder No 4	Detail view of south-west middle lift	WNW	18/12/2020
FLC_550	Gasholder No 4	Detail view of overflow pipework	SSE	18/12/2020
FLC_551	Gasholder No 4	General view of guide rail and stair structures on the south-west of the holder	NNW	18/12/2020
FLC_552	Gasholder No 4	Detail view of the stair and guide rail structure for the south-west bottom lift	N	18/12/2020
FLC_553	Gasholder No 4	Detail view of access onto the bottom lift from the base of the south-west bottom lift guide rail and stair structure	WNW	18/12/2020
FLC_554	Gasholder No 4	Detail view of handrails cut during decommissioning works to allow access onto the crown	SW	18/12/2020
FLC_555	Gasholder No 4	Detail view of the base of the top lift guide rail and stair structure, showing gap in handrail allowing access onto the top lift	NW	18/12/2020
FLC_556	Gasholder No 4	Detail view of brick tank wall with large stone setting	NE	18/12/2020
FLC_557	Gasholder No 4	Detail view of original vertical guide rails set within the brick tank wall	N	18/12/2020
FLC_558	Gasholder No 4	Detail view of gap in handrails cut during decommissioning works allowing access onto the crown and a better view of the pairs of tangential guide rollers	WSW	18/12/2020
FLC_559	Gasholder No 4	Detail view of the riveted steel sheet constructions of the lift walls	WSW	18/12/2020
FLC_560	Gasholder No 4	Detail view of pair of tangential guide rollers	NNW	18/12/2020
FLC_561	Gasholder No 4	Detail view of pipe partial submerged below ground	NNW	18/12/2020
FLC_562	Gasholder No 4	Detail view of rubber tubing supported by caging and swan neck	SSW	18/12/2020
FLC_563	Gasholder No 4	General view of the stair and guide rail structures on the WNW side of the holder	SSW	18/12/2020
FLC_564	Gasholder No 4	Detail view of removed cotter plates with grate covers added during decommissioning works	W	18/12/2020
FLC_565	Gasholder No 4	Detail view of pipework going into the tank on the west side of the holder	WSW	18/12/2020
FLC_566	Gasholder No 4	Detail view of pipework going into the tank on the west side of the holder	S	18/12/2020
FLC_567	Gasholder No 4	General view of caging for rubber tubing on the west side of the holder	SSW	18/12/2020
FLC_568	Gasholder No 4	Detail view of caging for rubber tubing on the west side of the holder	SSW	18/12/2020
FLC_569	Gasholder No 4	General view of caging and swan necks for rubber tubing on the west side of the holder	NNW	18/12/2020
FLC_570	Gasholder No 4	Detail view of stair and guide rail structure on the north-west side of the holder showing pair of tangential guide rollers	SSW	18/12/2020
FLC_571	Gasholder No 4	Detail view of stair and guide rail structure for the outer lift on the north-west side of the holder	SSW	18/12/2020
FLC_572	Gasholder No 4	Detail view of low-level platform on the exterior of the middle lift guide rail and stair structure on the north-west side of the	SSW	18/12/2020

		holder		
FLC_573	Gasholder No 4	Detail view of the base of the stair and guide rail structures on the north-west side of the holder showing breaks in the handrails to allow access onto the next lift	WNW	18/12/2020
FLC_574	Gasholder No 4	General view of the west side of the crown showing riveted steel sheet construction	SSE	18/12/2020
FLC_575	Gasholder No 4	Detail view of riveted steel sheet construction with additional rivet rows and flange plates near the top curb	SSE	18/12/2020
FLC_576	Gasholder No 4	General view of the centre of the crown showing riveted steel sheet construction, two crown vents and four decommissioning works vent points	SSW	18/12/2020
FLC_577	Gasholder No 4	Detail view of crown vent to the south-east of the crown centre	W	18/12/2020
FLC_578	Gasholder No 4	General view of the lift top and top curb	SSE	18/12/2020
FLC_579	Gasholder No 4	General view of overgrown fenced-off inlet and outlet pipework area	NE	18/12/2020
FLC_580	Gasholder No 4	General view of overgrown fenced-off inlet and outlet pipework area	W	18/12/2020
FLC_581	Gasholder No 4	Detail view of overgrown fenced-off inlet and outlet pipework area	W	18/12/2020
FLC_582	Gasholder No 4	Detail view of electrical fixture related to Gasholder No 4	N	18/12/2020
FLC_583	Gasholder No 4	Detail view of electrical fixture related to Gasholder No 4	WSW	18/12/2020
FLC_584	Gasholder No 4 interior	Detail view of the centre of the crown support frame top	NNE	04/05/21
FLC_585	Gasholder No 4 interior	Detail view of the top of the crown support frame centre post	NNE	04/05/21
FLC_586	Gasholder No 4 interior	General view of the bases of the timber uprights of the crown support frame	WNW	04/05/21
FLC_587	Gasholder No 4 interior	General view of the different rings of uprights of the crown support frame and pipework	N	04/05/21
FLC_588	Gasholder No 4 interior	Detail view of the concrete line settings on the dumpling of the crown support frame uprights	N	04/05/21
FLC_589	Gasholder No 4 interior	Detail view of the concrete line settings on the dumpling of the crown support frame uprights	NE	04/05/21
FLC_590	Gasholder No 4 interior	General view of the top of the crown support frame	NE	04/05/21
FLC_591	Gasholder No 4 interior	Detail view of pipe cemented into the WSW of the dumpling	ENE	04/05/21
FLC_592	Gasholder No 4 interior	General view of the gas inlet/outlet pipes	ENE	04/05/21
FLC_593	Gasholder No 4 interior	General view of different rings of timber uprights of the crown support frame	ENE	04/05/21
FLC_594	Gasholder No 4 interior	General view of different rings of timber uprights of the crown support frame	SE	04/05/21
FLC_595	Gasholder No 4 interior	Detail view of the top of the gas inlet/outlet pipes and their associated inspection cotter plates removed from the crown above	ENE	04/05/21
FLC_596	Gasholder No 4 interior	Detail view of pipe attached to the upright on the WSW of the crown support frame	ESE	04/05/21
FLC_597	Gasholder No 4 interior	General view of the crown support frame	WSW	04/05/21
FLC_598	Gasholder No 4 interior	General view of the crown support frame	W	04/05/21
FLC_599	Gasholder No 4 interior	General view of the crown support frame	NW	04/05/21
FLC_600	Gasholder No 4 interior	General view of the crown support frame	NNW	04/05/21
FLC_601	Gasholder No 4 interior	General view of the crown support frame	N	04/05/21
FLC_602	Gasholder No 4 interior	General view of the crown support frame	NNE	04/05/21
FLC_603	Gasholder No 4 interior	General view of the crown support frame	N	04/05/21
FLC_604	Gasholder No 4 interior	General view of the crown support frame	NNW	04/05/21
FLC_605	Gasholder No 4 interior	General view of the crown support frame	NNE	04/05/21
FLC_606	Gasholder No 4 interior	General view of the crown support frame	NE	04/05/21
FLC_607	Gasholder No 4 interior	General view of the crown support frame	E	04/05/21
FLC_608	Gasholder No 4 interior	General view of the crown support frame	SE	04/05/21
FLC_609	Gasholder No 4 interior	General view of the crown support frame	ENE	04/05/21
FLC_610	Gasholder No 4 interior	General view of the crown support frame	SE	04/05/21

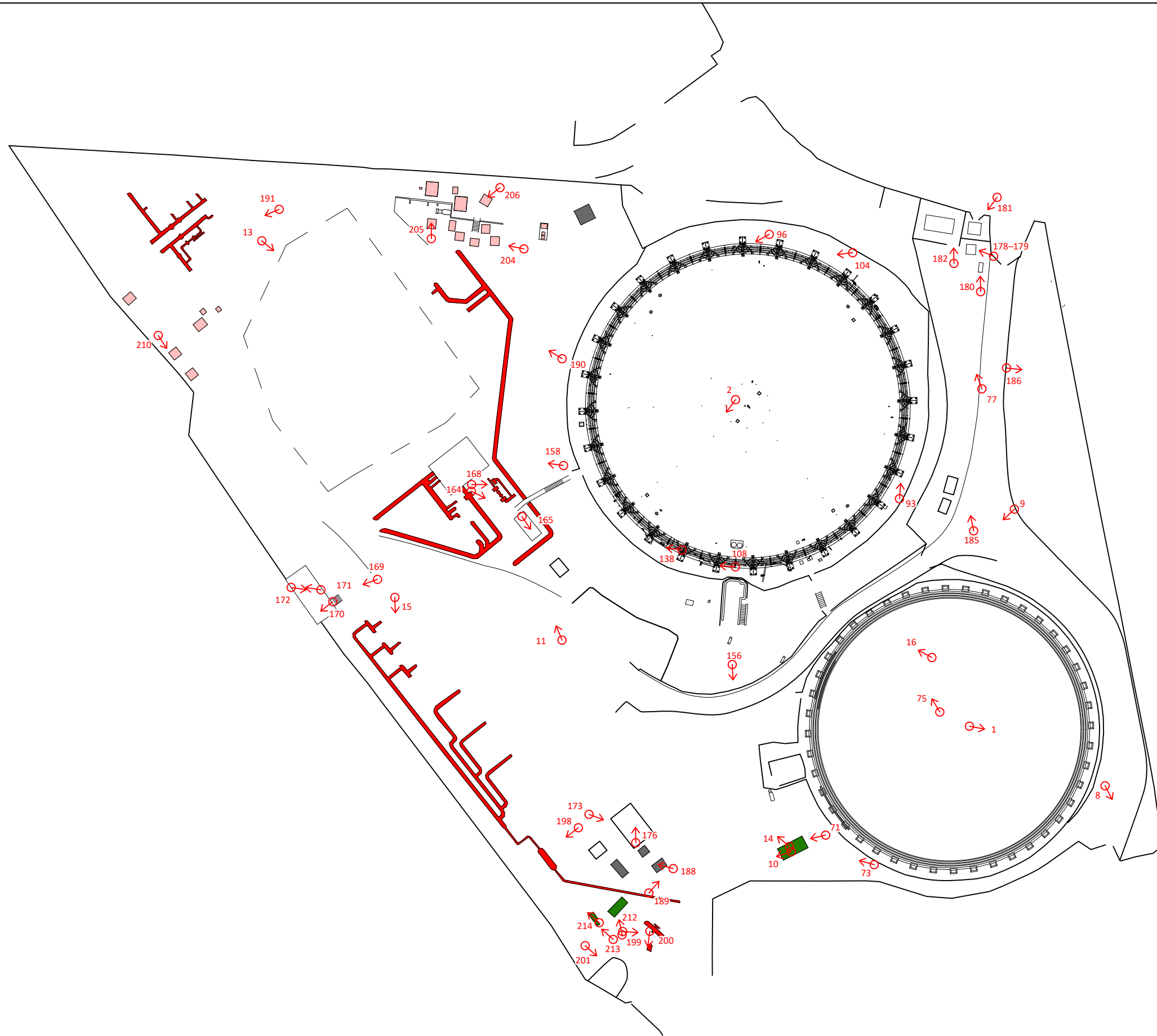
FLC_611	Gasholder No 4 interior	General view of the crown support frame	SSE	04/05/21
FLC_612	Gasholder No 4 interior	General view of the crown support frame	SSE	04/05/21
FLC_613	Gasholder No 4 interior	General view of the access ramp used during demolition	SSW	04/05/21
FLC_614	Gasholder No 4 interior	Detail view of the crown support frame top showing metal settings between timbers and small timber props	SE	04/05/21
FLC_615	Gasholder No 4 interior	Detail view of a base of an innermost ring upright of the crown support frame	NNW	04/05/21
FLC_616	Gasholder No 4 interior	Detail view of the cross timbers connecting the uprights of the innermost ring of the crown support frame	NE	04/05/21
FLC_617	Gasholder No 4 interior	Detail view of the pipes attached to uprights of the crown support frame on the WSW of the gasholder	NNE	04/05/21
FLC_618	Gasholder No 4 interior	General view of the top of the crown support frame	NE	04/05/21
FLC_619	Gasholder No 4 interior	General view of the top of the crown support frame	SW	04/05/21
FLC_620	Gasholder No 4 interior	General view of the top of the crown support frame	WNW	04/05/21
FLC_621	Gasholder No 4 interior	Detail view of the timbers and their fixtures of the top of the crown support frame	WNW	04/05/21
FLC_622	Gasholder No 4 interior	General view of the centre of the crown support frame during scanning	NNE	04/05/21
FLC_623	Gasholder No 4 interior	General view of the top of the crown support frame	E	04/05/21
FLC_624	Gasholder No 4 interior	General view during demolition	NW	04/05/21
FLC_625	Gasholder No 4 interior	General view during demolition	NNE	04/05/21
FLC_626	Gasholder No 4 interior	General view during demolition	E	04/05/21
FLC_627	Gasholder No 4 interior	Detail view of section cut through the square grips	E	04/05/21
FLC_628	Gasholder No 4 interior	Detail view of triangular bracket on the interior of the top curb	E	04/05/21
FLC_629	Gasholder No 4 interior	General view of the crown at the top curb interior	SE	04/05/21
FLC_630	Gasholder No 4 interior	Detail view of the crown at the top curb interior showing metal settings between timbers of the crown support frame	SE	04/05/21
FLC_631	Gasholder No 4 interior	Detail view of an iron setting connecting timbers of the crown support frame	SE	04/05/21
FLC_632	Gasholder No 4 interior	General view of metal fixtures connecting timbers of the crown support frame	SE	04/05/21
FLC_633	Gasholder No 4 interior	General view of the top curb interior	SE	04/05/21
FLC_634	Gasholder No 4 interior	General view of the centre of the crown support frame	NNE	04/05/21
FLC_635	Gasholder No 4 interior	General view of the centre of the crown support frame during scanning	NNE	04/05/21
FLC_636	Gasholder No 4 interior	General view of the top of the crown support frame	WNW	04/05/21
FLC_637	Gasholder No 4 interior	General view of the crown support frame	E	04/05/21
FLC_638	Gasholder No 4 interior	General view of the crown support frame	NNE	04/05/21
FLC_639	Gasholder No 4 interior	Detail view of pipework attached to an upright on the innermost ring of the crown support frame	NW	04/05/21
FLC_640	Gasholder No 4 interior	Detail view of a concrete block setting attached to the dumping to support the uprights of the crown support frame	W	04/05/21
FLC_641	Gasholder No 4 interior	General view of the crown support frame	W	04/05/21
FLC_642	Gasholder No 4 interior	General view of the crown support frame	W	04/05/21
FLC_643	Gasholder No 4 interior	Detail view of the timber and iron bar cross bars of the outermost ring of uprights of the crown support frame	W	04/05/21
FLC_644	Gasholder No 4 interior	Detail view of the iron bar cross bars of the outermost ring of uprights of the crown support frame	WSW	04/05/21
FLC_645	Gasholder No 4 interior	General view of the crown support frame	WSW	04/05/21
FLC_646	Gasholder No 4 interior	Detail view of the base of the top lift wall interior showing cup overflow pipes	W	04/05/21
FLC_647	Gasholder No 4 interior	Detail view of pipe	SSE	04/05/21
FLC_648	Gasholder No 4 interior	General view of the crown support frame	N	04/05/21
FLC_649	Gasholder No 4 interior	Detail view of carved <i>K</i> on displaced timber of the crown support frame	N/A	04/05/21
FLC_650	Gasholder No 4 interior	Detail view of carved <i>C11</i> on displaced timber of the crown support frame	N/A	04/05/21

FLC_651	Gasholder No 4 interior	Detail view of carved <i>D</i> on displaced timber of the crown support frame	N/A	04/05/21
FLC_652	Gasholder No 4 interior	Detail view of carved letters and possible numbers on a displaced timber of the crown support frame	N/A	04/05/21
FLC_653	Gasholder No 4 interior	General view of the access ramp used during demolition	S	04/05/21
FLC_654	Gasholder No 4 interior	Detail view of the top of the crown support frame showing diagonal metal rails	WNW	04/05/21
FLC_655	Gasholder No 4 interior	General view of the top of the crown support frame	NNW	04/05/21
FLC_656	Gasholder No 4 interior	Detail view of the concrete setting lines on the dumpling in which the crown support frame uprights are set	NNW	04/05/21
FLC_657	Gasholder No 4 interior	Detail view of wire wrapped around an upright of the crown support frame	NNW	04/05/21
FLC_658	Gasholder No 4 interior	Detail view of the uprights of the three outer rings of the crown support frame and loose wire	ESE	04/05/21
FLC_659	Gasholder No 4 interior	Detail view of the uprights of the three outer rings of the crown support frame	ESE	04/05/21
FLC_660	Gasholder No 4 interior	Detail view of the outer ring of uprights of the crown support frame	ESE	04/05/21
FLC_661	Gasholder No 4 interior	General view of scanning in progress during demolition	NNE	04/05/21
FLC_662	Gasholder No 4 interior	Detail view of the concrete base setting of the central upright of the crown support frame	W	04/05/21
FLC_663	Gasholder No 4 interior	Detail view of the centre of the crown support frame	N	04/05/21
FLC_664	Gasholder No 4 interior	Detail view of the innermost ring of uprights of the crown support frame	NE	04/05/21
FLC_665	Gasholder No 4 interior	Detail view of the base of the inner ring of uprights of the crown support frame	S	07/07/21
FLC_666	Gasholder No 4 tank	Detail view of guided rollers during demolition	NE	07/07/21
FLC_667	Gasholder No 4 tank	Detail view of brick tank wall interior showing spiral guided rollers and tank water overflow pipe	NE	07/07/21
FLC_668	Gasholder No 4 tank	General view of the brick tank wall	NE	07/07/21
FLC_669	Gasholder No 4 tank	Detail view of brick tank wall interior showing spiral guided rollers and tank water overflow pipe	NE	07/07/21
FLC_670	Gasholder No 4 tank	General view of spiral guided rollers during demolition	NE	07/07/21
FLC_671	Gasholder No 4 tank	Detail view of tank interior during demolition showing cut-off inlet/outlet pipes	NE	07/07/21
FLC_672	Gasholder No 4 tank	General view of the tank during demolition	NW	07/07/21
FLC_673	Gasholder No 4 tank	General view of the brick tank wall	NW	07/07/21
FLC_674	Gasholder No 4 tank	General view of the brick tank wall	NW	07/07/21
FLC_675	Gasholder No 4 tank	General view of brick tank wall	NW	07/07/21
FLC_676	Gasholder No 4 tank	Detail view of brick tank wall showing previous guide rail fixtures	NW	07/07/21
FLC_677	Gasholder No 4 tank	General view of concrete blocks set between the dumpling and the brick tank wall	NW	07/07/21
FLC_678	Gasholder No 4 tank	General view of dumpling during demolition with cut-off inlet/outlet pipes	NW	07/07/21
FLC_679	Gasholder No 4 tank	Detail view of concrete blocks set at the foot of the dumpling	SSW	07/07/21
FLC_680	Gasholder No 5	General view of laser scanning in progress during tank demolition	E	07/07/21
FLC_681	Gasholder No 5	Detail view of bottom lift wall exterior and brick tank wall during demolition	NE	07/07/21
FLC_682	Gasholder No 5	Detail view of bottom lift wall exterior and brick tank wall during demolition	NE	07/07/21
FLC_683	Gasholder No 5	General view of multiple bolt arrangements, and cotter plate, on the top lift wall interior	WNW	07/07/21
FLC_684	Gasholder No 5	Detail view of bolt arrangement on the top lift wall interior	WSW	07/07/21
FLC_685	Gasholder No 5	Detail view of cotter plate on the top lift wall interior	WSW	07/07/21
FLC_686	Gasholder No 5	General view of the dumpling top and outer ring of uprights of	ESE	07/07/21

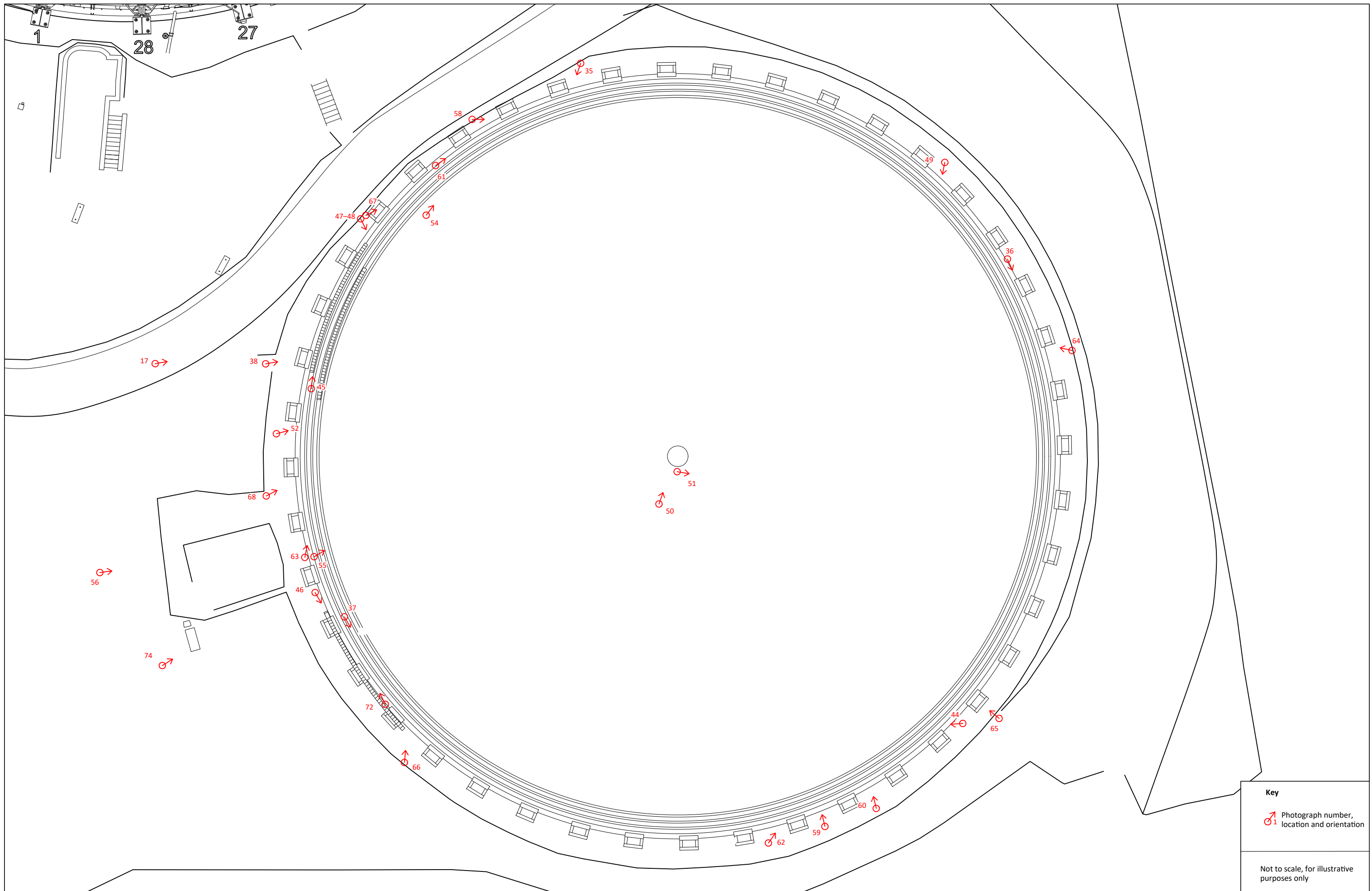
		the crown support frame		
FLC_687	Gasholder No 5	Detail view of the base of an upright from the outer ring of the crown support frame situated on a concrete block on the sloping side of the dumpling	SSE	07/07/21
FLC_688	Gasholder No 5	General view of the base of the inner ring of uprights of the crown support frame	N	07/07/21
FLC_689	Gasholder No 5	Detail view of the base of the inner ring of uprights of the crown support frame	NE	07/07/21
FLC_690	Gasholder No 5	Detail view of iron fixture connecting the base of the inner ring of uprights of the crown support frame and the concrete block of the dumpling	NE	07/07/21
FLC_691	Gasholder No 5	Detail view of the cross brackets between the uprights of the outer ring of the crown support frame	SW	07/07/21
FLC_692	Gasholder No 5	General view of the outer ring of uprights of the crown support frame	SW	07/07/21
FLC_693	Gasholder No 5	Detail view of the top of an outer ring upright of the crown support frame	E	07/07/21
FLC_694	Gasholder No 5	General view of the centre of the crown support frame top	NNW	07/07/21
FLC_695	Gasholder No 5	General view of the tank and bell interior	NNW	07/07/21
FLC_696	Gasholder No 5	General view of the tank and bell interior	N	07/07/21
FLC_697	Gasholder No 5	General view of the outer ring of uprights of the crown support frame	NNE	07/07/21
FLC_698	Gasholder No 5	Detail view of the top of an outer ring upright of the crown support frame	NNE	07/07/21
FLC_699	Gasholder No 5	Detail view of the outer ring of uprights of the crown support frame	E	07/07/21
FLC_700	Gasholder No 5	General view of laser scanning of the tank and bell interior	SE	07/07/21
FLC_701	Gasholder No 5	General view of the centre of the dumpling	NNW	07/07/21
FLC_702	Gasholder No 5	Detail view of bolted fixtures in the centre of the dumpling	NNW	07/07/21
FLC_703	Gasholder No 5	Detail view of bolted fixtures in the centre of the dumpling	NNW	07/07/21
FLC_704	Gasholder No 5	Detail view of bolted fixture in the south-east side of the dumpling	SSE	07/07/21
FLC_705	Gasholder No 5	Detail view of bolted fixture in the south-east side of the dumpling	SSE	07/07/21
FLC_706	Gasholder No 5	Detail view of bolted fixture in SSW side of the dumpling	SSE	07/07/21
FLC_707	Gasholder No 5	Detail view of sunken bolted fixture in south-west side of the dumpling	S	07/07/21
FLC_708	Gasholder No 5	Detail view of the inner ring of uprights of the crown support frame	N	07/07/21
FLC_709	Gasholder No 5	General view of the crown support frame	N	07/07/21
FLC_710	Gasholder No 5	Detail view of the centre of the crown support frame top	N	07/07/21
FLC_711	Gasholder No 5	Detail view of triangular brackets at the top of the top lift wall interior uprights	S	07/07/21
FLC_712	Gasholder No 5	Detail view of triangular brackets at the top of the top lift wall interior upright	S	07/07/21
FLC_713	Gasholder No 5	Detail view of sloped side of the dumpling	SSE	07/07/21
FLC_714	Gasholder No 5	General view of the outer ring of uprights of the crown support frame	NE	07/07/21
FLC_715	Gasholder No 5	General view of the top of the crown support frame	SE	07/07/21
FLC_716	Gasholder No 5	General view of the top of the crown support frame	SE	07/07/21
FLC_717	Gasholder No 5	General view of the top of the crown support frame	S	07/07/21
FLC_718	Gasholder No 5	Detail view of lower half of latticework upright on the top lift wall interior	SW	07/07/21
FLC_719	Gasholder No 5	Detail view of upper half of latticework upright on the top lift wall interior	SW	07/07/21
FLC_720	Gasholder No 5	Detail view of the top curb interior	SW	07/07/21
FLC_721	Gasholder No 5	General view of the access ramp used during demolition	WSW	07/07/21

FLC_722	Gasholder No 5	Detail view of bolted fixtures in the centre of the dumpling	E	07/07/21
FLC_723	Gasholder No 5	Detail view of bolted fixtures in the centre of the dumpling	E	07/07/21
FLC_724	Gasholder No 5	Detail view of the gas inlet/outlet pipes	NNE	07/07/21
FLC_725	Gasholder No 5	Detail view of the gas inlet/outlet pipes and the inspection cotters plates associated with them in the crown	NNE	07/07/21
FLC_726	Gasholder No 5	Detail view of the outer ring of uprights of the crown support frame	SE	07/07/21
FLC_727	Gasholder No 5	Detail view of cotter plate at the base of the top lift inner wall	E	07/07/21
FLC_728	Gasholder No 5	Detail view of the base of the top lift inner wall and dumpling	NE	07/07/21
FLC_729	Gasholder No 5	Detail view of the outer ring of uprights of the crown support frame and supporting uprights on the inner wall of the top lift	SE	07/07/21
FLC_730	Gasholder No 5	General view of the inner ring of uprights of the crown support frame	NW	07/07/21
FLC_731	Gasholder No 5	General view of the inner ring of uprights of the crown support frame	NNE	07/07/21
FLC_732	Gasholder No 5	Detail view of lattice-work at the outer edge of the crown	NNW	07/07/21
FLC_733	Gasholder No 5	Detail view of lattice-work at the outer edge of the crown	NNW	07/07/21
FLC_734	Gasholder No 5	Detail view of the gas inlet/outlet pipes entering the dumpling	N	07/07/21
FLC_735	Gasholder No 5	Detail view of the metal fixtures attaching the base of the uprights of the crown support frame to the concrete blocks of the dumpling below, and the supports of the gas inlet/outlet pipes fixed to the dumpling	NE	07/07/21
FLC_736	Gasholder No 5	Detail view of the supporting rods of the gas inlet/outlet pipes	NE	07/07/21
FLC_737	Gasholder No 5	General view of the inner ring of uprights of the crown support frame	SSE	07/07/21
FLC_738	Gasholder No 5	General view of the crown support frame	SE	07/07/21
FLC_739	Gasholder No 5	Detail view of a triangular bracket supporting the top curb	S	07/07/21
FLC_740	Gasholder No 5	General view of the inner ring of uprights of the crown support frame	SE	07/07/21
FLC_741	Gasholder No 5	General view of the dumpling sloped edge	SSE	07/07/21
FLC_742	Gasholder No 5	General view of the inner ring of uprights of the crown support frame	SE	07/07/21
FLC_743	Gasholder No 5	General view of the crown support frame	SE	07/07/21
FLC_744	Gasholder No 5	General view of the crown support frame	NNE	07/07/21
FLC_745	Gasholder No 5	General view of the crown support frame at the top curb	NNE	07/07/21
FLC_746	Gasholder No 5	General view of the crown support frame	NE	07/07/21
FLC_747	Gasholder No 5	General view of damaged crown support frame during demolition	SE	07/07/21
FLC_748	Gasholder No 5	Detail view of square grips covered with rubble debris during demolition	S	07/07/21
FLC_749	Gasholder No 5	Detail view of triangular bracket supporting the top curb	SSE	07/07/21
FLC_750	Gasholder No 5	General view of displaced guided rollers and carriage settings during demolition	ENE	07/07/21
FLC_751	Gasholder No 5	Detail view of guided roller and carriage setting displaced during demolition	ENE	07/07/21
FLC_752	Gasholder No 5	Detail view of standard with removed cross brackets during demolition	SSE	07/07/21


APPENDIX 2: SITE PLANS SHOWING POSITION AND DIRECTION OF PLATES AND PHOTOGRAPHS



Appendix 2a: Location and orientation of plates 1

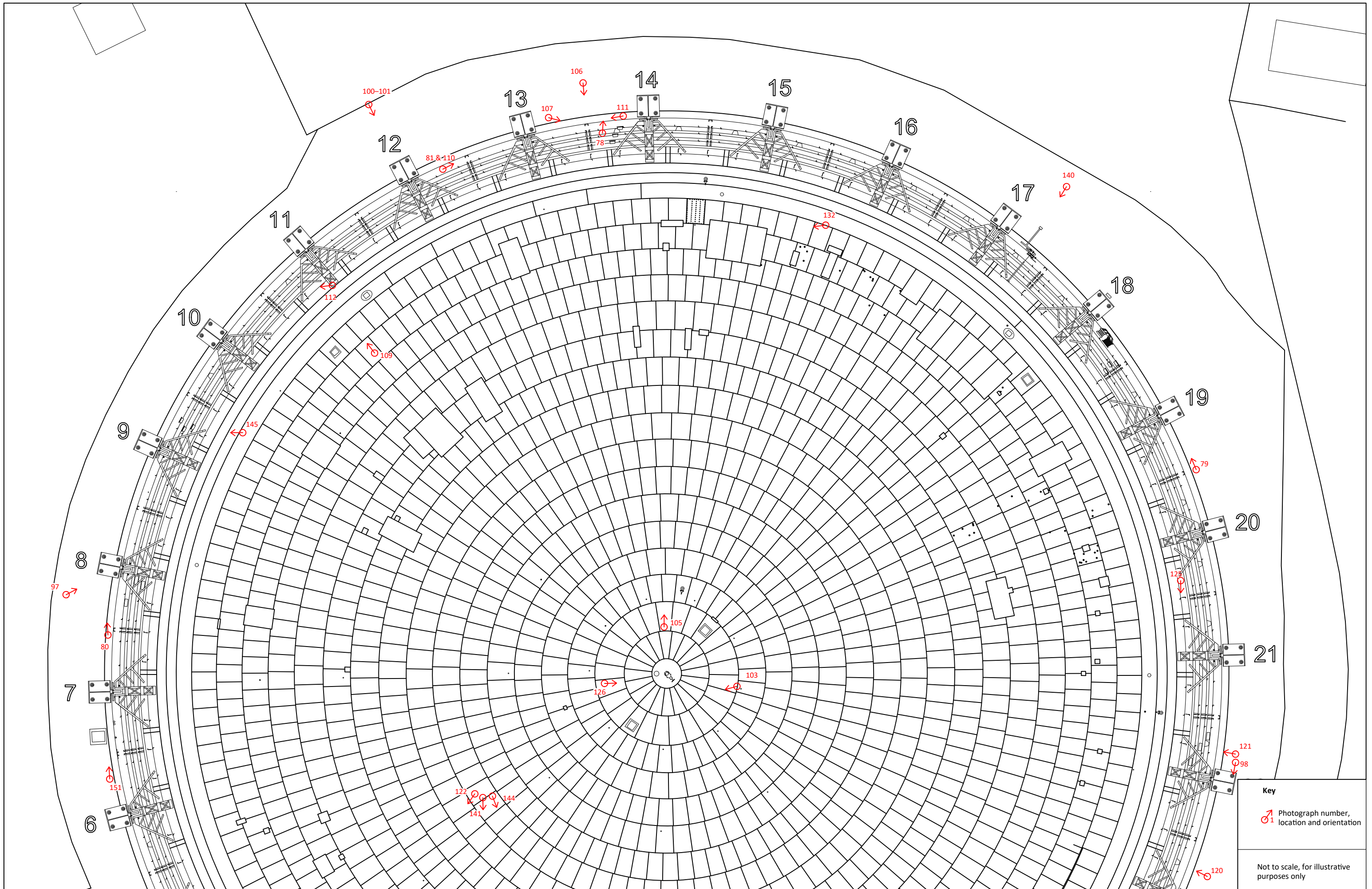


Key

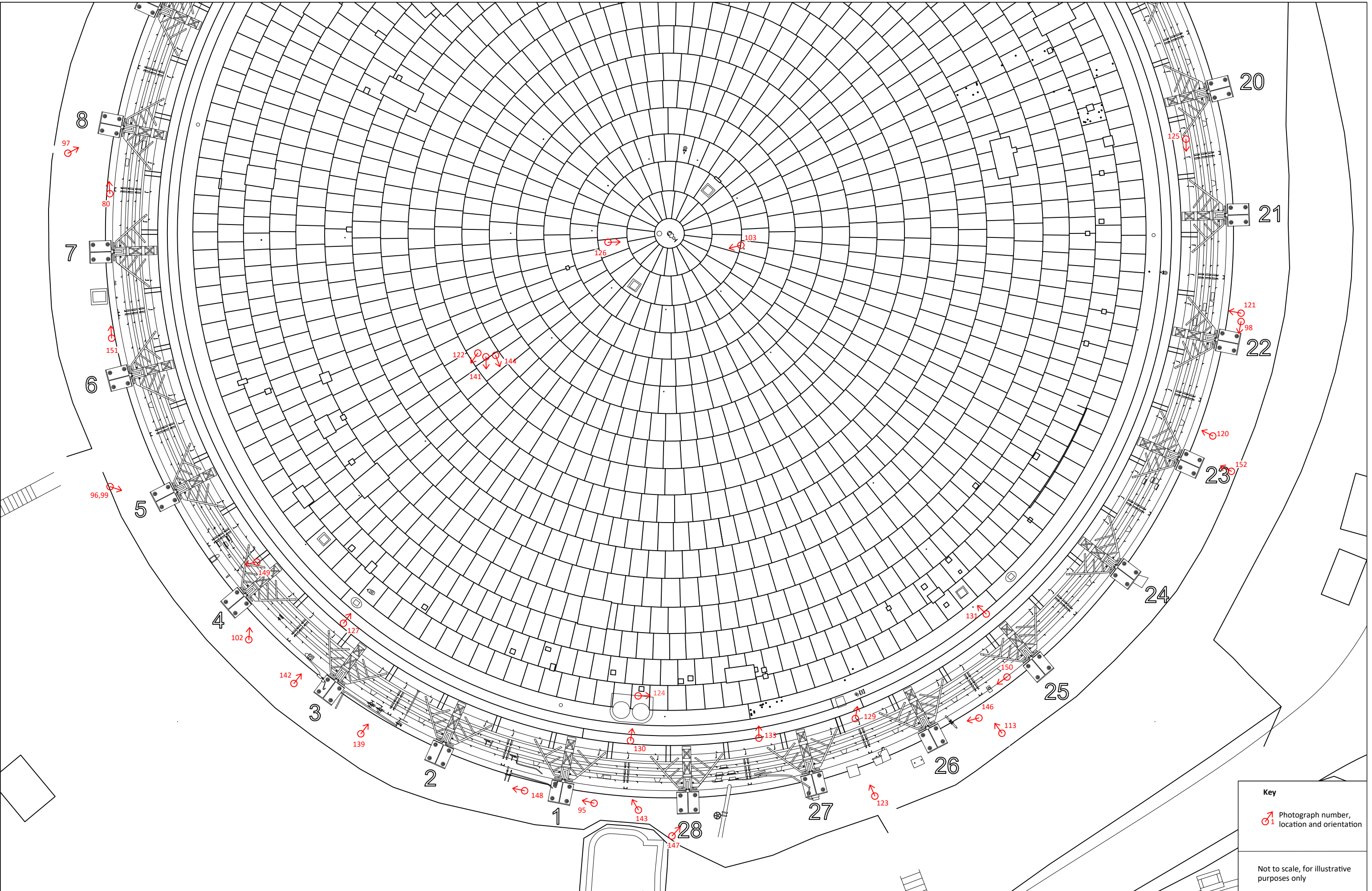
 Photograph number, location and orientation

Not to scale, for illustrative purposes only

Appendix 2b: Location and orientation of plates 2, Gasholder No 4

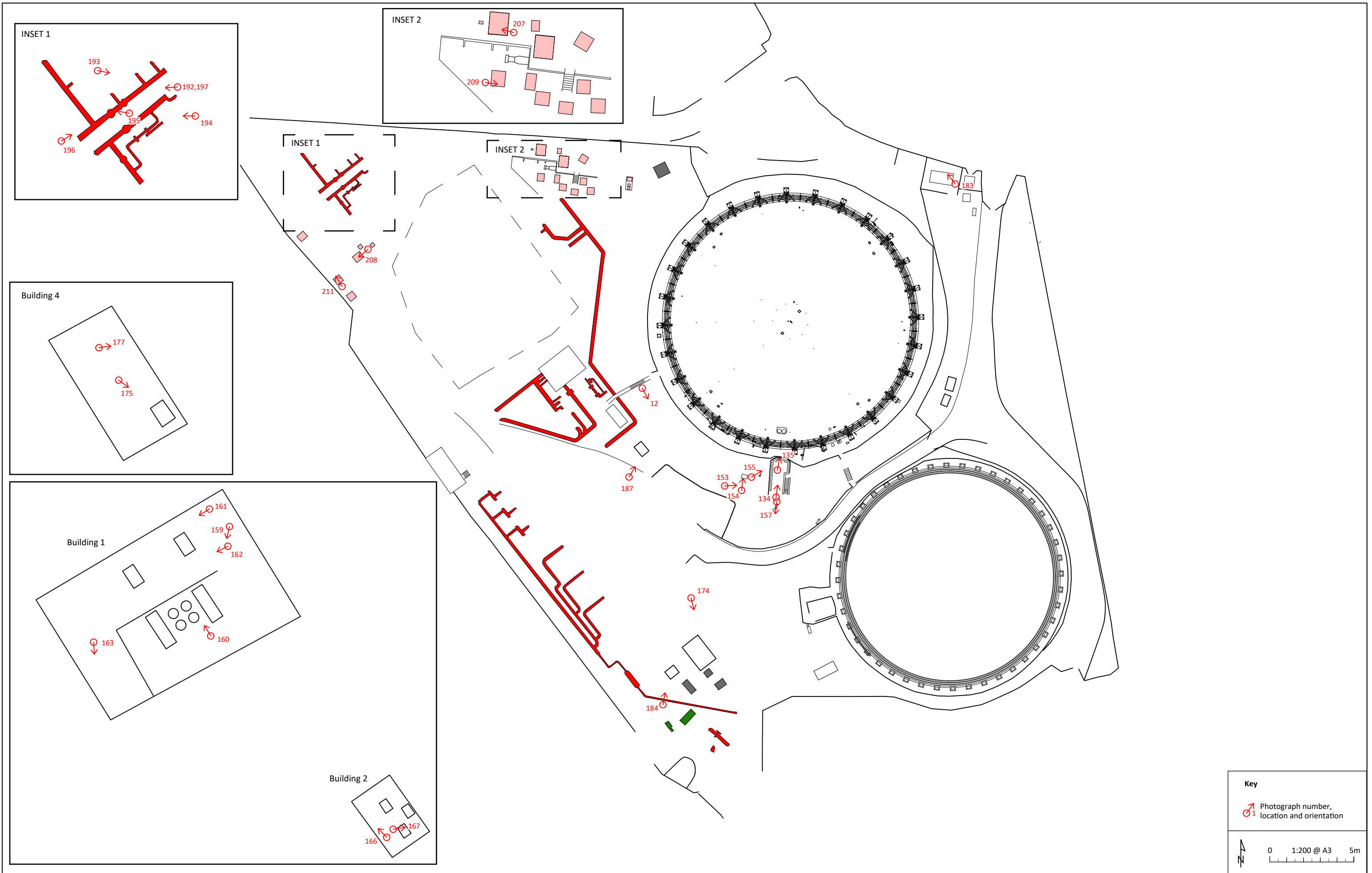


Appendix 2c: Location and orientation of plates 3, Gasholder No 5, north

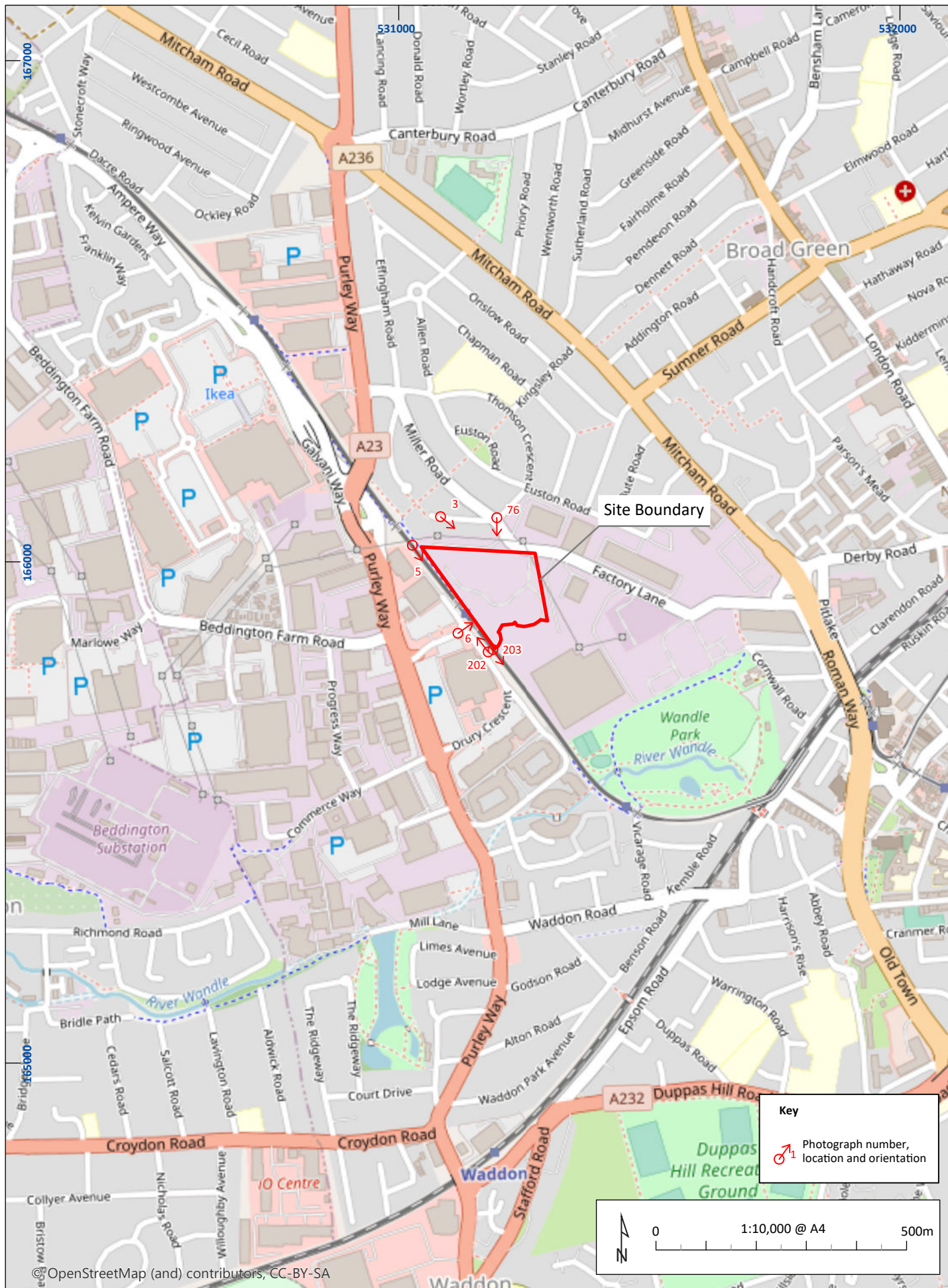


Appendix 2d: Location and orientation of plates 4, Gasholder No 5, south

01/23686_V/REP/A2d/01



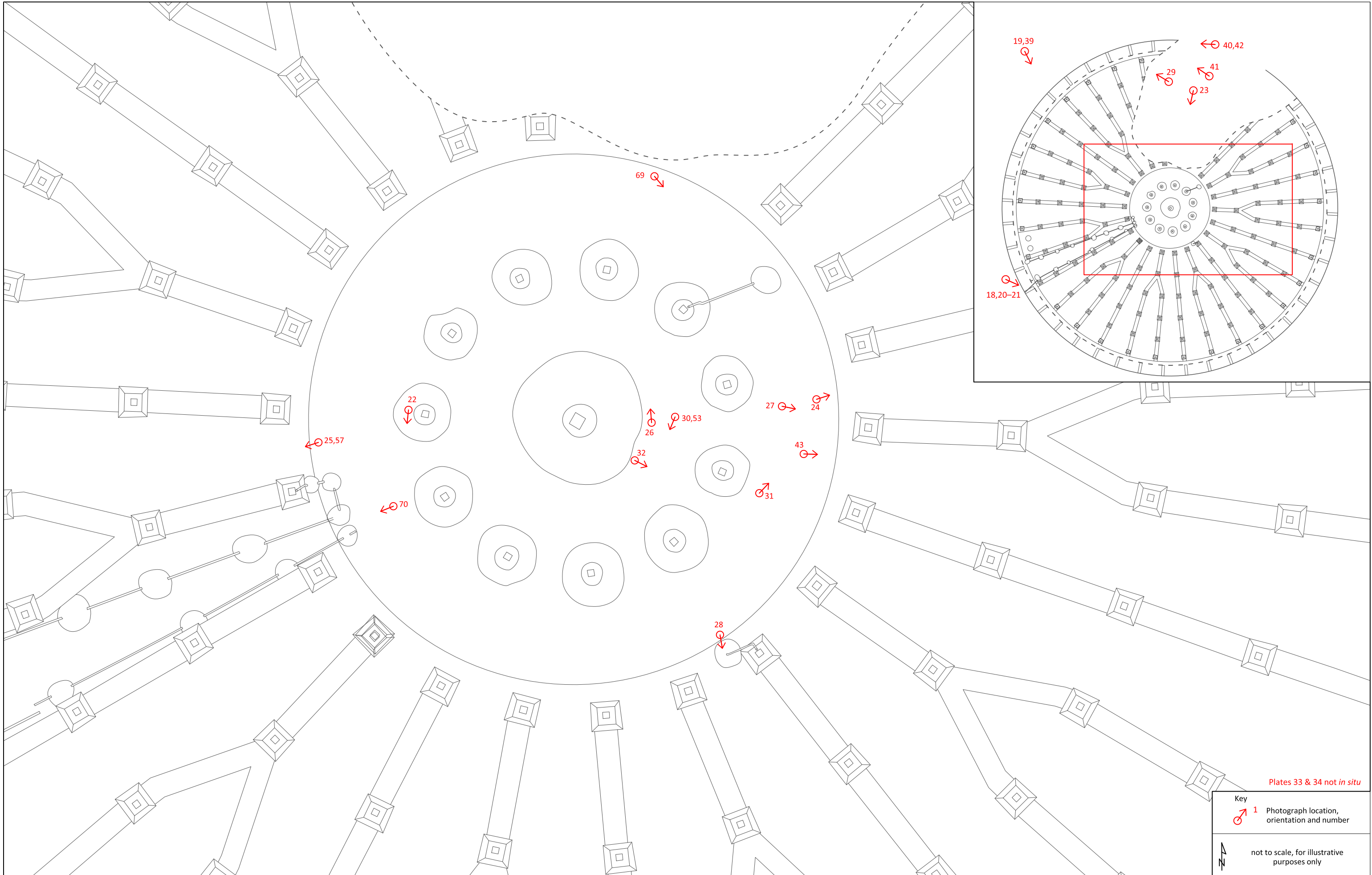
Appendix 2e: Location and orientation of plates 5



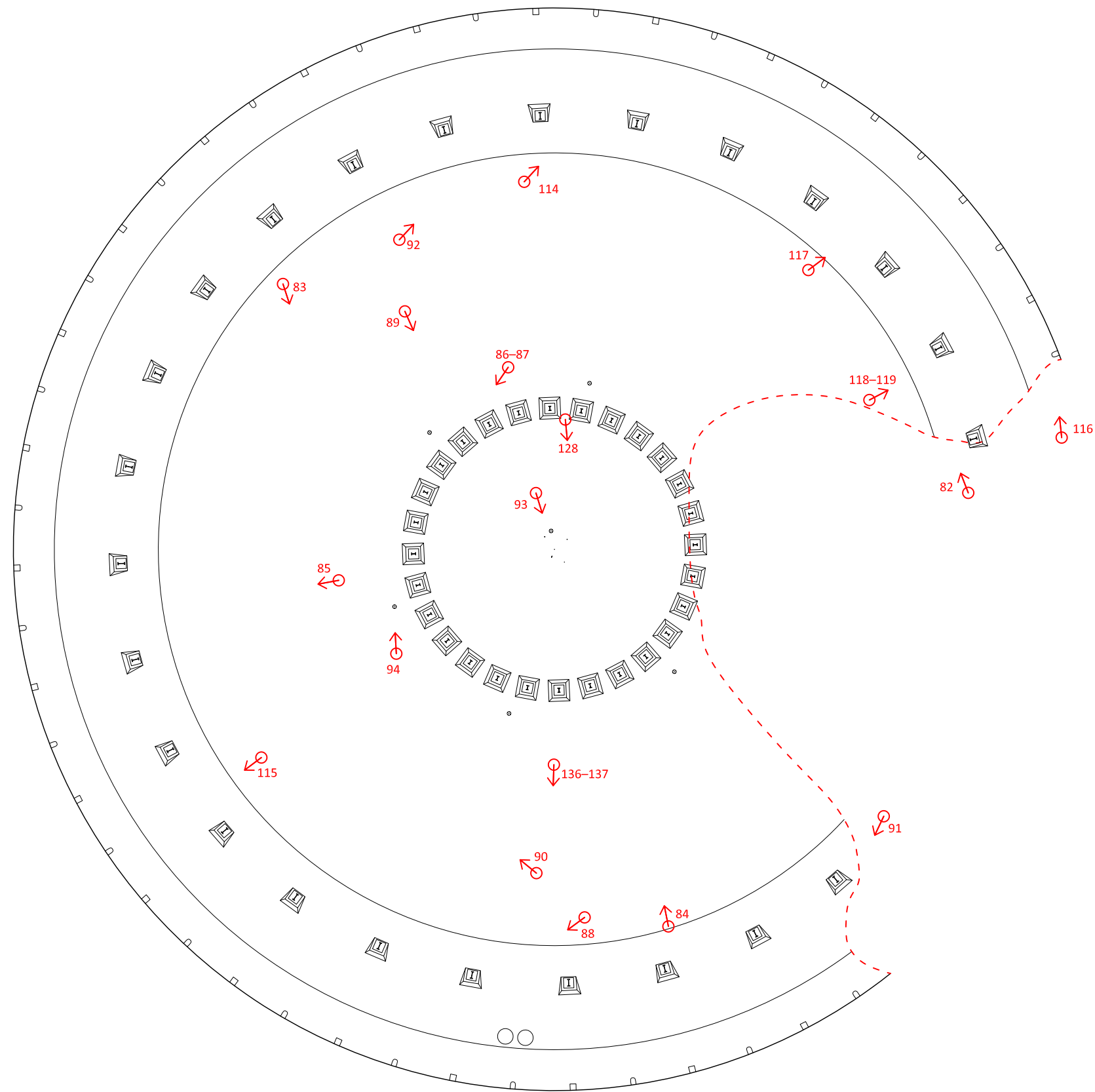
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
Appendix 2f: Location and orientation of plates 6

01/23686_V/REP/A2f/01

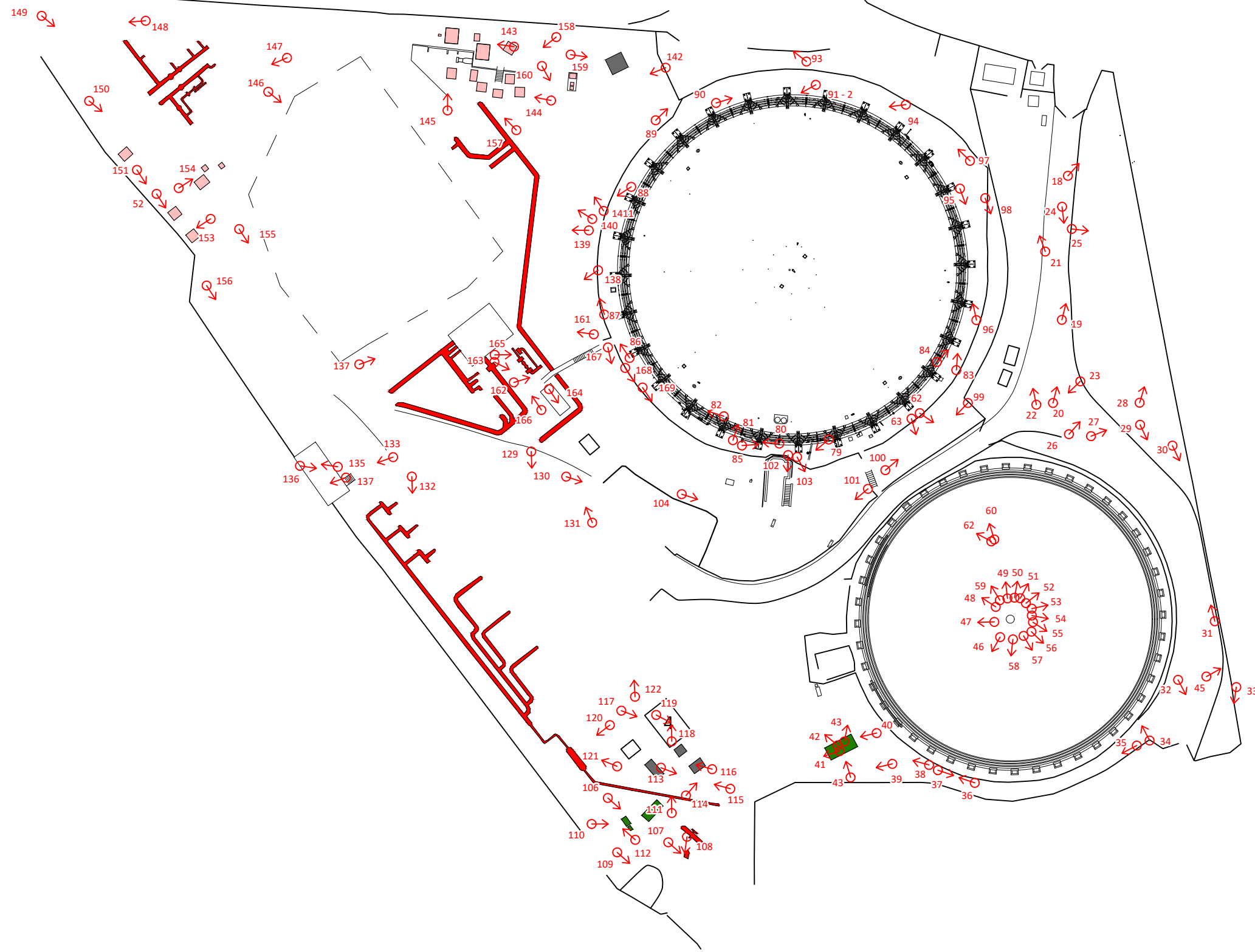


Appendix A2g: Location and orientation of plates 7, Gasholder No 4 below ground plan





Key	
	1 Plate location, orientation and number
	0 1:300 @ A3 10m

Appendix 2h: Location and orientation of plates 8, Gasholder No 5 below ground plan

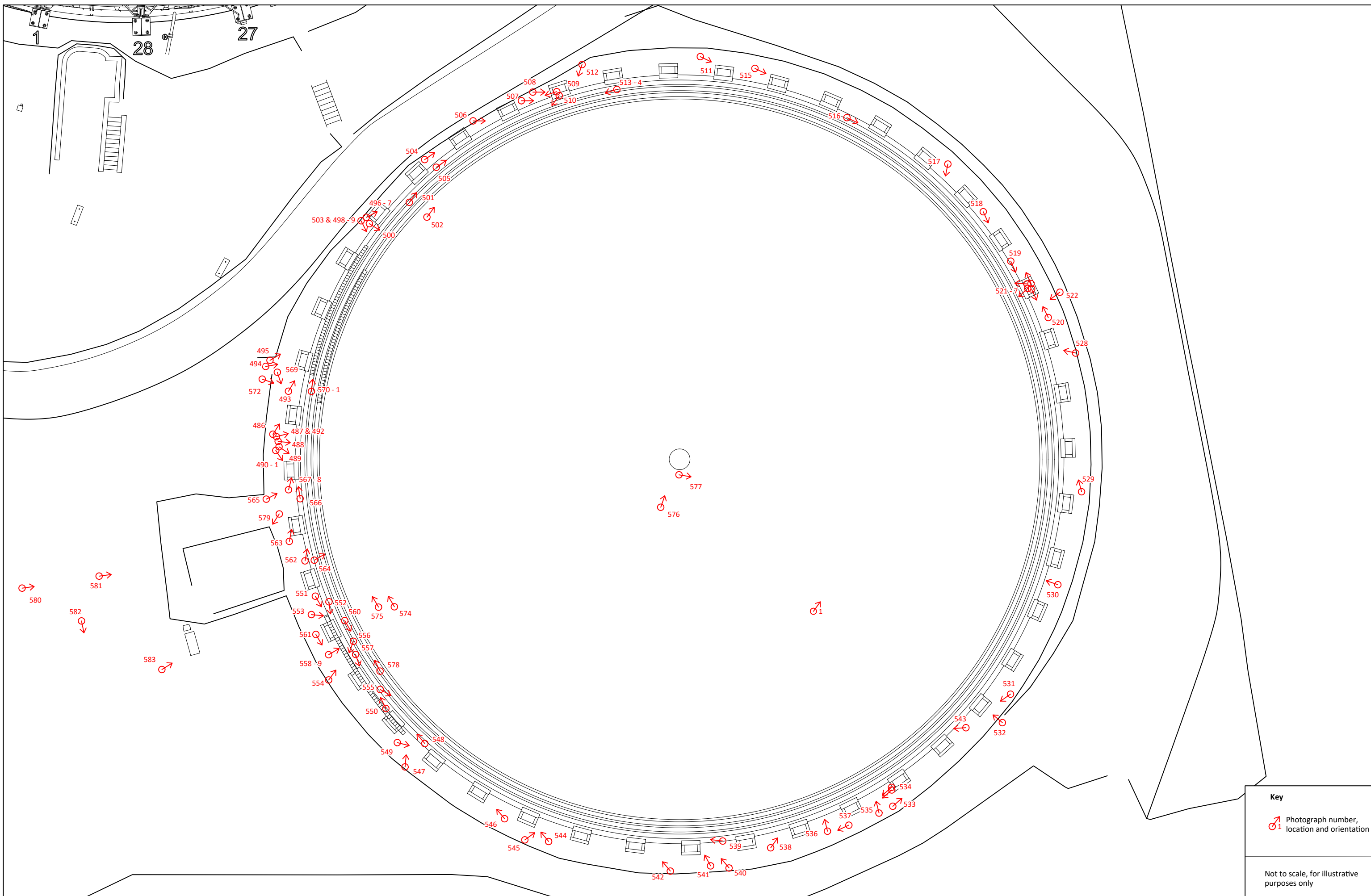


Key

 Photograph number, location and orientation

 not to scale, for illustration purposes only

Appendix 2i: Location and orientation of photographs 1

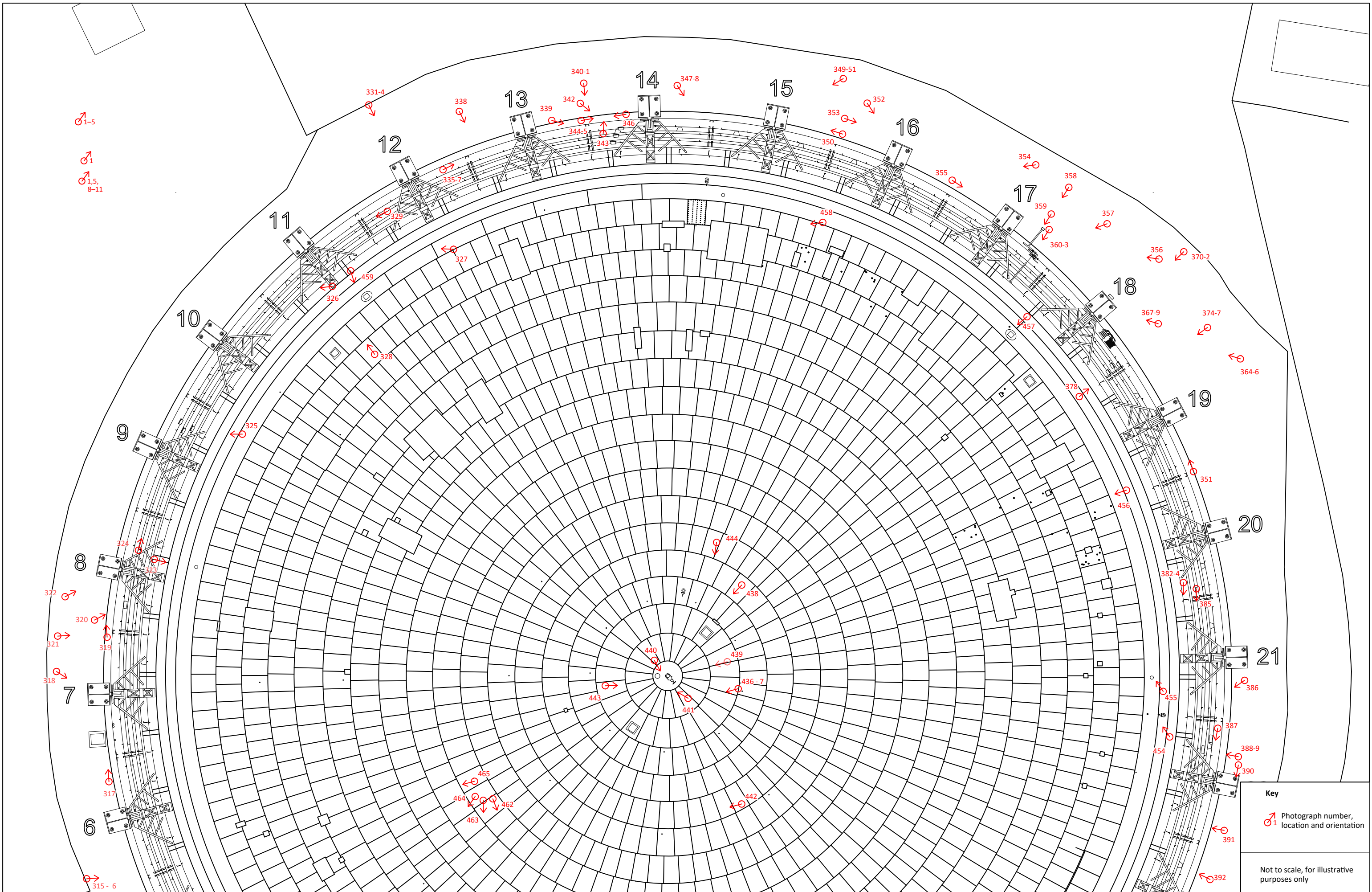


Appendix 2j: Location and orientation of photographs 2, Gasholder No 4


Key
① Photograph number, location and orientation

Not to scale, for illustrative purposes only

01/23686_V/REP/A2j/01

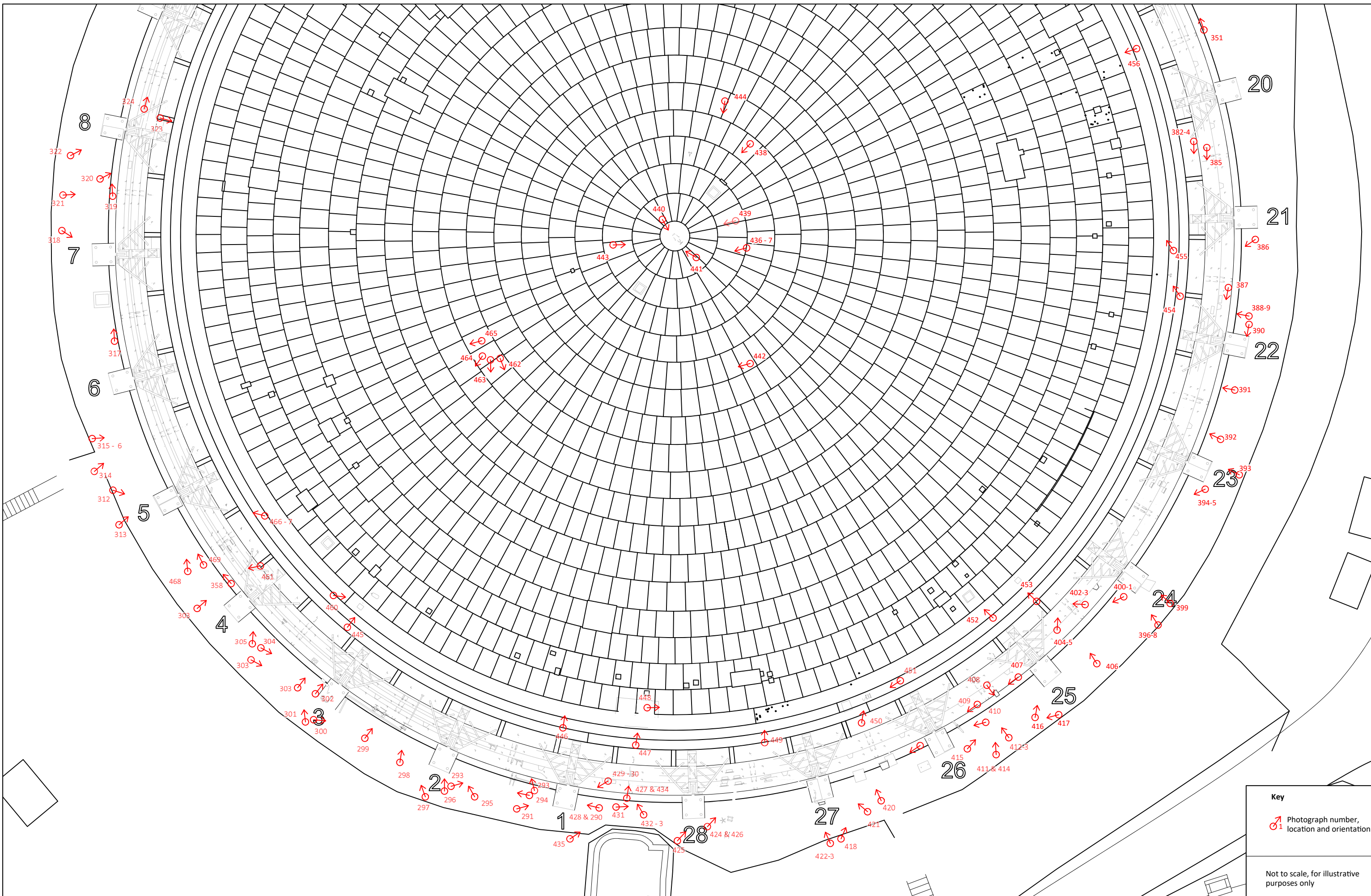


Key

 Photograph number, location and orientation

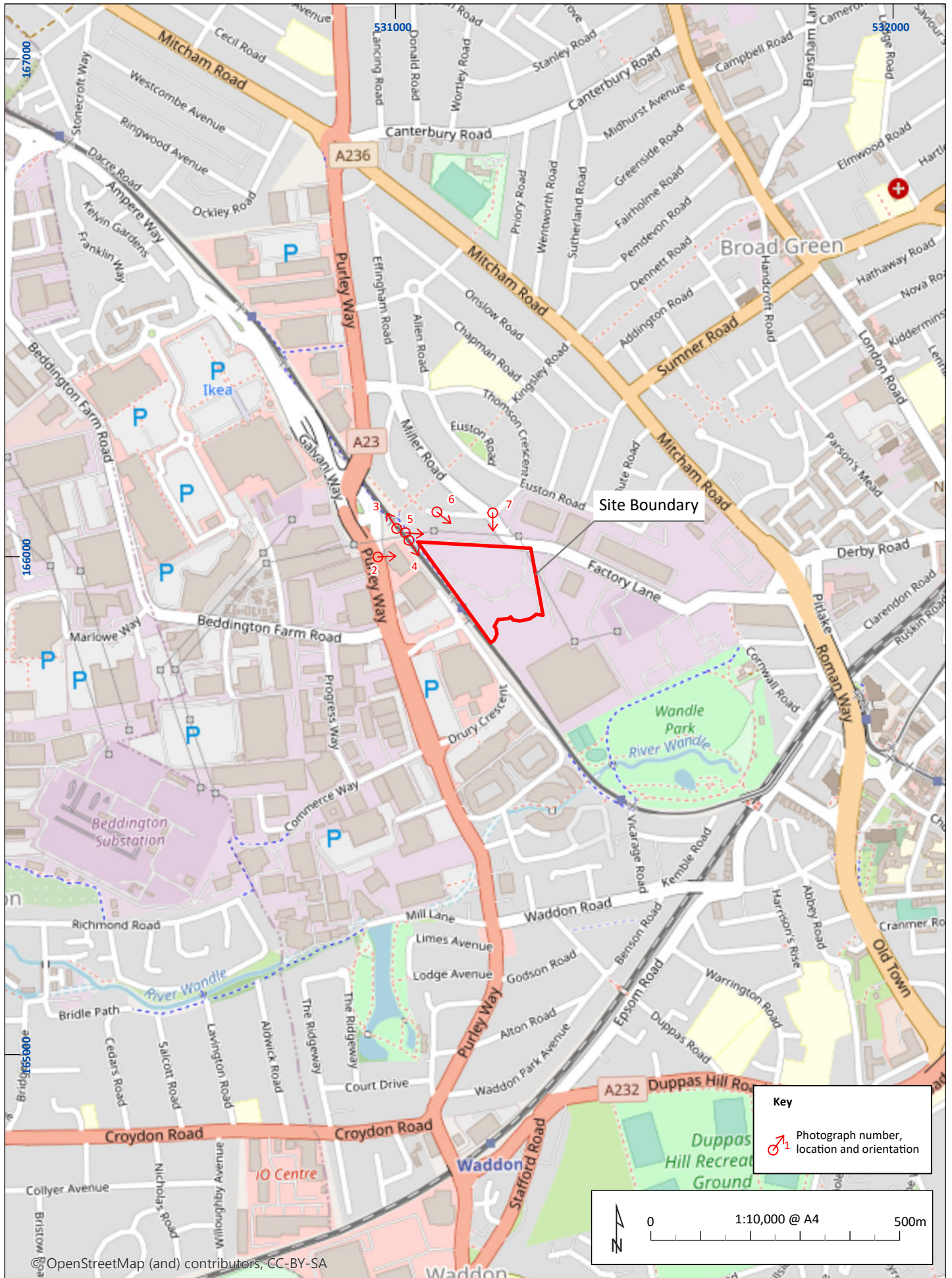
Not to scale, for illustrative purposes only

Appendix 2k: Location and orientation of photographs 3, Gasholder No 5, north



Appendix 21: Location and orientation of photographs 4, Gasholder No 5, south

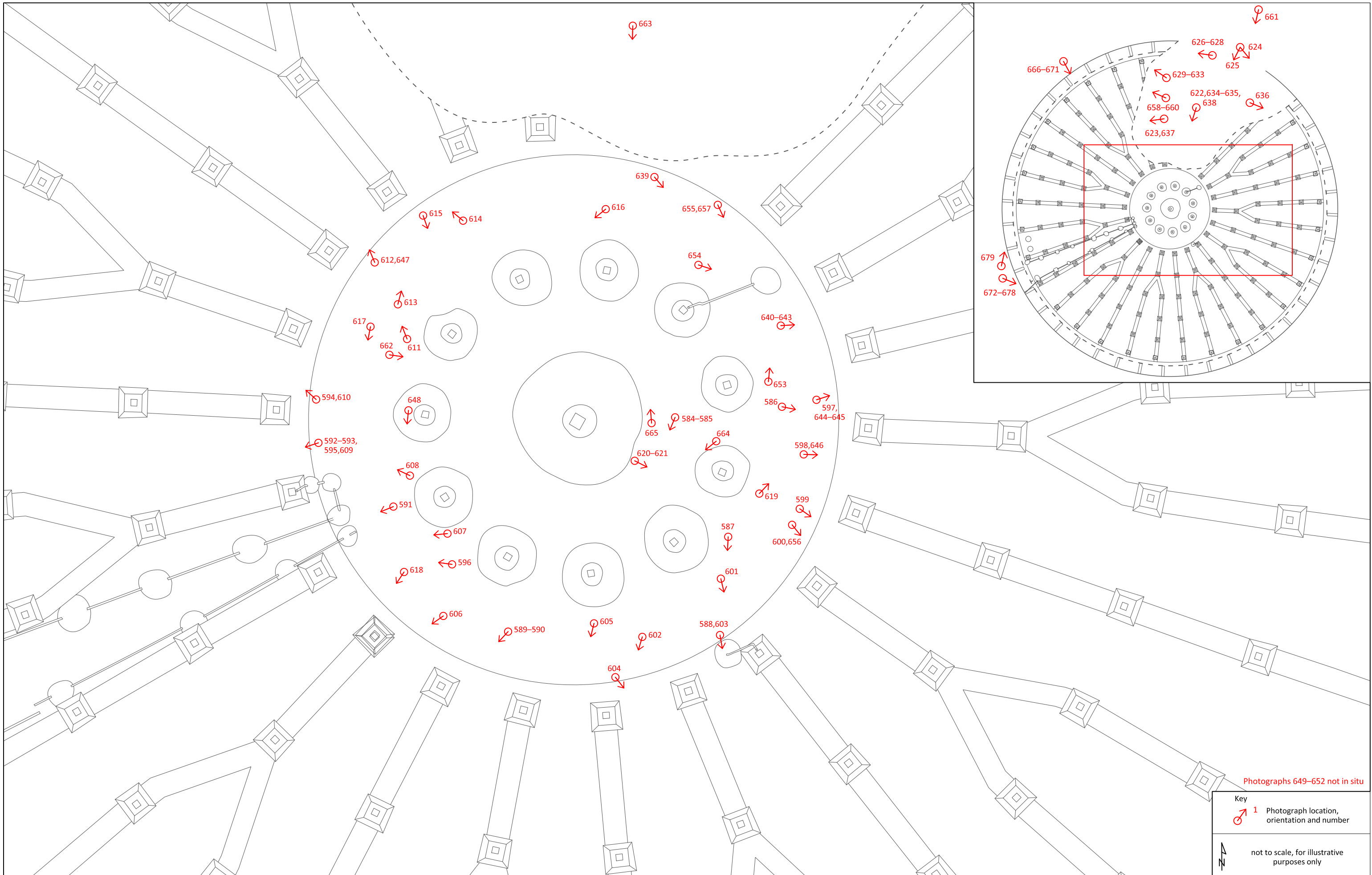
Key
① Photograph number, location and orientation
Not to scale, for illustrative purposes only



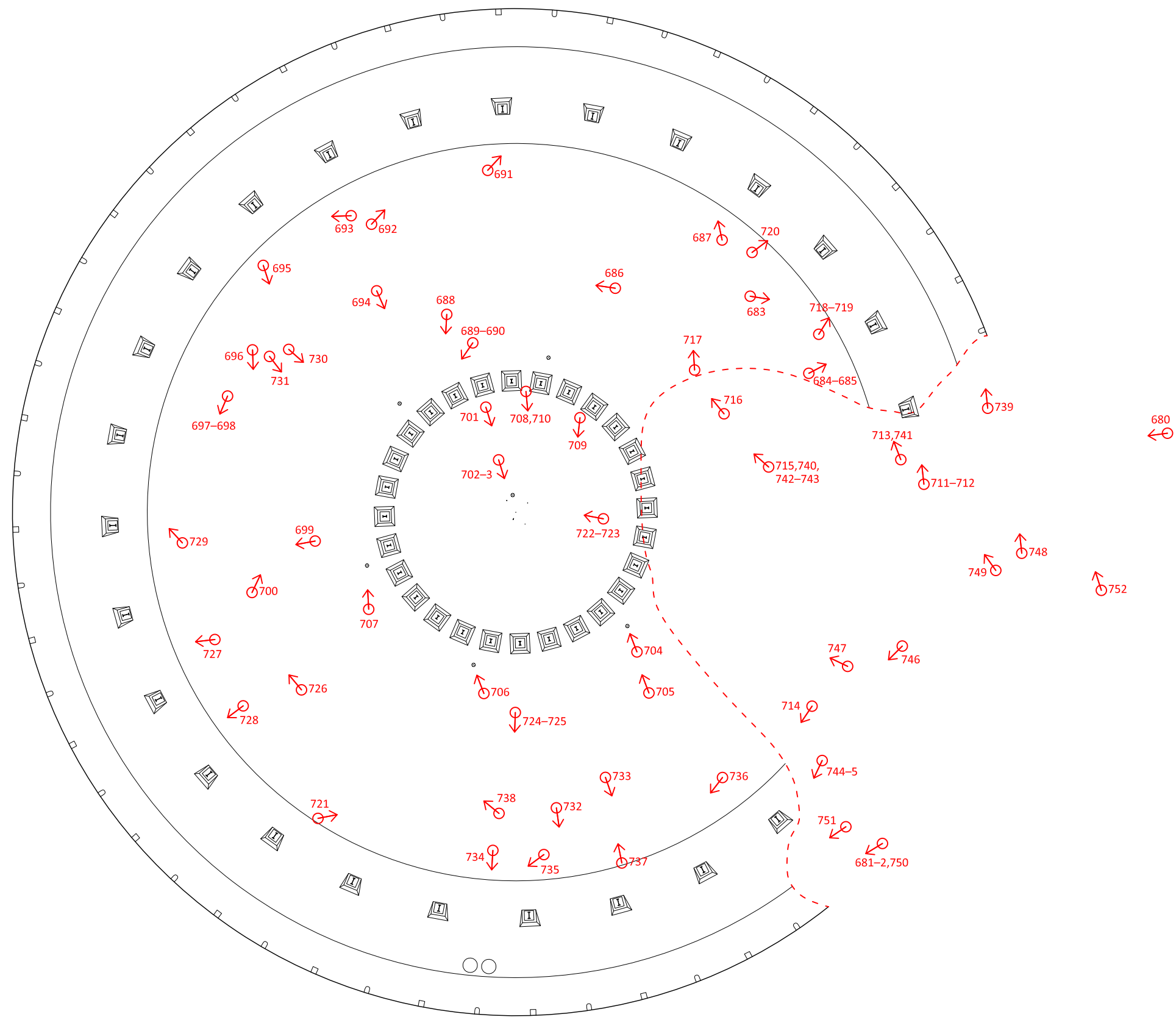
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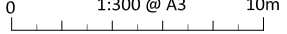
Appendix 2n: Location and orientation of photographs 6

01/23686_V/REP/A2n/01



Appendix A2o: Location and orientation of photographs 7, Gasholder No 4 below ground plan



Key	
	1 Photograph location, orientation and number
	
0	1:300 @ A3
	

Appendix 2p: Location and orientation of photographs 8, Gasholder No 5 below ground plan

APPENDIX 3: LASER SCAN METADATA

The measured surveys of Gasholders Nos 4 and 5 at Factory Lane, Croydon were undertaken using a Trimble TX8 laser scanner. The TX8 scanner is a time-of-flight system, capable of full dome scanning at ranges of ca. 0.6m to 120m and at resolutions of up to 92 lines per degree. Scanning was undertaken on site using resolutions as recorded below yielding a typical point-cloud resolution of between 5.7mm and 22.6mm at 30m from the instrument. Overlapping stations mean some of the site is scanned at a greater resolution. The survey was controlled via spherical target control carried out with Trimble S6 and S7 total stations with site control provided by a Trimble R8s GPS using the Trimble 'VRS now' service.

The laser scan data was registered via auto-matching by plane in Trimble Realworks 10.0. The site drawings were produced using Rhino 7.0, AutoCAD LT 2020 and ArcGIS Pro 10.7.2.

STATION NAME	NUMBER OF POINTS	RESOLUTION	DATE
Station 001	57,615,745	Level 2	16/12/20
Station 002	61,558,629	Level 2	16/12/20
Station 003	57,250,425	Level 2	16/12/20
Station 004	59,443,066	Level 2	16/12/20
Station 005	55,244,041	Level 2	16/12/20
Station 006	61,624,784	Level 2	16/12/20
Station 007	53,987,356	Level 2	17/12/20
Station 008	64,898,530	Level 2	17/12/20
Station 009	14,603,580	Level 2	17/12/20
Station 010	55,138,949	Level 2	17/12/20
Station 011	70,367,974	Level 2	17/12/20
Station 012	53,378,626	Level 2	17/12/20
Station 013	60,719,020	Level 2	17/12/20
Station 014	54,700,387	Level 2	17/12/20
Station 015	58,361,507	Level 2	17/12/20
Station 016	53,794,365	Level 2	17/12/20
Station 017	36,184,370	Level 2	17/12/20
Station 018	60,816,751	Level 2	17/12/20
Station 019	71,560,673	Level 2	17/12/20
Station 020	64,033,199	Level 2	17/12/20
Station 021	66,405,158	Level 2	17/12/20
Station 022	63,073,136	Level 2	17/12/20
Station 023	60,743,739	Level 2	17/12/20
Station 024	62,170,613	Level 2	17/12/20
Station 025	65,126,276	Level 2	17/12/20
Station 026	64,800,847	Level 2	17/12/20
Station 027	64,157,811	Level 2	17/12/20
Station 028	62,706,848	Level 2	17/12/20
Station 029	63,694,260	Level 2	17/12/20
Station 030	261,328,875	Level 3	17/12/20
Station 031	254,366,147	Level 3	17/12/20
Station 032	225,836,709	Level 3	17/12/20
Station 033	66,452,615	Level 2	17/12/20
Station 034	62,689,912	Level 2	17/12/20
Station 035	54,028,589	Level 2	17/12/20
Station 036	62,230,704	Level 2	17/12/20
Station 037	58,895,730	Level 2	17/12/20
Station 038	43,736,691	Level 2	17/12/20

Station 039	60,385,898	Level 2	17/12/20
Station 040	47,045,789	Level 2	17/12/20
Station 041	58,648,940	Level 2	17/12/20
Station 042	66,037,803	Level 2	17/12/20
Station 043	57,500,638	Level 2	17/12/20
Station 044	67,740,894	Level 2	17/12/20
Station 045	60,243,583	Level 2	17/12/20
Station 046	68,249,669	Level 2	17/12/20
Station 047	60,318,540	Level 2	17/12/20
Station 048	69,970,773	Level 2	17/12/20
Station 049	57,855,649	Level 2	17/12/20
Station 050	56,280,124	Level 2	17/12/20
Station 051	45,663,966	Level 2	17/12/20
Station 052	64,626,486	Level 2	17/12/20
Station 053	50,396,758	Level 2	17/12/20
Station 054	59,740,541	Level 2	17/12/20
Station 055	92,989,493	Level 2	17/12/20
Station 056	52,668,443	Level 2	17/12/20
Station 057	56,946,695	Level 2	17/12/20
Station 058	62,744,612	Level 2	17/12/20
Station 059	56,255,939	Level 2	17/12/20
Station 060	61,975,668	Level 2	17/12/20
FLC_002_Station 001	64,711,290	Level 2	18/12/20
FLC_002_Station 002	190,834,652	Level 3	18/12/20
FLC_002_Station 003	49,771,171	Level 2	18/12/20
FLC_002_Station 004	217,031,002	Level 3	18/12/20
FLC_002_Station 005	218,727,919	Level 3	18/12/20
FLC_002_Station 006	214,910,986	Level 3	18/12/20
FLC_002_Station 007	194,864,739	Level 3	18/12/20
FLC_002_Station 008	56,011,235	Level 2	18/12/20
FLC_002_Station 009	54,546,094	Level 2	18/12/20
FLC_002_Station 010	49,773,735	Level 2	18/12/20
FLC_002_Station 011	44,380,371	Level 2	18/12/20
FLC_002_Station 012	46,523,505	Level 2	18/12/20
gh4_v_Station1	118,027,157	Level 2	04/05/21
gh4_v_Station2	119,404,445	Level 2	04/05/21
gh4_v_Station3	119,857,185	Level 2	04/05/21
gh4_v_Station4	119,310,077	Level 2	04/05/21
gh4_v_Station5	118,026,130	Level 2	04/05/21
gh4_v_Station6	117,073,839	Level 2	04/05/21
gh4_v_Station7	113,393,425	Level 2	04/05/21
gh4_v_Station8	112,877,302	Level 2	04/05/21
gh4_v_Station9	278,492,928	Level 3	04/05/21
gh4_v_Station10	60,452,992	Level 2	04/05/21
CDN3_Station001	249,995,880	Level 3	07/07/21
CDN3_Station002	295,486,666	Level 3	07/07/21
CDN3_Station003	337,809,067	Level 3	07/07/21
CDN3_Station004	117,948,300	Level 2	07/07/21
CDN3_Station005	118,663,314	Level 2	07/07/21
CDN3_Station006	119,059,163	Level 2	07/07/21
CDN3_Station007	119,503,577	Level 2	07/07/21

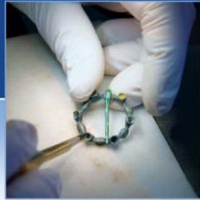
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CDN3_Station009	119,416,739	Level 2	07/07/21
CDN3_Station010	119,475,662	Level 2	07/07/21
CDN3_Station011	119,370,634	Level 2	07/07/21
CDN3_Station012	119,229,336	Level 2	07/07/21
CDN3_Station013	119,175,916	Level 2	07/07/21
CDN3_Station014	118,929,015	Level 2	07/07/21
CDN3_Station015	118,703,193	Level 2	07/07/21
CDN3_Station016	471,329,276	Level 3	07/07/21
CDN3_Station017	120,281,434	Level 2	07/07/21
CDN3_Station018	477,838,765	Level 3	07/07/21
CDN3_Station019	119,964,309	Level 2	07/07/21
CDN3_Station020	202,221,328	Level 3	07/07/21

APPENDIX 4: COPY OF OASIS REPORT

OASIS ID: aocarcha1-411878	
Project details	
Project name	Gasholder Nos 4 and 5, Factory Lane, Croydon
Short description of the project	AOC Archaeology Group was commissioned by SGN to undertake an historic building survey of two redundant gasholders located in Factory Lane, Croydon, South London. The Croydon Gasworks - formally known as the Waddon Gasworks - was established on the site to the immediate west of the present gasholder compound in 1866 - 1867. A period of expansion was started from the 1890s onwards spearheaded by Chief Engineer James W Helps, which saw the construction of Gasholder No 4 in 1895 (later rebuilt) and Gasholder No 5 in 1921. The gasworks, after becoming largely obsolete after the discovery of natural gas in the late 20th century, meant that all but Gasholders Nos 4 and 5 were demolished in the 1970s. The addition of a high-pressure works in 2020 together with the maintenance of existing pipework (such as for use with an intelligent pig) mean the once bustling site is still busy as a distribution centre. Gasholder No 4 was originally constructed in 1895, a guide-framed holder built with four lifts and a nominal capacity of 3,828,000ft ³ (108,397m ³) with a below-ground tank constructed by Aird and Co. However, between 1956 - 1958, the guide-framed holder was removed (the tank retained) and a new spiral-guided holder was built by J Dempster Ltd. Gasholder No 5 was constructed in 1921 by Ashmore Benson and Co Ltd, the tank constructed by T Vale and Co. It is a variant of a 'Type 42' cylindrical shell design by gasholder pioneer George Livesey with his brother Frank. George Livesey also constructed Gasholders Nos 1 and No 2 on the site in the late 19th century (now demolished). Its distinguishing features are its slender standards and is a late example of its type.
Project dates	Start: 16-12-2020 End: 07-07-2021
Previous/future work	No / Yes
Any associated project reference codes	23686_V - Contracting Unit No.
Type of project	Building Recording
Site status	None
Current Land use	Other 2 - In use as a building
Monument type	GASHOLDER Modern
Monument type	GASHOLDER Modern
Significant Finds	GASHOLDER Modern
Significant Finds	GASHOLDER Modern
Methods & techniques	"Laser Scanning","Measured Survey","Photographic Survey","Survey/Recording Of Fabric/Structure"
Prompt	Upon instruction from SGN

Project location	
Country	England
Site location	GREATER LONDON CROYDON CROYDON Gasholder Nos 4 and 5, Factory Lane, Croydon
Postcode	CR30 3RL
Study area	0 Square metres
Site coordinates	TQ 31212 65907 51.376521041854 -0.114517279204 51 22 35 N 000 06 52 W Point
Site coordinates	TQ 31169 65975 51.377142170909 -0.115109710469 51 22 37 N 000 06 54 W Point
Project creators	
Name of Organisation	SGN
Project brief originator	Montagu Evans
Project design originator	Montagu Evans
Project director/manager	Diana Sproat
Project supervisor	Gemma Hudson
Type of sponsor/funding body	Public Utilities
Name of sponsor/funding body	SGN
Project archives	
Physical Archive Exists?	No
Digital Archive recipient	Greater London Historic Environment Record
Digital Contents	"none"
Digital Media available	"Images raster / digital photography"
Paper Archive recipient	Greater London Historic Environment Record
Paper Contents	"none"
Paper Media available	"Report"

Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Gasholder Nos 4 and 5, Factory Lane, Croydon, London: Historic Building Recording Final Report
Author(s)/Editor(s)	Sproat, D and Hudson, G
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