JUNCTION OF HINDPOOL ROAD AND CORNMILL CROSSING, BARROW-IN-FURNESS, CUMBRIA

Archaeological Building Recording

Client: Positive Location Properties Ltd
Planning Ap. Ref.: 6/05/1530
NGR: SD 1955 6905

June 2007

Greenlane ARCHAEOLOGY

Greenlane Archaeology Ltd,
2 Albrights Yard, Theatre Street,
Ulverston, Cumbria, LA12 7AQ

Tel: 01229 588 500
Email: info@greenlanearchaeology.co.uk
Web: www.greenlanearchaeology.co.uk

Contents

Non-Technical Summary

Following a planning application for the construction of a warehouse and retail unit with associated car parking and landscaping a programme of archaeological investigation was requested by the Cumbria County Council Historic Environment Service (CCCHES). This initially comprised a desk-based assessment and site visit, which was completed in March 2006, and identified a number of sites of archaeological interest within the proposed development area, including a former gasworks, iron foundry, and rope walk. Several standing buildings that related to these sites were found to still be present within the area, and so an additional programme of archaeological recording was recommended by the CCCHES prior to their demolition.

Both the gasworks and iron foundry complexes were established in the 1860s. The gasworks was purchased by the Corporation of Barrow-in-Furness in 1869, but was found to be inadequate to meet demand by 1879, when a new gas holder was constructed. The iron foundry was established by Waddington and Longbottom before later becoming Waddington and Sons. It specialised in both iron and brass castings, particularly those required by Barrow's rapidly developing ship yards, but also made water pipes for the growing town. The rope walk was established in 1858, continued to expand into the 1870s, and was apparently still operating at the end of the 19th century.

The majority of the surviving buildings within the gasworks were found to be almost entirely modern, although a few elements of the original boundary walls were still present. The gas holders were also relatively early, but these too are likely to be later additions and not original. Within the former iron foundry site several original buildings survive, although these have been modified and extended by later occupiers of the site and large parts of the complex have been demolished. The remaining buildings formed a considerable part of the former foundry buildings, and also appear to have comprised elements of the rope walk.

The buildings within the former gasworks were considered to be of lesser significance than those within the former foundry, and only small fragments of the original structures survive. Those remaining within the iron foundry complex, however, represent a good survival of buildings of this type, although they only represent a small part of the overall site. Their record provides a useful insight into the function and construction of a foundry of this type and period, and should provide a useful comparison for similar complexes.

Acknowledgements

Greenlane Archaeology would like to thank Positive Locations Properties Ltd for commissioning and supporting the project, and Tony Clowes in particular. Further thanks are also due to David Joyce at Barrow Borough Council, David Dale at Regal Garage, Derek Murphy at Transco, and the staff of Elegant Window Systems for their help and co-operation during the initial building recording, and the staff of Demolition Services, particularly Jimmy Cook and Dave Colley, during the subsequent recording. Additional thanks are due to Jo Mackintosh, Historic Environment Record Officer for Cumbria County Council, Jeremy Parsons, Assistant Archaeologist at Cumbria County Council, Jenny Dickinson at Barrow Borough Council, and Howard Quayle for their help and additional information.

The building recording was carried out by Daniel Elsworth and Sam Whitehead, the report was written by Daniel Elsworth and Sam Whitehead, and Daniel Elsworth produced the illustrations. The project was managed by Jo Dawson, who also edited the report.

1. Introduction

1.1 Circumstances of the Project

1.1.1 A planning application (6/05/1530) was made by Positive Location Properties Ltd to construct a warehouse and retail unit with associated car parking and landscaping on land at the junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness (SD 1955 6905). After a recommendation by Cumbria County Council Historic Environment Service (CCCHES), Barrow Borough Council placed a condition on the planning consent requiring a scheme of archaeological investigation to be undertaken. The first phase of this work was an archaeological desk-based assessment, which was completed in March 2006 (Greenlane Archaeology 2006), and subsequent phases of work include a watching brief (Greenlane Archaeology 2007) and excavation (Greenlane Archaeology forthcoming a). A brief for the building recording work was produced by CCCHES, in response to which a project design was produced by Greenlane Archaeology (*see accompanying CD*). Following the acceptance of this the building recording was undertaken over the period 12th – 25th January 2007. Additional recording was carried out on 26th and 27th March and 9th May 2007. The results of a subsequent watching brief carried out on the below-ground remains in the area of the iron foundry are contained within a separate report (Greenlane Archaeology forthcoming b).

1.2 Location, Geology, and Topography

1.2.1 The proposed development area is situated on the north-east edge of Barrow-in-Furness' industrial area and docklands (Fig 1). It is positioned between the north-east side of the Devonshire Dock and Hindpool Road (part of the A5087) and is less than 10m above sea level (Ordnance Survey 2002; Fig 2). The landscape has been extensively altered by continuous building since at least the mid 19th century and part of the proposed development area is land that was reclaimed during the construction of the docks (Latham 1991, 26). The solid geology of the area is likely to comprise a mix of Mercia mudstones and red sandstones of the Triassic period (Moseley (ed) 1978, plate 1). This is likely to be covered by a thick glacially-derived till (Countryside Commission 1998, 27), which will have been affected by alluvial activity and in places layers of peat and marine clay have been recorded at a significant depth below the surface (Kendall 1900). The later industrial development of the area will, however, have significantly affected these deposits.

1.3 Site History

1.3.1 The background history of the site is intended to inform the results of the building recording. More specific information regarding structures, buildings and sites within the proposed development area is also presented in order to understand them in more detail. The information used to produce the site history is taken from the previous desk-based assessment report (Greenlane Archaeology 2006) and additional research carried out as part of the building recording.

1.3.2 Several early maps of the site were examined as part of the original desk-based assessment (Greenlane Archaeology 2006; Plates 1-4), ranging from a county plan of the late 18th century to Ordnance Survey maps of the 20th century. These revealed that, as with much of Barrow, the area was not developed until the mid to late 19th century. Prior to this date it was situated between the villages of Barrow and

Hindpool, and there were only a few farm buildings in the general vicinity. A large part of the site was directly on the shore and part was initially used as a patent slip. The whole area was, however, gradually reclaimed from the sea during the late 1850s by the tipping of ballast to form part of the docks that were developing alongside the growing town of Barrow-in-Furness.

1.3.3 By the 1870s the site had been transformed and was home to a number of industries, many of which remained in operation into the early to mid 20th century. The map regression demonstrated that five separate businesses are known to have been situated within the proposed development area, a shipyard, a gasworks, a foundry, a steam corn mill, and a rope walk. Three of these are discussed individually and in more detail below, as they relate most directly to the building recording.

1.3.4 ***Foundry:*** the foundry, known as the 'Hindpool Foundry', was one of several such complexes that sprung up during the industrialisation of Hindpool in the late 19th century (Melville 1956, 21). The company was established in 1860 by Waddington and Longbottom (The Acme Tone Engraving Company Limited 1900, 45), although the foundry was apparently not operational until 1863 (Richardson 1881, 94). There are several contemporary accounts of the foundry from various stages in its history; the company began as iron founders but soon expanded into engineering (particularly for shipping), brass founding and a variety of related activities (*ibid*). It is said that they '*Supplied most of cast iron bollards and fairleads etc for vessels built in ship yards in Ironworks Road, as well as much smithwork and, later, steam winches, capstans, etc. even for Messrs Vickers and other works throughout the country*' (Melville *c*1984).

1.3.5 There are few details of other products during their early period, although they are said to have supplied a 6hp engine for the Devonshire brewery on the opposite side of Hindpool Road, which was built by William Gradwell in *c*1879 (Richardson 1881, 101). A description from 1872 states that the moulding shop had '*recently been considerably extended*' (Leach 1872, 84), and gives a relatively detailed description of the buildings present, listing four steel cranes, one of which was made at the foundry, a smaller moulding shop adjoining the larger one, two cupola furnaces for melting iron (with a third under construction), as well as various overhead cranes and hoists in the yard (*ibid*). In addition, there was a brass foundry with two furnaces, on the ground floor of which was a fitting shop (although this was about to be converted into another foundry for the moulding of pipes and the fitting department moved into another new building). Near to the fitting shop was the smithy and shoeing forge, which contained eight hearths enhanced by fans, and within the yard was a three storey grinding mill powered by a 12hp steam engine used for producing the casting loam, which also drove a circular saw and machinery for cutting and punching iron on the ground floor (*op cit*, 85). The first floor was used for preparing patterns for pipes, and was where the new fitting shop was situated (which housed a variety of lathes, drilling machines, other machinery and the necessary benches), while the second was occupied by the joiners' and pattern makers' workshops (*ibid*).

1.3.6 It is evident that by 1900 the site had undergone several changes (The Acme Tone Engraving Company Limited 1900, 45; Plate 7), although the exact details of these are not known (Plate 6 shows some of the cranes and buildings adjoining the boundary wall at around this date). On 21st November 1906 (although Trescatheric and Barker mistakenly state that it was 1909 (1990, 22)) the foundry was severely damaged by a fire, which gutted the fitting and pattern shops (Anon 1906; Myers 2000, 32; Plates 8-9). The business survived, however, and some of the machinery was said to be reusable, although the damage was estimated to be £3000-£4000

(Anon 1906). After the fire the foundry was quickly returned to working order, and managed to remain in operation until 1921-2, at which point the depression led to a catastrophic loss of orders, which is said to have led to the closure of the business (Melville *c*1984).

1.3.7 There is only one recorded order from this period; for water pipes for a local church (CRO(B) BPR 27A/P/10/2 1923). A brief examination of the directories demonstrates that it remained in existence until at least 1935, however (Greenlane Archaeology 2006, 13-14), and it is not clear exactly what date it closed. It is evident from an aerial photograph taken in 1939 that a considerable number of the buildings on the site had been demolished by this date, however (Plate 10). During the Second World War the remaining buildings were requisitioned (in October 1940) by the War Department, and there is some correspondence regarding the subsequent claims for compensation (CRO(B) BDB 17/Box 19 1941-1943). A schedule compiled at the time lists the foundry as including workshops, stores, offices, and a yard, and a schedule of condition on entry compiled August 8th 1940 describes the buildings as follows:

'*Externally: Fences + Boundary Walls – brick, Walls – brick, Drainage – main, Roof – glass + slate, Paintwork – poor, Timber – sound, Structural – in poor order.*

Internally: Structural – in poor order, Decoration – nil, Ceilings – nil, Walls – sound, Floors – office floor, good, Woodwork – sound, Sanitary fittings – unexamined' (*ibid*).

1.3.8 A rent of £100 *per annum* was offer by way of compensation at the start of 1941, which was rejected but then only increased to £150, due to '*the condition of the premises at the time, & the fact that they had remained derelict for some years*' (*ibid*). This fits the evidence of the photograph from 1939 and suggests that, although trading (see Plate 11), Waddington and Sons were not making much use of the site at this time. It is also stated in the correspondence with the War Department that the site was damaged by enemy action on 4th April 1941, and it is counter-claimed that Waddington and Sons had deliberately tried to exempt themselves from the part of the requisition agreement that required them to maintain the building (*ibid*). The buildings were possibly considered for use by Unilever Limited in July 1943, as they were looking for factory premises as part of the War effort, but there is no evidence that Waddington and Sons' site was taken on. Negotiations between Waddington and Sons and the War Department were apparently not fully resolved even after the de-requisitioning notice was issued on 24th April 1945 (*ibid*).

1.3.9 Most recently the remaining buildings have been used for a variety of storage and business purposes, while modern buildings have been added on the north-west side of the site (Plate 5). One of the main companies to use it was a fruit and vegetable merchants, AE Docker and Sons, who had direct vehicular access to the site via the old rail sidings and their own garage for the maintenance of delivery lorries and company cars (Howard Quayle pers comm.).

1.3.10 Planning applications lodged between 1949 and 1995 demonstrate that AE Docker and Sons made a considerable number of alterations to the building, although it was not possible to access the details of all of these. Those that could be examined are also useful in confirming which other companies made use of the site; for example, a site plan dated 1972 (Ref. 8856) shows that the far north-east side of the site (Building 5) was occupied by FWB (Furness Water Board), and the building between them and Dockers (Building 4) was used by the Post Office. Similarly a plan from 1974 (Ref. 0507) shows the small building on the north-east side (Building 6) as occupied by 'T. Quinns' and the building between it and Dockers was the Post Office garage (Building 5). Plans from 1986 (Ref. 0757) show the presence of large storage

fridges at the north-west end of the Dockers building (Building 3) as well as storage and offices, and these and proposals from 1974 (Ref. 0507) show bolted steel roof structures like those present in Buildings 3 and 4.

1.3.11 ***Gasworks:*** the gasworks were established by a limited liability company in 1862 (Mannex and Co 1882, 22) or possibly 1861 (Baker 2005, 16; Baker 2006, 48), and according to a near contemporary source were '*supplied with the most recent and improved appliances for the manufacture of gas*' (Mannex and Co 1882, 22). Whether the works were built at this date is not certain, and this would conflict to some degree with the date that the dock was developed and the nearby shipyard went out of use (Latham 1991, 26). By 1869 they had been purchased by the Corporation of Barrow-in-Furness and despite having a large capacity the increase in the town's population meant that in 1879 an additional gasholder was constructed at Ormsgill (Mannex and Co 1882, 22).

1.3.12 The original gasworks buildings were apparently built using bricks from the North Lancashire Brick and Tile Works of Andrew Woodhouse, also in Hindpool (Leach 1872, 77), but contemporary details supply little further information about the site. A brief examination of the directories also provides little information prior to the 20th century (Greenlane Archaeology 2006, 14-15). The information in the directories stops in the 1920s, although it is not clear whether the site went out of use at this time. There are also references to a 'Gasworks House' during the 1920s and 1930s, which is also situated on the same part of Hindpool Road, although it is not clear what relationship, if any, this had to the gasworks themselves. The aerial photograph of the site from 1939 (Plate 10) shows that the large block of buildings along the south-east side of the site had been demolished by this date, and by 1985 modern buildings had been constructed on the north-west side of the site (Plate 5). These have most recently been used by Transco (Envirocheck 2005).

1.3.13 ***Ropewalk***: there is some information available regarding the ropewalk that ran along the north-east side of the site; in particular detailed descriptions from 1872 (Leach 1872, 85-86) and 1881 (Richardson 1881, 61-62). Richardson states Mr Henry Stuart established the ropewalk in 1858 (*ibid*). In the first three years it is said to have been open, but after that time '*sixty fathoms*' was roofed over (*op cit*, 62). A horse-powered machine was used to operate the machinery during the first five years, after which time an 18hp steam engine, the first made in Barrow, constructed at Messrs Kennedy and Eastwood's works on the opposite side of Hindpool Road, was installed (*ibid*). Leach, by contrast, states that it utilised both manual power and had a 14hp horizontal steam engine (Leach 1872, 85). The rope walk had hemp stores and hackling shops at the south end, equipment for tarring rope mid-way along the shed, and a rigging loft behind this (*ibid*). The machinery at the works powered an endless band that ran the full length of the shed as well as a tramway that travelled along it and the winding machine and other equipment (*op cit*, 85-86). The ropewalk is clearly named on the early Ordnance Survey maps as 'Stuart's Rope Walk' (Ordnance Survey n.d.; Plate 1), and occupied a plot of land 300 yards long, which ran between the junction of Hindpool Road and Cornwallis Street and Abbey Road (Leach 1872, 85).

2. Methodology

2.1 Introduction

2.1.1 The building recording comprised a Level 1-type investigation of the buildings situated on the gasworks site, and a Level 2-type investigation of the buildings that had formed part of the iron foundry (English Heritage 2006). The project was carried out in accordance with the brief and the project design (*see accompanying CD*), and followed suitable IFA standards (IFA 1999). An archive was compiled to provide a permanent record of the project and its results in accordance with English Heritage and IFA guidelines (English Heritage 1991; Ferguson and Murray n.d.).

2.2 Building Recording - Level 1

2.2.1 The Level 1 recording consisted of a rapid examination of all of the buildings situated on the former gasworks site, principally looking at the external elevations. An internal inspection was also carried out, although this was limited as the buildings were in use. Brief written records relating to each building were compiled and general photographs of the principal external and internal elements of the buildings were taken in both black and white 35mm print and colour digital formats. The location of each building was marked on a plan of the site (Fig 2).

2.3 Building Recording – Level 2

2.3.1 The Level 2 building recording comprised three main elements: the production of drawings, the compilation of written records, and the compilation of a photographic record.

2.3.2 ***Drawings***: this comprised two elements:

- The production of plans of all of the principal floors - no 'as existing' plans of the site were available so these were produced using a total station with reflectorless capabilities connected to a portable computer operating AutoCAD LT. Paper copies of the resulting survey information were then printed out at a suitable scale and additional detail hand-annotated onto a drawing film overlay;
- The production of a single cross-section – again, no 'as existing' section was available so this was also produced using a total station during the production of the plans. Paper copies of the resulting survey information were then printed out at a suitable scale and additional information hand-annotated onto a drawing film overlay.

2.3.3 ***Written record***: descriptions of all of the details of the buildings were recorded on Greenlane Archaeology *pro forma* record sheets. These provide information about all of the elevations and rooms of the building, with areas of historic or architectural interest being particularly noted.

2.3.4 ***Photographic record***: photographs in black and white 35mm print format were taken of all of the principal elements of the building, with particular emphasis on areas of architectural or historic interest. In addition, general views of the site and its immediate environs were also taken. These were supplemented by colour digital photographs.

2.4 Further Recording

2.4.1 Additional photographs and recording was carried out in those areas of the site that had been inaccessible or covered by fittings and debris during the original building recording. This additional investigation was carried out during demolition.

2.5 Archive

2.5.1 A comprehensive archive of the project has been produced in accordance with the project design, and current IFA and English Heritage guidelines (Ferguson and Murray n.d.; English Heritage 1991). The paper and digital archive and a copy of this report will be deposited in the Cumbria Record Office in Barrow-in-Furness (CRO(B)) on completion of the project. Three copies of this report will be deposited with the Cumbria Historic Environment Record, one with the client, and one will be retained by Greenlane Archaeology. In addition, a digital copy will be offered to the NMR and a record of the project will be made on the OASIS scheme. Digital copies of the report will also be offered to the client's agents, as required.

3. Gasworks

3.1 Arrangement and Fabric

3.1.1 The gasworks site comprises a total of eight buildings, the majority of which are entirely freestanding (Fig 2). All of theses buildings are situated within or built onto a tall perimeter wall. They are primarily built of modern brick or concrete blocks, although some elements of earlier brick walling have been incorporated into some of them.

3.2 Building 1

3.2.1 This forms the south-east end of the 'L-shaped' block of buildings formed by with Building 2 (Fig 2) and is currently used as a store and associated buildings. It is built from concrete blocks in stretcher bond and has a gabled corrugated aluminium roof. The north-east elevation (onto Hindpool Road) is probably part of the original boundary wall, as it is built with an angled plinth and numerous buttresses, although 11 three-light modern windows at high level are present, with a further two at a lower-level at the north-west end (Plate 12). There are two windows and two doors in the south-east end with modern casements (Plate 13). The south-west side has one door, two windows, and a blocked door (Plate 13) and there are large high level windows at the north-west end with a roller garage door at a high level. The south-east end is clearly a later addition with a raised level interior.

3.2.2 Internally the main part of the building essentially comprises a large hanger with a steel-frame roof structure supporting the corrugated aluminium roof. It has a concrete floor, which is raised relative to the external ground level on the south-west side but may be at the same height as that to the north-east. There are internal timber stud partition walls finished with plasterboard forming a smaller room in the north corner with a suspended tile ceiling, within which is a smaller room formed in the same way with a window in the north-east elevation. Both of these rooms have a carpeted floor and modern paint finish to the walls. The north-east wall has a row of buttresses with small high-level windows between them. The south-east end of this building is made up of various small rooms including additional offices, meeting rooms, and toilets. All of these have a modern finish with vinyl tiles, modern wall coverings and suspended ceilings. Stud partition walls divide up the space and there are also some internal brick walls. Again the floor level is raised, but at the far south-east end it is lower, where there are two additional reception rooms alongside the main gates, which contain fuse boxes and associated fittings.

3.3 Building 2

3.3.1 This comprises offices, a store, and a garage and makes up the south-west end of the L-shaped block formed with Building 1 (Fig 2). It is built from concrete blocks laid in a stretcher bond with a gabled corrugated aluminium roof. The building is accessed by a door on the north east side, which also houses a row of high level windows (Plate 14). There is a group of doors and small windows looking into work rooms to the south-west and a row of large garage doors at the south-west end (Plate 15). The north-west elevation is obscured by the adjoining building, but has apparently been clad with corrugated aluminium.

3.3.2 Internally the building comprises several parts. The north-east end is made up of offices and meeting rooms and has a modern finish throughout with a suspended

ceiling and raised concrete floor relative to the external ground level. A partition wall with a glass panel forms a reception area between the two main rooms at this end, and there are further partitions to the north-east dividing it from the small rooms in the north corner of Building 1. To the south-west of the office/reception is a narrow corridor with steps up from the lower ground level to the south-east and incorporates toilets off the south-west side. The centre of the building is made up of a workshop and associated toilets. The workshop has a concrete floor and a steel frame roof supporting the ceiling and there are brick partitions against the south-east and north-east elevations forming a small store room. The north-west elevation is probably part of the original outer boundary as it is constructed from early brick, laid in English garden wall bond at a ratio of three rows of stretchers to one row of headers, while the rest are stretcher bond. The toilets to the south-west of the workshop have a concrete floor and modern brick partitions, and there is a small boiler room to the north-west of these. Again the north-west wall of this room appears to be earlier, and is apparently laid in some form of English bond (apparently laid in alternating rows of headers and stretchers). The north-east wall of the toilets may also be original as it is laid in Flemish bond, as is a fragment of the wall to the south-west.

3.3.3 The south-west end of Building 2 comprises a large garage and associated rooms. The garage is a large open space with a steel frame roof and a concrete floor with a tiled inspection pit running across most or all of its entire width (this was mainly covered during the recording). The north-west wall is again probably original, but it has been largely concealed by a skin of concrete blocks. There are large roller-shutter doors in the south-east elevation. Brick partition walls have been added into the west corner to form a small office, within which is some of the original boundary wall, also laid in alternating rows of stretchers and headers and with a tie bolt plate attached to it. There is a further partition forming a small store in the north corner and additional partitions to the south-west form another garage accessed via a separate roller-shutter door. There is a further store at the south-west end with a concrete floor, the north-west wall of which is original and laid in English garden wall bond at a ratio of three rows of stretchers to two rows of headers. It is butted by the south-west wall, which continues to form the boundary wall extending to the south-east and incorporates several angled buttresses.

3.4 Building 3

3.41 This is the north-westernmost gasholder (Plate 16). It is currently empty and so retracted into the ground and comprises a circular tank surrounded by a low modern concrete brick wall 0.7m high, which is seated on a concrete ring. The concrete ring is connected to equally-spaced concrete stanchions to which are bolted iron plates. These each continue beneath the concrete wall and connect to a rolling mechanism which enables the holder to expand (the rollers are stamped ‘18756 ABP’). Three iron stair cases allowing access to the upper level of the extended holder project from the concrete ring; these have a bolted frame structure with the hand rail on the outer side and are locked into the walls of the gasholder. The retracted walls of the gasholder are built from bolted sheet iron with a hand rail bolted to top. The domed top is also constructed from riveted iron plates with occasional valves and pipes projecting through it. There is a large valve mechanism on the south-east side comprising two large pipes connected to two horizontal sections, one with a wheel topped valve stop marked ‘FLOW OF GAS’ with an arrow pointing approximately north-east (Plate 17). The pipe is marked ‘49803 B208 STANTON’ and has the British Standard kite mark. There are valves marked ‘DONKIN S20

EB01' and 'CORT READING' but the other marks are obscured by paint. A modern control box has been added to the north-west side on an aluminium frame.

3.5 Building 4

3.5.1 This is essentially the same as Building 3 (Plates 18-20) but without the adjacent large valve mechanism. The rollers on the outer ring are evidently a different style and are marked 'S 33 853', and there is a modern control panel on the south side on an aluminium frame.

3.6 Building 5

3.6.1 This is the gas governor house, and comprises a mono pitch fibreglass roof on concrete brick pillars with wire mesh fence between them preventing access (Plate 21) and a brick 'instrument room' in south-east corner. Inside the main part there are several large gas control valves running from the south-east to the north-east. At the north-east end the pipes project from the ground into valves marked 'DONKIN S18 E801'. There is a row of pipes along the south-east side, parallel to the brick boundary wall, to which are attached modern control switches. The central valve is marked 'THE BRYAN DONKIN C^{o} L^{TD} FLOW OF GAS' with an arrow pointing approximately north. One valve is marked 'SR17 S12 A1 OS[?]' and 'BS', and at least part of this is evidently no longer still operating as it is propped up on timber. At the north-east end there are parallel valves marked '208 DA 004' 'DONKIN', and 'S12 H6 001[?]'.

3.7 Gasworks Boundary Wall

3.7.1 The south-east of the south-west boundary wall is evidently part of the original gasworks (Plate 22; see also Plate 6). The earliest phase is a section of brick wall that is butted by a later brick boundary wall. The earlier section includes two round-headed apertures blocked with brick with some render remaining. The construction of this part is English garden wall bond, generally at a ratio of three rows of stretchers to one row of headers, with the bricks typically measuring 0.23m long by 0.11m wide and 0.08m thick. They are handmade, with lots of pebbly inclusions and a mid-orange colour, and are bonded with a pale gritty mortar. There is one wall scar between the two arches and evidence of a return at the north-west end. This section is butted by the boundary wall at its south-east end and extended at the north-west end where the bricks are much redder, contain fewer pebble inclusions and are handmade, are typically 0.23m long, 0.11m wide, and 0.08m thick. At this point the bricks are bonded with a grey mortar. There is flat arched aperture within this section, which has been blocked with brick, with a roll-moulded surround in a thick grey render, which is continued into a return at the north-west end where there is another aperture with the same decorative finish. Further to the north-west this wall is butted by a modern wall with dark red machine-moulded bricks which are laid in an English garden wall bond with dark grey mortar at a ratio of five rows of stretchers to one row of headers. This section of the wall has a plinth and buttresses and the bricks typically measure 0.225m long, 0.15m wide and 0.065m thick.

3.7.2 The opposing, south-west facing, side of this section of wall shows most of the same features, although this area could only be accessed during the excavation of the corn mill (Plate 23). The north-west end is clearly an extension, built from a darker red brick, with a blocked doorway with a flat arched aperture and bull-nosed surround in a much more orangey-red brick. It has a bench mark carved into the brick

at its north-west end, where the wall is butted by the later boundary. To the south-east of this section the wall is built in alternating courses of headers and stretchers and there are two windows, both of which are blocked with brick, with round-headed arches and yellow sandstone sills. Immediately south-east of this the wall is extended again behind Building 8 (see *Section 3.10* below), in English garden wall bond (comprising three rows of stretchers to one row of headers). Within this are another blocked window with a flat round arch, and a tall blocked doorway with a truncated round-headed arch. To the south-east this wall butts another section of wall, with burnt brick quoins, built in alternating courses of headers and stretchers, which incorporates two narrow blocked openings or alcoves, and further to the south-east has another possible large blocked opening (although this may be a further extension) and additional narrow blocked openings or alcoves, one of which houses a timber post and has two iron tie rod plates attached. At the far south-east end this walling is butted by a more recent wall, which continues to the north-west corner of Building 1 of the iron foundry (see *Section 4.2* below).

3.8 Building 6

3.8.1 This forms the north-east end of an L-shaped block of buildings (formed with Building 7), formerly the offices of SITA. It is constructed from modern brick laid in stretcher bond, is up to three storeys tall in the centre, and has large UPVC windows on each level and a flat roof. The front (north-east) elevation is two stories tall, and the north-west half of the ground floor has a colonnaded porch beneath it leading to the front door (Plate 24). There is a door in the south-east side elevation below a small window. Building 7 is attached to the south-west elevation, but there is a fire escape leading onto a flat roof at first floor level to the north-west, and the building extends in this direction on several levels incorporating a chimney, groups of large and small windows and a modern UPVC door (Plate 25). The north-west elevation is plain with two windows on the ground floor.

3.8.2 Internally the entire building has a modern finish with carpet or vinyl tiles throughout and suspended ceilings. Partition walls form rooms at the north-east end including a fuse cupboard on the ground floor and offices, conference rooms and toilets on the first floor. A central staircase on a square plan (Plate 26) provides access to the various floors and extends into the second floor which comprises a single small room housing water tanks and allowing access to the roof on the north-east side. The first floor has a row of store cupboards off the stairs and extends into an area at the north-west end where there are several offices. The ground floor has a lobby on the north-east side off the main Hindpool Road entrance and a series of offices to the north-west and south-east, some of which connect to Building 7. These also include a kitchen, and are generally finished with carpet or vinyl tiles and plastered walls. There is a small basement area beneath the central stair tower, which has the same general build as the rest of the complex, and contains boilers, fuse boxes, and a locked cage store area.

3.9 Building 7

3.9.1 This forms the south-western part of a single L-shaped block with Building 6, and is built of the same modern brick laid in stretcher bond, and also has a flat roof. It is only a single storey high and appears to have formed offices and workshops. There are several large and small UPVC casement windows on each of the long sides (north-west and south-east; Plates 26-27) and three doors with steps or ramps on the south-east side, and only one door on the north-west. The south-west end is

plain with a raised parapet. Internally this comprises a suite of offices at the north-east end and workshops at the south-west, divided by a short entrance hall on the south-east side of the building. All of the rooms have concrete floors and ceilings and modern partition walls and there is evidence for a blocked doorway in the south-west wall (Plate 28). This is not visible externally, which, along with the style of brick work (which is a variation of English garden wall bond comprising five rows of stretchers to one row of alternating headers and stretchers) might indicate that it is an earlier re-used wall. There is another blocked doorway in a partition wall to the north-east of this.

3.10 Building 8

3.10.1 This comprises a row of garages, built onto or butting the boundary wall leaving only the north-east and south-east elevations visible (Plates 29-30). They are all constructed from red machine-made bricks with concrete lintels over the garage doors. The north-westernmost garage projects from the line and internally has a concrete roof supported by iron girders resting on buttresses, and there is a vehicle inspection pit in the floor. The remaining garages are of similar construction but smaller and without girders supporting the roof (this instead rests on the buttresses) and no inspection pits. There are pipes running along the south-west wall. In addition, the three at the south-east end have had the main doorway to the north-east partially blocked to form a pedestrian doorway and there have been further alterations sub-dividing the internal space, all of which have been carried out with concrete blocks and bricks. At the south-east end the garages are butted by a concrete block and brick built oil store. The majority of the boundary to the south-west of this is modern, but the central part is earlier and built of hand-moulded brick laid in English garden wall bond at a ratio of five rows of stretchers to one row of headers with buttresses. There is a slight return at the south-east end before it is continued by the modern wall.

4. Iron Foundry/Rope Walk

4.1 Arrangement and Fabric

4.1.1 The iron and brass foundry site comprises seven buildings, most of which (Buildings 1-6) form part of a single large block orientated north-west/south-east, with a number of minor extensions to the north-west end (Figs 4-5; Plates 31-32). Some of these buildings probably originally formed part of a ropewalk, but for the purpose of simplifying the description of the site they will be referred to as being from the foundry. The majority of the foundry area is situated within a tall perimeter fence or wall, apart from the south-east side, which fronts directly onto Cornmill Crossing. The buildings are all built from brick, generally with slate or corrugated concrete roofs, supported by timber or steel trusses.

4.2 Building 1

4.2.1 ***External detail:*** the roof is only partially intact, the north-west end having collapsed. What does survive is finished with grey slate and ceramic bonnet ridge tiles. The south-west elevation is brick-built, in two phases (Plate 33). The first phase comprises the ground floor, which is constructed from mid orangey-red brick in Flemish bond, each brick typically 0.225m long by 0.075m wide and 0.105m thick. The bricks contain some small pebbly inclusions, and are mould-made. The second phase comprises the first floor, which is made up of bricks similar in size to those on the ground floor, only slightly thinner, with a similar fabric but with burnt faces in most cases. These bricks are laid in five rows of stretchers to one of alternate headers and stretchers. There is a row of headers between the two build phases. There is a mix of plastic and cast iron downpipes, plastic gutter, and metal pipe housing electrical cables attached to the wall. There is a plastic sign attached with the text 'Strictly private car park unauthorised vehicles liable to wheel clamping £50 release fee – no liability for damage accepted A & E Docker Ltd', and another timber sign attached, with no remaining text. The words 'No spud pickers' have been graffitied in sealant across the lower part of the wall.

4.2.2 There are three windows and one door on the ground floor, with flat arches and blocked with modern brick. There are three buttresses of modern machine-made brick, with angled coping. Two iron tie rod plates, one circular and one rectangular, are attached to the wall. There are four windows on the first floor, with low arches in edge-set brick. The roof has collapsed on the north-west side and the south-west corner has been rebuilt in modern brick topped with a concrete slab. The roof is finished with slate and there are ceramic bonnet tiles on the ridge. A short section of wall is attached on the north-west end, and this is butted by a larger boundary wall.

4.2.3 The south-east elevation is built in the same style as the south-west (see *Section 4.2.1* above; Plate 34), with the ground floor comprising mid orangey-red bricks laid in Flemish bond, and the first floor laid in English garden wall bond (at a ratio of five rows of stretchers to one row of headers) finishing in a pediment topped with yellow sandstone coping. The exception is the south corner, which is capped with concrete on top of a rebuilt section in modern brick. A modern lamp and cabling is attached to the upper part of the wall. There are two windows and a door on the ground floor, and the windows have 'voussoir' yellow sandstone lintels. The door has a yellow concrete lintel with 'Nicholson + Wright' scored into it. All these windows and doors are blocked with more modern machine-made brick. There are two windows on

the first floor with flat brick arches, which are also blocked. Building 1 appears to butt onto Building 2, where there is an iron hopper for the downpipe.

4.2.4 The north-west elevation is built of mould-made brick in Flemish bond, and it butts Building 2 (Plate 44). The first floor is mainly collapsed, but there are the remains of four windows (one with a concrete sill still present). There is a large inserted door on the ground floor, with a concrete lintel and rebuilt jambs, and there is a smaller original door to the south-west with one light above and a sandstone lintel.

4.2.5 ***Internal detail:*** the ground floor has a concrete floor and there are six upright posts, the corners of which are finished with stop-chamfer decoration (Fig 6), supporting the beams that support the ceiling (Plate 35). This comprises large beams (several of which have Baltic timber marks on them; Plate 36), orientated north-east/south-west, on top of which are joists and tongue and groove floorboards. Pairs of opposing small circular 'bosses' in a row, apparently made of iron with an enamelled finish (Plate 37), are attached to the joists on the north-east side and seem to represent the line of a rope pulley or power system. A row of three iron framed floor lights is also situated in the ceiling on the north-east side of the ground floor, the frames and panes of which are marked 'HAYWARD BROTHERS LONDON' (Plate 38). Part of the ceiling in the north corner of the room is covered with tongue and groove boards and the scar of a timber partition wall is present in this area. All of the walls have the remains of a whitewash finish. A timber staircase leading to the first floor, orientated north-east/south-west, is situated on the south-west side of the centre of the room. It has baluster-turned spindles and heavy newel posts with ball finials (Plate 39), and timber partition walling has been added to either side, with a doorway to the north-west. An iron tie-rod runs north-east/south-west across the room just beneath the ceiling.

4.2.6 The north-west elevation has a large inserted doorway with a folding metal door, the jambs of which have been rebuilt to form buttresses, and there is a smaller doorway to the south-west with rounded jambs, which are also inserted, and a timber frame including a two-light overlight. The south-west elevation is plain, with plaster over the north-west end (within the area of the panelled ceiling), and the visible brickwork is laid in stretcher bond. There is one blocked window visible on the north-west side and a blocked doorway at the foot of the stairs. In the south corner there are the remains of a fireplace, comprising a ceramic fireback, part of a ceramic flue, and a scar denoting the extent of the fireplace. The south-east elevation is partially rendered, and there are blocked windows visible in places. The north-east elevation has a metal frame with fuse boxes attached adjacent to it on the south-east side, and attached to the wall, just below the beams, is a large chamfered batten which originally ran the whole length of the room (although it has been broken off at the south-east end). This has three slots in the underside, presumably for attached vertical timbers, and a scarf joint mid-way along its length. The line of a possible re-build to the upper part of the wall is visible as a row of headers and narrow iron bars built into the wall beneath the beams.

4.2.7 The first floor is divided into two halves. The north-west half is in a ruinous condition and could not be fully accessed, but the remains of the roof show that it had three king post trusses supporting a slate roof with at least one skylight. Each king post is joggled to meet the tie beams, soffitted to meet the ridge purlin, and has a pair of queen struts and angled braces (Plate 40). There are various carpenter's marks visible on one of the trusses in the form of chiselled crosses, crescents, and Roman numerals (Fig 6). Baltic timber marks are also present on the south-west end of the

central tie beam. The north-east wall of the north-west side of the first floor has two or three blocked windows visible, at least two of which have flat round arches, and there are three heavy iron brackets bolted to the wall (Plate 41). There are a further three blocked windows in the south-west elevation. The south-east elevation, which divides the two halves of the first floor, is constructed from stud partition walls finished with tongue and groove boards and there is a single six-panel doorway with moulded panels connecting the north-west side to the stair case. A single-light window overlooks the staircase from the south-west, and there is another possible doorway to the north-east, although this is more likely a missing section of stud walling.

4.2.8 The south-east half of the first floor is accessed via a narrow corridor. The walls to the north-east are later stud partitions, but those to the south-west are original stud partitions finished with tongue and groove boards. There is a five-light window with stained glass panes (Plate 42) between the corridor and the south-west room, plus two doorways providing access, both of which have two panels with two lights above. The corridor divides the south-east part of the floor into two rooms, north-east and south-west. The north-east room has modern stud partitions forming the south-west and most of the north-west wall (although part of the latter is finished with tongue and groove boards), and a suspended ceiling, beyond which a truss is visible, which is of the same style as those to the north-west, but finished with stop chamfer decoration. The south-east and north-east walls are plain and finished with plaster. The south-west room has tongue and groove panelling forming the north-east walls, with a short wall projecting into the room alongside the north-western doorway. The south-east wall is finished with plaster and there is a projecting area forming a flue in the south corner, and large aluminium hooked brackets attached to all of the walls. The north-west wall is a stud partition, with a doorway on the south-west side leading into a small cupboard or store over the stairs in the area between the north-west and south-east halves of the floor.

4.3 Building 2

4.3.1 ***External detail:*** the roof is finished with grey slate, although in the central section there is a large collapsed area that may represent the remains of a pair of skylights. The original build of the south-east elevation is mid orange brick, although several of these are burnt, with some pebble inclusions in Flemish bond and a pale grey mortar. There is a plinth along the base with angled burnt bricks forming a chamfer, which has been rebuilt at the south-west end (Plate 43). There are four large windows on the ground floor, each with round headed arches of burnt bricks. There is a central door, with a yellow sandstone lintel, blocked with early bricks between a pair of central buttresses, while the windows are blocked with modern bricks. Above the windows is a stepped row of burnt bricks, above which the wall is recessed, forming a triangular area in the top of the gable. In the centre of this is a circular aperture finished with burnt headers, blocked with brick but leaving a slight recess. There is an iron socket on a bracket and a loop attached to the wall, presumably for a flag pole. The gable is finished with yellow sandstone coping.

4.3.2 The north-west elevation is built of dark red early brick, in English garden wall bond at a ratio of three rows of stretchers to one row of headers (Plate 44). It has a gable, a cast iron downpipe, and the end of the valley on the north-east side. There is a large round-headed window on the north-east side, with edge-set headers, the top of which is blocked with modern brick, leaving a two-light timber casement with a concrete lintel and a yellow sandstone sill. There is a circular aperture below the

eaves in the centre and a large inserted door below and on the south-west side, with a steel girder lintel. There is some rebuild above the door in concrete blocks and the projecting jambs of the door are built from modern bricks.

4.3.3 ***Internal detail:*** this building has a concrete floor with a vehicle inspection pit built from concrete blocks on the south-west side with steps at either end and there are two recesses for lights in the side walls (Plate 45). There is a raised platform constructed from dark red machine-made bricks along the north-east side with concrete steps on either end and a concrete top and a steel edging strip. The roof is slate, although a considerable amount has collapsed, and there are four trusses, and angled queen braces bolted to the king tie rod, which fixes to a plate on the junction of the principal rafters (Fig 6). There are various iron rod attachments and tie rods running across the room, and at least one of the tie beams has Baltic timber marks inscribed into it (Plate 46). The walls are painted white.

4.3.4 The north-east internal elevation is brick-built, in English garden wall bond at a ratio of five rows of stretchers to one row of headers. There are buttresses supporting the trusses (which have iron plates strapped to them on this side), and there is the scar of a low wall on the south-east side of the south-eastern buttress. In the east corner the north-east elevation butts the south-east elevation, and there are buttresses filling an opening or possibly forming a later addition. The south-east elevation has four blocked round-headed windows and a blocked central door with a timber lintel. There are various battens, blocks, and bolted plates also attached to the wall.

4.3.5 The south-west elevation is essentially the same as the north-east elevation, with buttresses supporting the trusses, but there are also two small apertures on the north-west side, with iron strap lintels (Plate 47). The one to the south-east has a slightly arched top. There is an additional small buttress on the north-westernmost buttress. The north-west elevation has a large inserted door, with a roller shutter, and a circular aperture in the top. There is a round-headed window on the north-east side of the wall, the upper part of which is blocked.

4.4 Building 3

4.4.1 ***External detail:*** the roof is finished with corrugated asbestos concrete sheets and the main, south-east, section has skylights on the south-west pitch at the apex. The south-west side of the south-east elevation contains a small section of an earlier build (Plate 48). It comprises early hand-moulded brick and a chamfered plinth and includes a small doorway with a concrete lintel. The majority of the elevation is more modern machine-made brick, in alternating rows of stretchers and headers. The brick is dark red, built onto the earlier brick, and forming a parapet topped with concrete slab coping. There is a large doorway within this with an iron girder lintel, which has been partially filled in with more modern brick to form a smaller roller shutter door. This door has smaller girders (on concrete pads) for a lintel. There is modern cabling attached and there is a light and a bracket for a sign.

4.4.2 The south-west elevation mainly comprises a large outshut, which forms the north-west end (Plate 49). It is a single storey structure built of modern brick in stretcher bond. There are six ground floor windows, with each being iron-hinged irregular 12-light casements, with concrete lintels and narrow concrete sills. There are two small apertures at the south-east end on the first floor, both with timber surrounds and one with a concrete lintel. There is a corrugated concrete roof and plastic rainwater goods attached to a timber fascia. The wall returns at the south-east

end to meet the main part of the elevation. The return is earlier brick, in English garden wall bond at a ratio of five rows of stretchers to one row of headers. It has been raised in height with later brick, and has a tall window on the north-east side with a stop chamfered yellow sandstone lintel and a stone sill. This window is partly blocked with concrete blocks, with a brick platform with a concrete top in the corner, supporting a timber frame with an engine on top. The main wall to the south-east is early brick in an uncertain bond. There are four windows on the first floor and three on the ground floor, all with concrete sills and lintels, which suggests that they are inserted. There is lots of added modern brick on the ground floor.

4.4.3 The north-west elevation is brick-built, mainly of early type, in English garden wall bond at a ratio of five rows of stretchers to one row of headers (Plate 50). The top left corner is rebuilt in machine-made dark red brick, and the gable forms a parapet topped with brick. This end is lower in height than the rest of the building, and to the south-east there is another raised parapet with diagonal brickwork. There are two buttresses on the north-east side, topped with concrete, either side of a large doorway. The doorway has an iron girder lintel and a rebuilt section above. The central area has a wide door on the ground floor, inserted into what was either two windows or a smaller door, with a concrete lintel. It is partially blocked with concrete blocks to leave a smaller doorway with a UPVC door and a large iron box girder lintel. Against the main part of the elevation is a large concrete block incorporating a pair of moveable iron ramps in the north-west side and concrete steps on the north-east.

4.4.4 The south-west end is extended with a monopitch addition in later machine-made brick with a doorway on the first floor, with a concrete lintel and a small window to the south-west (covered by mesh). There is also a large sliding door on the ground floor, with a very large iron girder for a lintel. The plastic sign on the door reads 'Dockers of Barrow I.M. Riddell' (Plate 50). There is a return to the north-west at the south-west corner into a smaller two storey structure with a monopitch corrugated concrete roof. The first floor houses a machine of some sort on a large concrete base. There are modern brick walls, and the ground floor is a store for gas canisters. There is a large concrete platform to the north-west of the elevation with two moveable iron ramps in the top. It is built on concrete blocks with steps up the north-east side.

4.4.5 ***Internal detail - arrangement***: the building is divided internally between the north-west and south-east halves by a modern timber partition with a pedestrian doorway butting against the original walls and an office on the south-west side of the building.

4.4.6 ***Internal detail – north-west end***: this section has a raised concrete floor covering most of its area, beneath which is a low crawl-space formed by concrete block walls, although in the west corner there is a lower basement area (see *Section 4.4.15*). The ceiling comprises several trusses of a steel frame structure of angled braces bolted to a tie beam and sat on buttresses along the north-east wall (Fig 6). The trusses are concealed by a modern suspended ceiling everywhere but the far north-west end, where the ceiling is exposed and has a large row of skylights in its north-east pitch. A modern timber stud partition wall, with a relatively large doorway on the north-east side, separates this end of the building from the remainder. The north-west elevation has a modern UPVC pedestrian doorway within a larger and partially blocked opening, with an iron box girder forming the lintel. To the north-east there is another large doorway with a roller door, which has an electric motor labelled 'CRAWFORD' on the south-west side. Below the apex of the wall is a small circular

opening. Both the north-east and south-west elevations are constructed from brick laid in English garden wall bond at a ratio of five rows of stretchers to one row of headers and finished with paint. Several of the buttresses in the central part of this end of the building have clearly been altered or enhanced and have stepped profiles. There is a tall doorway in the south-west elevation, split to provide access to the two levels of the outshut to the south-west. A smaller door has been inserted to the south-east of this, which allows access to the first floor of the same outshut.

4.4.7 The raised concrete floor ends towards the south-east end of the north-west half of the building and the two levels are connected by a short flight of timber steps with a timber hand rail. In the south corner additional walls have been inserted to form a two-storey office (Building 3a). The brickwork appears to be contemporary with the buttress on the south-west wall and seems to be laid in a stretcher bond. The north-west elevation of this inserted block has three apertures on the ground floor, all of which have been blocked with concrete blocks (Plate 51), and what appears to be at least one more at first floor level. The north-east elevation has two doorways on the ground floor, the north-western of which provides access to a small toilet cubicle, and the south-eastern of which leads into the office proper. Between these there is another, blocked, doorway, and on the first floor there are three nine-light windows all with iron hinged casement windows.

4.4.8 Inside the office (Building 3a) the ground floor is made up of two rooms. On the south-east side there is a small entry hall providing access to the main ground floor room, a store and the stairs to the first floor. The store is positioned against the south-east wall in a space beneath the stairs and formed by a partition wall along the north-west side. The entry hall has a doorway at the south-west end leading to the main office, and a small reception hatch in the north-west wall. The main room has a modern finish throughout, with the walls and ceiling finished with plaster and paint (Plate 52). The ceiling is also supported by two boxed-in girders. The blocked doorway is evident as a recessed area in the north-east wall, and there are three large two and three-light windows with hinged timber casements in the south-west elevation with a buttress between them supporting one of the girders. There is a doorway in the west corner, leading to a small toilet cubicle and wash basin, the walls and floors of which are tiled, with an alcove formed in the south-west corner and a Belfast sink against the north-west wall. A chamfered lintel, probably concrete, is present in the north-west elevation, which presumably relates to one of the blocked apertures. A series of large cupboards are attached to the north-west wall, to the north-east of the door to the toilet.

4.4.9 The first floor is accessed via a narrow flight of timber steps along the south-east side, which leads to a corridor along the north-east side that connects to two small offices. The walls are all brick built laid in stretcher bond and there are two buttresses within the north-east wall supporting beams that hold the flat concrete ceiling. There is a single nine-light window in the north-east elevation of this corridor and another to the south-east. The south-western office has wallpapered walls and a carpeted floor and a flat ceiling with a simple moulded cornice. A single stop-chamfer decorated beam supports the ceiling and there is a recess in the south corner in a space over the stairs housing a group of cupboards. There is a small two-light window in the south-west elevation with a hinged timber casement. The north-west office is larger and also has wallpapered walls and a plastered ceiling supported by a stop-chamfer decorated beam supported by a buttress in the south-west wall (Plate 53). There are two windows in the south-west elevation, one of one-light, the other of three-lights, with fixed and hinged timber casements. There are two nine-light

windows with hinged iron casements in the north-east elevation and a brick partition to the north-west forming a cupboard at the north-east end and a toilet and washroom at the south-west. The toilet and washroom has a tiled floor and there is a two-light window with a hinged timber casement in the south-west elevation and what appears to be a large blocked aperture in the north-west with a stop-chamfer decorated beam.

4.4.10 ***Internal detail – south-east end:*** the door is externally labelled 'A&E Docker & Sons Ltd Entrance to Rear of Building off Hindpool Road'. There is a concrete floor with a raised platform along the north-east wall and in the south corner, and there is also an iron drain cover within the floor. The roof structure is obscured by a suspended polystyrene ceiling, but is assumed to be the same as that at the north-west end. The north-east elevation is still built of the original brickwork, in English garden wall bond at a ratio of three rows of stretchers to one row of headers. It has four buttresses, and there is a cupboard with pipes and electric cables attached on the south-east side. The south-east elevation is also built of the original brickwork, in English garden wall bond at a ratio of five rows of stretchers to one row of headers, with some alterations. There is a small door on the south-west side, with a timber lintel, and an inserted large door with a roller shutter to the north-east, partially blocked with concrete blocks (Plate 54). The south-west elevation is also the original brickwork, in English garden wall bond at a ratio of five rows of stretchers to one row of headers. There are four tie rod plates and three buttresses and two blocked windows on the north-west side, with flattened arches and a recessed section/blocked aperture to the south-east of the south-east buttress. There is a cupboard with fuse boxes on the south-east side. The north-west elevation is a timber partition on the north-east side with a pedestrian doorway, which butts the brick-built section to the south-west. This has a single window with a nine-light hinged cast iron casement. There appears to be earlier brickwork in places, of uncertain bond, with the later additions incorporating the window and the north-east end of the wall.

4.4.11 ***Internal detail - outshut:*** the first floor has a monopitch corrugated concrete roof with at least four corrugated plastic skylights. This is all supported on a structure of iron I-beam girders, marked 'Lanarkshire Steel Company', and L-shaped purlins all bolted together, which is essentially the same roof structure as Building 3. There is a tongue and groove board floor, and the walls are whitewashed brick.

4.4.12 The north-east elevation is painted brick in English garden wall bond, at a ratio of five rows of stretchers to one row of headers. There are numerous buttresses each topped with concrete blocks, against the main wall, and a large doorway in the centre, with the inserted (?) end of a girder protruding to the south-east of this. There is a smaller door to the south-east end with a concrete lintel, and two or three original buttresses. The brickwork appears to be earlier here, and is built in English garden wall bond at a ratio of three rows of stretchers to one row of headers. The south-east elevation is mainly English wall bond bond at a ratio of three rows of stretchers to one row of headers, or five rows of stretchers to one row of headers. There is a small double door on the north-east side and a boiler is attached. The south-west elevation is built of brick in a stretcher bond. It has buttresses topped with concrete blocks supporting the girders of the roof with welded upside down L-shaped brackets. There are two small inserted apertures on the south-east side, the largest with a concrete lintel. There are various pipes and ducts attached to the north-west elevation, which is built of unpainted very modern brick in stretcher bond, built onto the earlier brick in

the west corner. There is a small aperture with a concrete lintel, and a large doorway also with a concrete lintel.

4.4.13 The ground floor of the outshut is on a lower level than the raised floor of Building 3 to the north-east, but higher than its basement. It has a concrete floor with an iron platform, and a lift on the north-east side. There are modern refrigeration panels against the south-west side forming a small room, and filling and obscuring the entire south-east end. The ceiling is timber joists supported on iron girders sitting on buttresses, with floor boards on top. The walls are painted.

4.4.14 The north-east wall is brick-built, in English garden wall bond, at a ratio of three rows of stretchers to one row of headers, and has at least two buttresses, both enlarged. It has a blocked aperture at the north-west end and a large split level door near the centre – the lower part accesses the basement level of Building 3 via the lift platform, and the upper level is accessed via an iron ladder into the upper level of Building 3, through a sliding door. The south-east end is obscured by refrigeration panelling, which is sat on a concrete base, and there are fans attached to the ceiling, which is panelled. The south-west elevation is partially covered, and part of it has a modern partition forming an office attached to it. There are at least three buttresses, all possibly enlarged. There is one open window – a three-light hinged timber casement, with two more windows blocked with concrete blocks to the north-west. The north-west wall contains a large inserted doorway, with rebuilt jambs.

4.4.15 ***Internal detail – basement:*** the basement floor of Building 3 is situated in the north-west end of the building (Fig 3). It has a concrete floor, which is lower than the outshut to the south-west, and it is accessed via a lift and a flight of brick and timber steps from the outshut to Building 3 (Plate 55). It has a concrete ceiling, with iron reinforcing, and there is a central space with an iron girder running north-west/south-east, marked 'BSC AF GT BRITAIN' on the north-east side. There are two rooms either side of this (north-west and south-east). All of the walls are built in English garden wall bond at a ratio of three rows of stretchers to one row of headers, with some panelling forming refrigeration units. All the rooms have concrete ceilings supported by heavy iron girders with L-shaped brackets bolted to the upper side against the ceiling (Plate 56). In most cases these are sat on buttresses on the outer walls. There are small apertures above fans at the far ends of each of the rooms, which are generally blocked.

4.5 Building 4

4.5.1 ***External detail:*** the roof is finished with corrugated sheets of aluminium within which are large corrugated plastic skylights. The south-east elevation is similar to that of Building 2, with hand-moulded brick in a Flemish bond, and a chamfered plinth (Plate 48). It also has lots of burnt brick, including a near-complete recessed triangular area within the gable, with a blocked circular aperture that is slightly off centre, and yellow sandstone slab coping. There is a large central door, with a roller shutter and iron girders forming the lintel beneath a timber fascia, which is probably inserted. There are windows flanking this door, the south-western of which is a large nine-light fixed casement with a yellow sandstone lintel with a stop chamfer moulding. To the north-east is a smaller nine-light window with three large lights and six small lights, which was evidently originally the same size as that to the south-west. Beneath the smaller window is a narrow doorway, which has been blocked with brick that cuts through the plinth and has a concrete step. There is a security camera and a light fixed to the wall.

4.5.2 The main section of the north-west elevation is built of early brick forming the gable end, with a recessed triangular area and a slight parapet with dressed sandstone coping (Plate 57). The brick is in English garden wall bond at a ratio of three rows of stretchers to one row of headers. There are courses of diagonal brickwork, and a later brick chimney attached on the north-east side. The chimney is tiered, with one ceramic pot, and continues down into the building below (4a). There is an extension to the north-west forming 4a, built of more modern brick in stretcher bond, with a flat felt roof, attached to which is a timber fascia with a plastic gutter, and electrical cables and a cast iron downpipe. There are three long windows to the south-west, all three-light hinged casements with concrete lintels.

4.5.3 ***Internal detail:*** this building has a concrete floor with drain covers at the south-east end and recessed plates (tyre stops) near the centre. The north-west end is divided off with a folding door as in Building 5 (see *Section 4.6*), which is positioned beneath a steel girder with a timber partition roof on top. The roof is constructed from corrugated aluminium panels with corrugated plastic skylights supported by ten steel frame tie-beam trusses (Fig 6). Each truss has queen struts and two pairs of angled braces all bolted together (Plate 58). Iron water pipes have been attached to these with rods and clips, and a group of central panels (presumably for heating) have also been attached. The walls are all painted.

4.5.4 The north-east elevation is brick-built, in English garden wall bond at a ratio of three rows of stretchers to one row of headers. There are two large inserted openings with steel girder lintels marked 'Lanarkshire Steel Coy Ltd Scotland 12x5 British Steel'. There is one smaller inserted opening with a girder marked 'Dorman Long & Co Ld Middlesborough England' at the south-east end. In addition, there is a smaller inserted opening with a concrete lintel at the north-west end. There is a recessed area in the centre with rounded corners.

4.5.5 The south-east elevation is brick-built, in English garden wall bond at a ratio of five rows of stretchers to one row of headers. There is a blocked circular aperture in the top and a partially blocked window to the north-east with a small four-panel door on the north-east side below. There is a large roller shutter door in the centre (Plate 59). There are attached brick walls in the south-east corner forming a toilet block, built of more modern brick in stretcher bond, with a concrete ceiling, and attached to the walls is the winding mechanism for the roller door. Inside are two brick walls forming two toilet cubicles and a urinal against the north-east wall. There is a window to the south-east partially incorporated within a cubicle, and there are sinks attached to the south-east wall.

4.5.6 The south-west elevation is brick-built, in English garden wall bond at a ratio of three rows of stretchers to one row of headers, with buttresses. There is a large horizontal pipe attached at low level, and small ducts elsewhere. There are larger later buttresses forming the jamb of the folding door, and a metal valley is visible along the top of the wall. The north-west elevation is brick-built, in English garden wall bond at a ratio of three rows of stretchers to one row of headers (Plate 60). A water tank and pipes are fixed to it. There is a wide doorway on the ground floor beneath a steel girder marked 'Lanarkshire Steel Coy Ltd Scotland 9x4 British Steel'. This has been partially blocked leaving two doors and a window of eight lights. There is a concrete ramp leading up to the door and windows.

4.5.7 ***Internal detail of Building 4a:*** this is a suite of rooms to the north-west of Building 4. The main room has a painted concrete floor and a flat concrete ceiling supported by two girders. The walls are all painted, are built of modern brick in

stretcher bond, and have pipes, cables, and radiators attached. The north-west elevation has three long windows with metal three-light hinged casements and bars. The north-east and south-west elevations have two buttresses supporting girders in the roof, which are marked 'Lanarkshire Steel Coy Ltd Scotland 9x4 British Steel'. There are additional brick partitions in the south corner, which comprise low walls topped with fixed timber casement windows of eight and six lights, and there is a door on the north-east side (Plate 61). The walls are modern, and built in stretcher bond. This area forms a small office, with a five-light skylight in the ceiling.

4.6 Building 5

4.6.1 ***External detail:*** the roof is finished with grey slate and incorporates a number of small skylights and vents. The south-east elevation butts that of Building 4. It is built of an early type of brick, in a bond of five courses of stretcher to one of alternating headers and stretchers (Plate 62). It has a plain gable, and a slate roof with a cement render finish beneath the eaves. There is a valley between Buildings 4 and 5, and an inserted garage doorway, with iron girder lintels and a folding timber door. A sign attached to it reads 'No parking 24 access required' and 'Baxter' is scratched into the door. There are two small areas of patching in later brick above the door and a plastic alarm box attached. The boundary wall to the north-east, which butts onto it, is described in *Section 4.9* below.

4.6.2 The north-east elevation is divided either side of Building 6. The south-east end is rendered, with a scored ashlar effect (Plate 63). The ends of the trusses project through the wall, the south-east end is taller than the rest, and there is a slight return near the centre. It has an all slate roof, with bonnet ridge tiles, two two-pane skylights, and a metal vent with a mushroom cap top. There are iron and plastic downpipes, a plastic gutter on the south-east end, and a timber fascia on the rest. It is apparently keyed into Building 6. The north-west end continues from Building 6. Here it is built of painted brick, with a timber fascia and a plastic gutter. There is a recessed area housing a plastic downpipe. The brick is laid in an English garden wall bond at a ratio of three rows of stretchers to one row of headers. There is the possible butt joint marking the line of an extension, and an inserted and blocked aperture just to the south-east of the downpipe. The north-west end is a slightly lower extension, with a flat roof, and it comes to a column at the north-west end. The gable end of the main part of Building 5 is visible above this and the extension forms Building 5a.

4.6.3 The north-west elevation is a single-storeyed, flat-roofed, relatively modern extension. It has two three-light windows and a door, all with concrete lintels (Plate 64). It butts the wall to the north-east. It has a plastic gutter attached to a timber fascia, and cast iron downpipes. It has metal electrical ducting attached and a fuse box marked 'Royal BI R303 30A 500V'. South-west of this is another door with a concrete lintel and a timber fascia. It has a slatted door with signs 'Notice only the authorised attendant is permitted to enter' and 'It is dangerous to obstruct the ventilation openings to this boiler house'.

4.6.4 ***Internal detail***. there is a concrete floor, sloping down onto a ramp at the south-east end to a large folding door. There is one drain cover in the floor, which is marked 'BURN BROS LONDON', and there are possible scars for repairs to the floor or the lines of walls. The roof is higher at the south end, where it is effectively a separate room, with the remains of a wall between it and the section to the north-west. This wall is built of brick in an uncertain bond, which has been painted, and has a large inserted aperture, with an iron girder lintel marked 'Cargo Fleet England', and

rebuilt jambs. Above the inserted doorway there are inserted ceramic ventilation (?) pipes. The roof within the south-east section is supported by just two purlins per pitch, and a ridge purlin.

4.6.5 The main part of the roof has nine trusses, each with a king post bolted to a tie beam, and soffitted for principals (Plate 65; Fig 6). There are what appear to be blocked apertures, 0.48m wide, extending to the ground beneath the trusses on the south-west side, and the remains of others to the south-east. There are also two slots per pitch for angled braces (?), and two slots per pitch possibly for the original purlins. There is now only one purlin on the north-east pitch plus two on the south-west side, plus the ridge purlin. The ridge purlin is soffitted into the king post, and there are the remains of rafters present on the south-west side. The roof is clad with modern (?) plasterboard, and there are eight three-light skylights per pitch. Some of these skylights incorporate fans, and there is one raised glazed louvre, with a four-light gabled glass roof, and opening slit vent sides. Three of the trusses have had extra straps bolted to the beams.

4.6.6 The walls are all painted off-white (Plate 66). The north-east wall is English garden wall bond at a ratio of three rows of stretchers to one row of headers. It has electrical plugs and pipes for radiators attached as well as other electrical fittings. There is a stub wall or buttress onto which a folded door is fixed towards the north-west end. The handles are labelled 'HENDERSON ROMFORD'. There is a recessed area to the south-east end and a buttress. The south-east wall has a large folding door, and is built of brick, with a slight shelf at a high level. There is a door to the north-west, which has iron girder lintels, before a buttress for the doorway to the south-east end. There are two more large inserted doors to the north-west, with iron girder lintels, one of which is labelled 'CARGO FLEET ENGLAND'. There is a small inserted doorway to the north-west, with a concrete lintel. The north-west elevation is possibly an inserted wall built in stretcher bond, with two doorways with concrete lintels, and pipes attached.

4.6.7 The extension to the north-west end of Building 5 comprises three small additional rooms, the largest taking up the whole of the north-west end (5c) and the two smaller rooms to the south-east of this (5a and 5b). The south-western of the two smaller rooms (5a) has a concrete floor and ceiling and all of the walls are apparently built from modern brick laid in stretcher bond, and finished with paint. There is a concrete step formed by slabs against the north-west wall sat on a low brick 'wall', apparently covering a hollow area. Each slab has two small perforations in the top and overhangs the brick 'wall' beneath. Various pipes and electrical ducting are attached to the wall.

4.6.8 The north-eastern of the two rooms (5b) also has a concrete floor and ceiling, with a domed or semi-circular plastic skylight on the south-west side. The walls are all painted and apparently built in modern brick laid in a stretcher bond. Again, there are concrete slabs forming a step against the north-west wall within which several metal pipes are evidently housed (Plate 67).

4.6.9 The larger room making up the north-west end of the extension to Building 5 (5c) also has a concrete floor at a raised level relative to the rooms to the south-east, which is accessed via a concrete ramp leading onto the same concrete slab step in rooms 5a and 5b. It has a flat concrete ceiling supported by a single girder orientated north-east/south-west, which is marked 'LANARKSHIRE STEEL COY LTD SCOTLAND 19x5[?] BRITISH STEEL'. The walls are all finished with plaster and paint and there are buttresses on the north-east and south-west walls supporting the

girder in the roof. There are two windows in the north-west elevation, both with three-light hinged and latched iron casements and covered by iron bars with radiators below (Plate 68). There is a pedestrian doorway to the south-west of these with a plain timber surround. A modern sink unit with tiled splash-back is fitted against the north-east wall, and there are various cables and pipes attached to the walls throughout.

4.6.10 ***Internal detail:*** there are two further internal spaces forming small rooms between 4a and 5c at the north-west end of Buildings 4 and 5, both of which are accessible only from the outside on the north-west side. The north-eastern of these (4b) is a small boiler room (Plate 69), which is accessed by a flight of four concrete steps, each *c*0.2m wide, and has a concrete floor, with a concrete slab ceiling, and one iron girder marked 'LANARKSHIRE STEEL COY LTD SCOTLAND'. The walls are all brick, covered in rough whitewash.

4.6.11 The north-west wall has a door on the west side up from the steps, with a concrete lintel. It returns to the south-west, with a slightly projecting area with a blocked aperture beneath the concrete beam, now with a control panel attached. The south-west wall is built of brick in stretcher bond, with a plinth and a single buttress supporting the beam, and a slight step in the west corner and pipes attached. The south-east wall is built of plain brick in English garden wall bond, at a ratio of three rows of stretchers to one row of headers, perhaps suggesting that it is one of the original walls of the foundry. It has a large platform built of bricks topped with concrete *c*1m tall. A square flue sits on top of this, which is built in English garden wall bond at a ratio of three rows of stretchers to one row of headers. The flue has a circular blocked aperture of voussoir headers, some stamped 'FB'. Below this is a square aperture with a metal shuttered surround (Plate 70). The north-east elevation is built of plain brick in stretcher bond, with a plinth and one buttress, and a slight step at the north-west end, where the build changes to English garden wall bond, at a ratio of three rows of stretchers to one row of headers.

4.6.12 The boiler fills most of the floor space (Plate 69). It is a 'Saacke Eurotherm' oil boiler, installed in 1972 according to plans present in the room. It has various valves and thermometers, some of which are labelled: 'Workshop return', 'Garage No 2 return', and 'Garage No 1 pump'. The power transformer is labelled 'Power Transformer No 4 Isolating Transformer B.S. 3535 1962 200/250V 50Hz 25V 250VA P.19669, W.F. Parsonage & Co Ltd Bloxwick'. The control cupboard is labelled 'Canair Limited, Controls Division, Fairacres Industrial Estate, Windsor Berks, Windsor 63201/3 and at Blackpool'.

4.6.13 The interior of the south-western of these two spaces (4c) was visible through the door but could not be fully accessed. It has fairly modern painted brick walls, and the south-west and south-east walls are laid in English garden wall bond at a ratio of three rows of stretchers to one row of headers, while the north-east wall is in stretcher bond. The floor level is very low, and there is a recessed area along the north-east wall, and a blocked aperture in the south-east wall. It has a flat concrete roof on a single iron girder.

4.7 Building 6

4.7.1 ***External detail:*** the roof is finished with grey slate incorporating skylights. The north-east elevation is covered in rough concrete render, but it is evidently built of early brick, and has a plinth and buttresses and a timber fascia and a plastic gutter (Plate 71). There are two large doorways with timber lintels, the south-east of which

has a sign attached stating 'Furness Water Board no parking emergency vehicle'. The roof is slate and there are two large two-light skylights.

4.7.2 The south-east elevation forms a gable and is built of mid orangey red brick in English garden wall bond at a ratio of three rows of stretchers to one row of headers. It has been re-pointed below the eaves, and the purlin end holes have been filled with brick (Plate 71). It has a small ground floor window to the south-west, with a red sandstone lintel, which has been blocked with brick. There is a very tall doorway in the centre, with a timber lintel and the remains of a plank door with chamfered battens. This too is blocked with brick internally, and has plastered jambs and an arched light above. There is a wide window to the north-east, with a timber lintel, which is also blocked with brick. There is a small aperture on the first floor, north-east of the centre, with a timber lintel and surround, which is also blocked with brick. The stub of a wall return to the south-east can be seen on the north-east corner.

4.7.3 The north-west elevation forms the opposing brick-built gable, the lower part of which is painted (Plate 72). The upper part is apparently rebuilt in a stretcher bond of dark red machine-made brick. One of the bricks has 'D. Lowrie wall this' scratched into it. The lower part is a mixed bond, part of which is possibly English garden wall bond. It has been re-rendered below the eaves, and it has an aerial attached. There are timber battens attached in the bottom right corner, and a small aperture in the bottom corner. There is a flat iron rod connecting it at an angle to Building 5, which it butts.

4.7.4 ***Internal detail:*** the floor is concrete, and the roof is backed with tongue and groove boards. It has three trusses, all slightly different. At the north-west end there is a simple king post truss, which is too short for the room and principal rafters have been fixed with bolts around the king post and tie beam to make it span the full room, and a collar has been nailed to it. The tie beam has two slots on the south-east side for posts or some other attachment, and rests on a concrete block buttress at the north-east end.

4.7.5 The central truss is simpler, and comprises a king post joggled to meet the principals and angled braces, and bolted to the tie beam (Plate 73; Fig 6). The principals are also bolted to the tie beam, which sits on a buttress at the north-east end. The south-east truss also comprises a king post as per the central truss, but with queen braces not fixed to the king post (Plate 74). The north-east brace is vertical and original, the south-west one is angled and probably re-used, and there is an additional pair of angled braces formed by two pieces of bolted timber.

4.7.6 There are three purlins in the south-west pitch and two in the north-east, and there are two two-light skylights per pitch. The walls all have traces of whitewash and there is an inserted plywood-walled office in the north corner, with a three-light window in the south-east side, and a door and a window on the south-west.

4.7.7 The north corner of the north-east wall is concrete block rebuild coming to a buttress supporting a truss, and with the office wall butting it (Plate 75). South-east of this there is a buttress forming the jamb of a large sliding door. The wall is brick in the centre, in probable English garden wall bond, with two inserted two-light sliding sash windows with beaded casements (Plate 75). South-east there is another buttress and then another large sliding door. Both doors and windows have timber lintels. The south-east elevation is brick-built, in English garden wall bond, at a ratio of three rows of stretchers to one row of headers. It has a blocked aperture on the north-east side leaving a recess with a timber lintel. There is a blocked door and a small

aperture above in the centre, both with timber lintels, and there is also a blocked window on the south-west side, possibly with a timber lintel (Plate 76).

4.7.8 The south-west elevation is built of plain brick in English garden wall bond, at a ratio of three rows of stretchers to one row of headers, and keyed into the south-east wall. The north-west side is roughcast and has a recessed area for a downpipe. There is a brick column against the wall for the south-east truss. The north-west wall is mostly plain, with roughcast render on the south-west side, and brick on the north-east. It is part-covered by the office.

4.8 Building 7

4.8.1 ***External detail:*** the roof is flat and probably finished with felt. The walls are built of relatively modern machine-made brick laid in a stretcher bond. It has a flat felt roof, a timber fascia, and plastic rainwater goods. It stands proud of the wall to the south-west.

4.8.2 The north-east elevation has a large doorway south-east of the centre. It has a roller shutter door, a concrete lintel, and is accessed by a concrete ramp (Plate 77). There is a small window to the north-west, which is an irregular four-light hinged metal casement. The south-east elevation has two small windows with concrete lintels and tiled sills, and they are irregular three-light hinged metal casements.

4.8.3 The south-west elevation is plain, and has the scar of mortar and bricks for the roof of an attached outshut. It is butted by steps leading onto the platform outside Building 3. The north-west elevation has two windows, as per the south-east elevation and there is some repair to the west corner.

4.8.4 ***Internal detail:*** the floor is concrete, painted green, as is the roof (Plate 78). There is a single central skylight with a one-light fibreglass pane, and the roof is supported by two iron beams orientated north-west/south-east marked 'CARGO FLEET ENGLAND', and a smaller beam orientated north-east/south-west. All of the walls are brick, laid in stretcher bond and painted. The south-east and north-west walls both have two three-light hinged metal casement windows with tiled sills and incorporate pairs of buttresses supporting the beams in the ceiling. The south-west wall is plain, with numerous scars for shelving, electrical ducting and the remains of a partition wall on the north-west side. The bricks used in its construction are marked 'FURNESS BRICK C^{O} L^{D} BARROW'. The north-west wall has a five-light hinged metal casement window on the north-west side and a large doorway with a roller shutter door on the south-east. Between the two is a partition wall built of brick laid in a stretcher bond. There are fixings for lights and radiators throughout.

4.9 Boundary wall

4.9.1 Three sections of boundary wall were associated with the former iron foundry buildings: one attached to the south-west corner of Building 1, one attached to the north-east corner of Building 5, and one attached to the north-west corner of the outshut attached to Building 3. The wall attached to Building 1 comprises a short, low buttress built of relatively early bricks, butting against which is the main boundary wall, which is built from more modern bricks laid in English garden wall bond (at a ratio of five rows of stretchers to one row of headers), topped with edge-set bricks and a wider string coping. Where the boundary wall butts the north-east elevation of Building 5 it is built of early brick with a chamfered plinth on the south-east face and chamfered yellow sandstone coping. It is laid in an English garden wall bond at a

ratio of five rows of stretchers to one row of headers, and there is evidence for a return at the north-east end.

4.9.2 Where the boundary adjoins the north-west end of the outshut attached to the south-west side of Building 3 it is initially built of modern brick, laid in a similar form to that attached to Building 1. The rest comprises early brick in English garden wall bond, at a ratio of four rows of stretchers to one row of headers, with buttresses.

4.10 Further recording

4.10.1 ***Introduction:*** because some of the rooms were obstructed during the initial building recording, either by material stored within them or, in the case of the outshut attached to foundry Building 3, by heavy wall coverings, a watching brief was maintained during the demolition of certain parts of the structure. This was intended to provide additional information about their fabric, structure, and arrangement, as well as enable additional photographs of uncluttered spaces to be taken, and detail to be hand-annotated onto the existing plans where necessary.

4.10.2 ***Building 3 outshut, interior***: because the walls at the south-east end of this room had been obscured by refrigeration panels they could not be fully examined and so a watching brief was maintained while these panels were removed during the demolition of the building. This revealed that the buttresses against the north-west end of the north-east wall butted against it and did not form part of its structure, while those to the south-east were part of the wall. Between two of the buttresses near the centre the wall had been built out to fill the gap, with a timber beam above the widened section suggesting some form of blocked aperture was present. To the south-east, between the next three buttresses, the wall was clad with aluminium sheeting and apparently also had a timber beam above, indicative of a blocked opening. The north-east end of the south-east wall was keyed into the north-east wall, while the south-west wall was constructed from perforated ventilation bricks and dark red bricks marked 'Furness Brick Askam in Furness'. At least one of the beams supporting the first floor/ground floor ceiling was marked 'LANCASHIRE STEEL MFC C^{o} L^{TD} ENGLAND 7x4'.

4.10.3 ***Buildings 3-5***: a number of bricks marked 'CLAUGHTON' were observed within the fabric of Buildings 3-5. They had evidently been used in the extensions to the north-west ends of Buildings 3 and 4 and within the south-west wall of Building 5. In addition, they had been extensively used in the north-west wall of Building 5. The junction between Buildings 5 and 6 was apparently a large blocked doorway.

4.10.4 ***Buildings 6 and 7***: little additional information was acquired following the removal of material stored in these rooms, although it did allow further photographs to be taken. It was evident, however, that the north-west wall of Building 6 butted the south-west wall (Plate 79). Observations relating to Building 7 were incorporated into *Section 4.8* above.

5. Discussion

5.1 Introduction

5.1.1 The nature of the investigation of the site, split into two parts, means that it is necessary to divide the results of the investigation into two sections – one for the gasworks and one for the iron foundry. There are few structural, architectural or historical relationships remaining between the two complexes, and they therefore have little in common in terms of their phasing. The interpretation of the gasworks was based on information taken from a number of sources (Baker 2005; 2006; Cossons, 1978; Cotterill 1981; Watt 1999), and similar sources were used for the interpretation of the iron foundry (Cossons 1978; Headley and Scott 1999; Melville *c*1984).

5.2 Phasing

5.2.1 ***Gasworks:*** all of the buildings situated on the former gasworks site are of relatively modern date. They were certainly constructed by 1985 (Plate 5), and the documentary evidence suggests that they were certainly constructed after 1939 (Greenlane Archaeology 2006). There is some evidence that elements of the original outer boundary wall were incorporated into these structures, particularly along the north-west and part of the north-east side of the site. In addition, a section of the wall belonging to one of the original gasworks buildings is situated in the south corner of the site (Fig 2). This has been incorporated into the present boundary, and evidently represents parts of two or three buildings.

5.2.2 The north-western of these shows evidence of one phase of extension to the north-west, which evidently took place prior to 1873 (Plate 1). The purpose of this building is uncertain, but the windows in the main part give it a somewhat domestic appearance, which might suggest that it was the gasworks manager's house, although this not referenced until the 1920s (Greenlane Archaeology 2006, 14). The very detailed 1:500 Ordnance Survey map of 1891 shows what appear to be gardens, which even include a fountain and glasshouses, which perhaps confirms this hypothesis (Plate 2). The central section of this wall appears to relate to a linking boundary wall between the house and what is probably the retort house and purifiers for the gasworks situated to the south-east, and formed by the south-eastern section of the wall.

5.2.3 The gasholders within the gasworks are apparently in the same position as those shown on the earliest map of the site (compare Plates 1 and 4). However, anecdotal evidence suggests that they are both of early 20th century date (Derek Murphy pers. comm.) and therefore not original. It is further suggested that the south-eastern of the two (Building 4) is slightly later still, having been rebuilt following an explosion in the early part of the 20th century (*ibid*), and it is evident that there are slight differences between the two.

5.2.4 ***Iron Foundry:*** the former iron foundry buildings show several phases of construction and alteration, some of which can be traced by reference to the cartographic record of the site. This reveals seven probable phases of activity.

5.2.5 *Phase 1*: the earliest elements remaining within the former foundry are Building 2, including the remnants of a small outshut on the east corner, and Building 5. These are evident on the undated plan of the site surveyed in 1873 (Plate 1), and so they are likely to belong to the earliest phase of construction when the foundry

was established in the early 1860s. Building 5 is additionally interesting because it is close to the area marked 'Stewart's Rope Walk' and may have originally formed part of this site, although the boundary between it and the foundry is not clear. Additional buildings are shown in the space between Building 2 and 5 on the 1873 map, but there was no apparent evidence for these visible during the building recording and they do not appear to have formed part of Buildings 3 or 4. The presence of Baltic timber marks in this building is unusual – these are normally found in buildings dating to the late 18th to early 19th century, so these would be late examples (Greene 1995; 1996).

5.2.6 *Phase 2*: Building 1 was also evidently constructed before 1873 as is shown on the first plan of the site (Plate 1). Its relationship to Building 2 shows, however, that it was added at a slightly later date. This may have been part of the large-scale expansion recorded as taking place in or immediately prior to 1872 (see *Section 1.3.5*). The floor lights marked 'Hayward Brothers London' are perhaps unlikely to date to before July 1871, when a patent for 'Improvements in Pavement Lighting', which incorporated prism-like glass to direct light at an angle into the room, was made (Winterton 1953, 38). It is not certain, without further research, that the lights present in Building 2 are of exactly this type, however. If they are, this would therefore suggest that Phase 2 was completed between the patent application in 1871 and the surveying of the Ordnance Survey map in 1873. Again, the presence Baltic timber marks within this part of the building is of interest as they are even later examples than those in Phase 1.

5.2.7 *Phase 3*: the 1891 Ordnance Survey map shows that Building 6 was constructed between *c*1873 and 1890 (Plate 2). It was apparently built on the site of or as part of the rope walk, although the boundary between these two businesses is still not clear at this date.

5.2.8 *Phase 4*: the fire of 1906 is recorded as resulting in a period of rebuilding as the foundry was reconstructed. The Ordnance Survey map of 1913 shows that this resulted in the construction of Buildings 3 and 4, although the physical evidence appears to contradict this. Building 4 was probably constructed at this time (Plate 3), while Building 3 perhaps only comprised a covered area, with a front (south-east) elevation only added at a later date, probably as part of Phase 6. Building 1 was also raised in height some time after 1906 (compare Plates 7 and 33), presumably as a result of the same general phase of rebuilding that followed the fire.

5.2.9 *Phase 5*: a small addition was made to the north-west end of Building 3 after 1938 and before the alterations of Phase 6. This appears to have incorporated a basement area, which was extended to the south-east beneath the north-west end of Building 3.

5.2.10 *Phase 6*: a series of small additions were made to the site after the publication of the 1938 Ordnance Survey map (Plate 4) and following the demolition that evidently took place between this date and 1939 (Plate 10) and most probably after the end of WW2. This comprised the addition of single-storey extensions to the north-west ends of Buildings 4 and 5, the construction of Building 7, and the addition of other structures to the north-west end of Building 3. The outshut on the south-west side of Building 3 was also enlarged, partially incorporating the footprint of the previous one. In addition a small toilet was added within Building 4, and an office was added to Building 3, which required some rebuilding of the south-west wall in this area. The roofs of Buildings 3 and 4 were possibly replaced with a steel frame construction and the south-east elevation of Building 3 was probably rebuilt. The wall

between Buildings 4 and 5 was also perforated with the addition of several large doorways; the beam marked 'Dorman Long and Co Ld Middlesborough' fits with the general dating of this phase as they seem to have become a major steel producer by the late 1920s (Frey 1929). In addition, a complex system of water pipes connected to a boiler in the extension to the north-west was attached to the roof structure of Buildings 3 and 4, an inspection tank and raised platform were added to Building 2 and the floor was raised in the north-west end of Building 3, above the already existing cellar. Most of these alterations would appear to have been carried out to facilitate the use of the site for storing fruit and vegetables and carrying out maintenance to vehicles.

5.2.11 *Phase 7*: a small number of more recent alterations have also been made, many of which relate to buildings going out of use or being used for fruit and vegetable storage and garages and subsequently being divided into smaller units. To this end the majority of the windows in Buildings 1, 2, 6, and the outshut to Building 3 were blocked and doorways were remodelled in Buildings 3 and 4. The north-west wall of Building 6 was rebuilt with concrete blocks and timber partitions were added across two parts of Building 3, and refrigeration panels and associated equipment were added to the outshut and cellar in the same building. The planning applications from the 1970s show roof trusses very similar to those used in Buildings 3 and 4 of the former iron foundry, which would suggest that these are much later additions, presumably replacing an earlier roof structure.

5.3 Conclusion

5.3.1 ***The gasworks***: the buildings situated on the site of the former gasworks are of lesser historical or archaeological interest than those within the former foundry, and were most likely constructed to serve the needs of the gas providers that currently use them, presently Transco. The few remaining elements of the outer boundary wall that remain are of more interest, but are severely truncated and have been so extensively rebuilt and altered that very little remains. The section making up the north-east wall of Building 1, which is finished with buttresses and an angled plinth, probably formed part of a continuous boundary wall that ran along this side of Hindpool road and is still visible to the south-east, beyond the iron foundry. This is echoed in the opposing walls of the buildings on the opposite side of the road, and presumably represents the original appearance of the whole street. The section of the gasworks buildings surviving in the boundary wall in the south corner of the site clearly relates to buildings shown in this location on the early maps of the area (Plates 1-4). The larger of these buildings probably comprised the main retort house, purifiers and associated parts of the gasworks.

5.3.2 ***The foundry***: the surviving buildings from the former foundry were probably initially used as workshops for finishing castings and detailed engineering; the small fireplaces along the wall between Buildings 1 and 2 suggest that small hearths or furnaces were utilised. It is likely that castings were carried out in the large buildings shown on the maps to the north-west, against the gasworks. The documentary evidence relating to the fire demonstrates that the original fitting and pattern rooms were situated in the centre of the site and following the rebuilding it seems probable that these were housed in some of the buildings against Cornmill Crossing, perhaps Buildings 3 and 4. The enlargement of Building 1, to incorporate what appear to be offices, might also suggest that these were originally within the block of buildings in the centre of the complex. The records relating to the requisitioning of the site in 1940 essentially confirm that the buildings present on the site (i.e. those that were

standing during the building recording) comprised workshops, offices, and stores, and that the rest of the complex had been demolished by this date.

5.3.3 ***The ropewalk***: Buildings 5 and possibly 6 may have originally formed part of the rope walk. The tall end of Building 5 would certainly correspond to the position of the heckling shop as described in 1872, and is similar in form, being tall but with a small square plan, to one that used to be situated at a 'rope mill' in the Ellers, Ulverston (Crossley 1987, 6). The long, low shape of the main part of Building 5 would also fit the likely form of the shed that covered the rope making process. The purpose of Building 6 is more difficult to determine; its position makes it likely to have also formed part of the ropewalk, although its function is unknown. It is not known when the ropewalk went out of use, although a rope manufacturer named Henry Stuart was still operating in Barrow in at least 1898 (CRO(B) BD HJ 184/14/2 1898), and so the phasing of the building would suggest it formed part of the ropewalk.

6. Bibliography

6.1 Primary and Cartographic Sources

* original not examined

CRO(B) BDB 17/Box 19, 1941-1943 *Waddington Foundry: Form of Requisition; Compensation (Defence) Act*

*CRO(B) BD HJ 184/14/2, 1898 *Admittances to the Manor of Plain Furness: Henry Stuart of East Mount, Barrow-in-Furness, Rope Manufacturer*

CRO(B) BPR 27A/P/10/2, 1923 *Plan of Mission Water Popes*

Envirocheck, 2005 *Former Transco Site, Hindpool Road, Barrow-in-Furness*, Order No. EC856617_1_1, (supplied by client)

Ordnance Survey, n.d. *Lancashire Sheet* **21.11**, 1: 2500, surveyed 1873

Ordnance Survey, 1891 *Lancashire Sheet* **21.11.10**, 1: 500, surveyed 1890

Ordnance Survey, 1913 *Lancashire Sheet* **21.11**, 1: 2500, revised 1910-1911

Ordnance Survey, 1938 *Lancashire Sheet* **21.11**, 1: 2500, revised 1931-1932

Ordnance Survey, 2002 *The English Lakes South-Western Area: Coniston, Ulverston & Barrow-in-Furness*, Explorer **OL6**, 1: 25000

6.2 Newspaper Articles

Anon, 1906 Destructive Barrow Fire, *The Barrow News*, November 24th, 8

Melville, J, *c*1984 John Waddington's Early Foundry at Barrow, undated newspaper article in Scrapbook 18, Page 28, CRO(B)

6.3 Planning Applications

Ref. 0507, 1974 *AE Docker and Sons Ltd, Roofing Over Existing Yard in Hindpool Road to Form Fruit-Vegetable Store*

Ref. 0757, 1986 *To Increase Height of Existing Storage Building to Provide First Floor Office Accommodation, at AE Docker & Sons, Cornmill Sidings, Hindpool Road, Barrow-in-Furness*

Ref. 8856, 1972 *Construct New Access from Dockers via FWB Land to Hindpool Rd*

6.4 Secondary Sources

Acme Tone Engravings Company Limited, The, 1900 *Official Guide to the Sea Ports of the Furness Railway, Barrow-in-Furness, its Railway, Town and Docks, also Millom and Whitehaven*, Watford

Baker, R, 2005 Gasworks in Cumbria – Draft List, *Cumbria Indust Hist Soc Bulletin*, **62**, 16-17

Baker, R, 2006 Gasworks in Cumbria: The Early Years, *Cumbrian Industrialist*, **6**, 47-59

Cossons, N, 1978 *The BP Book of Industrial Archaeology*, 3rd edn, Newton Abbot

Cotterill, MS, 1981 The Development of Scottish Gas Technology 1817-1914: Inspiration and Motivation, *Industrial Archaeology Review*, **5.1**, 19-40

Countryside Commission, 1998 *Countryside Character, Volume 2: North West*, Cheltenham

Crossley, ME, 1987 The Hecklin' Shop, in North Lonsdale Society (ed), *Reflections*, Ulverston, 6

English Heritage, 2006 *Understanding Historic Buildings: A Guide to Good Recording Practice*, Swindon

Ferguson, LM, and Murray, DM, n.d. *Archaeological Documentary Archives*, IFA Paper **1**, Reading

Frey, JW, 1929 Iron and Steel Industry of the Middlesborough District, *J Economic Geography*, **5:2**, 176-182

Greene, JP, 1995 An Archaeological Study of the 1830 Warehouse at Liverpool Road Station, Manchester, *Industrial Archaeology Review*, **17:2**, 117-128

Greene, JP, 1996 Enigmatic Marks on Timbers, *IFA Buildings Special Interest Group News*, **9**, 4-5

Greenlane Archaeology, 2006 *Junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Desk-Based Assessment*, unpubl rep

Greenlane Archaeology, 2007 *Junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Watching Brief*, unpubl rep

Greenlane Archaeology, forthcoming a *Junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Excavation*, unpubl rep

Greenlane Archaeology, forthcoming b *Junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Watching Brief (Iron Foundry)*, unpubl rep

Headley, I, and Scott, I, 1999 The St Helens Iron Foundry, *Industrial Archaeology Review*, **21:1**, 53-60

Institute of Field Archaeologists, 1999, *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures*, Reading

Kendall, WB, 1900 Submerged Peat Mosses, Forest Remains, and Post-Glacial Deposits in Barrow Harbour, *Trans Barrow Nats' Field Club*, **3**, 55-62

Latham, T, 1991 *The Ashburner Schooners: The Story of the First Shipbuilders of Barrow-in-Furness*, Manchester

Leach, F, 1872 *Barrow-in-Furness Its Rise and Progress*, Barrow-in-Furness

Mannex, P, and Co, 1882 *History and Directory of Furness and West Cumberland*, Preston

Melville, J, 1956 A History of Hindpool, *Proc Barrow Nats' Field Club*, n ser, **8**, 5-24

Moseley, F (ed), 1978 *The Geology of the Lake District*, Yorkshire Geological Society, occ publ **3**, Leeds

Myers, B, 2000 *Barrow-in-Furness Remembered*, Stroud

Norman, KJ, 1994 *Railway Heritage – The Furness Railway*, Peterborough

Richardson, J, 1881 Barrow-in-Furness, its History, Development. Commerce, Industries and Institutions, Barrow-in-Furness

Thompson, B, 2005 *Barrow-in-Furness, A History and Celebration*, Salisbury

Trescatheric, B, 1992 *Building Barrow: From Fisher's Farm to Maggie's Farm*, Barrow-in-Furness

Trescatheric, B, and Barker, DJ, 1990 *Barrow-in-Furness in Old Picture Postcards*, Zaltbommel (Netherlands)

Watt, D, 1999 Fakenham Gasworks: Over 150 Years of History, *Trans Ancient Monuments Soc*, **43**, 25-44

Winterton, LC, 1953 *Years of Reflection 1793-1953: The Story of Haywards of the Borough*, London, http://www.glassian.org/Prism/Hayward/YOR/dj.html

7. Illustrations

7.1 List of Figures

7.2 List of Plates

Figure 1: Site location in relation to Barrow-in-Furness

Project:
Hindpool Road - Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Building Recording

Project Code: G1042

Site Code: HC06

Date: June 2007

Key:

gasworks buildings

iron foundry/
rope walk buildings

0 50m

Figure 2: Detailed site location

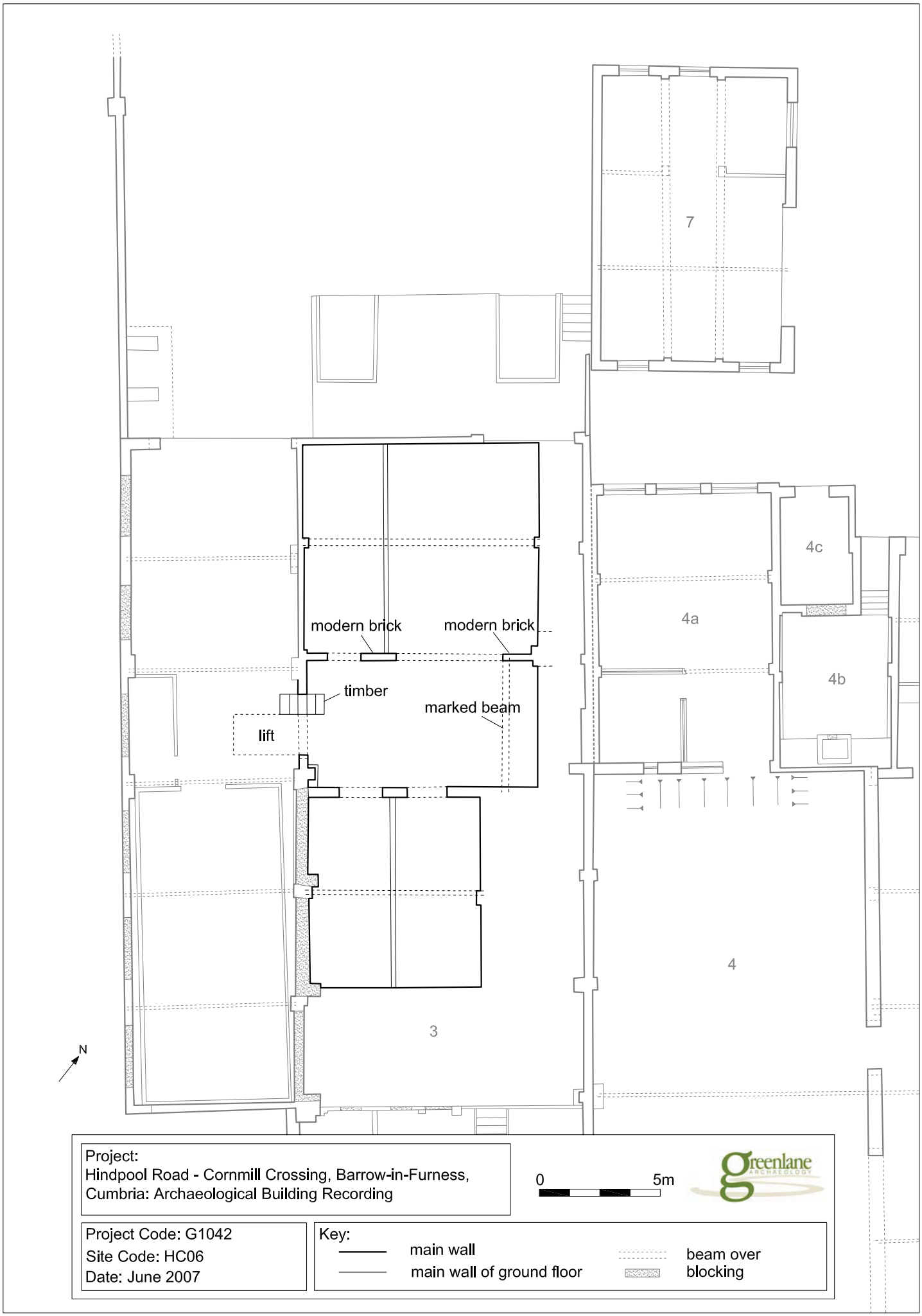


Figure 3: Basement plan

Project:
Hindpool Road - Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Building Recording

Project Code: G1042
Site Code: HC06
Date: June 2007

0 8m

Key:
main wall | sectional timber | projected line | concrete | 4 building number | beam over | blocking | section line

Figure 4: Ground floor plan

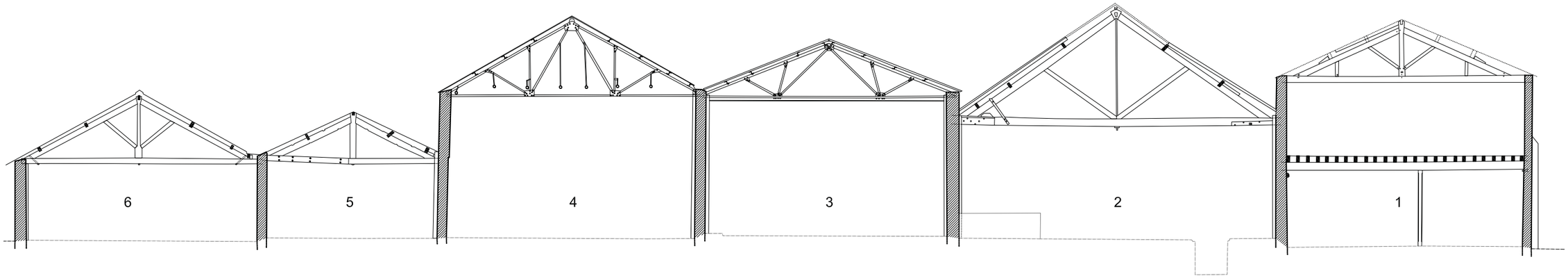
Project:
Hindpool Road - Cornmill Crossing, Barrow-in-Furness, Cumbria:
Archaeological Building Recording

Project Code: G1042
Site Code: HC06
Date: June 2007

0 8m

Key:
main wall | sectional timber | projected line | concrete | 4 building number | beam over | blocking | section line

Figure 5: First floor plan



Project:
Hindpool Road - Cornmill Crossing, Barrow-in-Furness, Cumbria: Archaeological Building Recording

Project Code: G1042

Site Code: HC06

Key:
main wall
concrete
ground
sectional timber
4 building number
blocking
projected line

0 10m

Date: June 2007

Figure 6: North-west facing cross-section

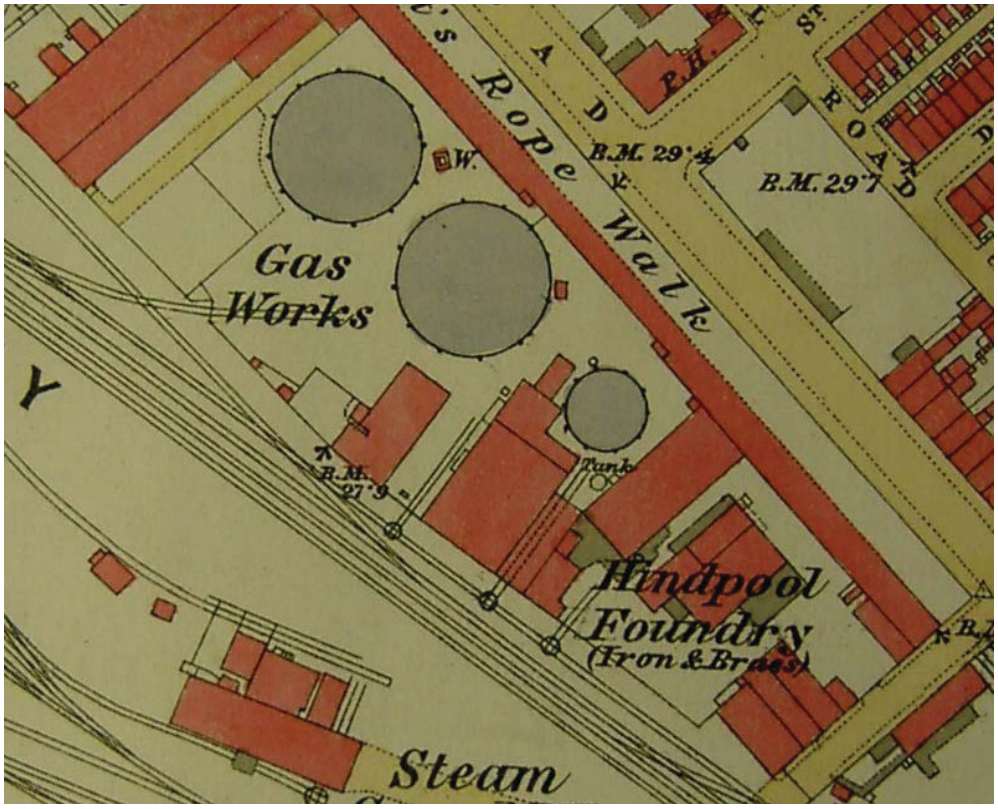


Plate 1: Part of the undated Ordnance Survey 1:2500 map (surveyed in 1873) showing the gasworks and iron foundry

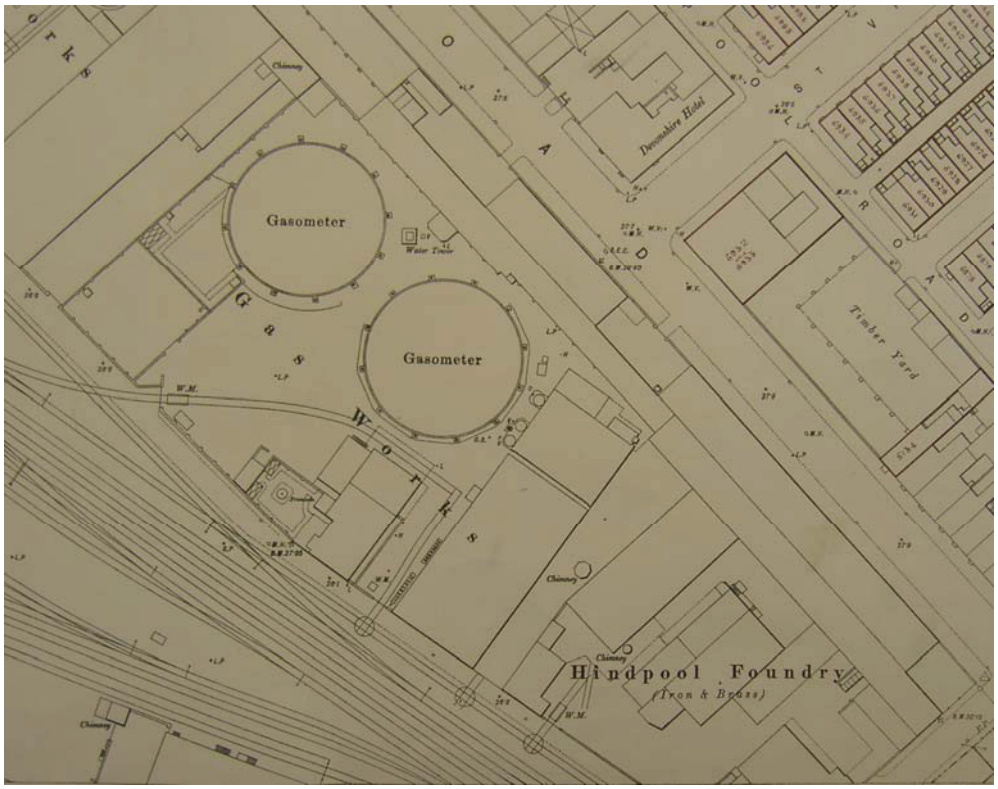


Plate 2: Part of the Ordnance Survey 1:500 plan of 1891 showing the gasworks and part of the foundry

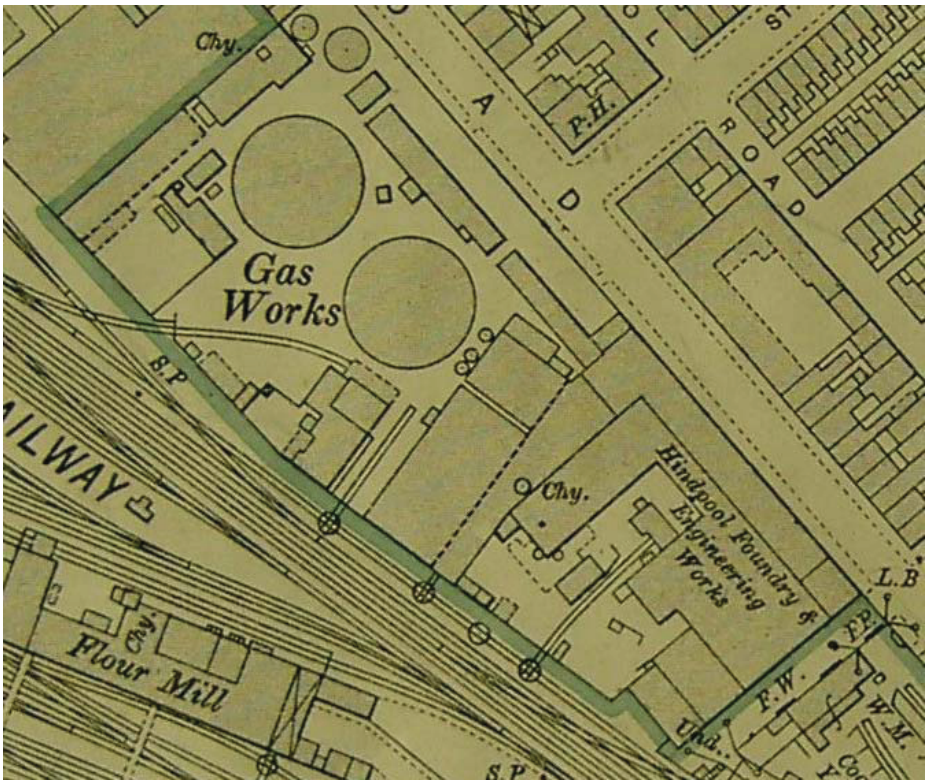


Plate 3: Part of the Ordnance Survey 1:2500 map of 1913 (revised in 1910-1911) showing the gasworks and iron foundry

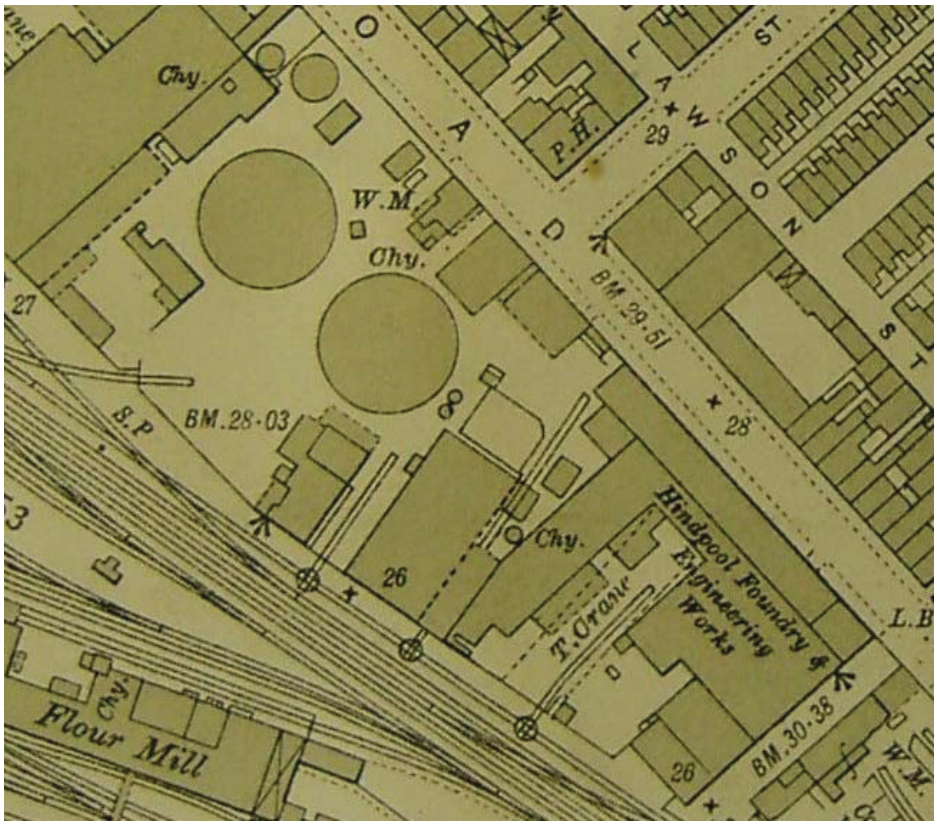


Plate 4: Part of the Ordnance Survey 1:2500 map of 1938 (revised in 1931-1932) showing the proposed development area

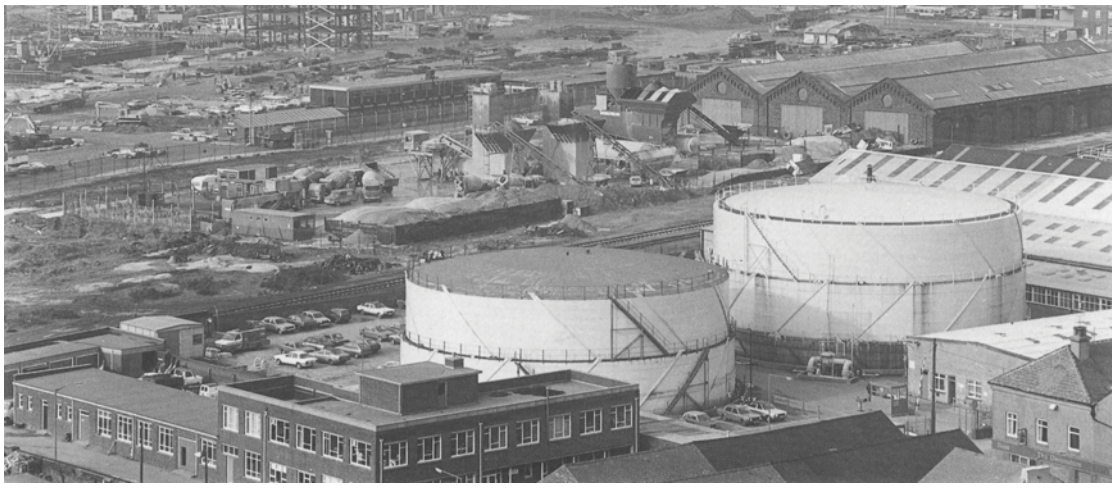


Plate 5: View of the gasworks in 1985 showing the extended gasholders and associated buildings (from Trescatheric 1992, 68)

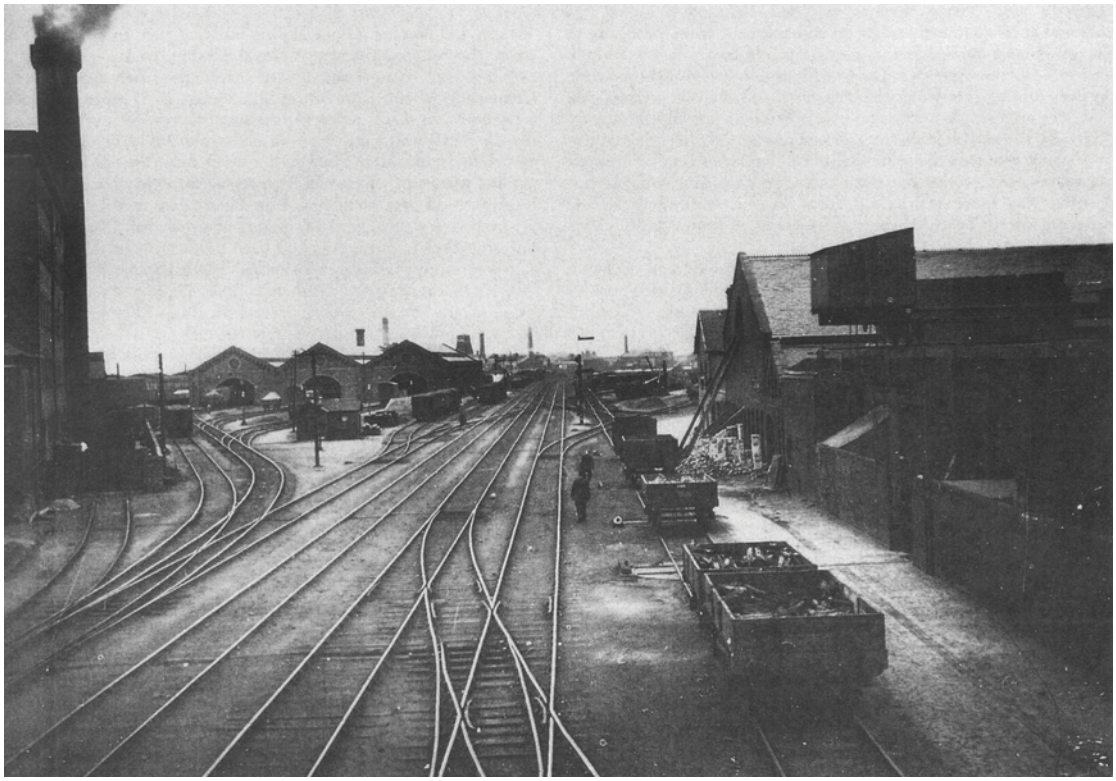


Plate 6: View of the south-west end of the iron foundry (right) and environs (from Norman 1994, 39)

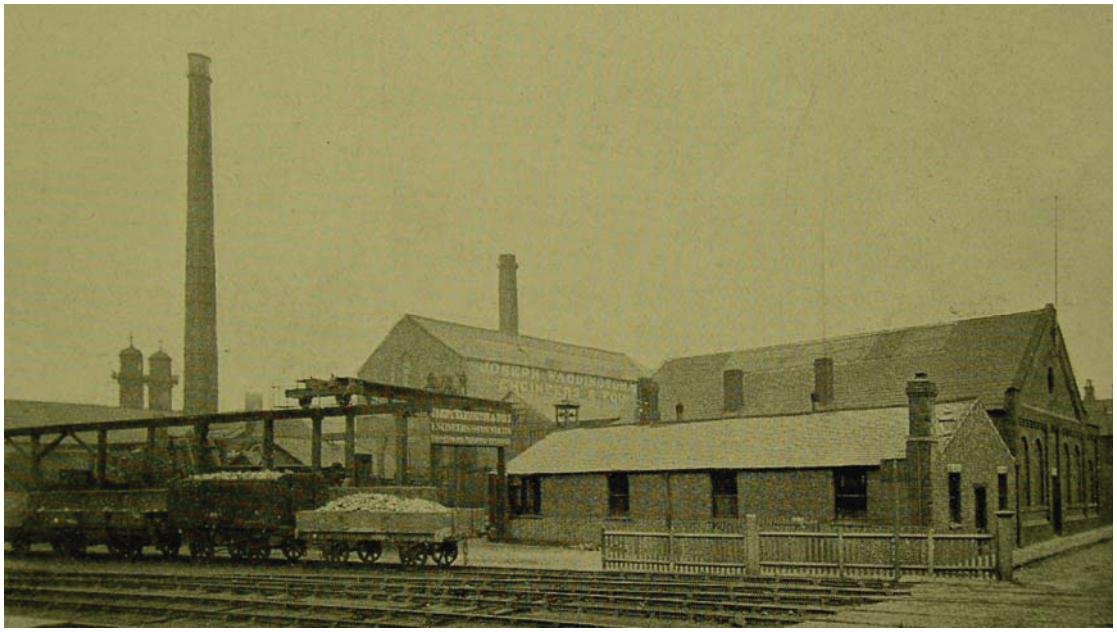


Plate 7: View of the iron foundry (from The Acme Tone Engravings Company Limited 1900, 45)

Plate 8: View of the foundry after the fire of 1906 (from Trescatheric and Barker 1990, 22)

Plate 9: Detailed view of the foundry after the fire (from Myers 2000, 32)

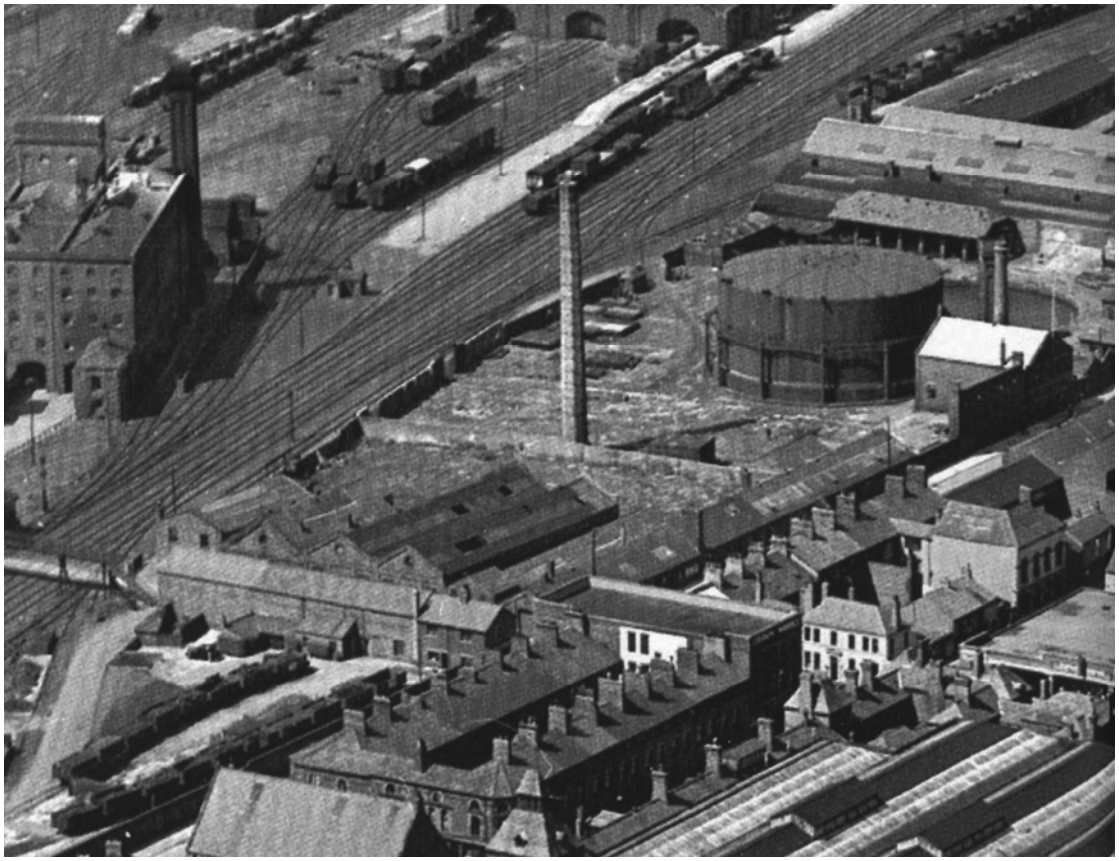


Plate 10: Aerial view of the gasworks and foundry from 1939 (from Thompson 2005, ref AFR6237)

Plate 11: Letter heading from 1941 (from CRO(B) BDB 17/Box 19 1941-1943)

Plate 12: North-east wall of gasworks Building 1

Plate 13: South-east end of gasworks Building 1

Plate 14: North-east end, south-east elevation of gasworks Building 2

Plate 15: South-west end, south-east elevation of gasworks Building 2

Plate 16: North-western gasholder, gasworks Building 3

Plate 17: Large valve associated with gasworks Building 3

Plate 18: South-east gasholder, gasworks Building 4

Plate 19: Detail of stanchion on gasworks Building 4

Plate 20: Detail of rolling mechanism, gasworks Building 4

Plate 21: The gas governor, gasworks Building 5

Plate 22: North-east face of the gasworks boundary wall

Plate 23: South-west face of the gasworks boundary wall

Plate 24: Front (north-east) elevation of gasworks Building 6

Plate 25: Rear (south-west) elevation of gasworks Building 6

Plate 26: Staircase within gasworks Building 6

Plate 26: South-east elevation, gasworks Building 7

Plate 27: North-west elevation, gasworks Building 7

Plate 28: Blocked doorway, south-west end, gasworks Building 7

Plate 29: North-east elevation, north-west end, gasworks Building 8

Plate 30: North-east elevation, south-east end, gasworks Building 8

Plate 31: General view of foundry buildings and environs, from east

Plate 32: General view of foundry and environs from north

Plate 33: South-west elevation of foundry Building 1

Plate 34: South-east elevation, foundry Buildings 1 and 2

Plate 35: Internal view, ground floor foundry Building 1

Plate 36: Baltic timber marks inscribed into a beam, ground floor foundry Building 1

Plate 37: Enamelled iron pulley wheel(?), ground floor foundry Building 1

Plate 38: Iron-framed floor light in foundry Building 1

Plate 39: Staircase between ground and first floor, foundry Building 1

Plate 40: Exterior view of north-west elevation foundry Building 1 showing truss

Plate 41: Iron brackets and blocked windows, north-west side, first floor, foundry Building 1

Plate 42: Stained glass window on first floor, foundry Building 1

Plate 43: South-east elevation, foundry Building 2

Plate 44: North-west elevation foundry Buildings 1 and 2

Plate 45: General view of interior of foundry Building 2

Plate 46: Baltic timber marks inscribed into tie beam, foundry Building 2

Plate 47: Hearths in the south-west elevation, foundry Building 2

Plate 48: South-west elevations of foundry Buildings 3 and 4

Plate 49: Outshut attached to the north-west end of the south-west elevation of foundry Building 3

Plate 50: North-west elevation of foundry Building 3

Plate 51: North-east elevation of offices (Building 3a) within foundry Building 3

Plate 52: Interior of ground floor foundry Building 3a

Plate 53: First floor north-west office, foundry Building 3a

Plate 54: Interior of south-east end of foundry Building 3

Plate 55: Lift and steps connecting outbuilding attached to foundry Building 3 and the basement

Plate 56: General view of part of basement in foundry Building 3

Plate 57: North-west end of foundry Building 4 showing extension and chimney

Plate 58: The steel roof structure in foundry Building 4

Plate 59: General view of south-east end of interior of foundry Building 4

Plate 60: General view of north-west end of interior of foundry Building 4

Plate 61: General view of extension to foundry Building 4 forming office 4a

Plate 62: South-east elevation of foundry Buildings 4 and 5

Plate 63: South-east end of the north-east elevation of foundry Building 5

Plate 64: Single story extension to the north-west end of foundry Building 5

Plate 65: General view of interior of foundry Building 5 showing trusses

Plate 66: General view looking north-west along foundry Building 5

Plate 67: Concrete 'step' housing water pipe in foundry Building 5a

Plate 68: General view of interior of foundry Building 5c

Plate 69: General view of boiler room between foundry Buildings 4a and 5c (Building 4b)

Plate 70: Detail of apertures in chimney in boiler room

Plate 71: South-east and north-east elevations of foundry Building 6

Plate 72: North-west elevation, foundry Building 6

Plate 73: Central truss, foundry Building 6

Plate 74: South-east truss, foundry Building 6

Plate 75: Internal north-east elevation, foundry Building 6

Plate 76: Blocked apertures in the south-east elevation, foundry Building 6

Plate 77: North-east elevation, foundry Building 7

Plate 78: General view of interior, foundry Building 7

Plate 79: Blocked opening between foundry Buildings 5 and 6 revealed during demolition