



GASHOLDERS 1 AND 2 BENGAL STREET, CHORLEY, LANCASHIRE TECHNICAL APPENDIX

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OASIS Report Form

The Environment Partnership (TEP)

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Project Name:	Bengal Street, Chorley
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PROJECT DETAILS:		
Short description	TEP carried out historic building recording during the demolition of Gasholders 1 and 2 at the former Bengal Street Works, Chorley, Lancashire. Gasholder 1 was spirally-guided with below-ground tank and was built in 1953, replacing an earlier column-guided gasholder. Gasholder 2 was a spirally-guided gasholder built in 1931 with an above-ground tank.	
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	
PROJECT LOCATION:		
County	Lancashire	
Site address	Bengal Street, Chorley, PR7 1EX	
Easting Northing	SD 358575 418097	
Area (sq ,/ha)	-	
Height aOD	-	
PROJECT CREATORS:		
Organisation	The Environment Partnership (TEP) Ltd	
Project brief originator	Montagu Evans	
Project design originator	TEP	
Director/Supervisor	Amir Bassir	
Project manager	Jason Clarke	
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Figure 1: Site Location Plan

Abstract

The Environment Partnership (TEP) carried out an archaeological observation during the demolition of Gasholders 1 and 2 at the former Bengal Street Works, Chorley, Lancashire. Gasholder 1 was a spiral-guided gasholder with below-ground tank which was built in 1953, replacing a former early 20th century column-guided gasholder. Gasholder 2 was a spiral-guided gasholder built in 1931 with an above-ground tank.

The gasholders reflect typical developments in gasholder design and construction of their respective periods, however they also demonstrate the overlap in use between the earlier column-guided design and the later spiral-guided holders. The early 20th century column-guided gasholder that was replaced by Gasholder 1 was built after the introduction of the spiral-guided design, and shows that although it was later replaced with a spiral-guided holder, the transition between the two designs was not linear.

The late replacement of the column-guided design by Gasholder 1 is indicative of the popularity gained by the design, which could utilise the pre-existing below-ground tanks but also accommodate a greater number of lifts, thus increasing the storage capacity within the same sized footprint.

Both gasholders utilise trussed crowns rather than static frames, another indication of a shift in preference from one design to another, which in this case gained popularity from the late 19th century. An area of difference between the two gasholders on this site however is seen in their physical construction, with Gasholder 1 comprising welded sheets, and the earlier Gasholder 2 comprising riveted sheet construction.

1.0 Introduction

- 1.1 The Environment Partnership (TEP) was instructed by Atkins Ltd, acting on behalf of National Grid to undertake archaeological observations during the dismantling of two gasholders at the former Bengal Street Gasworks, Chorley, Lancashire. This report, which records the internal structure of the two gasholders, serves as a technical appendix to an initial historic building report undertaken for Atkins Ltd by Museum of London Archaeology (MOLA (Bassir 2018) prior to the demolitions. The demolitions contractor during these works was KDC Ltd.

Objectives and Methodology

- 1.2 The objectives of this survey were to provide a record of the internal structure, fabric and form of the gasholders prior to demolition.
- 1.3 The Level of recording corresponds, as far as possible, with Level 2 Historic England guidelines as defined in *Understanding Historic Buildings: A Guide to Good Practice* (HE 2016), and with Historic England guidance *Gasworks and Redundant Gasholders: Guidelines for their Evaluation and Recording* (HE 2019) however due to safety issues relating to active demolition works, access to the structures was limited and recording was undertaken from the edge of the gasholder tanks.
- 1.4 A site visit was undertaken on the 5th February 2020. The interiors of the gasholders were photographically recorded to include general views of the tank and details of the lifts and roller carriages.
- 1.5 A large part of the demolition work had been completed prior to this survey and the demolitions contractor provided photographs of the gasholders and the crown frames, from which part of the following description was produced.

2.0 Gasholder 1

- 2.1 Gasholder 1 is recorded as having been constructed in 1953 by R & J Dempster of Oldham Road, Manchester. It was a four-lift spiral-guided gasholder with a below-ground tank, replacing an earlier column-guided holder of c1910 and utilising the below-ground tank of that holder. The tank was 36m in diameter and sunk to a depth of 7.5m, with a total storage capacity of 24,875 cubic metres (cu.m) which included the 1.6m crown rise capacity. The gasholder was constructed primarily from steel, and the tank formed of welded sheets with thicker sheets at the top and bottom rows. The crown sheeting also comprised welded steel sheets, in this case organised in concentric rows. The crown frame comprised 24 main rafters with tie bars and bracing, a form considered fairly standard for gasholder framing from this period.
- 2.2 At the time of recording the entirety of the crown frame and sheeting had been removed, as had the four lifts. The exposed tank brickwork was faced in standard English bond and displayed areas of damage from the removal of vertical guides associated with the previous gasholder. The annulus was filled with water and so could not be examined, but was observed to measure c.2m in width. The dumping rose a short distance below the level of the tank and comprised a flat platform approximately 10m wide with sides extending down to the annulus at a c.45 degree angle. The construction material for the dumping could not be seen due to demolition rubble, however it likely comprised puddled clay over bricks. The annulus was filled with water however concrete rest blocks for subsequent lifts were observed within it at regular intervals throughout the structure.
- 2.3 The stone edging and kerb around the perimeter of the tank remained extant at the time of the site visit, as did the outer roller carriages which projected slightly over the tank face and interrupted the kerb at regular intervals. The roller carriage footings comprised short pairs of I-section beams held together by flange plates.
- 2.4 Photographs provided by the demolitions company during the demolition works show the inner lift and crown frame in more detail. The bottom sheet of the inner-most lift was observed to comprise concentric horizontal sheets, with subsequent sheets laid vertically. The location of the external spiral rail was visible from the interior of the lift.
- 2.5 The crown frame was observed to comprise a central crown post with both lower and upper chords, and struts in between. An anchor collar at the top of the central crown post provided a point of attachment for the upper chords, which were observed to comprise of steel tees. The lower chords were similarly attached by a second collar at the base of the central post, however these, like the struts in between, comprise flat steel bars. The twenty-four main rafters that made up the crown frame were attached to vertical stiffeners on the lift sheeting by means of bolted gusset plates.

3.0 Gasholder 2

- 3.1 Gasholder 2 was a three-lift spiral-guided gasholder with an above-ground tank and was constructed in 1930/1 by C & W Walker. The gasholder had an overall diameter of 37.9m stood to a height of 9.8m and had a total capacity of 29,862 cu.m (including the 2.4m crown rise capacity). The gasholder was constructed primarily from steel with the tank being formed of five courses of riveted steel sheets, riveted steel lifts with square profile cup and grips, and a crown comprising concentric rows of steel sheets riveted at the edges.
- 3.2 At the time of recording only the lower courses of the tank remained standing with the crown frame and lifts having been removed prior to the survey. The tank was built on a concrete pad and was observed to be fabricated from staggered courses of rectangular steel sheets with riveted construction. The sheets had been overlapped at the seams with an extra overlapped sheet riveted on top to create an airtight seal. The floor plates were likewise formed of riveted steel sheets with an angled bracket riveted to the floor and walls to join it to the tank. The lowest part of an inlet or outlet pipe was visible near to the western edge of the base of the tank at the time surveying.
- 3.3 Photographs provided by the contractors during demolition works show further detail of the gasholder construction. Regularly spaced vertical stiffeners were located around the perimeter of the tank, and the location of the external spiral rails were visible from the interior of the innermost lift. Two inlet/outlet pipes can be seen inside the structure, both extending from the base of the tank up to the crown sheeting, and each braced by three flat tees joining the pipes approximately half way up their height.
- 3.4 The crown frame was observed to comprise a central crown post extending from the crown sheeting down to a height in line with the main rafters, which in turn were attached to the central post with an anchor collar. The rafter attachments to the corresponding vertical stiffeners was not visible on the photographs provided by the contractors.

4.0 Conclusion

- 4.1 The two gasholders provide useful examples of gasholder design and development through the later 19th and into the mid-20th centuries. The gasholders demonstrate typical features expected of their type and respective periods, but also highlight that the development of the spiral-guided design was not all-encompassing. The two gasholders on this site show that the earlier style column-guided holders were still being constructed after the introduction of the spiral-guided design in the 1880s.
- 4.2 The replacement, however, of the earlier column-guided structure by the spiral-guided design of Gasholder 1 demonstrates the popularity gained by this design, which were commonly used to replace earlier structures as the pre-existing tanks could be re-used. These gasholders could accommodate a greater number of lifts, thereby providing a greater storage capacity within the same footprint as the earlier gasholder.
- 4.3 Both gasholders demonstrate the utilisation of trussed crowns as opposed to static frames, a choice that gained popularity from the late 19th century onwards. Trussed crown-framing comprising primary and secondary rafters, as demonstrated by both Gasholders 1 and 2, was the common approach to crown-framing in spiral-guided gasholders, however variation is frequently seen in the arrangement of these elements. One such variation noted between the two gasholders on this site were the means of construction, with Gasholder 1 demonstrating welded lift sheets, and Gasholder two comprising riveted sheet construction.
- 4.4 This document serves as an appendix to the more detailed historic building report (Bassir 2018) and should be read in conjunction with that document.



Figure 1: View of Gasholder 1 at time of survey with brick tank and dumping visible.



Figure 2: Extant Roller Carriage for Gasholder 1 projecting over the perimeter of the tank.



Figure 3: View of Gasholder 1 concrete and brick curb, roller carriages, brick tank, water filled annulus and dumping.



Figure 4: View inside Gasholder 1 showing trussed crown frame. Provided by demolitions contractor.



Figure 5: View of concrete rest pads within annulus of Gasholder 1. Provided by demolitions contractor.



Figure 6: Extant lower courses of the tank at Gasholder 2. Base of inlet/outlet pipe visible.



Figure 7: Riveted steel sheet construction of Gasholder 2.



Figure 8: Detail of rivets in the steel tank sheeting.



Figure 9 Flow Valve for Gasholder 2.



Figure 10: Demolition of Gasholder 2, crown frame visible inside innermost lift. Provided by demolitions contractor.



Figure 11: Interior of Gasholder 2 innermost lift. Inlet/outlet pipe visible.

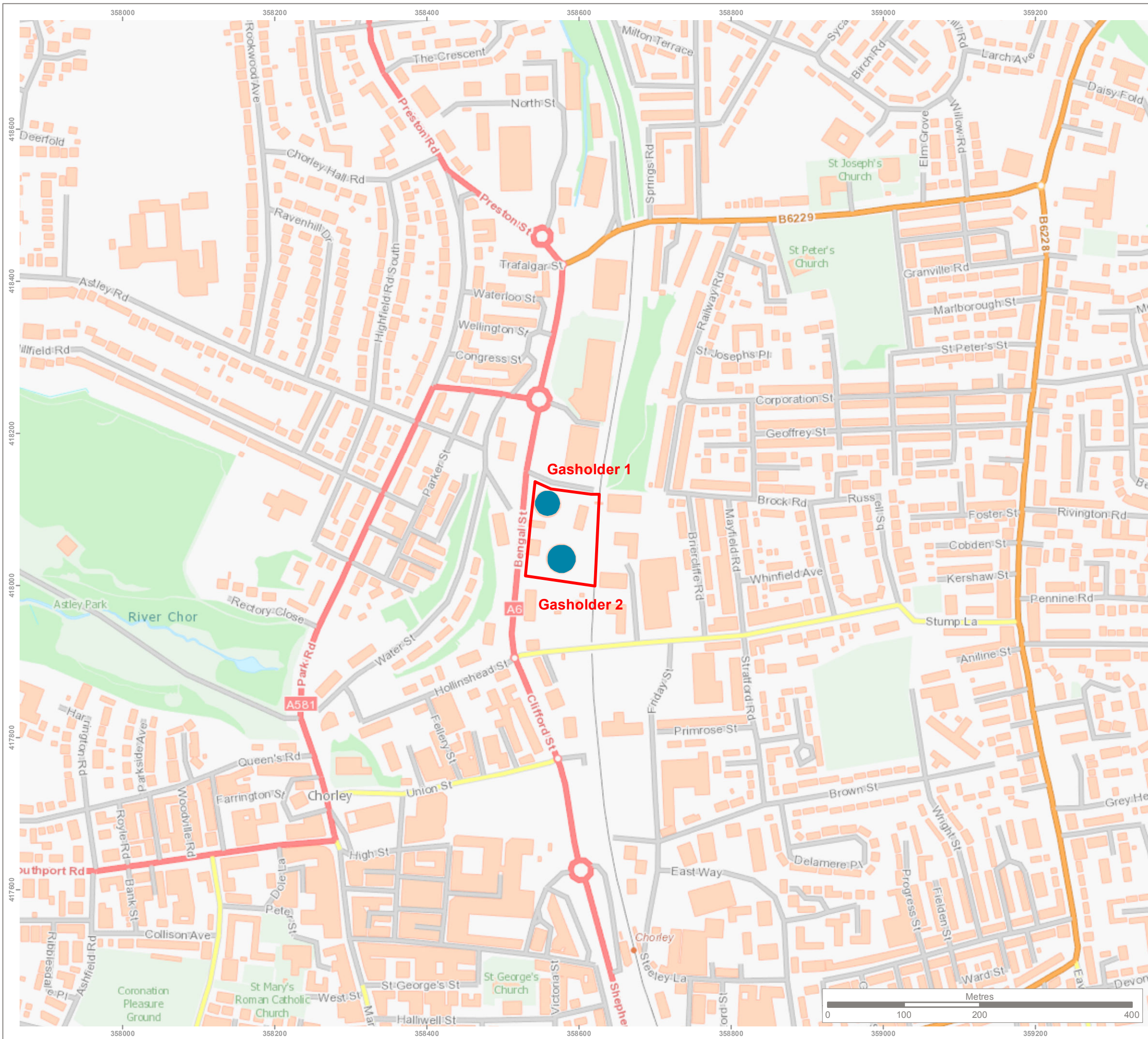
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APPENDICES



KEY

- Site outline
- The surveyed gasholders

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Rev	Description	Drawn	Approved	Date

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Project
Bengal Street, Chorley

Title
Site location, showing the surveyed gasholders

Drawing Number
G8068.001

Drawn	Checked	Approved	Scale	Date
AB	SA	JC	1:5,000 @ A3	27/03/2020



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