

Former Gasworks
Station Road, Arthington, West Yorkshire:
Historic Building Record



April 2011
NGR: SE 25710 44450
Historic township: Arthington

STEPHEN HAIGH

B u i l d i n g s A r c h a e o l o g i s t

11 Browcliff Silsden Keighley West Yorkshire BD20 9PN
Tel/Fax: 01535 658925 Mobile: 07986 612548
www.stephenhaigh.co.uk enquiries@stephenhaigh.co.uk

Former Gasworks Station Road, Arthington, West Yorkshire: Historic Building Record

CONTENTS

List of photographs.....	overleaf
1 Introduction	1
2 Location and current use	1
3 Planning background.....	1
4 Previous investigative work	2
5 Historical background.....	2
6 Recording methodology.....	3
7 Description of the site and buildings	4
8 Conclusion	5
Appendix 1: WYAAS Specification	6
Appendix 2: List of digital photographs.....	16
Appendix 3: Contents of the project archive	17

Figures

- | | |
|-----------------------------|---------------------------------------|
| 1: Location maps | 6: Extract from 1934 OS map |
| 2: Extract from 1851 OS map | 7: Extract from 1965 OS map |
| 3: Extract from 1893 OS map | 8: Site plan with key to photographs |
| 4: Extract from 1908 OS map | 9: Floor plan with key to photographs |
| 5: Extract from 1921 OS map | |

Photographs

SUMMARY

The gas works at Arthington (NGR: SE 25710 44450) was established in 1876 by the North Eastern Railway for its own supply of coal gas to be used on trains, at local stations and perhaps in the nearby Bramhope tunnel, but the facility was closed in 1905. The surviving visible remains comprise the retort house, chimney and gasholder pit, and although all gas-making plant has been removed, the site's original function is readily discernible. Historic building recording, principally photographic, was carried out in April 2011 for Mr N Hood, to fulfil a condition of planning consent for the residential development of the site.

April 2011

STEPHEN HAIGH

B u i l d i n g s A r c h a e o l o g i s t

11 Browcliff Silsden Keighley West Yorkshire BD20 9PN
Tel/Fax: 01535 658925 Mobile: 07986 612548
www.stephenhaigh.co.uk enquiries@stephenhaigh.co.uk

FORMER GASWORKS, STATION ROAD, ARTHINGTON, WEST YORKSHIRE:

HISTORIC BUILDING RECORD

LIST OF BLACK AND WHITE PHOTOGRAPHS

Photo	Subject
--------------	----------------

- | | |
|----|---|
| 1 | The retort house and gasholder pit, from the east |
| 2 | The retort house and gasholder pit, from the east |
| 3 | The retort house and gasholder pit, from the south |
| 4 | The retort house, from the south |
| 5 | The retort house, from the south-east |
| 6 | The retort house with repaired chimney, from the north |
| 7 | Detail of ridge ventilator to retort house, from the south |
| 8 | The retort house, from the south-east |
| 9 | The retort house, from the south |
| 10 | The retort house: detail of original doorway |
| 11 | The retort house: detail of original window |
| 12 | The retort house: north-west elevation |
| 13 | The retort house: altered window in north-west elevation |
| 14 | The retort house: north-west elevation |
| 15 | The retort house: interior, from the north-east |
| 16 | The retort house: modern opening in north-east gable |
| 17 | The retort house: interior, from the south (stove in approximate location of retorts) |
| 18 | The retort house: interior, from the east |
| 19 | The retort house: interior, from the north |
| 20 | The retort house: interior, from the west |
| 21 | The retort house: former location of retorts, from the south-east |
| 22 | The retort house: inserted opening into south-east lean-to |
| 23 | The retort house: roof truss, from the east |
| 24 | The retort house: roof truss and ridge vent, from the west |
| 25 | The retort house: south-east lean-to |
| 26 | The retort house: interior of south-east lean-to |
| 27 | The retort house: detail of brickwork in south-east elevation |
| 28 | The retort house, from the north-east, showing gable lean-to |
| 29 | The retort house: interior of north-east lean-to, from the north-west |
| 30 | The retort house: interior of north-east lean-to, from the south |
| 31 | The retort house: interior of north-east lean-to, showing modern roof |
| 32 | The retort house: interior of modern south-west lean-to, from the north-west |
| 33 | The retort house: interior of modern south-west lean-to, from the south-east |
| 34 | The retort house, from the north-west, showing rebuilt top of chimney |
| 35 | Detail of flue from retort house to chimney |
| 36 | Gasholder pit, from the south-west |
| 37 | Gasholder pit, from the south-west |
| 38 | Gasholder pit: detail of brick lining with stone block, from the south |

FORMER GASWORKS, STATION ROAD, ARTHINGTON, WEST YORKSHIRE:

HISTORIC BUILDING RECORD

1 Introduction

- 1.1 This report presents the results of historic building recording of a former gasworks at Arthington, near Otley, West Yorkshire. The work was carried out in April 2011 for the owner and developer Mr N Hood, to discharge a condition attached to planning consent for the conversion of the building to residential use.
- 1.2 The gasworks was established by the North Eastern Railway to supply gas principally for its own use, and operated between 1877 and 1905. It was a relatively small brick-built plant, which stands within the junction where the dismantled Otley branch line met with the Leeds – Harrogate line, but the structures now contain very little specific evidence for their original function.
- 1.3 The work was carried out in accordance with a specification from the West Yorkshire Archaeology Advisory Service (WYAAS) (Appendix 1), and mainly involved photographic recording. This report will be submitted to the client, the West Yorkshire Historic Environment Record, the West Yorkshire Archive Service, and the English Heritage National Monuments Record.

2 Location and current use

- 2.1 The site stands on the west side of the Leeds – Harrogate railway line (next to the demolished Arthington Station), some 500m south of the A659 road where it passes through Arthington, 1.5km south-east of Pool-in-Wharfedale (Figure 1). The national grid reference for the site is SE 25710 44450 and the postcode is LS21 1NN.
- 2.2 Surrounded on all three sides by railway embankments, the building faces south-east (Figure 2), with various appendages on all sides, and there are other, ephemeral buildings in the vicinity. Although presently used only for storage, the building was recently home to a miniature railway, many of whose tracks remain in place, and these should not be confused with any original function of the gasworks.

3 Planning background

- 3.1 The former gasworks is not listed as having special architectural or historic interest. Planning consent has been granted by Leeds City Council for its conversion to a dwelling (application number 10/05108/FU/NW), and a condition

attached at the request of the council's archaeological advisor, WYAAS, requires archaeological recording before development.

4 Previous investigative work

- 4.1 The site was recorded by Neil Mackay in 1973 as part of a study of gasworks of the North Eastern Railway, and his published work has been made available by the present owner.¹

5 Historical background

- 5.1 Coal gas (also known as town gas) is produced by heating low-ash bituminous coal in a vessel known as a retort, within a furnace, to a point where the gases emitted can be drawn off and distilled. The main ones given off are hydrogen and carbon monoxide, which are then cooled and purified to remove tar and other substances, before being stored in a gasholder prior to distribution. Coke is produced as a by-product, as the residue of the coal from which the more volatile components have been extracted. The discovery that coal gas could be produced in this way is generally attributed to William Murdock, an engineer employed by Boulton & Watt in the 1790s, and by the early 19th century gas was being produced commercially for distribution to consumers, a situation which soon became widespread throughout urban areas.
- 5.2 Typical components of a gasworks included the *retort house*, a *hydraulic main* (a simple device consisting of a water-filled pipe, which prevented gas flowing back to the retorts); a *condenser*, in which the gas was cooled and tar drained off; an *exhauster*, or pump to draw gas from the retorts through the condenser and into the subsequent components; a *scrubber*, or vertical metal cylinder in which ammonia and other impurities were removed by water; additional *purifiers* which contained lime or iron oxide; a *meter*, *gasholder* and *governor*, the last to maintain a constant pressure in the outgoing supply, where it was to be distributed by pipe rather than vessel.²
- 5.3 The North East Railway (NER) was an early user of gas in lighting, and the fuel was supplied by both independent producers, and increasingly during the second half of the 19th century, by its own gasworks, some of the earliest of which were built in the 1840s at Richmond and Pickering. At Arthington, where lighting would have been required not only for the station and passenger trains, but also perhaps for the 3.5km long Bramhope tunnel immediately to the south, the NER had used gas from a local manufacturer from 1856. This supplier's price in 1874 had reached 10s 6d per 1000 cubic feet, which together with the annual

¹ Mackay, N 1982 "The NER Arthington Gasworks" *North Eastern Express* No 88; 1993 "Gas Works of the North Eastern Railway" *North Eastern Express* No 131

² Jones, W 1996 *Dictionary of Industrial Archaeology*

consumption of about 1,000,000 cubic feet, persuaded the railway company to provide its own gasworks instead, which could produce gas at about half the cost per unit. The plans for these were approved in 1876, the new works costing about £710, so that annual savings would be over £300, a benefit which was increased by extending the supply to both Pool station and Pool church; over the next thirty years however developments in technology and a changing market led to a rationalisation of the company's gas manufacturing in the early 20th century, and the Arthington works was closed in 1905, with the affected stations being converted to more modern "oil gas" lighting. During the 20th century, as natural gas replaced the manufactured variety, all other coal gasworks in the country fell out of use, and although a few are preserved as museums, most have been demolished or altered beyond recognition, meaning that the survival of the Arthington example is significant.

- 5.4 Historic Ordnance Survey maps (figures 3 to 8) show the site from before the gasworks was constructed (the 1851 first edition 1:10560 map shows it vacant). The first edition 1:2500 map of the 1890s shows the works as fully established, and with what is probably a chute running down the embankment from the south-west, for coal deliveries directly from the railway. The structures at that time included the main retort house, with irregular outline, and the detached circular gasholder. "P" marks a water pump. The 1908 map shows a similar arrangement, perhaps with a second coal chute, as does the 1921 map, although the latter marks the site as disused. It is shown unnamed and without any coal chutes in 1934 and again in 1965, at which date it seems that the gasholder was still in place. Mackay's record made in 1973 shows only the gasholder pit so the tank must have been removed by then; his plan also shows further significant details of the building, which are discussed in the more detailed account below.

6 Recording methodology

- 6.1 The building recording was carried out in accordance with the specification issued by WYAAS (Appendix 1), during the week beginning 4 April 2011. It comprised a photographic and written record of the gas works, made using a medium format camera with perspective control and other lenses, and black and white film for archival permanence. External and internal photographs were taken, in most cases using either a 1m or 2m ranging pole marked with 0.5m graduations as a scale, and their locations are shown on copies of the plans. All the photographs are copied in this report, and in the following description they are referred to by numbers in **bold**. As well as the black and white photographs, some external, digital colour photographs were taken.

7 Description of the site and buildings

- 7.1 The gasworks occupies a fairly level site (1-3), but is hemmed in on two sides by the adjacent railway embankment to the west, and a spoil heap to the north (which the historic maps show to have grown between the 1890s and 1920s). This heap may derive in part from the coal used at the site over three decades of gas production, although as it may have been tipped from a siding from the north-west, it was probably also a more general waste tip for the railway.
- 7.2 The retort house itself, in which gas manufacture took place, is a rectangular structure of one storey, with a lean-to to each of its four sides (4,5). It is brick-built in English garden wall bond, with a roof of blue slate with tile ridge, replaced on the north-west pitch by asbestos cement sheets, and with a louvred ventilator in the centre (6,7). The main building itself measures 6.9m by 6.7m in plan, and about 4m to the eaves; of the four lean-tos, only those on the south-east and north-east sides are original, the other two being late 20th century constructions, of a mixture of breeze block and re-used brick, although that to the south-west is on the footprint of an earlier lean-to, according to Mackay's drawing and the OS maps. The chimney stands at the north corner and is square in plan, and detached except for a connecting flue about 2m above ground level. The gasholder pit lies some 5m to the south-east of the building.
- 7.3 Openings within the main building include the original pedestrian entrance under a flat brick arch, with framed plank door bearing strap hinges (8-10), and a tall, semi-circular arched window to each long elevation, both with multi-pane steel-frames, partly opening (11-12). Another enlarged (and now blocked) opening in the north-west elevation may have been a window at one time, but is in the position where the retorts are thought to have stood (13,14). Meanwhile the gables both have wide entrances under steel beams, communicating with the lean-tos; that to the south-west may be an original opening, the painted brickwork of the jambs making it hard to determine whether these have been altered (15). Mackay notes that this doorway was bricked up in 1973, so making it more likely that there was a wide opening here from the outset, and if so this was no doubt the means by which coal was brought into the building. The jambs of the doorway to the north-east gable are however clearly cut back, and Mackay describes this opening as secondary (16).
- 7.4 The interior of the main building bears almost no evidence for its former purpose which is not visible externally: it is simply an undivided building open to the roof, with brick walls and modern concrete floor (17-19). A pair of stub walls near the north-east end support an overhead crane and are not believed to be part of the original construction, contra Mackay's interpretation (20,21), and there is also doubt over his recording of the small, narrow doorway to the south-east lean-to (22): this now appears to be an insertion, but he shows it (perhaps erroneously)

as a much wider opening. An area of disturbed brickwork above this narrow doorway may possibly indicate the removal of something to do with gas manufacture. Overhead are two equally spaced roof trusses, of standard, late 19th century king post form, and between them is the louvred ventilator (23,24).

- 7.5 The smallest of the four lean-tos is that on the south-east side, and this was part of the original building, although it has been altered (25). There seems to have been a wide but low doorway in its south-west side, now partly blocked to form a window; the other two sides have very small arched windows which have been inserted recently and are probably connected with the miniature railway. Nothing within its very small interior indicates its original purpose (26). Also original is the north-east lean-to, although part of its end wall has been rebuilt recently, incorporating a window, and it was until very recently roofless, the original roof having been burnt down (27,28). Again there is little to be said about this part of the building, although it is worth noting that the side walls are only half a brick thick, albeit strengthened by central piers, in contrast to the main block (29-31). As noted above, the other lean-tos are late 20th century structures in their present forms (32,33), although it should be reiterated that the predecessor of that to the south-west is shown on the historic maps.
- 7.6 The upper half of the present chimney has been rebuilt recently, but its present height of approximately 8m is very similar to that recorded by Mackay in 1973, so it seems as though it has been rebuilt with regard for its historic form, although it now serves as an outlet from a heating stove, and has been partly capped (34). The original brick flue which once served the retorts enters the chimney about 2m above ground level (35).
- 7.7 The only other feature of the site which merits description is the circular pit for the gasholder, some 7.8m in diameter (36,37). This is brick lined, the sides 0.8m high, and with four stones at 90° points, to which the gasholder would have been fastened (38). The pit was designed to be watertight, as the water acted as a seal (the gas being stored under relatively low pressure), and Mackay suggests that the holder itself (removed before his survey) was a "single-lift bell with guide columns and counterweights". He also suggests that the outside tar condenser used at Arthington would most likely have been a hairpin-type coil, around 10 feet high and four feet wide, situated close to the retorts, and with a tar well below, but that both had also been removed by the 1970s.

8 Conclusion

- 8.1 The Arthington railway gasworks is an unusual survival of the structural remains of a 19th century gas manufacturing plant, and this photographic record, together with the published information on the site, forms a valuable archive relating to both the coal gas industry and railway history.

Appendix 1: WYAAS Specification

Specification For Photographic Building Recording at the Old Gashouse, Arthington, Otley LS21 1NN (425710 444450)

Specification prepared at the request Mr. Nick Hood. on behalf of Leeds City Council (Planning Permission 10/05108/FU/NW)

1 Summary

1.1 A building record (photographic survey) is required to identify and document items of archaeological and architectural interest prior to the conversion of this small purpose built late 19th century railway gas house to a dwelling. This specification for the necessary work has been prepared by the West Yorkshire Archaeology Advisory Service, the curators of the West Yorkshire Historic Environment Record in response to a recording condition placed on a grant of planning (10/05108/FU/NW).

NOTE: The requirements detailed in paragraphs 6.1.1 to 6.1.5 inclusive, 8.3 and 8.4 are to be met by the archaeological contractor **prior** to the commencement of fieldwork by completing and returning the attached form to the WY Archaeology Advisory Service.

2 Site Location and Description

2.1 Location

(Grid ref 425710 444450) The Old Gas House is located in the township of Arthington and lies on level ground in the south West corner of an embanked railway triangle or junction off Station Road and c. 450m south of the A669 between Harewood and Pool. Although located in an area of suspected medieval iron working identified by the WY Historic Environment Record (PRN1258) it is considered highly unlikely that evidence for this earlier activity survives in the site's immediate vicinity. The proposed development has a footprint of approximately 135 square meters.

2.2 Description

The Old Gas House comprises a group of contiguous buildings constructed around the original 1877 gas house and a squat industrial chimney. Red brick is used throughout. The gas house is a tall single storey building with an original ridge vent and Crittal type arched windows. Historic photographs supplied by the applicant illustrate that the present extensions are of various dates and the site's use as a light engineering works has seen numerous changes and additions to the building. The sunken stone base of a cylindrical gas holder is located close by.

3 Planning Background

The site owners, through their agents Farrar Bamforth Associates Ltd (51 Trinity Street, Huddersfield, West Yorkshire, HD1 4DN, contact Tony Bowling ☎ 01484 424008) have obtained planning consent (Planning Application No. 10/05108/FU/NW) for conversion of the former gas house to a dwelling. The WY Archaeology Advisory Service (as Leeds City Council's archaeological advisor) has prepared this specification in order to allow the owner to meet the terms of an archaeological condition which has been placed on the consent.

4 Archaeological Interest

4.1 Historical Background

The applicant, Mr Nick Hood, has supplied research material detailing both the general development of gas provision by the North Easter Railway and the specific history and arrangement of the site. The Arthington gas works supplied a small quantity of gas (1,223,700 cubic feet is reported in 1902) for use at the station, adjacent junction and nearby Bramhope Tunnel. Although possible it is not known if provision was also made to supply rolling stock with gas for lighting. Costing £710 when constructed during 1876-77 a further £100 was spent in 1880 to provide Pool Station with a supply. Pool Church was also supplied. The gas works closed in 1902 when gas supply was centralised and electric lighting was beginning to be a cost effective alternative. Given its remote location it can be speculated that Arthington station continued to be supplied by gas transported by rail until much later and the gas holder may therefore have continued in use beyond this date.

While the physical remains of the retort house, chimney and gas holder pit survive the site decommissioning and reuse have removed any physical evidence of associated features and plant such as retorts, condenser, scrubber, washer, purifier and meter house. Nonetheless the Old Gas House remains a significant and rare example of changing technology (the move from oil to gas for lighting and the eventual replacement of gas by electric light) and the scope of a large railway company's business during their florescence in the late 19th century.

4.2 Impact of proposed development

Conversion will alter the appearance of the building and potentially result in the loss of evidence of historic processes carried out therein.

5 Aims of the Project

5.1 The first aim of the proposed work is to identify and objectively record by means of photographs any significant evidence for the original and subsequent historical form and functions of the site, and to place this record in the public domain by depositing it with the WY Historic Environment Record (Registry of Deeds, Newstead Road, Wakefield WF1 2DE).

5.2 The second aim of the proposed work is to analyse and interpret the buildings as an integrated system intended to perform a specialised function. The archaeologist on site should give particular attention to reconstructing as far as possible the functional arrangements and division of the buildings. The roles of historical plan form, layout and circulation / process flow should all be considered in this process of interpretation.

6 Recording Methodology

6.1 General Instructions

6.1.1 Health and Safety

The archaeologist on site will naturally operate with due regard for Health and Safety regulations. Prior to the commencement of any work on site (and preferably prior to submission of the tender) the archaeological contractor may wish to carry out a Risk Assessment in accordance with the Health and Safety at Work Regulations. The archaeological contractor should identify any contaminants which constitute potential Health and Safety hazards (e.g. chemical drums or asbestos lagging) and make

arrangements with their client for decontamination/making safe as is necessary and appropriate. The WY Archaeology Advisory Service and its officers cannot be held responsible for any accidents or injuries which may occur to outside contractors engaged to undertake this survey while attempting to conform to this specification.

6.1.2 Confirmation of adherence to specification

Prior to the commencement of any work, the archaeological contractor must confirm in writing adherence to this specification (using the attached form), or state in writing (with reasons) any specific proposals to vary the specification. Should the contractor wish to vary the specification, then written confirmation of the agreement of the WY Archaeology Advisory Service to any variations is required prior to work commencing. Unauthorised variations are made at the sole risk of the contractor (see para. 8.3, below). Modifications presented in the form of a re-written project brief will not be considered by the West Yorkshire Archaeology Advisory Service.

6.1.3 Confirmation of timetable and contractor's qualifications

Prior to the commencement of *any work*, the archaeological contractor must provide WYAAS in writing with:

- ∞ a projected timetable for the site work
- ∞ details of project staff structure and numbers
- ∞ names and CVs of key project members (the project manager, site supervisor, any proposed specialists, sub-contractors etc.)
- ∞ details of any specialist sub-contractors

All project staff provided by the archaeological contractor must be suitably qualified and experienced for their roles. In particular, staff involved in building recording should have proven expertise in the recording and analysis of industrial buildings. The timetable should be adequate to allow the work to be undertaken to the appropriate professional standard, subject to the ultimate judgement of WYAAS.

6.1.4 Site preparation

Material stored inside the Old Gas House should be removed in order to permit a complete photographic record to be made.

6.1.5 Documentary research

The archaeological contractor should perform a rapid map regression and obtain copies of all relevant articles, photographs and reports held by the applicant to assist in the analysis and interpretation of the site.

6.1.6 Use of existing plans

Historic and current architect's drawings exist and, with the agreement of the originator, may be used to provide a location plan for the photographic recording.

6.2 Sequence of recording

6.2.1 Principal Record

A photographic record should be made of the Old Gas House prior to conversion work commencing.

6.3 Written Record

The archaeologist on site should carefully examine all parts of each building prior to the commencement of the photographic recording, in order to identify all features relevant to its original use and to obtain an overview of the development of the building and of the site as a whole. As part of this exercise, the archaeologist on site should produce written observations (e.g. on phasing; on building function) sufficient to permit the preparation of a report on the structure. This process should include the completion of a Room Data Sheet or similar structured recording pro-forma¹ for each room or discrete internal space within the volume of the structure. The crucial requirement is that each room should be examined individually, that the results of that examination should be noted in a systematic fashion, and that these objective observations should be used to inform an analytical interpretation of the overall development and operation of the site.

6.5 Photographic Record

6.5.1 External photographs

An external photographic record should be made of all elevations of the buildings, from vantage points as nearly parallel to the elevation being photographed as is possible within the constraints of the site. The contractor should ensure that all visible elements of each elevation are recorded photographically; this may require photographs from a number of vantage points. A general external photographic record should also be made which includes a number of oblique general views of the buildings from all sides, showing them and the complex as a whole in its setting. In addition, a 35mm general colour-slide survey or digital photography (see 6.5.6 below) of the buildings should also be provided (using a variety of wide-angle, medium and long-distance lenses). While it is not necessary to duplicate every black-and-white shot, the colour record should be sufficiently comprehensive to provide a good picture of the form and general appearance of the complex and of the individual structures.

6.5.2 Internal photographs

A general internal photographic record should be made of the building. General views should be taken of *each room* or discrete internal space from a sufficient number of vantage points to adequately record the form, general appearance and manner of construction of each area photographed. In areas which are wholly modern in appearance, character and materials, a single shot to record current appearance will suffice.

6.5.3 Detail photographs

In addition, detailed record shots should be made of the following elements:

- ∞ Roof Structure and ridge vent
- ∞ Original doors, windows and window frames
- ∞ The gas holder
- ∞ Any other evidence considered to be related to the manufacture and storage of coal gas

¹ The WY Archaeology Advisory Service would recommend the employment of the attached pro-forma, but will consider any suitable alternative which the archaeological contractor may wish to submit (Note that agreement for the employment of an alternative *schema* must be obtained in writing from the WY Archaeology Advisory Service prior to the commencement of work on site).

But this list should not be treated as exhaustive. The archaeologist on site should also identify and note:

- ∞ any significant changes in construction material – this is intended to include significant changes in stone/brick type and size
- ∞ any blocked, altered or introduced openings
- ∞ evidence for phasing, and for historical additions or alterations to the building.

Elements for which multiple examples exist (e.g. each type of roof truss, column or window frame) may be recorded by means of a single representative illustration. **N.B.** Detail photographs must be taken at medium-to-close range and be framed in such a way as to ensure that the element being photographed clearly constitutes the principal feature of the photograph.

6.5.4 Equipment

General photographs should be taken with a Large Format camera (5" x 4" or 10" x 8") using a monorail tripod, or with a Medium Format camera which has perspective control, using a tripod. The contractor must have proven expertise in this type of work. Any detail photographs of structural elements should if possible be taken with a camera with perspective control. Other detail photographs may be taken with either a Medium Format or a 35mm camera. All detail photographs must contain a graduated photographic scale of appropriate dimensions (measuring tapes and surveying staffs are not considered to be acceptable scales in this context). A 2-metre ranging-rod, discretely positioned, should be included in a selection of general shots, sufficient to independently establish the scale of all elements of the building and its structure.

6.5.5 Film stock

All record photographs to be black and white, using conventional silver-based film only, such as Ilford FP4 or HP5, or Delta 400 Pro (a recent replacement for HP5 in certain film sizes such as 220). Dye-based (chromogenic) films such as Ilford XP2 and Kodak T40CN are unacceptable due to poor archiving qualities.

6.5.6 Digital photography

As an alternative to our requirement for colour slide photography, good quality digital photography may be supplied as an alternative, using cameras with a minimum resolution of 4 megapixels. Note that conventional black and white print photography is still required and constitutes the permanent record. Digital images will only be acceptable as an alternative to colour slide photography if each image is supplied in three file formats (as a RAW data file, a DNG file and as a JPEG file). The contractor must include metadata embedded in the DNG file. The metadata must include the following: the commonly used name for the site being photographed, the relevant centred OS grid coordinates for the site to at least six figures, the relevant township name, the date of photograph, the subject of the photograph, the direction of shot and the name of the organisation taking the photograph. Images are to be supplied to WYAAS on gold CDs by the archaeological contractor accompanying the hard copy of the report.

6.5.7 Printing

6.5.6a Record photographs should be printed at a minimum of 5" x 4". In addition, a small selection of photographs (the best of the exterior setting shots and interior shots) should be printed at 10" x 8". Bracketed shots of identical viewpoints need not be reproduced, but all viewpoints must be represented within the report.

6.5.6b Prints may be executed digitally from scanned versions of the film negatives, and may be manipulated to improve print quality (but **not** in a manner which alters detail or perspective). All digital prints must be made on paper and with inks which are certified against fading or other deterioration for a period of 75 years or more when used in combination. If digital printing is employed, the contractor must supply details of the paper/inks used in writing to the WY Archaeology Advisory Service, with supporting documentation indicating their archival stability/durability. Written confirmation that the materials are acceptable must have been received from the WYAAS prior to the commencement of work on site.

6.5.7 Documentation

A photographic register detailing (as a minimum) location, direction and subject of shot must accompany the photographic record; a separate photographic register should be supplied for any colour slides or for colour digital photographs. The position and direction of each photograph and slide should be noted on a copy of the building plan, which should also be marked with a north pointer.

7. Post-Recording Work and Report Preparation

7.1 After completion of fieldwork

Prior to the commencement of any other work on site, the archaeological contractor should arrange a meeting at the offices of the WY Archaeology Advisory Service to present a photo-location plan and the photographic contact prints adequately referenced to this plan (material supplied will be returned to the contractor). **N.B.** if full-sized prints or digital versions of contact sheets are supplied for this purpose, they must be accompanied by a sample of the processed negatives. If appropriate, the WY Archaeology Advisory Service will then confirm to Leeds Planning Services that fieldwork has been satisfactorily completed and that other work on site may commence (although discharge of the archaeological condition will not be recommended until a completed copy of the full report and photographic record has been received and approved by the West Yorkshire Archaeology Advisory Service).

7.2 Report Preparation

7.2.1 Report format and content

A written report should be produced. This should include:

- ∞ an executive summary including dates of fieldwork, name of commissioning body, and a brief summary of the results including details of any significant finds
- ∞ an introduction outlining the reasons for the survey
- ∞ a brief architectural description of the buildings correlated to the photographic record, presented in a logical manner, (as a walk around and through the building, starting with setting, then progressing to all sides of the structure in sequence, and finally to the interior) and correlated/fully referenced to the photographic record.

The architectural description should be fully cross-referenced to the photographic record, sufficient to illustrate the major features of the site and the major points raised. It is not envisaged that the report is likely to be published, but it should be produced with sufficient care and attention to detail to be of academic use to future researchers. A copy of this specification and a quantified index to the field archive should also be bound into the back of the report. The cover sheet should include a centred eight-figure OS grid reference and the name of the township in which the site is located (ARTHINGTON).

7.2.2 Report Illustrations

Illustrations should include:

- ∞ a location map at a scale sufficient to allow clear identification of the buildings in relation to other buildings in the immediate area
- ∞ a drawing at a legible scale, on which position and direction of each photograph has been noted
- ∞ any relevant historic map editions, with the position and extent of the site clearly indicated
- ∞ any additional illustrations pertinent to the site
- ∞ a complete set of good-quality laser copies of all photographs. All photographs should be accompanied by detailed captions clearly locating and identifying any pertinent features.

The latter should be bound into the report, appropriately labelled (numbered, and captioned in full) and fully referenced within the report. When captioning, contractors should identify the individual photographs by means of a running sequence of numbers (e.g. Plate no. 1; Plate no. 2), and it is this numbering system which should be used in cross-referencing throughout the report and on the photographic plans. However, the relevant original film and frame number should be included in brackets at the end of each caption.

7.3 Report deposition

7.3.1 General considerations

7.3.1a The report should be supplied to the client and identical copies supplied to the West Yorkshire HER, the WY Archive Service and to the National Monuments Record (English Heritage, Kemble Drive, Swindon SN2 2GZ – for the attention of Mike Evans, Head of Archives). The report supplied to the NMR should be in digital format only. A recommendation from WYAAS for discharge of the archaeological condition is dependant upon receipt by WYAAS of a satisfactory report which has been prepared in accordance with this specification. Any comments made by WYAAS in response to the submission of an unsatisfactory report will be taken into account and will result in the reissue of a suitably edited report to all parties, within a timescale which has been agreed with WYAAS.

7.3.1b The report copy supplied to the West Yorkshire HER should include a complete set of photographic prints (see Para. 7.3.2 below). The finished report should be supplied within eight weeks of completion of all fieldwork, unless otherwise agreed with the West Yorkshire Archaeology Advisory Service. The information content of the report will become publicly accessible once deposited with the

Advisory Service, unless confidentiality is explicitly requested, in which case it will become publicly accessible six months after deposit.

7.3.1c Copyright - Please note that by depositing this report, the contractor gives permission for the material presented within the document to be used by the WYAAS, in perpetuity, although The Contractor retains the right to be identified as the author of all project documentation and reports as specified in the *Copyright, Designs and Patents Act 1988* (chapter IV, section 79). The permission will allow the WYAAS to reproduce material, including for non-commercial use by third parties, with the copyright owner suitably acknowledged.

7.3.1.d The West Yorkshire HER supports the Online Access to Index of Archaeological Investigations (OASIS) project. The overall aim of the OASIS project is to provide an online index to the mass of archaeological grey literature that has been produced as a result of the advent of large-scale developer funded fieldwork. The archaeological contractor must therefore complete the online OASIS form at <http://ads.ahds.ac.uk/project/oasis/>. Contractors are advised to contact the West Yorkshire HER officer prior to completing the form. Once a report has become a public document by submission to or incorporation into the HER, the West Yorkshire HER may place the information on a web-site. Please ensure that you and your client agree to this procedure in writing as part of the process of submitting the report to the case officer at the West Yorkshire HER.

7.3.1e With the permission of the developer, the archaeological contractor are encouraged to consider the deposition of a copy of the report for this site with the appropriate Local History Library.

7.3.2 Deposition with WY Archaeology Advisory Service (West Yorkshire Historic Environment Record)

The report copy supplied to the WY Archaeology Advisory Service should also be accompanied by both the photographic negatives and a complete set of labelled photographic prints (mounted in KENRO display pockets or similar, and arranged in such a way that labelling is readily visible) bound in a form which will fit readily into a standard filing cabinet suspension file (not using hard-backed ring-binders). Labelling should be on the *back* of the print in pencil giving film and frame number only and on applied printed labels on the front of the appropriate photographic sleeve which should include:

- ∞ film and frame number
- ∞ date recorded and photographer's name
- ∞ name and address of building
- ∞ national grid reference
- ∞ specific subject of photograph.

Negatives should be supplied in archivally stable mounts (KENRO display pockets or similar), and each page of negatives should be clearly labelled with the following:

- ∞ Township name (ARTHINGTON)
- ∞ Site name and address
- ∞ Date of photographs (month/year)
- ∞ Name of archaeological contractor

∞ Film number

Colour slides should be mounted, and the mounts suitably marked with – 'Arthington' (the Township name) with 'Old Gas House' under, at the top of the slide; grid reference at the bottom; date of photograph at the right hand side of the mount; subject of photograph at the left hand side of the mount. Subject labelling may take the form of a numbered reference to the relevant photographic register. The slides should be supplied to the WY Archaeology Advisory Service in an appropriate, archivally stable slide hanger (for storage in a filing cabinet).

7.4 Summary for publication

The attached summary sheet should be completed and submitted to the WY Archaeology Advisory Service for inclusion in the summary of archaeological work in West Yorkshire published on the WYAAS website. During fieldwork monitoring visits WYAAS officers will take digital photographs which may be published on the Advisory Service's website as part of an ongoing strategy to enable public access to information about current fieldwork in the county.

7.5 Preparation and deposition of the archive

After the completion of all recording and post-recording work, a fully indexed field archive should be compiled consisting of all primary written documents and drawings, and a set of suitably labelled photographic contact sheets (only). Standards for archive compilation and transfer should conform to those outlined in *Archaeological Archives – a guide to best practice in creation, compilation, transfer and curation* (Archaeological Archives Forum, 2007). The field archive should be deposited with the Leeds Office of the West Yorkshire Archive Service (Chapel Town, Sheepscar, Leeds, LS7 3AP, 0 113 214 5814, leeds@wyjs.org.uk), and should be accompanied by a copy of the full report as detailed above. Deposition of the archive should be confirmed in writing to the WY Archaeology Advisory Service.

8 General considerations

8.1 Technical queries

Any technical queries arising from this specification should be addressed to the WY Archaeology Advisory Service without delay.

8.2 Authorised alterations to specification by contractor

It should be noted that this specification is based upon records available in the West Yorkshire Historic Environment Record and on a brief examination of the site by the West Yorkshire Archaeology Advisory Service. Archaeological contractors submitting tenders should carry out an inspection of the site prior to submission. If, on first visiting the site or at any time during the course of the recording exercise, it appears in the archaeologist's professional judgement that

- i) a part or the whole of the site is not amenable to recording as detailed above, and/or
- ii) an alternative approach may be more appropriate or likely to produce more informative results, and/or
- iii) any features which should be recorded, as having a bearing on the interpretation of the structure, have been omitted from the specification,

then it is expected that the archaeologist will contact the WY Archaeology Advisory Service as a matter of urgency. If contractors have not yet been appointed, any variations which the WY Archaeology Advisory Service considers to be justifiable on archaeological grounds will be incorporated into a revised specification, which will then be re-issued to the developer for redistribution to the tendering contractors. If an appointment has already been made and site work is ongoing, the WY Archaeology Advisory Service will resolve the matter in liaison with the developer and the Local Planning Authority.

8.3 Unauthorised alterations to specification by contractor

It is the archaeological contractor's responsibility to ensure that they have obtained the West Yorkshire Archaeology Advisory Service's consent in writing to any variation of the specification prior to the commencement of on-site work or (where applicable) prior to the finalisation of the tender. Unauthorised variations may result in the WY Archaeology Advisory Service being unable to recommend discharge of the archaeological recording condition to the Local Planning Authority and are made solely at the risk of the contractor.

8.4 Monitoring

This exercise will be monitored as necessary and practicable by the WY Archaeology Advisory Service in its role as 'curator' of the county's archaeology. The Advisory Service should receive at least one week's notice in writing of the intention to start fieldwork. A copy of the contractor's Risk Assessment should accompany this notification.

8.5 Valid period of specification

This specification is valid for a period of one year from date of issue. After that time it may need to be revised to take into account new discoveries, changes in policy or the introduction of new working practices or techniques.

Any queries relating to this specification should be addressed to the WY Archaeology Advisory Service without delay.

West Yorkshire Archaeology Advisory Service
David Hunter

March 2011

West Yorkshire Archaeology Advisory Service
Registry of Deeds
Newstead Road
Wakefield
WF1 2DE

Telephone: (01924 306798).
Fax: (01924) 306810
E-mail: dhunter@wyjs.org.uk

Appendix 2: List of digital photographs

CD of images deposited with the West Yorkshire Historic Environment Record

Number	Subject
D01	The retort house and gasholder pit, from the east
D02	The retort house and gasholder pit, from the east
D03	The retort house and gasholder pit, from the south
D04	The retort house, from the south
D05	The retort house, from the south-east
D06	The retort house with repaired chimney, from the north
D07	The retort house, from the south
D08	The retort house, from the north-east, showing gable lean-to
D09	The retort house, from the north-west, showing rebuilt top of chimney
D10	Gasholder pit, from the south-west
D11	Gasholder pit, from the south-west

Appendix 3: Contents of the project archive

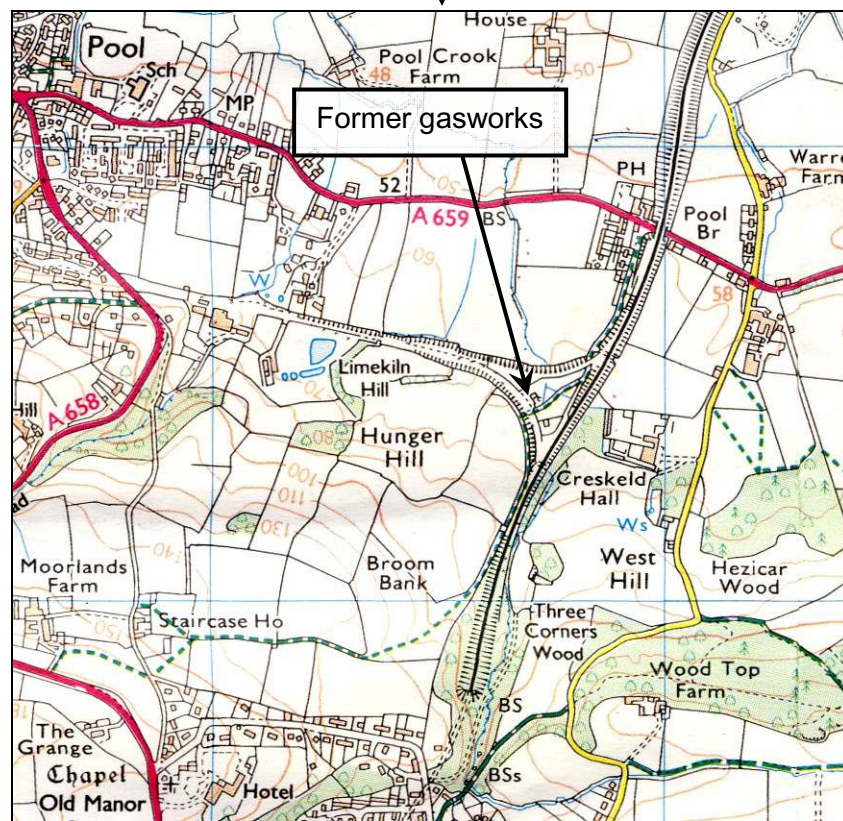
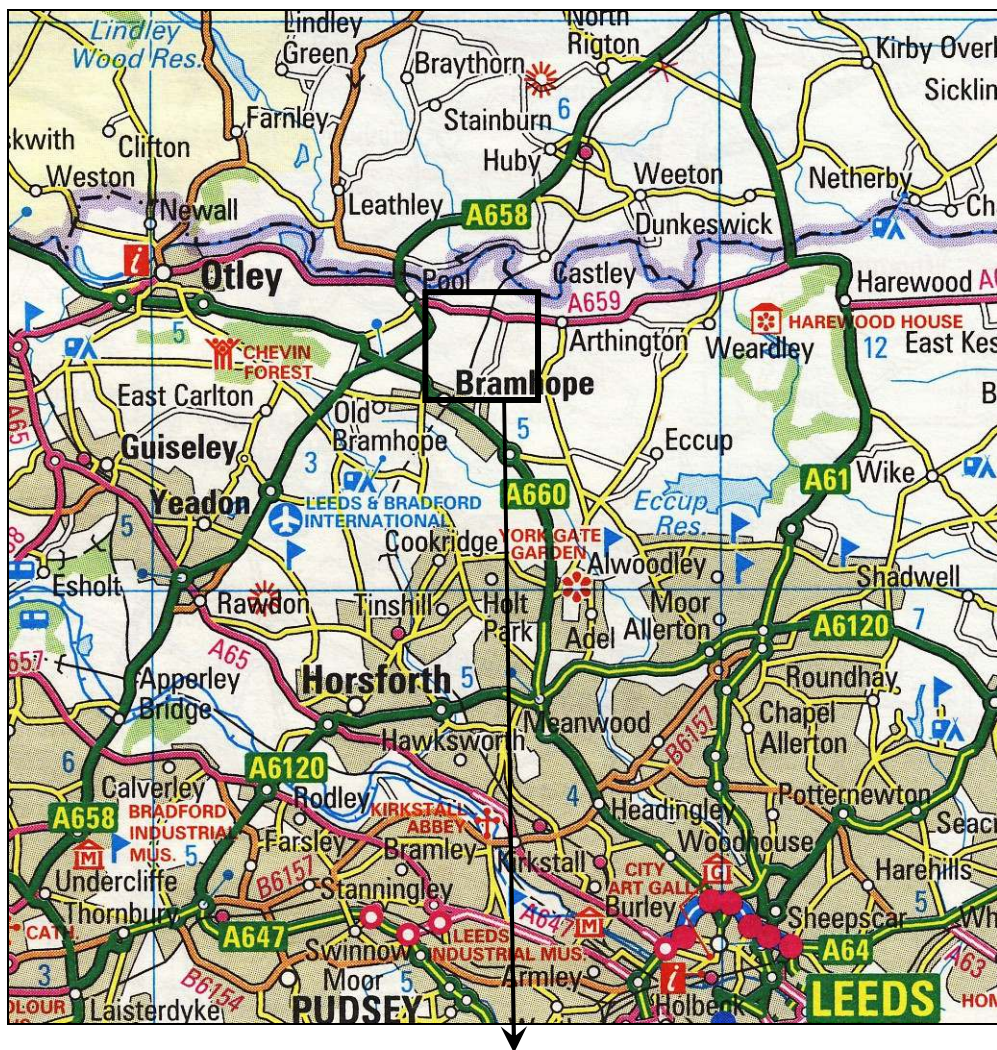
To be deposited with the Leeds office of the West Yorkshire Archive Service

1 file, containing:

- a copy of the report
- photographic contact sheets (3 no)
- site notes (annotated plans etc)

Complete list of black and white photographs taken, in film order

Photo	Film	Frame	Subject
3	1	1	The retort house and gasholder pit, from the south
8	1	2	The retort house, from the south-east
9	1	4	The retort house, from the south
1	1	5	The retort house and gasholder pit, from the east
28	1	6	The retort house, from the north-east, showing gable lean-to
6	1	7	The retort house with repaired chimney, from the north
34	1	8	The retort house, from the north-west, showing rebuilt top of chimney
4	1	10	The retort house, from the south
36	1	11	Gasholder pit, from the south-west
37	1	12	Gasholder pit, from the south-west
7	1	13	Detail of ridge ventilator to retort house, from the south
25	1	14	The retort house: south-east lean-to
27	1	16	The retort house: detail of brickwork in south-east elevation
38	1	17	Gasholder pit: detail of brick lining with stone block, from the south
10	1	18	The retort house: detail of original doorway
11	2	1	The retort house: detail of original window
2	2	2	The retort house and gasholder pit, from the east
17	2	4	The retort house: interior, from the south (stove in approximate location of retorts)
20	2	5	The retort house: interior, from the west
22	2	6	The retort house: inserted opening into south-east lean-to
19	2	7	The retort house: interior, from the north
18	2	8	The retort house: interior, from the east
21	2	10	The retort house: former location of retorts, from the south-east
23	2	11	The retort house: roof truss, from the east
24	2	12	The retort house: roof truss and ridge vent, from the west
32	2	14	The retort house: interior of modern south-west lean-to, from the north-west
33	2	16	The retort house: interior of modern south-west lean-to, from the south-east
35	2	17	Detail of flue from retort house to chimney
12	2	18	The retort house: north-west elevation
14	3	1	The retort house: north-west elevation
13	3	2	The retort house: altered window in north-west elevation
30	3	4	The retort house: interior of north-east lean-to, from the south
29	3	5	The retort house: interior of north-east lean-to, from the north-west
31	3	6	The retort house: interior of north-east lean-to, showing modern roof
26	3	7	The retort house: interior of south-east lean-to
15	3	9	The retort house: interior, from the north-east
16	3	10	The retort house: modern opening in north-east gable
5	3	11	The retort house, from the south-east



1:25,000

Figure 1: Location maps

Reproduced by permission of Ordnance Survey© on behalf of the Controller of Her Majesty's Stationery Office.
© Crown Copyright. All rights reserved. Licence no: AL100034008

(shows site before
gasworks
constructed)



Figure 2: Ordnance Survey 1:10560 map
Published 1851; sheet no: Yorkshire 187



Figure 3: Ordnance Survey 1:2500 map
Published 1893; sheet no: Yorkshire 187.12

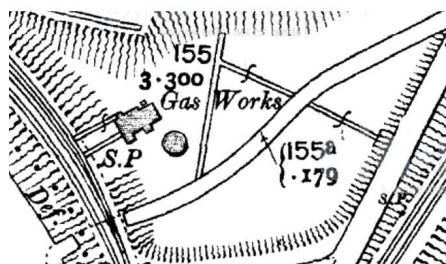


Figure 4: Ordnance Survey 1:2500 map
Published 1908; sheet no: Yorkshire 187.12



Figure 5: Ordnance Survey 1:2500 map
Published 1921; sheet no: Yorkshire 187.12

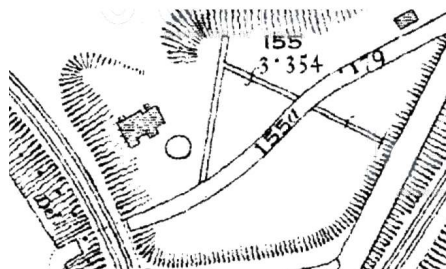


Figure 6: Ordnance Survey 1:2500 map
Published 1934; sheet no: Yorkshire 187.12

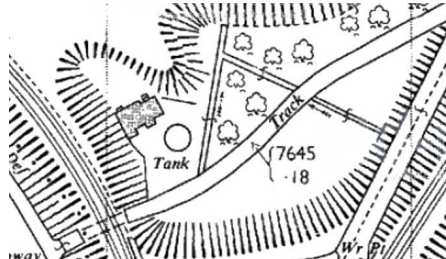
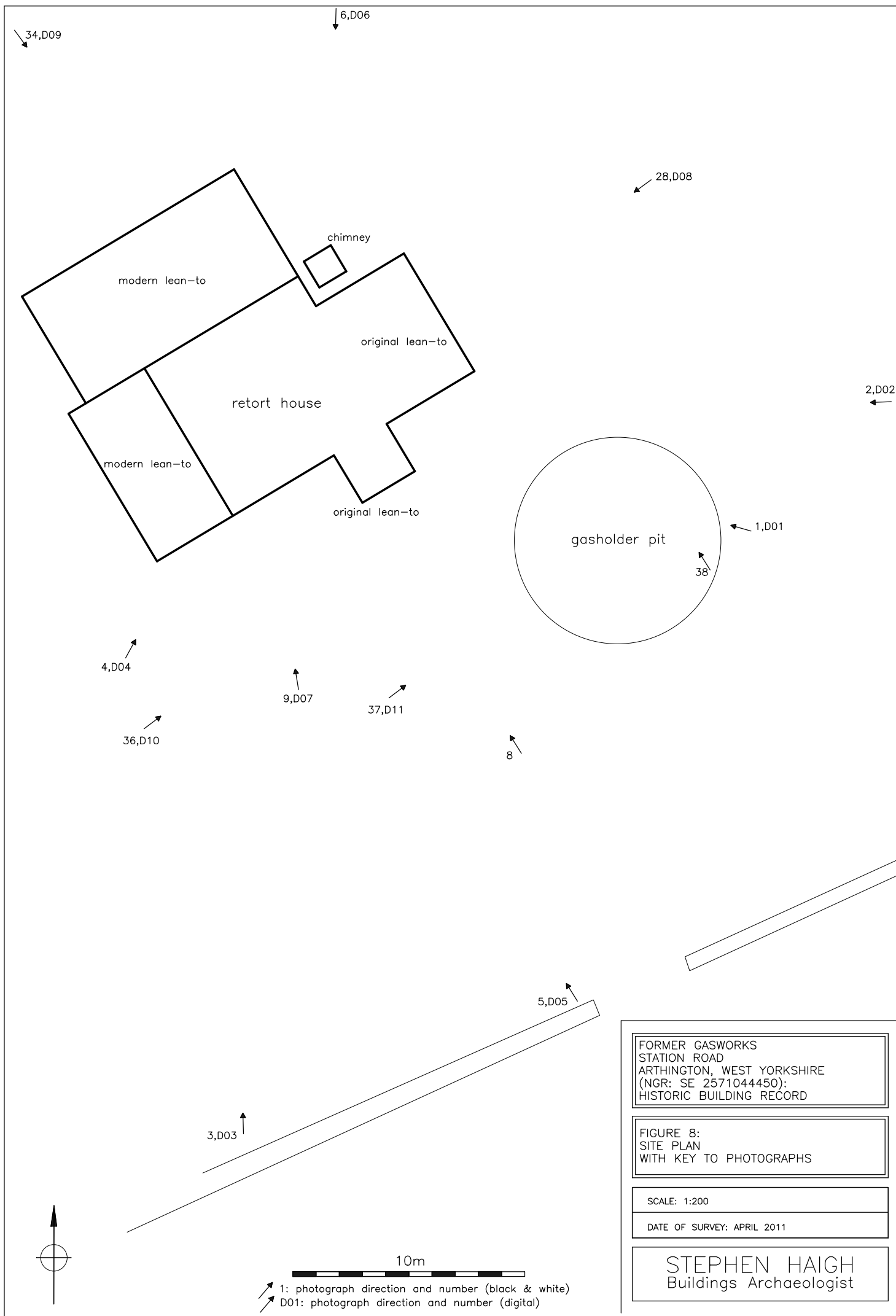
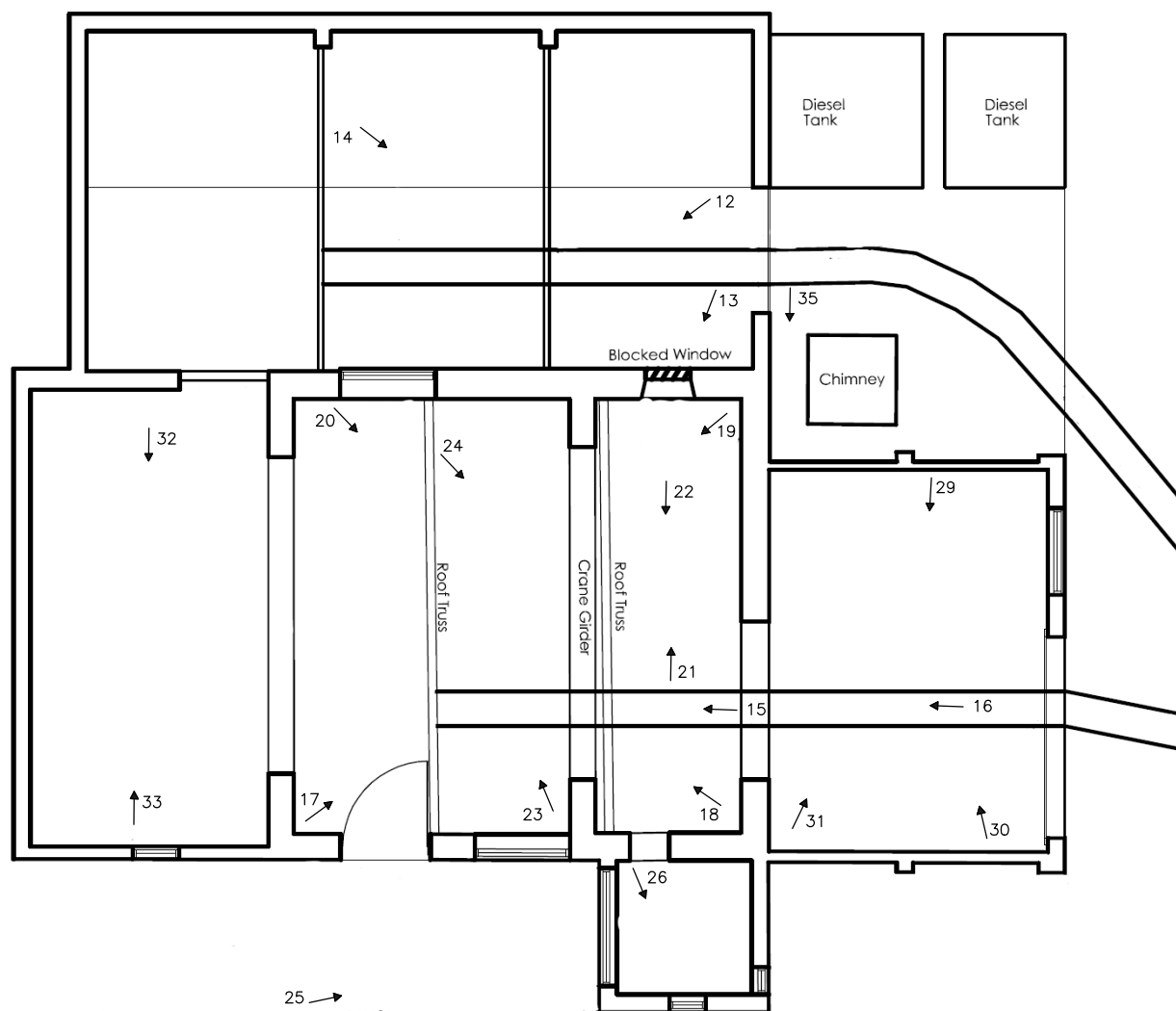


Figure 7: Ordnance Survey 1:2500 map
Published 1965; sheet no: SD 2544

Reproduced by permission of Ordnance Survey© on behalf of the
Controller of Her Majesty's Stationery Office. © Crown Copyright. All
rights reserved. Licence no: AL100034008





FORMER GASWORKS
STATION ROAD
ARTHRINGTON, WEST YORKSHIRE
(NGR: SE 2571044450):
HISTORIC BUILDING RECORD

FIGURE 9:
FLOOR PLAN
WITH KEY TO PHOTOGRAPHS

SCALE: 1:100

DATE OF SURVEY: APRIL 2011

STEPHEN HAIGH
Buildings Archaeologist

1: photograph direction and number (black & white)

DRAWING REPRODUCED COURTESY OF HOLDEN SURVEYS LTD/FARRAR BAMFORTH ASSOCIATES LTD

