



Historic Building Recording of gasholders at the former Colchester Gasworks Hythe Quay, Colchester

Report No. 18/38

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NGR: TM 0134 2430

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OASIS REPORT FORM

PROJECT DETAILS		OASIS molanort1-312639
Project title	Historic Building Recording of gasholders at the former Colchester Gasworks, Hythe Quay, Colchester	
Short description	<p><i>MOLA (Museum of London Archaeology) carried out a programme of historic building recording of Gasholders 119 and 120 at the former Colchester Gasworks, Hythe Quay, Colchester. The gasholders were both above-ground, spiral-guided holders. Gasholder 119 was constructed between 1923 -1938 to store coal gas and was later converted to store natural gas; Gasholder 120 dated to the 1960s and was built to store natural gas. Neither gasholder incorporated elements of earlier structures and both were considered to have minimal heritage significance. Gasholder 120 has been fully dismantled but Gasholder 119 remains extant at the time of writing.</i></p>	
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Future work	Unknown	
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Site address	Hythe Quay, Colchester	
NGR	TM 0134 2430	
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PROJECT CREATORS		
Organisation	MOLA Northampton	
Project brief originator	Montagu Evans on behalf of National Grid	
Project Design originator	MOLA Northampton	
Director/Supervisor	Amir Bassir	
Project Manager	Anthony Maul	
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Historic Building Recording of gasholders at the former Colchester Gasworks Hythe Quay, Colchester

Abstract

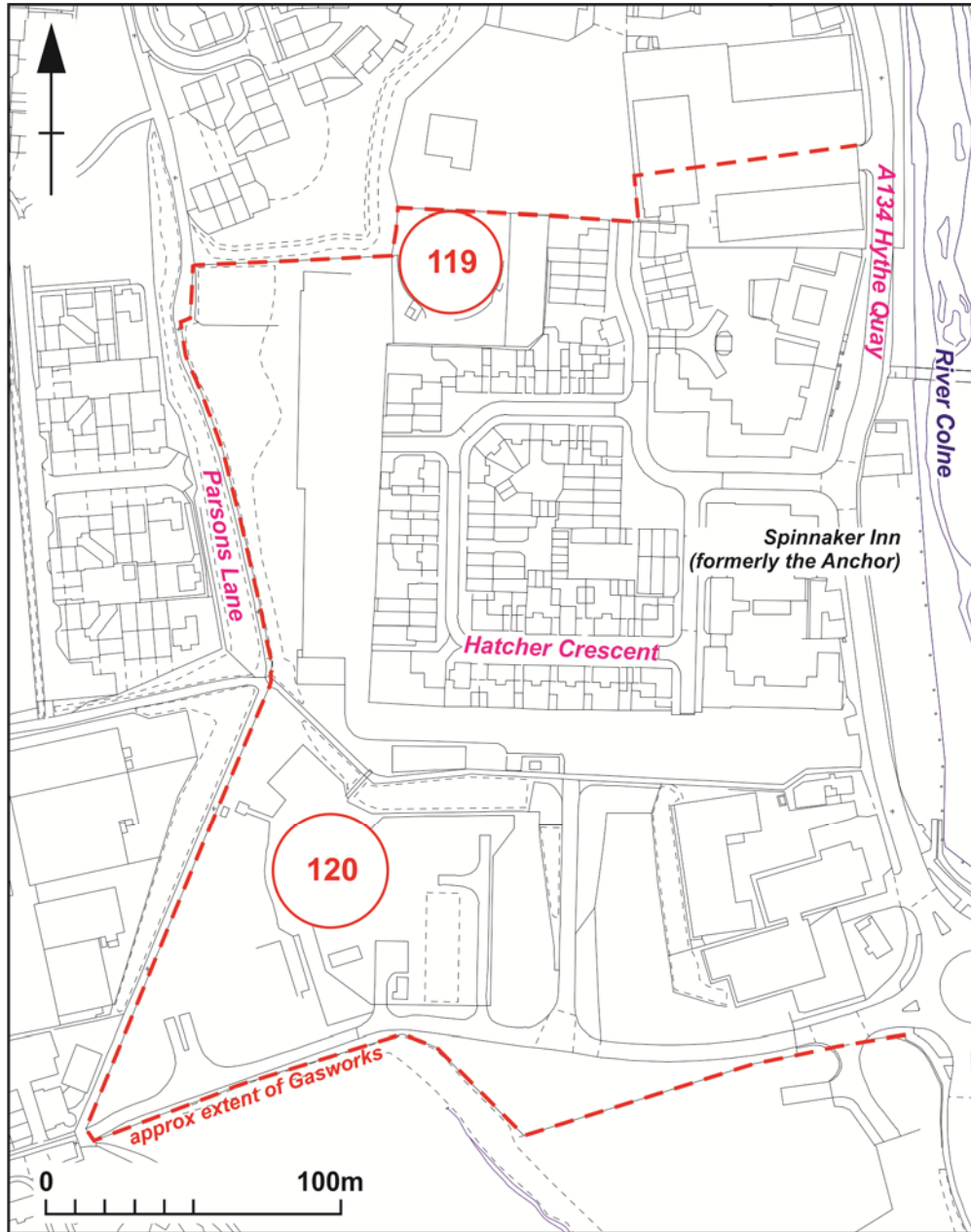
MOLA (Museum of London Archaeology) carried out a programme of historic building recording of Gasholders 119 and 120 at the former Colchester Gasworks, Hythe Quay, Colchester. The gasholders were both above-ground, spiral-guided holders. Gasholder 119 was constructed between 1923 -1938 to store coal gas and was later converted to store natural gas; Gasholder 120 dated to the 1960s and was built to store natural gas. Neither gasholder incorporated elements of earlier structures and both were considered to have minimal heritage significance. Gasholder 120 has been fully dismantled but Gasholder 119 remains extant at the time of writing.

1 INTRODUCTION

MOLA was commissioned by Montagu Evans, acting on behalf of National Grid, to undertake a programme of historic building recording at the former Hythe Quay Gasholder Station, Colchester, Essex (NGR TM 0134 2430, Fig 1).

The survey is a voluntary exercise commissioned by National Grid as part of their commitment to the heritage of their broader estate. This report is in response to a Historic Building Recording brief by Montagu Evans (Montagu Evans 2015) and in accordance with current best archaeological practice as defined in the Chartered Institute for Archaeologists' *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures* (CIfA 2015) and the Historic England procedural document *Management of Research Projects in the Historic Environment* (HE 2015).

The former gasworks is located in the Hythe area to the south-east of modern Colchester, close to the western bank of the River Colne. The surrounding area is mixed industrial and commercial retail units, and modern residential developments. To the west the site is bound by Parsons Lane which separates the site from modern warehouses and industrial units. To the south of the site are allotments, a vehicle scrapyard and modern housing. The central area of the former gasworks is now occupied by a modern residential development which separates the two gasholders. To the east of the site is the A134 Hythe Quay which runs along the west bank of the river. The remainder of the former gasworks site is now largely overgrown.



Site location Fig 1

2 OBJECTIVES AND METHODOLOGY

The objectives of this survey as set out in the brief were to:

- Produce an illustrated, written document detailing the fabric, appearance and form of the gasholders and associated structures and pipework. Due to the safety constraints associated with gasholders, recording was limited to the exterior of the structures;
- Provide historical survey drawings (or sketches) for comparable investigation relating to building form and function, identification of fixtures and fittings where visible or accessible;
- Provide an account of historic fixtures, fittings and architectural features where visible or accessible;
- Provide a photographic record of the structures in context.

The level of recording was specified as basic Level 2 – a descriptive record (Historic England 2015). This is defined by consisting of

- A systematic account of the building's origins, development and use
- A drawn and photographic record to illustrate the building's appearance and structure as well as measured drawings of specific elements of historic or architectural interest.

Recording was carried out in two phases. Phase I encompassed pre-demolition recording of the extant elements of the site whilst Phase II comprised recording of any areas not visible or accessible during Phase I. The demolitions contractor carried out the Phase II photography of Gasholder 120 during dismantling.

Phase I recording was carried out in October and November 2015. The site was photographically recorded to include general views of the site and structures, placing them within their wider context, and detailed views of any structural, historic and architectural details that would be lost during demolition. It was intended to provide a record of Gasholder 119 during dismantling but such work has been postponed due to difficult access to the site.

Photography was carried out using a Nikon D200 DSLR equipped with Sigma 35-17mm and Nikon 18-70mm lenses. The photographs are reproduced on archive quality photographic paper, submitted alongside this report.

In this report, the main, larger area of the former gasworks will be referred to as the gasworks and the survey area containing the gasholders will be referred to as the gasholder station.

3 HISTORICAL BACKGROUND

3.1 Local history and development of the Hythe area

There would appear to have been a port here from earliest times affording a trading place when the sailing vessel was the main means of transport. Although no definite evidence exists to prove it, Roman vessels most likely used the Colne bringing in supplies for their Legions station in Britain... The word Hythe is said to derive from the Saxon "Hatha" meaning a port or haven... The Saxons may have abandoned the old Roman harbour and moved down river but by 1276 the present harbour is referred to as the New Hythe is the Court Rolls (Cockerill & Woodward 1975).

The eighteenth century saw changes in Colchester and at the Hythe. The town began to change from an industrial one to a market centre which processed the local agricultural produce (Cockerill and Woodward 1975).

Until the 19th and 20th-century expansion of Colchester during which the outlying areas were absorbed into the city, Hythe was a physically separate area with a local industry focused around the Hythe harbour from which goods were transported.

The Hythe area was connected to the town proper by Magdalene Street (now Hythe Hill) along which had developed a linear arrangement of properties. During the 18th century;

the parish of Hythe...extends from the sea shore, the southern bounds of it, northward up the hill a very little way beyond the church, which is about half a mile, and from the bridge at the east end of the town westward, about half way up the hill towards Newingreen, being more than a mile and a half (Hasted 1979).

Attempts were made in the 19th century to improve the channel which was prone to silting and provided difficulty with navigation. Acts of Parliament were put forward to help provide for the upkeep of the river. Several propositions were put forward for the removal and replacement of old locks and excavation of new cuttings. These plans also involved the deepening of the river and construction of sluice gates at Hythe Bridge to scour the channel.

In the late 19th and early 20th century Colchester remained an important market town for the surrounding rural area. Agriculture continued to prosper until c. 1875, after which it became depressed as food imports from overseas became increasingly competitive (Thornton 1994).

The depression of the agricultural industry was accompanied by an increase in manufacturing businesses and by the early 20th century engineering had become a leading industry of the town.

Because the town's industrial growth came later than in places in the north and midlands, it was less dependent on staple industries like cotton and iron and steel, which were threatened by competition from more recently industrialized countries in Europe and from the United States (Thornton 1994).

Following the First World War, in response to the problem of high unemployment, the local council undertook schemes to provide work for the unemployed including road widening and the construction of a new quay and railway siding extension at the Hythe. The port was further improved in the inter-war period to allow berth for larger vessels.

The Hythe district was an increasingly important industrial centre for the town, the new electricity power station being opened there in 1926 and new firms moving in during the 1920s and 1930s...The local economy was increasingly

affected by wider national and international developments and in the early 1990s particularly by Britain's membership of the European Community and by industrial recession. By the late 1980s Colchester had developed from an agricultural market town to a potential leading regional service centre for eastern England, viewing its proximity to Europe as an asset (Thornton 1994).

3.2 The Colchester Gas Company and Hythe Gasworks

Gas lighting was introduced to Colchester by Harris & Firmin, High Street chemists, who from 1817 manufactured coal gas to light their own and adjoining shops. In 1819 the improvement commissioners accepted Harris & Firmin's tender to light High Street from the top of North Hill to St Nicholas's church...Before 1825 the gasworks were moved from High Street to Duck Lane (later Northgate Street) near river Colne...Following Harris's retirement the Colchester Gas-Light and Coke Co. was formed in 1826 with 31 shareholders. In 1838 new gasworks at Hythe replaced the old ones which were sold in 1839. Auxiliary gasworks were built in 1843 in Dead Lane (later St Peter's Street), west of the silk factory, to improve the supply to the north and east sides of the town but were moved to the Hythe in 1849 (VCH 1994, 295).

The construction of the new gasworks at Hythe is recorded as being unpopular with local residents who objected that they already had "nuisances now existing and arising from the laboratories at Hythe Quay" (Cockerill & Woodward 1975).

As part of documentary research for this report, a document entitled *Prospectus for extending the works of the Colchester Gas Company and removing them to the Hythe* (D/F 27/2/38) was obtained from the Essex Record Office, Chelmsford. With regards the reasons for and advantages of this work it states that the move is

in consequence of the increased and progressing demand for Gas Lights generally and pressing applications made for the extension to the Hythe. A great saving will be effected in the carriage of coke lime and other articles used in the business. It will give the Company an opportunity of introducing the most modern improvements in the erection of the necessary buildings and apparatus and it is...the commanding station in the neighbourhood for distributing the gas to every quarter of the town.

Documents of tender received in May 1838 included Charles B. Robinson of the Leicester Gasworks at £5626 4s 9d, C. Gray at £5530 and Edward Harrison Barwell of Northampton who submitted the winning tender of £5646, though the total sum following completion of the works was £5446, 16s.

The gasworks seem to have been in some state of disrepair not long after construction. In May 1847 an "agreement in respect of dilapidations at gas works" was made between the Colchester Gas-Light & Coke Company and Thomas Joslin, which made arrangements for surveying and making good, though the extent of repairs is not recorded (D/F 27/2/68).

In 1865 a small group of consumers formed the Gas Consumers' Co. and tried to obtain an act of Parliament to supply gas in Colchester. Members of the existing company...felt compelled to fight their potential rivals by securing in 1866 an Act of Incorporation so they could raise additional capital and increase gas supplies, and the Gas Consumers abandoned their action (VCH 1994).

Following an Act of 1866 the Colchester Gas-Light & Coke Company was incorporated as the Colchester Gas Company. This was followed by an Act of 1875 which enabled the Company to fix a higher maximum price and enabled it to raise

additional capital for improvements the gas plant at Hythe were “improved and enlarged and a telescopic gas holder was built for storing 300,000 cu. ft. of gas. New income was derived from manufacturing sulphate of ammonia” (VCH 1994).

The Ordnance Survey map of 1876 (not reproduced) shows the gasworks to be well developed by this date, comprising at its northern area two large gasholders flanking a smaller holder, with two smaller gasholders or tanks, and a group of gasworks buildings to the south. A number of coal and timber yards were located immediately to the west of the gasworks, arranged parallel to the river. A short distance to the north-west of the site was located the Standard Ironworks which had been opened that same year. The gasworks at this time was approximately half of its later extent. To the south of the gasworks was a *Timber Dock* adjacent to wooded area labelled as *Nicholl's Grove*. On the eastern bank of the river, roughly opposite to the gasworks was located a *Tar Distillery* with arable farmland beyond, crossed by the Great Eastern Railway. The area to the east of the river remained largely undeveloped until the early 20th century. Likewise, to the south of the gasworks, the land comprised enclosed fields and wooded areas, with Hythe Maltings, a number of gravel pits and a brick field.

By 1896 the smaller gasholder had been replaced with a much larger gasholder, flanked by the two original holders. These holders were designated, from east to west as holders 1, 2 and 3. A small liquor tank had also been constructed to the west of the gasholders. The gasworks had also been expanded with the construction of several new structures to the west of the original buildings.

In 1916 the gas company obtained a further Act to construct new gasworks, acquire lands, raise additional capital and extend their limits beyond Colchester... The gas company, by constructing a retort house and extending its plant at the Hythe in 1920, was able to withstand competition from electricity and remain profitable until the nationalisation of gas in 1949 (VCH 1994).

Ordnance Survey mapping of the 1920s shows that the gasworks was extended further to the south by that time and a number of new structures had been built around the earlier buildings. In addition, a branch of the rail line to the north of the site had been extended so that it runs into the gasworks passing by the east of the gasholders. Gasholder No 4, (Gasholder 119), was constructed in the north-western corner of the site, adjacent to the existing three gasholders, between 1923 and 1938.

An undated description of the works (likely 1920s / 1930s) provides a comprehensive description of the plant and workings at the Hythe Gasworks at that time.

Gasworks were first erected on the existing site in 1838. Coal is received both by rail and water to the amount of 20,000 tons per annum. Sea-borne coal is brought from the North of England in small steamers or motor vessels in cargoes up to 400 tons... The retort house has a total gas making capacity of 1 ¾ million cubic feet per day, and contains 72 horizontal retorts... [After the gas-washing plant] follows the station meter, capacity 100,000 cubic feet per hour, and the gasholders in which the gas is stored and which have a capacity of 450,000 cubic feet each (EA/COG/X/X/2).

In January 1953, the Hythe area and many other parts of Essex were hit by the *Great Tide*. A night storm, coincident with a high tide in the North Sea, resulted in a tidal surge along the east coast of England. At Hythe, water engulfed the Hythe Bridge Ironworks, and the Gas and Electric works. Also flooded were a canning factory, printing works, Motor Works and Petroleum Depot: “Luckily for Colchester the gasholders were able to maintain the supply until the gas works were pumped out and production resumed” (Cockerill & Woodward 1975).

In 1964, additional plant at Hythe Quay enabled gas to be manufactured from oil as well as coal. The gasworks at Hythe were closed in 1971 and gas

supplied from Chelmsford and Hitchin through the grid until 1973 when Colchester was converted to natural gas from the North Sea. The Hythe Gasworks were demolished in 1973 (VCH 1994).

The process of extracting gas from oil is described as follows:

An Otto continuous catalytic reformer, heated by propane, will produced a lean gas from propane feedstock the sulphur content of which has been reduced to 10ppm by passage through Otto Degussa sodium material. The CO content of the lean gas will be reduced...The gas will be enriched by propane, odorized...and leave the plant at a pressure of 150 psig. (BGC/CNCT/P/2/44)

An exact construction date is not known for Holder No 5 (Gasholder 120); however, Ordnance Survey mapping and a schematic drawing of foundations (EA/SA/COG/E/T/1) by Newton Chambers & Co Ltd National Grid plans place its construction to around 1968. By this time Gasholder No 1, at the north-east of the site had been dismantled to make way for rail sidings, tar tank and coke storage. Plans for the demolition of Gasholders 2 and 3 and a large portion of the former gasworks buildings and tanks were put in place between 1968 and 1971 (EA/SA/COG/E/E2).

3.3 Archival and Documentary evidence

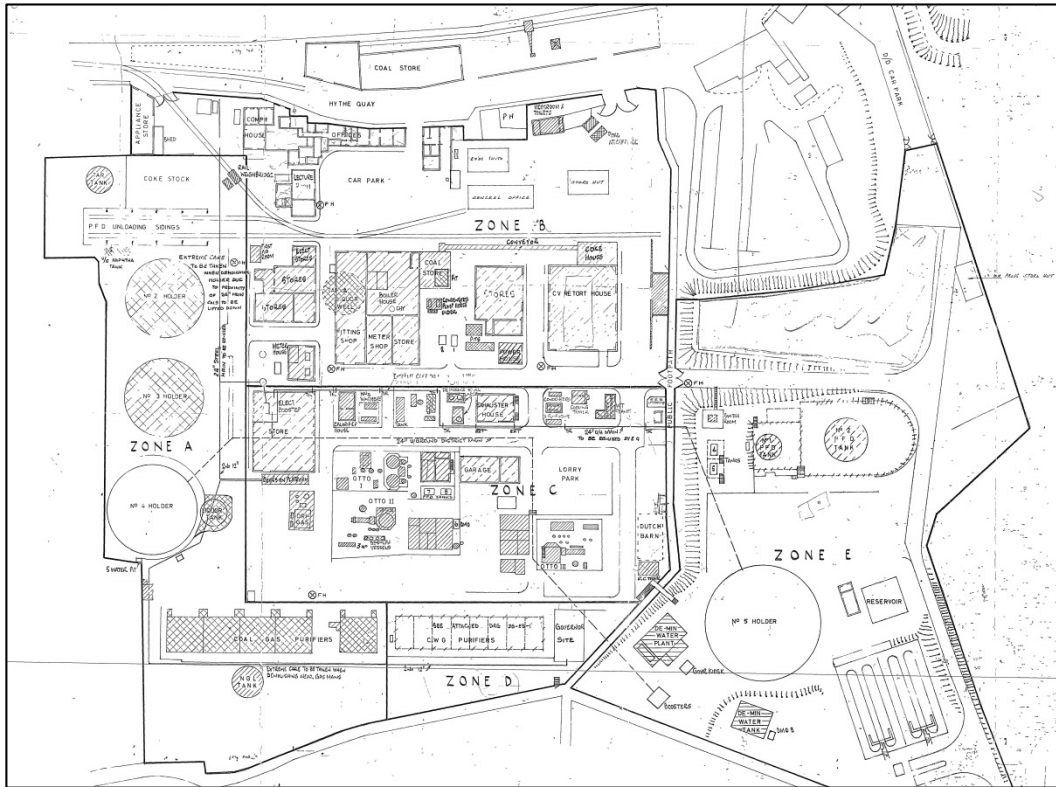
Table 1: Archive documents referenced in this report, held at Essex Record Office, Chelmsford

Reference	Description	Date
D/F 27/2/38	Prospectus for extending the works of the Colchester Gas Company and removing them to the Hythe	1838
D/F 27/2/41	Tender for gasworks, Richard Coleman	May 7th 1838
D/F 27/2/42	Tender for gasworks, Charles., B., Robinson	May 7th 1838
D/F 27/4/45	Tender for gasworks, Edward Barwell	May 8th 1838
D/F 27/2/68	Arrangements for surveying and repairs	May 1847

Table 2: Archive documents referenced in this report. Held at National Gas Archive

Reference	Description	Date
BG14/COG/X/X/2	Colchester Gas Company – Description of Works	Undated
EA/SA/COG/E/E/2	Demolition Plan	1968-1971
EA/SA/COG/E/E/5	Colchester Works Plan – Layout of Gas Mains	1967
EA/SA/COG/E/T/1	3 Lift Spiral Guided Gasholder – Details of Foundations	1968
BGC/CNC/T/P/2/44	New Gasmaking Plant	1964/1965
Xg02863	Aerial view of the site	1970-1980

COLCHESTER GASWORKS, HYTHE QUAY



Plan of the site, c1971, shortly prior to demolition of the former works buildings. North is to the left of the image (National Gas Archive ref: EA/SA/COG/E/E/2) Fig 2



Aerial view of the site following clearance of the gasworks buildings, looking north-west (NGA ref: xg02863) Fig 3

4 BUILDING REORDING

4.1 Gasholder 119 (No.4 Holder)

Access to this gasholder was limited due to large areas of standing water and contaminants within the gasholder compound, as well as established vegetation which limited photographic recording to a distance from the subject, outside of the compound fence. Immediately to the north of the gasholder is a scrapyard with large piles of scrap, and a housing estate is to the east of the site, again limiting views from these directions. The clearest views were obtained from the western side of the site, outside of the compound

The gasholder is a spiral-guided, above ground type, approximately 32m in diameter, with a static base tank and three lifts. Sunken pipe pits for inlet and outlet pipes are located in close proximity to each other at the southern side of the tank.

The tank is formed of large rectangular steel sheets riveted at the edges. Floating pilasters formed of rolled steel channels braced with diagonal straps rise to the top of the tank and support for the outer row of roller carriages and the tank walkway.

Although the top of the gasholder could not be accessed it is evident that it retains standard fittings including oil film, applicators, anti-freeze piping, mag-locks, pumps, spiral steps to the lifts, hand-rails, emergency stops etc.

The outer tank is in a fairly poor condition with many small puncture marks visible on its surface. The resistant paint has peeled in several places and rust staining is evident in a number of locations.



Aerial view of Gasholder 119, c1980s (EA/DX/E/F/2) Fig 4



General view of Gasholder 119, looking east Fig 5



View of the tank and pilasters, also showing truncated gas pipe Fig 6



The spiral stairs and railings Fig 7

4.2 Gasholder 120 (No. 5 Holder)

This was a spiral-guided gasholder measuring c38m in diameter, and comprised a static above-ground base tank and three lifts. The tank was constructed of six courses of steel sheets, overlapped and riveted at the edges. Additional riveted overlap plates were installed at the lowest two courses, both on their external face and with matching plates on the inner face of the tank. Twenty four box pilasters or vertical supports, each comprised of a pair of C-section Rolled Steel Channels, spanned the height of the tank, stopping short of the ground. At the top of the supports were tapered gusset plates which were riveted to the supports and the tank, with top angles to which the walkway was bolted. The vertical supports were held a short distance away from the tank sheeting and were fixed to the tank by means of brackets.

Each lift was formed of riveted, fairly small rectangular steel sheets arranged in ten courses with square profile cup and grips or dips. Shallow channels were affixed to the inside of the lifts, fastened at top and bottom of the lifts and at intersections with the spiral rails. A circular manhole access was located just above the base of the gasholder at its northern side, allowing passage through the tank and lifts when the gasholder was at rest.

A commemorative cast iron or steel plaque with the manufacturers' mark *Newton Chambers* was installed on a pilaster adjacent to the tank stairs at the east side of the tank. Green-blue colour protective coating had been applied to the base tank as well as the principal components of the gasholder including pilasters, stairs and walkways.

The gasholder was built atop a level concrete base with a slight 6" rise to the centre. The concrete platform was surfaced with welded steel sheets which were in turn welded and riveted to angles at the bottom edge of the tank sides.

Inlet and outlet pipes were located at the south-east and north-west sides of the gasholder. Those at the north-east side rose level to the top of the tank, providing flood protection for the system. A wheel-spun flow valve with manufacture's stamp *HOLMES* was installed at the bottom of one of the pipes. A second wheel-spun flow valve, also with manufacturer's mark *HOLMES* was located at the top of the pipe pit at the north-west of the tank.

The base tank stair was located at the south-east side of the gasholder. It rose from a concrete pad and was held a short distance from the tank by brackets connected to the pilasters. The stair had safety rails at either side and a security gate was located at the bottom of the stair to prevent unauthorised access. The treads were steel with embossed grip. An emergency stop button was installed at the top of the stair. A steel walkway with embossed tread encircled the top of the base tank, projecting outwards from it, with steel safety rails along its outer edge. Three sets of free-standing stairs provided access to the lift tanks when these were raised. When the tanks were at rest, the stairs converged at the eastern side of the tank.

The movement of the lifts was guided by means of curving guide rails on the outer face of each tank, which engaged with regularly spaced roller carriages at the top of the tanks. The outer ring comprised 24 roller carriages, each positioned at the top of the 24 pilasters. The middle and inner rings had 16 and 12 roller carriages. The roller carriages are formed of a flat base plate with two barrels or hubs housing the axel, with the guide wheel projecting from the inner face of the carriage. Manufacturing designations in the form of welded lettering can be seen on most of the roller carriages. The design of the carriages is necessarily compact so as to encompass minimal space, allowing the mechanism to sit comfortable at the top of the lift tanks.

A lagged anti-freeze main was connected to the outer edge of a pilaster at the south of the tank and connected to flexible pipes which in turn were attached to a pair of pylons allowing the pipes to stretch between the lifts as they rose. The anti-freeze system was controlled via six control units labelled *Modular Anti-Freeze Units*. The pumps were dated 1988, post-dating the gasholder's construction. Cable tracking, carrying electric cables was located on the adjacent pilaster to the anti-freeze pipe. A compressor house was formerly located alongside the gasholder to its south, with pipes and cables running overhead between the two, but had been demolished prior to this survey.

The crown was formed of staggered, concentric rings of tapered rectangular steel sheets. The sheets were riveted at the edges and those of the outer curb were strengthened by additional overlap plates. The crown surface was found to be in a generally good condition with minimal warping or distortion. Gas vents were located at the centre of the crown and oil film applicators were located at the south side of the crown.

A Booster House was formerly located to the north of the gasholder. This had been removed by the time of this survey, leaving remnant pipework and valves in situ. Other plant such as de-mineralisation water plant and Governor were formerly to the north-west of the gasholder and reservoir and tanks were to the south.



Aerial view of Gasholder 120, c1980s, looking south-east (EA/DX/E/F/2) Fig 8



General view of Gasholder 120, looking north-west Fig 9



Detail of the tank sheeting, note electric cables and pipes on the pilasters Fig 10



The tank stair, looking north, with inlet / outlet pipes beyond Fig 11



Detail of commemorative plaque adjacent to the stair Fig 12



The inlet / outlet pipes and dry well Fig 13



The anti-freeze pipes and pylons at the south side of the gasholder Fig 14



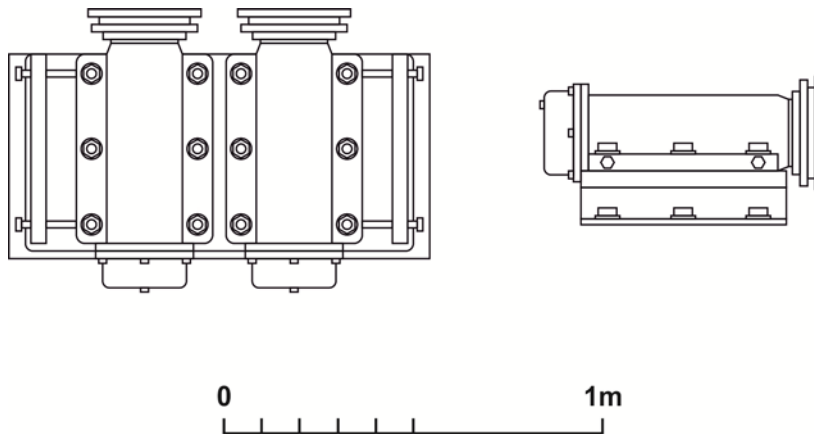
View of the crown and spiral stairs, looking south-east Fig 15



View of the tank walkway, lifts and railings Fig 16



The arrangement of roller carriages Fig 17



Detail of the roller carriages Fig 18



Example of the modular anti-freeze units Fig 19



Detail of holder height controls at the south side of the gasholder Fig 20



View of the crown top curb, also showing valve and manhole Fig 21



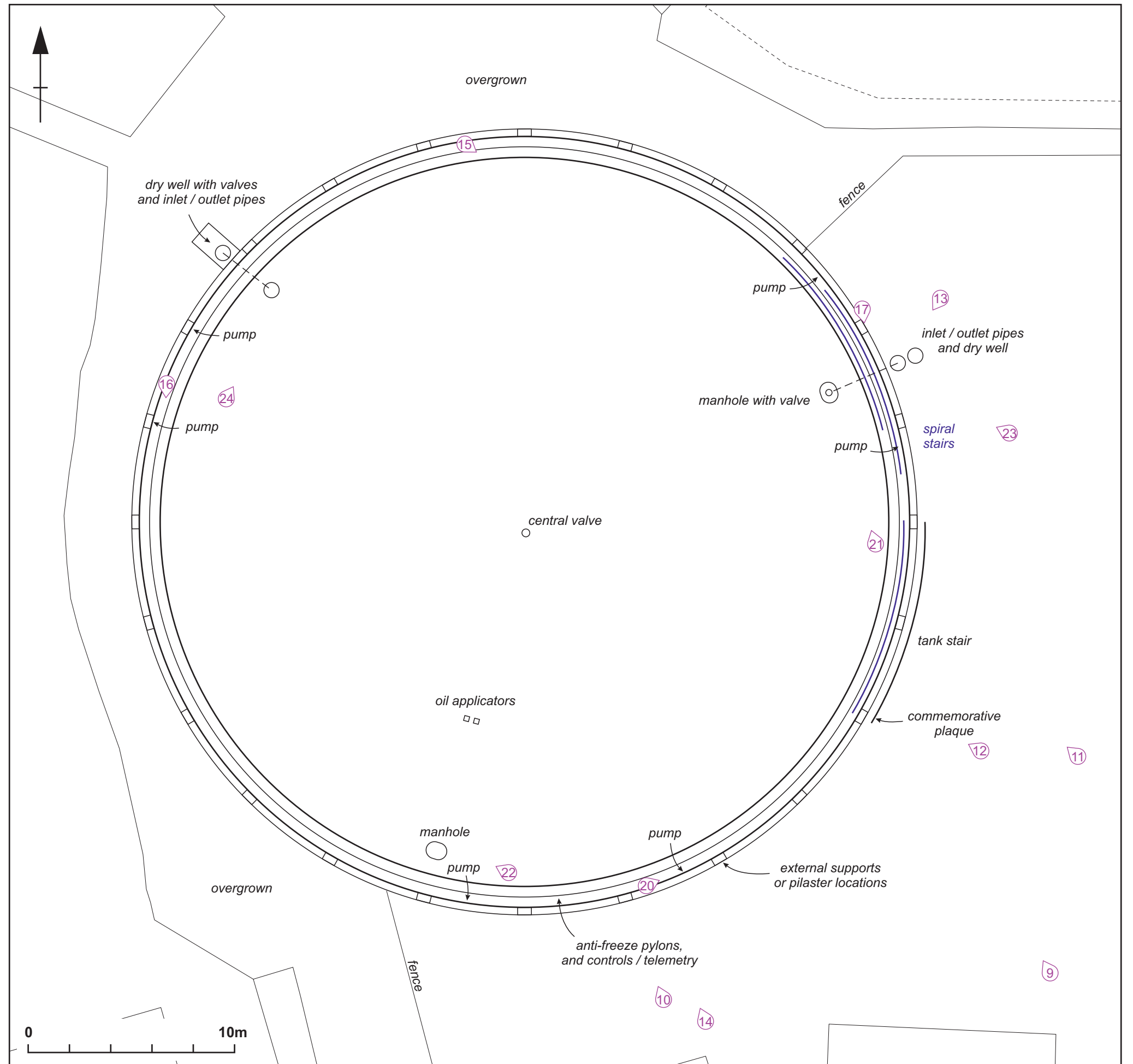
Detail of manhole on the crown Fig 22



The gas holder during dismantling, note inlet and outlet pipes in foreground Fig 23



The gas holder tank during dismantling Fig 24



Scale 1:200 (A3)

Plan of Gasholder 120, showing photograph locations Fig 25

5 DISCUSSION

The Hythe Gasworks, established in 1838, was well planned from its inception, with a considered layout and plentiful space to allow for future expansion as necessity required. It was located in an area of established industry and had easy access to both road and water links to allow for the transportation of the raw materials needed for the gas production process. Its gas storage requirements were initially served by three column-guided gasholders at the north of the site, however, with the construction of No.4 holder (later redesignated Gasholder 119) between 1923 and 1938, the spiral-guided design was adopted instead. This corresponds with the general national trend in gasholder construction in which, from the late 19th century though to the early and mid 20th century, cast iron column-guided holders gave way to steel frame-guided gasholders and spiral-guided gasholders. The first spiral-guided gasholder was built in 1890 but it was not until the early-mid 20th century that the design gained popularity due to the comparatively low cost of construction, ease of maintenance and potential for large storage capacity.

No.5 Holder (Gasholder 120) was a fairly late build, being constructed around 1968, at the infancy of the exploitation of natural gas from the North Sea which would render many of the UK's gasworks obsolete and lead to the closure and demolition of many gasworks. The manufacturer of No.5 Holder, Newton Chambers was a notable manufacturer of gasholders and gasholder components. The firm was established in 1795, with its ironworks at Thorncliffe near Sheffield.

The two main formal surveys of gasholders and gasworks, *the London Gasholders Survey* and *Step 3 Report for Monuments Protection Programme* (Tucker 2000, Trueman 2002) have focussed primarily on earlier column-guided gasholders and the typology of their components, with little or no formalised classification of the later gasholders and the spiral-guided and waterless types as these are considered to have less historic and heritage significance, being generally of a later period. The Hythe Gasworks is not included in the 151 gas sites assessed in the Step 3 report.

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(See section 3.3 for archival references)

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