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# HITCHIN, HERTFORDSHIRE CADWELL LANE GASHOLDER STATION HISTORIC BUILDING SURVEY

TEP

No. 1 The Chambers,  
Bowden Business Village,  
Market Harborough,  
Leicestershire,  
LE16 7SA

Tel: 01858 383120  
E-mail: [mh@tep.uk.com](mailto:mh@tep.uk.com)  
[www.tep.uk.com](http://www.tep.uk.com)

Offices in Warrington, Market Harborough, Gateshead, London and Cornwall

Document Title	Historic Building Survey
Prepared for	Atkins Ltd
Prepared by	TEP - Warrington
Document Ref	7807.002

Author	Amir Bassir
Date	September 2019
Checked	Sarah Hannon-Bland
Approved	Ian Grimshaw

Amendment History					
Version	Date	Modified by	Check / Approved by	Reason(s) issue	Status
1.0	27/09/19	AB	IG	Draft for client review	Draft
2.0	10/10/19	AB		Final report	Final





# OASIS Report Form

The Environment Partnership (TEP)

<b>Job Number:</b>	<b>7807</b>
<b>Project Name:</b>	Cadwell Lane Gasholder Station, Hitchin
<b>OASIS Number:</b>	theenvir1-436474

<b>PROJECT DETAILS:</b>		
Short description	The historic environment team at TEP carried out archaeological recording of Gasholder 39 at the Cadwell Lane Gasholder Station, Hitchin, ahead of planned demolition works. The gasholder was constructed in 1938 by Clayton Son and Co Ltd and was a spirally-guided gasholder with above-ground tank and three lifts.	
Project type	Historic building recording	
Previous work	Historic building recording	
Current lane use	Industrial, derelict	
Future work	Unknown	
Monument type and period	Modern gasholder	
Significant finds	None	
<b>PROJECT LOCATION:</b>		
County	Hertfordshire	
Site address	Cadwell lane, Hitchin, SG4 0SL	
Easting Northing	TL 7648 2287	
Area (sq ,/ha)	-	
Height aOD	-	
<b>PROJECT CREATORS:</b>		
Organisation	The Environment Partnership (TEP) Ltd	
Project brief originator	Atkins Ltd	
Project design originator	TEP	
Director/Supervisor	Amir Bassir	
Project manager	Jason Clarke	
Sponsor or funding body	National Grid	
<b>PROJECT DATE:</b>		
Start date	21-08-2019	
End date	10-10-2019	
<b>ARCHIVES:</b>	<b>Contents</b>	<b>Location (Accession No.)</b>
Physical	None	
Paper	None	
Digital	Photographs	
<b>BIBLIOGRAPHY:</b>		
Title	Hitchin, Hertfordshire, Cadwell Lane Gasholder Station, Historic Building Survey	
Serial title & volume	7876.002	
Author(s)	Bassir, A	
Page numbers	26	
Date	10-10-2019	

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## Executive Summary

1. The Environment Partnership (TEP) Ltd was commissioned by Atkins Ltd on behalf of National Grid to undertake archaeological recording of Gasholder 39 at the Cadwell Lane Gasholder Station, Hitchin (TL 1890 3100), ahead of planned demolition works. The gasholder had previously been assessed as having low heritage value and the recording was undertaken as a basic Level 2 survey in-line with Historic England guidelines.
2. The gasholder was constructed in 1938 by Clayton Son & Co Ltd and was a spirally-guided, low pressure and water-sealed gasholder with above-ground tank and three lifts, and had a nominal capacity of c1 million cubic feet (cu. ft.). The historic building survey encompassed the gasholder itself as well as associated infrastructure and buildings in the vicinity.
3. Gasholder 39 was found to be of a typical type and design for its period of construction, incorporating a standard range of fittings including modern additions, and, in common with gasholders throughout the UK, had been repurposed in around the 1960s to distribute natural gas.

## 1.0 Introduction

- 1.1 The Environment Partnership (TEP) Ltd was commissioned by Atkins Ltd, acting on behalf of National Grid, to undertake a programme of archaeological recording at the Cadwell Lane Gasholder Station, Hitchin, Hertfordshire (TL 1890 3100). This survey is a voluntary exercise commissioned by National Grid as part of their commitment to the heritage of their broader estate. This report has been produced in accordance with current best archaeological practice as defined in the Chartered Institute for Archaeologists' *Standard and Guidance for the Archaeological Investigation of Standing Buildings or Structures* (CIfA 2019) and the Historic England document *Management of Research Projects in the Historic Environment* (HE 2015a).
- 1.2 A Heritage Appraisal document (Montagu Evans, Undated), assessing the heritage significance of the site and gasholder, considered the gasholder to be of limited heritage significance and recommended a basic Level 2 recording as set out in the document *Understanding Historic Buildings, A Guide to Good Recording Practice* (HE 2015a) and the draft document *Guidelines for Evaluating and Recording England's Former Gasworks and Redundant Gasholders* (HE 2019). This report follows an approved Written Scheme of Investigation (TEP 2019). This report was produced by TEP and reviewed by Atkins Ltd.
- 1.3 The gasholder station was approximately 1.3 miles to the north-east of the historic core of Hitchin and 800m to the south-east of Ickleford. The gasholder was located within a National Grid/Cadent compound which was part of an industrial area bound on all sides by railway lines.
- 1.4 The gasholder was decommissioned and purged. The site was accessed from the west via Cadwell Lane. The gasholder was fenced off from the surrounding area, a telecommunications mast was located adjacent to the gasholder.
- 1.5 The site contained a single Gasholder designated No. 39; this was a three-lift spirally-guided gasholder with an above ground tank, and was constructed in 1938 by Clayton Son & Co. The gasholder and associated infrastructure was subject to a basic Level 2 historic building survey.
- 1.6 The local planning authority is North Hertfordshire District Council and the historic environment record is held by the Hertfordshire Historic Environment Record (HER).

## 2.0 Objectives and Methodology

- 2.1 The objectives of the archaeological work were as follows:
- Produce a drawn, photographic, and written record of the gasholder and associated infrastructure;
  - Provide a written account of the site, analysing any features of archaeological, historic or architectural interest, and to disseminate these findings in the form of a report and orderly archive.
- 2.2 The objective of Level 2 historic building recording is to provide a descriptive record of an extant structure, before and during demolition or conversion, where the building is known or suspected to retain limited historic significance. This provides a basic record in accordance with the Historic England document *Understanding Historic Buildings: A guide to good recording practice (HE 2015a)*. Draft guidelines for evaluating and recording former gasworks and gasholders recommend Level 1 / 2 recording for spiral guided gasholders or those of which there are numerous examples (HE 2019).
- 2.3 The survey was undertaken on the 21st August 2019 and included a photographic survey comprising general views of the site and gasholders, as well as detailed views of features of structural, historic or architectural interest such as the spiral guidance system and operating elements. Measured sketches were produced of an example roller carriage of each gasholder.
- 2.4 Photography was carried out using a Nikon D90 camera equipped with a Nikon 18-70mm lens. Photographic scales were included in shots where practical.
- 2.5 An Operations Manual providing detailed information about the gasholder and the site more generally was provided by the client.
- 2.6 This report includes an overview of documents held at the National Gas Archive. A visit was made to the Hertfordshire Archives to view any relevant documents, maps, and photographs.

## 3.0 Historic Background

- 3.1 The National Gas Archive provides the following information about the Hitchin Gas Company:

*"The Hitchin Gas Company was formed by deed of settlement in 1834 and became a Ltd. Co. in 1873. The Hitchin and District Gas Act in 1905 dissolved the company and reincorporated it as the Hitchin and District Gas Company with extended limits of supply and authority to extend the gas works. By 1936 the Tottenham and District Gas Co. held a controlling interest in the Hitchin GC. On Nationalisation in 1949 the undertaking became part of the Hitchin Group of the Watford Division of EGB"*

- 3.2 The Hertfordshire Archives hold an agreement and correspondence between the Hitchin Gas Company and Hitchin Council in which the Company, in March 1933, agreed to provide public lighting for a period of five years (ref: PUG/21/2/1). The recorded Gasholder was erected in 1938 at the expiry of this agreement period and provided a storage capacity of c1 million cubic feet (cu. ft.).
- 3.3 The recording area was located partway between Ickleford and Hitchin and adjacent to the Great Northern Railway and close to the River Hiz. Ordnance Survey mapping of the late 19th century demonstrates that this area primarily comprised an agricultural landscape with the area of the gasholder station remaining undeveloped until the construction of the gasholder and works in 1938. A Sewage Farm and the Greystone Limeworks with associated extraction pit were close to the site, on the northern outskirts of Hitchin.
- 3.4 The gasholder preceded the construction of the works and was built by Clayton Son & Co Ltd, and as was typical of gasholder construction at the time was spirally-guided and with an above-ground tank. Little information about the works or the Hitchin Gas Company was found in archival material and unfortunately there were no Ordnance Survey maps of the area dating to between 1940 and 1960. A number of site plans and aerial views are held at the National Gas Archive but date from the 1970s onwards.
- 3.5 An Ordnance Survey map of 1960 available online appears to show that the Gasholder stood in isolation until at least that date with the surrounding works being constructed subsequent to 1960 and in place by c1970. By the late 1960s the production of town gas had ceased nationally in favour of natural gas from the North Sea and the gasholder would have been converted to distribute natural gas by this period. A number of the buildings on the works site are labelled on various plans and included stores and electrical substations, transmission centres, workshops, and offices. In addition to the gasholder there were a series of propane tanks and oil or petrol tanks, as well as water reservoir.
- 3.6 At the time of this survey the site served as a Cadent/National Grid Operations Centre and several of the former buildings and all of the propane and oil tanks had been removed.



## 4.0 Historic Building Recording

4.1 The recording area comprising the gasholder station was fenced from the surrounding area and was accessed from the west. To the immediate west of the gasholder were a number of small single-storey structures including stores, probably a booster house, and electrical substation. A telecommunications mast was also located within the gasholder compound area though fenced off. The area to the north of the gasholder, formerly serving as a British Gas Eastern distribution centre, comprised a National Grid/Cadent Operations Centre, with the northern part of the earlier site having become semi-vacant. To the south and east of the site were light industrial units.

### Gasholder 39

4.2 A detailed description of the gasholder's specification, fittings, and operation was made available by the client (Hitchin Gasholder Station Manual (M81B)).

4.3 Gasholder 39 was a low pressure water-sealed and spirally-guided gasholder with three lifts and above ground steel tank. The gasholder was constructed in 1938 by Clayton Son & Co. Ltd, manufacturers of the earliest spiral-guided gasholder in 1889, and who constructed a great number of gasholders throughout the early and mid-20th century. The tank measured c39m in diameter and stood to a height of c9.5m; with the lifts raised, the gasholder reached a total height of c30m including the 1.8m (6' 0") crown rise. The nominal storage capacity of the gasholder was 1,051,905 cu. ft.

*Table 1 - Gasholder 39*

Lifts	1st (inner)	2nd	3rd (outer)	Tank
Diameter	36.54m 119' 10.75"	37.32 122' 5.5"	38.1m 125' 0"	38.88m 127' 7"
Depth	9.14m 30' 0"	9.14m 30' 0"	9.14m 30' 0"	9.44m 31' 0"
No. of guide carriages	-	12	16	20
Lift rotation	Clockwise	A/Clockwise	Clockwise	-

4.4 The gasholder was built onto a concrete base of which 200mm was exposed; the ground level around the east and north sides of the gasholder were at a higher level, forming a bund around the tank.

- 4.5 The tank was comprised of six courses of rivet-joined elongated steel sheets. The first (base) course was measured as being 1.33m in height, the second course 1.33m and the third course 1.67m. The sheeting of the lower two courses were strengthened at the seams by riveted overlap plates on the outer and inner face of the tank. The outer face plates were measured as 270mm in width. The rivets across the whole tank appeared to be of uniform size and an example rivet head was measured as 45mm in diameter. The upper two courses of the tank sheeting were interrupted at regular intervals by vertical sheets to which tapered gusset plates supporting the tank roller carriages were mounted.
- 4.6 The gasholder designation number was stencilled onto the tank at its south-west side adjacent to the tank stair.
- 4.7 An oval manhole access measuring 800mm x 640mm was located at the south-west side of the tank adjacent to the common inlet/outlet pipe drywell. The manhole was on the second course sheeting and was bolted closed; rivets around the manhole inferred a plate on the inner face of the tank.
- 4.8 The Station Manual document notes an overflow tank fitted on the inside of the tank, below the platform at the south side of the gasholder, connecting to a 4" discharge pipe.
- 4.9 The common inlet and inlet pipes were at the south-west side of the gasholder and rose from a dry-well to the height of the tank with anti-flood protection. Two 1" syphons were attached to the mains. The pipes each comprised three drums, externally flanged. A small cast iron plaque with the number '22' was fixed to the tank just behind the pipes. A redundant 24" outlet main with anti-flood protection was at the north-east side of the gasholder. These pipes also comprised externally flanged drums.
- 4.10 The tank stair was at the south-west side of the gasholder and stood a short distance from the tank, joined only at the top. The stair was carried on a steel-frame gantry over which was a mid-level landing. Circular profile handrails were installed on both sides of the stair and the top of the stair was caged to prevent unauthorised access to the tank platform.
- 4.11 The tank platform measured c0.5m in width and was supported by the tank gusset plates as well as intermediate brackets. A toe guard around the outer edge of the walkway also acted as a mounting point for the handrail stanchions.
- 4.12 The lifts were noted as each comprising eight courses of sheeting as well as the cup plates. The square-profile cup and grips comprised 9" x 3" channels with the top and bottom cup depths given as 27.5". The distance between the outer lift and tank walkway was measured as 450mm. Circular section handrails were installed on each of the lifts.

- 4.13 The dual-guide roller carriages were housed in simple single-piece footings supported from below by the external gusset plates and vertical stiffeners on the inside face of the tank. The roller wheels were measured as 280mm in diameter. The lift roller guides were of a more compact form of the same design. The guiderails are described as standard weight 55lbs per yard and were mounted on 12" x 1/4" rail plates. No run-out stops were noted.
- 4.14 The crown rise is noted as being 1.8m (6' 0"); the crown sheets were arranged in ten concentric rings with a central plate. The operations manual notes the sheeting thickness as 3/8" at the outer ring and 7 gauge for the other rings and the centre plate. The crown sheets were overlapped and riveted and the seams of the outer ring were strengthened with overlap laps which also served to attach the underlying rafters.
- 4.15 There was a circular manhole lid at the south-west side of the tank over the common inlet/outlet main and another at the north-east where the redundant former outlet pipe was located. An oval manhole was noted towards the east side of the crown.
- 4.16 At the centre of the crown were a 2" and a 3" Audco plug valve. A hydrostatic tank was located on the third ring at the south side of the crown. An emergency low level 'knock off arm' was fitted to the hand rails at the south side of the crown. Other arms were located on the other two lists along with corresponding hammer switches and maglocks.
- 4.17 The crown frame is described in the station manual as consisting of twenty-four 4" x 5" tee rafters with eight rows of angle purlins and tension roads. The stiffening curb comprised 6" x 3.5" angles.
- 4.18 The three spiral stairs were of a standard form comprising frames of steel angles forming principal horizontal and vertical elements as well as diagonal bracing. Spiral rails were attached to the inner side of each stair rise.
- 4.19 The gasholder utilised an electrical anti-freeze system which the operations manual describes thusly "*both cups...are fitted with electrical wire type heating elements suspended approximately 10"-12" below the surface of each grip*". The tank however was fitted with a water heating circulating pump manufactured by Worthington Simpson. Anti-freeze units visible on the lifts were labelled 'T Dryden and Sons' of Preston. Two electrical cable pylons were located at the south side of the gasholder; adjacent to these were various switching and control units and emergency grabwires.
- 4.20 The Britain from Above archive website holds a series of interesting and detailed photographs of the gasholder (ref: EAW020884-020887) in its raised position.

## 5.0 Discussion

- 5.1 Gasholder 39 was constructed in 1938 by Clayton Son & Co. and was found to be fairly typical of its type and period, and incorporated a standard range of fittings and features and including modern additions such as remote monitoring units and alterations such as rearrangement of the inlet/out pipes.
- 5.2 During the mid to late 19th century, gasholders were primarily column-guided, with the earliest spiral-guided gasholder being built in the late 1880s. The column-guided design was limited in the sizes that could be achieved and became unsuitable in the 20th century when growing population and urban growth, as well as greater numbers of domestic gas appliances resulted in an increasing demand for gas which the smaller historic gasholders could not provide. A common development on gasworks was the replacement of existing gasholders with spirally-guided ones which could be fitted into the existing tank and could provide a substantially increased storage capacity. Where built on new sites, spiral gasholders were generally constructed with above-ground tanks built onto a concrete platform, negating the need for excavating a tank. Other advantages of spiral-guided holders were their lower construction and maintenance costs as well as ease of maintenance and repair.
- 5.3 Gasholder 39 was to the north of a late 19th century gas works at Cambridge Road to which it was connected by 18" and 24" mains approximately 3/4 mile in length. The remote siting of the new gasholder was likely due to the lack of available space within the gasworks which was bound to its immediate west by railway lines, and, by the 1930s, had become bound to the east and south by residential development.
- 5.4 Following Nationalisation in 1949 the site came under the control of the Hitchin Group of the Watford Division of the Eastern Gas Board. With the national move towards North Sea natural gas in the 1960s the gasworks became obsolete and Gasholder 39 repurposed to distribute natural gas as part of a new distribution centre.
- 5.5 The site is not included in the 151 sites covered in the Step 3 Monuments Protection Programme (Trueman 2002).

## References

Chartered Institute for Archaeologists, updated 2019, *Standard and Guidance for the Archaeological Investigation of Standing Buildings or Structures*

Historic England, 2015a, *Management of Research Projects in the Historic Environment*

Historic England, 2015b, *Understanding Historic Buildings, A Guide to Good Recording Practice*

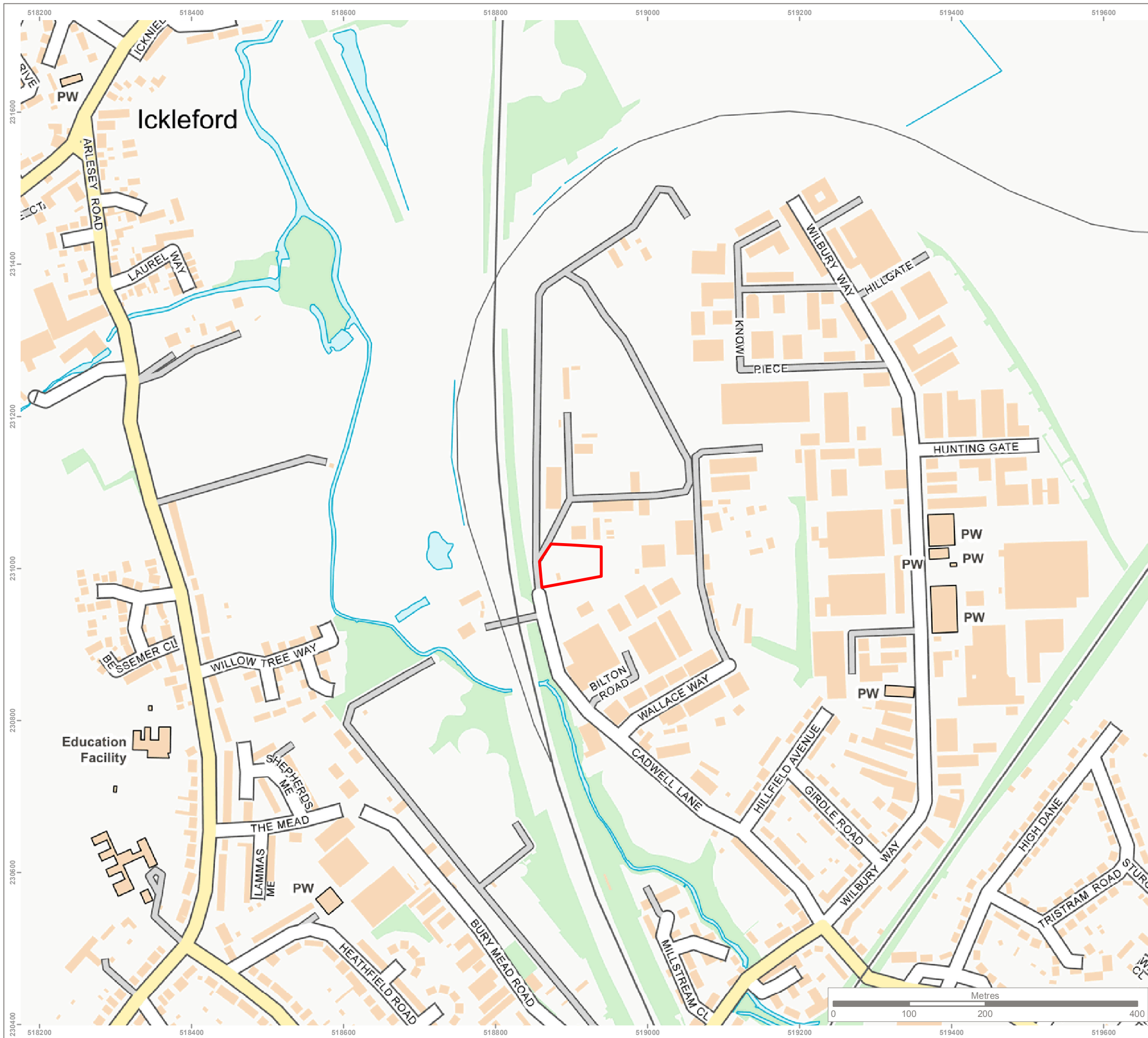
Historic England, 2019, *Guidelines for evaluating and recording England's former gasworks and redundant gasholders* (Draft)

Montagu Evans, Undated, *National Sites Heritage Review, 51 - Cadwell Lane, Hitchin, SG4 0SL*

Hitchin Gasholder Station Manual (M81B)

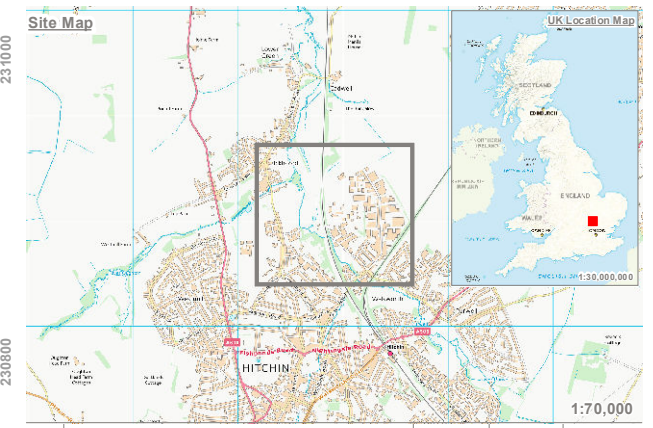
TEP, 2019, *Written Scheme of Investigation for Historic Building Recording at the Cadwell Lane Gasholder Station, Hitchin*

Trueman, M, 2002, *Gas Industry Step 3 Report for Monuments Protection Programme*, English Heritage



**KEY**  
 Site boundary

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Rev	Description	Drawn	Approved	Date

**TEP** | **THE ENVIRONMENT PARTNERSHIP**  
 No.1 The Chambers, Bowden Business Village  
 Leicester Road, Market Harborough, LE16 7SA  
 Tel 01858 353120 e-mail tep@tep.uk.com www.tep.uk.com

Project  
**Cadwell Lane, Hitchin**

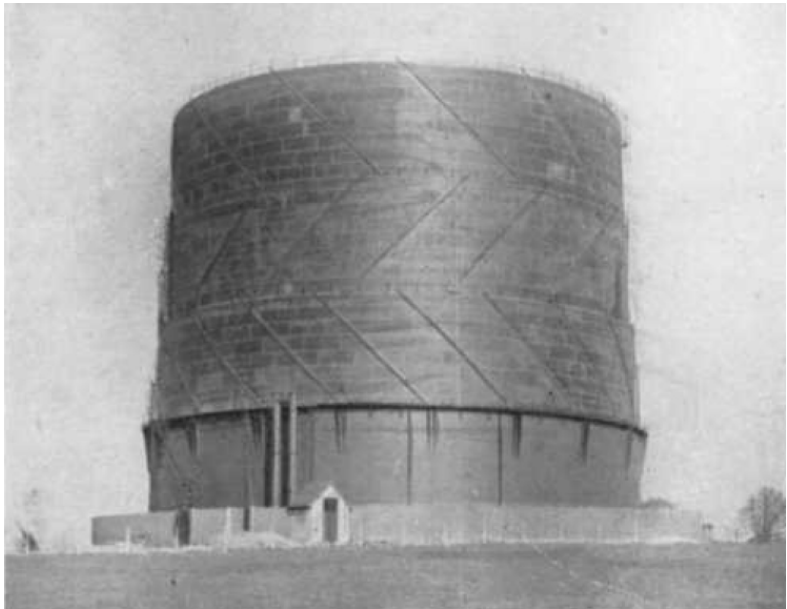
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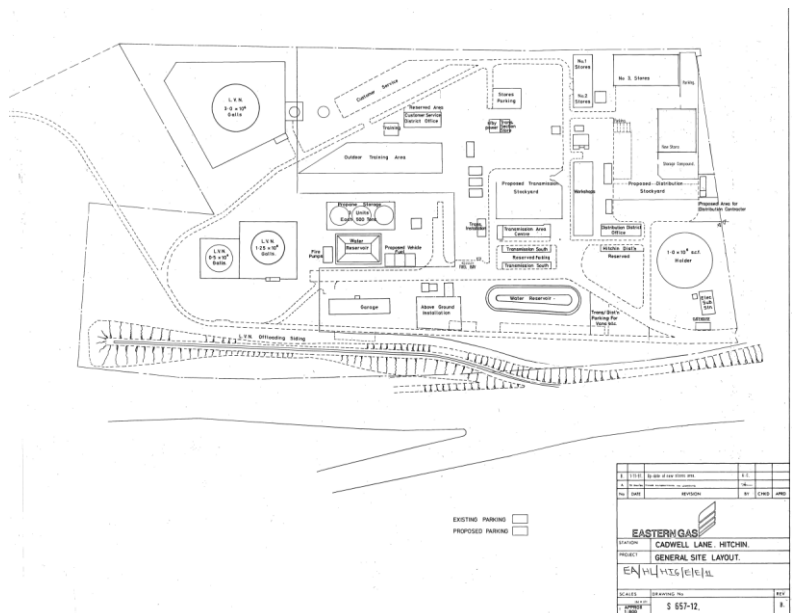
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LB	MK	JC	1:5,000 @ A3	12/08/2019



Late 20th century aerial view of the site Fig 2



c1938 photograph of the gas holder Fig 3



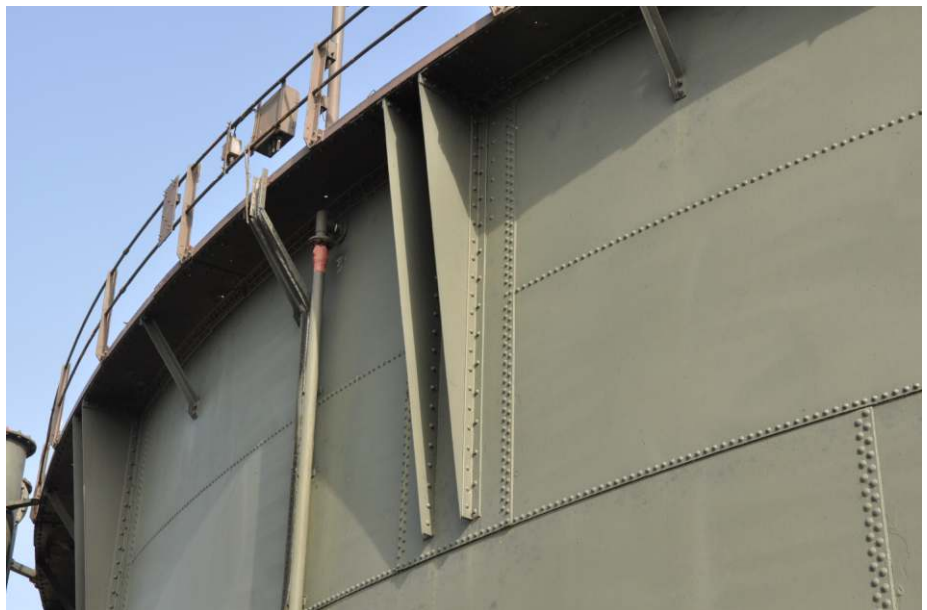
Plan of the site, 1991 Fig 4



General view of the gasholder, looking north-west Fig 5



Detail of the tank base construction Fig 6



Detail of the upper tank construction Fig 7





The inlet / outlet pipes and dry-well, with adjacent manhole Fig 8



Redundant pipes and dry-well Fig 9



The tank stair Fig 10



General view of the crown and spiral stairs, looking south-west Fig 11



Detail of the tank walkway, lift grips and hand-rails Fig 12



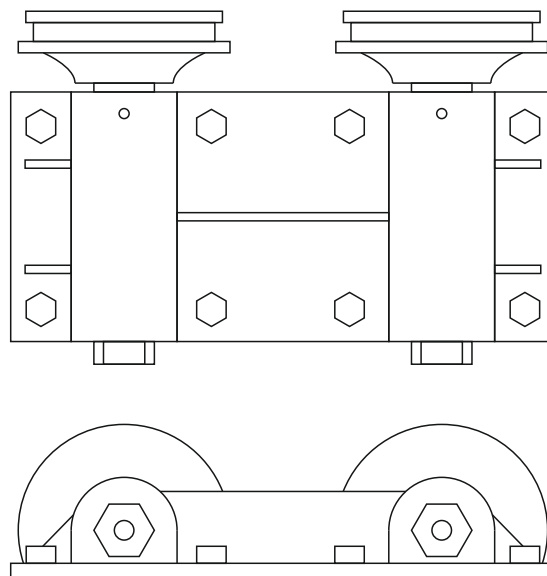
Detail of the crown with manhole Fig 13



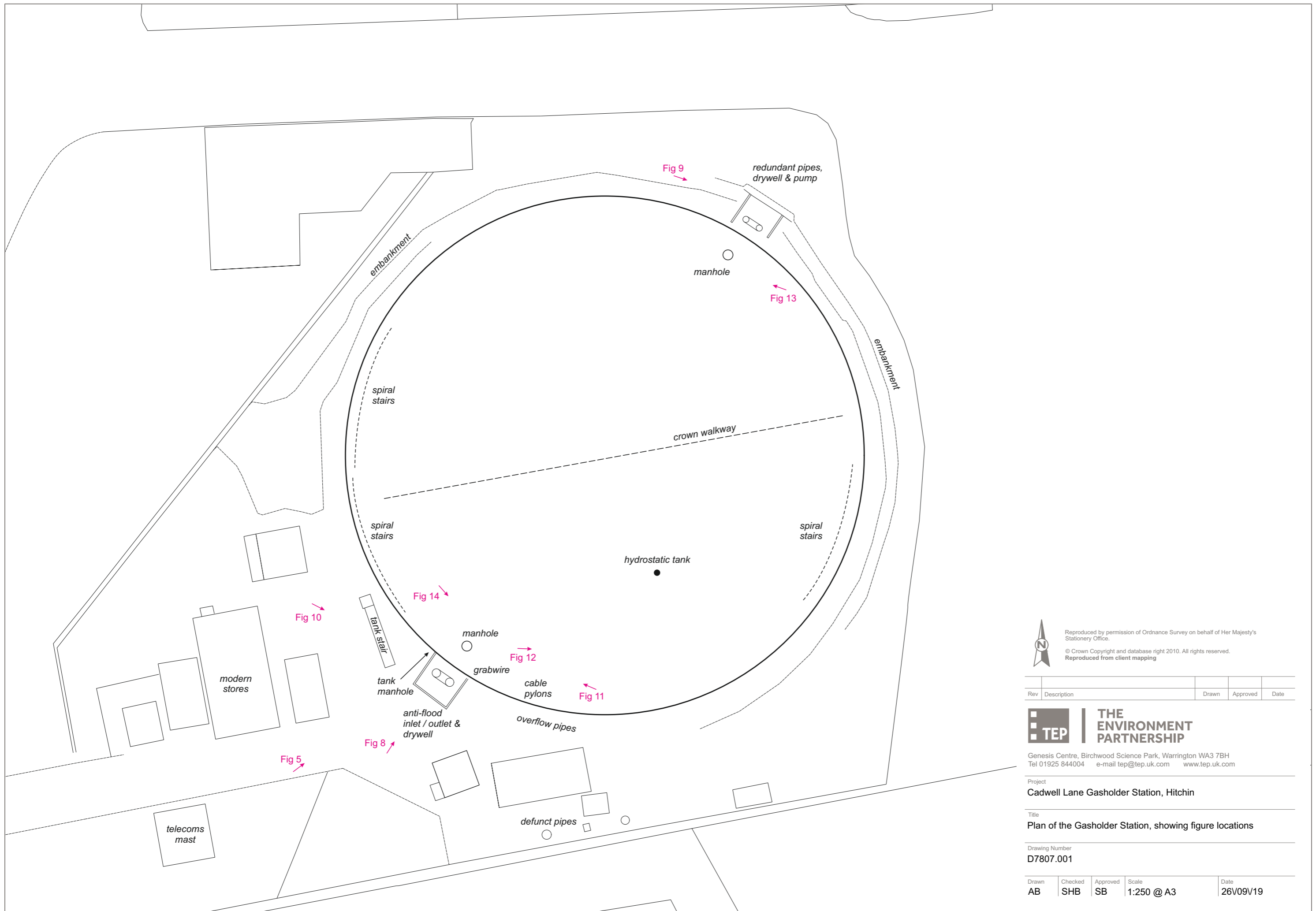
General view of the crown, showing cable pylons, looking west Fig 14



Example of the tank roller carriages Fig 15



Measured drawing of an example roller carriage Fig 16



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Genesis Centre, Birchwood Science Park, Warrington WA3 7BH  
 Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project  
**Cadwell Lane Gasholder Station, Hitchin**

Title  
**Plan of the Gasholder Station, showing figure locations**

Drawing Number  
**D7807.001**

Drawn	Checked	Approved	Scale	Date
AB	SHB	SB	1:250 @ A3	26V09V19

## Hitchin, Cadwell Lane Gasholder Station

Photographic Register

20<sup>th</sup> August 2019

Nikon D3500, Nikon 18-70mm Lens

File / Photo No.	Description
DSC0001	General view from W
DSC0002	Spiral stair and stair landing
DSC0003	Cable pylons
DSC0004	General view from W
DSC0005	General view from W
DSC0006	Detail of manhole
DSC0007	Drywell and mains pipes
DSC0008	Detail of sign adjacent to mains pipes
DSC0009	Tank base
DSC0010	Mains anti-flood pipes
DSC0011	Mains anti-flood pipes
DSC0012	Blanked pipes
DSC0013	General view at S of holder
DSC0014	General view from NE to W
DSC0015	Moat / tank base
DSC0016	Redundant pipes
DSC0017	Redundant pipes
DSC0018	Redundant pipes / dry well
DSC0019	Tank base
DSC0020	Tank base
DSC0021	Buildings at site entrance
DSC0022	Spiral stair
DSC0023	Buildings at site entrance
DSC0024	Tank stair
DSC0025	General view at W
DSC0026	Spiral stair
DSC0027	General view of tank
DSC0029	Tank gusset plates
DSC0030	Stair landing
DSC0031	Buildings at site entrance
DSC0032	General view from W
DSC0033	Cable pylons / cable tray and water pipe
DSC0034	Blanked pipe
DSC0036	Telecoms mast
DSC0039	Telecoms mast
DSC0041	General view from SW
DSC0042	Spiral stairs
DSC0043	View of tank
DSC0044	View of tank
DSC0045	Mains pipe and manhole
DSC0046	Signage adjacent to tank stair
DSC0047	View from crown from stair landing
DSC0048	View from crown from stair landing
DSC0049	Crown manhole
DSC0050	Cable pylons
DSC0051	Anti flood mains
DSC0052	grabwire
DSC0053	Spiral stairs
DSC0054	Spiral stairs
DSC0055	Hydrostatic tank
DSC0056	Crown top curb
DSC0057	Crown looking W
DSC0058	Crown looking W
DSC0059	Vents at crown apex
DSC0060	Anti-freeze units

DSC0061	Crown walkway
DSC0062	Roller carriage
DSC0063	Roller carriages
DSC0064	Anti-flood mains
DSC0065	Crown manhole
DSC0066	View of crown from N to SW
DSC0067	Anti freeze unit
DSC0068	Anti freeze unit
DSC0069	Crown manhole
DSC0070	Roller carriage
DSC0071	Roller carriage
DSC0072	Roller carriage
DSC0073	Electrical junction unit
DSC0074	Electrical junction unit
DSC0075	Roller carriage
DSC0076	Roller carriage



DSC\_0001



DSC\_0002



DSC\_0003



DSC\_0004



DSC\_0005



DSC\_0006



DSC\_0007



DSC\_0008



DSC\_0009



DSC\_0010



DSC\_0011



DSC\_0012



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DSC\_0024



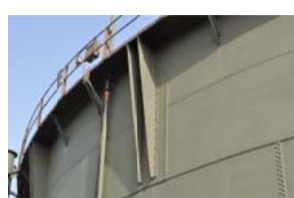
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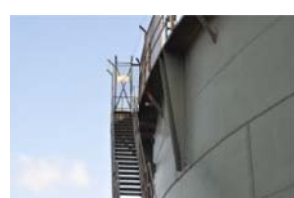
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DSC\_0027



DSC\_0029



DSC\_0030



DSC\_0031



DSC\_0032



DSC\_0033



DSC\_0034



DSC\_0036



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DSC\_0041



DSC\_0042



DSC\_0043



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DSC\_0045



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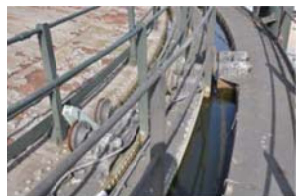
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DSC\_0066



DSC\_0067



DSC\_0068



DSC\_0069



DSC\_0070



DSC\_0071



DSC\_0072



DSC\_0073



DSC\_0074



DSC\_0075





DSC\_0076



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**HEAD OFFICE**

Genesis Centre,  
Birchwood Science Park,  
Warrington  
WA3 7BH

Tel: 01925 844004  
E-mail: [tep@tep.uk.com](mailto:tep@tep.uk.com)

**MARKET  
HARBOROUGH**

No. 1 The Chambers,  
Bowden Business Village,  
Market Harborough,  
Leicestershire,  
LE16 7SA

Tel: 01858 383120  
E-mail: [mh@tep.uk.com](mailto:mh@tep.uk.com)

**GATESHEAD**

Office 26, Gateshead  
International Business  
Centre,  
Mulgrave Terrace,  
Gateshead  
NE8 1AN

Tel: 0191 605 3340  
E-mail: [gateshead@tep.uk.com](mailto:gateshead@tep.uk.com)

**LONDON**

8 Trinity Street,  
London,  
SE1 1DB

Tel: 020 3096 6050  
E-mail: [london@tep.uk.com](mailto:london@tep.uk.com)

**CORNWALL**

4 Park Noweth,  
Churchtown,  
Cury,  
Helston  
Cornwall  
TR12 7BW

Tel: 01326 240081  
E-mail: [cornwall@tep.uk.com](mailto:cornwall@tep.uk.com)

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