

**BELMONT
BLEACH WORKS,
EGERTON ROAD,
BELMONT,
BLACKBURN WITH
DARWEN**

**Historic Building
Investigation**



Oxford Archaeology North

October 2015

Millson Associates
Planning Application 10/12/0590

Issue No: 2015-16/1684
OA North Job No: L10800
NGR: 367684 415783

Document Title: BELMONT BLEACH WORKS, EGERTON ROAD, BELMONT,
BLACKBURN WITH DARWEN

Document Type: Historic Building Investigation

Client: Millson Associates

Planning Application: 10/12/0590

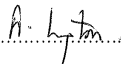
Issue Number: 2015-16/1684
OA Job Number: L10800
National Grid Reference: 367684 415783

Prepared by: Andy Phelps
Position: Project Officer
Date: August 2015

Checked by: Ian Miller
Position: Senior Project Manager
Date: September 2015

Signed 

Approved by: Alan Lupton
Position: Operations Manager
Date: October 2015

Signed 

Oxford Archaeology North

Mill 3
Moor Lane Mills
Moor Lane
Lancaster
LA1 1GF
t: (0044) 01524 541000
f: (0044) 01524 848606

w: www.oxfordarch.co.uk
e: info@oxfordarch.co.uk

Oxford Archaeology Ltd (2015)

Janus House
Osney Mead
Oxford
OX2 0EA
t: (0044) 01865 263800
f: (0044) 01865 793496

Oxford Archaeology Limited is a Registered Charity No: 285627

Disclaimer:

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Oxford Archaeology Ltd being obtained. Oxford Archaeology Ltd accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person/party using or relying on the document for such other purposes agrees, and will by such use or reliance be taken to confirm their agreement to indemnify Oxford Archaeology Ltd or all loss or damage resulting therefrom. Oxford Archaeology Ltd accepts no responsibility or liability for this document to any party other than the person/party by whom it was commissioned.

CONTENTS

SUMMARY	2
ACKNOWLEDGEMENTS.....	3
1. INTRODUCTION.....	4
1.1 Project Background.....	4
1.2 Site Location	4
1.3 Historical Background	6
1.4 Background to the Calico-Printing Industry	11
1.5 Background to the Bleaching Industry.....	14
2. SURVEY METHODOLOGY	16
2.1 Methodology	16
3. RESULTS.....	17
3.1 Introduction.....	17
3.2 Building A.....	17
3.3 Building B.....	27
3.4 Building C.....	35
3.5 Building D.....	43
3.6 Building E.....	53
3.7 Building F	55
3.8 Building G.....	62
3.9 Building H.....	65
3.10 Building I	72
3.11 Building J.....	74
3.12 Building K.....	75
3.13 Building L	84
4. DISCUSSION.....	91
4.1 Introduction.....	91
4.2 Development	91
BIBLIOGRAPHY	93
WRITTEN SCHEME OF INVESTIGATION	95
ILLUSTRATIONS	102
List of Figures	102

SUMMARY

Blackburn with Darwen Borough Council has granted planning permission for the redevelopment of part of the former Belmont Bleach Works on Egerton Road, Belmont (centred on NGR 367684 415783). The existing planning permission (Application No 10/12/0590) allows for the demolition of the existing buildings, and the erection of new houses with associated parking.

In order to secure archaeological interests, Blackburn with Darwen Borough Council recommended that an appropriate programme of archaeological investigation of the works is carried out in advance of demolition. Following consultation with the Lancashire County Archaeology Service, it was recommended that an archaeological building investigation commensurate with an English Heritage Level 2/3-type survey should be carried out. This was carried out by Oxford Archaeology North in October 2014.

The bleach works complex comprises numerous buildings, of which 12 lie within the boundary of the proposed development. This part of the site had formed the historic core of the complex, dating to the early 1800s, when it was established as a calico printing works. The works expanded significantly in the second half of the nineteenth century, and was converted for use as a bleach and dye works.

The earliest structure identified during the archaeological survey potentially dated from the early 1800s, although only fragmentary elements of the building survived. It appeared to have been a detached two-storey structure, aligned with Egerton Road to the south and one of the reservoirs to the north. The quality of the southern elevation suggests that it originally faced directly onto the road, perhaps with an open yard immediately in front. The loss of the western wall prior to the present survey limited the interpretation of the building, but it is nevertheless clear that the eastern elevation was external and included a large cart entrance at the southern end. This tentatively suggests that the building may have been intended, at least in part, as a warehouse, where grey cloth was stored after delivery to the works for printing.

Several buildings were added to the east of the original structure in the nineteenth century, representing the later development of the site. Some of these appear to have been added on a fairly ad hoc basis, although the archaeological survey has enabled, in broad terms, their chronological development to be identified. However, most of the buildings were in a very poor structure condition, and elements had either collapsed or were partially demolished prior to the archaeological survey.

ACKNOWLEDGEMENTS

Oxford Archaeology North would like to thank Stephen Griffiths of Millson Associates for commissioning and supporting the project. Thanks are also expressed to Doug Moir, the former Planning Officer (Archaeology) with the Lancashire County Archaeology Service, for his guidance and advice.

The building investigation was undertaken by Andy Phelps, and the historical research was carried out by Ian Miller. The illustrations were produced by Mark Tidmarsh and the report was edited by Ian Miller, who was also responsible for project management.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Blackburn with Darwen Borough Council has granted planning permission for the redevelopment of part of the former Belmont Bleach Works on Egerton Road, Belmont. The planning permission (Application No 10/12/0590) allows for the demolition of the existing buildings, and the erection of new houses with associated parking. The buildings form part of the historic bleach works, although they are currently vacant and in a state of serious disrepair, with water and weather damage, decaying roof trusses and structural failure. It has been acknowledged by Blackburn with Darwen Borough Council that the existing buildings are beyond viable economic or operational use.

1.1.2 In order to secure archaeological interests, however, Blackburn with Darwen Borough Council recommended that an appropriate programme of archaeological investigation of the works is carried out in advance of demolition. Following consultation with the Lancashire County Archaeology Service (LCAS), it was recommended that an archaeological building investigation commensurate with an English Heritage Level 2/3-type survey should be carried out. In accordance with this recommendation, Blackburn with Darwen Borough Council attached a condition (Condition 7) to planning consent that stated:

‘No works shall take place on the site until the applicant, or their agents or successors in title, has secured the implementation of a programme of building recording and analysis. This must be carried out in accordance with a written scheme of investigation, which shall first have been submitted to and agreed in writing by the Local Planning Authority.

REASON: To ensure and safeguard the recording and inspection of matters of archaeological/historical importance associated with the building/site in accordance with Policy HD18 of the Blackburn with Darwen Borough Local Plan.’

1.1.3 In October 2014, Oxford Archaeology North (OA North) was commissioned by Millson Associates to undertake the required historic building investigation. The work was carried out in October 2014.

1.2 SITE LOCATION

1.2.1 Belmont Bleach Works nestle at the bottom of a narrow valley, approximately half a mile from the centre of Belmont village (Plate 1), some 5 miles north of Bolton (NGR 367684 415783). The bleach works lies either side of Egerton Road, with the present survey concerning those buildings located to the north of the road (Fig 1).

- 1.2.2 The present study area is bounded to the east by the Eagley Brook, which flows in a southerly direction, and is culverted by the existing buildings on the site. A reservoir situated immediately to the north occupies an elevated position above the proposed development site, from which it is separated by a c 3m high retaining wall; the reservoir is currently in use for private recreational fishing. The western boundary of the site comprises a small, irregular-shaped disused workshop, which again occupies an elevated position above most of the site. Egerton Road forms the southern boundary of the present study area, although buildings associated with the bleach works survive on the southern side of the road. Most of these buildings are currently in use as individual commercial and industrial units. The site lies at a height of approximately 220m above Ordnance Datum (aOD).
- 1.2.3 The land encompassing the bleach works comprises open countryside, woodland and reservoirs. The village of Belmont lies a short distance to the west, and is focused along the A675 Belmont Road.



Plate 1: Recent aerial view of Belmont Bleach Works, with arrow marking the approximate centre of the present development area

1.3 HISTORICAL BACKGROUND

- 1.3.1 The origins of Belmont Bleach Works can be traced to 1804, when Thomas Rycroft of Manchester established a textile-printing business in partnership with William Cooke and Thomas Barnes. Their new works at Belmont was probably an undeveloped site previously, as there is no indication of any building occupying the site on Yates' map of 1786.
- 1.3.2 The partnership between Rycroft, Cooke and Barnes was short-lived and was dissolved by mutual consent in April 1808 (*London Gazette*, 16 April 1808), but the business continued as Rycroft, Barnes & Co until October 1810, when this partnership was dissolved (*London Gazette*, 25 December 1810). It seems that Thomas Rycroft continued in business on his own for a short while, until he was declared bankrupt in 1813 and the print works was passed by private contract to Lawrence Wright (*London Gazette*, 6 July 1813).
- 1.3.3 There is no documentary evidence to indicate that Wright operated the print works, which appears to have been leased to Parker, Ellison & Baron. This firm traded as John Parker & Co, as listed in a trade directory for 1818 (Rogerson 1818, 66). However, this firm failed in 1819, and the works was then unoccupied for about six years before being taken over by Spencer & Co, who continued for about nine years and then failed. The works is shown during this period on Hennessey's map of Lancashire, which was published in 1830 (Plate 2). Whilst the small-scale of the map precludes any useful analysis of individual buildings, a reservoir and a group of structures on both side of Egerton Road almost certainly represent the print works.

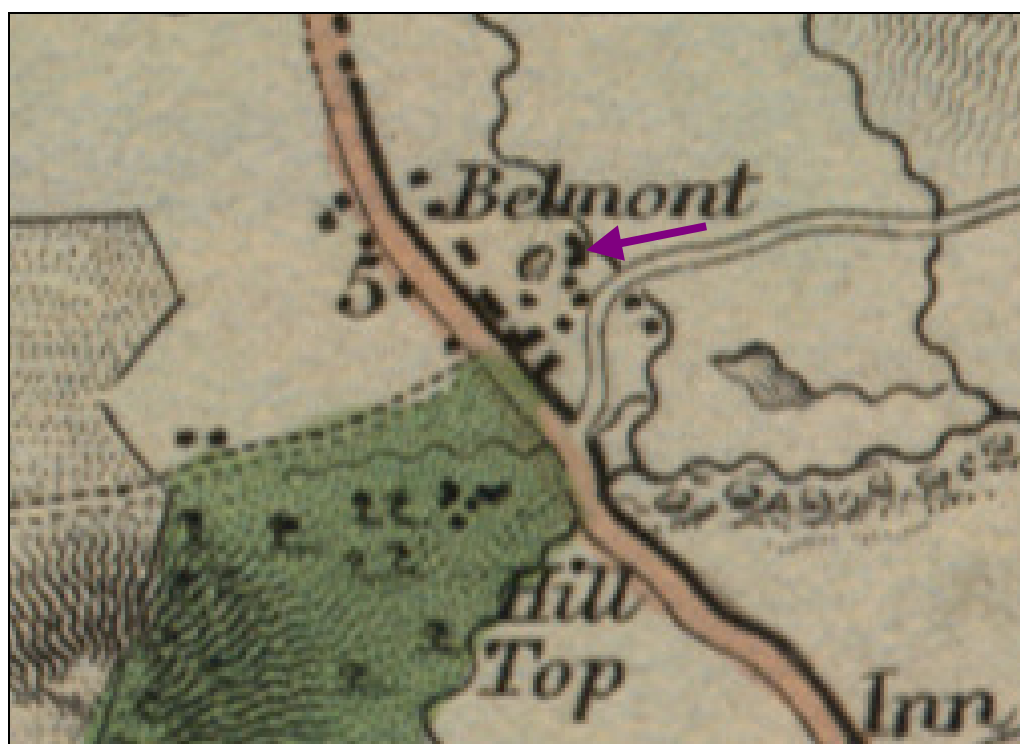


Plate 2: Extract from Hennessey's map of Lancashire, published in 1830

- 1.3.4 The works was taken over from Spencer & Co by Robert West, who continued in business for approximately five years. It seems that West may have entered a partnership with a Mr Winder, as the firm of West & Winder of Belmont is included in a list of English calico printers that was compiled in 1840, and published in *The Textile Colourist* of April 1876. This accredits the works with housing three printing machines, 70 short printing tables, and no long tables, implying that it was a comparatively small concern (Turnbull 1951).
- 1.3.5 In 1845, the lease of the works was passed to Edward Dewhurst and Robert Walker, both of Little Bolton. The lease included ‘the messuages or dwelling-houses, cottages, print-works, buildings, and premises, situate at Belmont, in Sharpies, in the county of Lancaster, and lately in the occupation of Mr. Robert West, together with the water-wheel, wash-wheels, fixtures, machinery, utensils, articles, and things, in and about the said premises...’ (*London Gazette*, 22 April 1845). It was reported in 1846 that Edward Walker Dewhurst & Co had three machines and 80 printing tables (Graham 1846, 350).
- 1.3.6 In June 1847, that the firm of Dewhurst, Walker & Company, calico printers at Belmont, was dissolved by mutual consent so far as regards William Mackenzie; Edward Dewhurst and Robert Walker continued the business under the same name (*London Gazette*, 16 June 1847). The layout of the works at this date is captured on the Ordnance Survey map of 1849 (Plate 3), which provides the earliest detailed survey of the area. This shows a large, broadly rectangular building adjacent to one of the large reservoirs, together with two small detached structures on the north side of Egerton Road. These buildings almost certainly formed the manufacturing core of the print works, with two buildings situated to the south of Egerton Road probably representing ancillary structures.

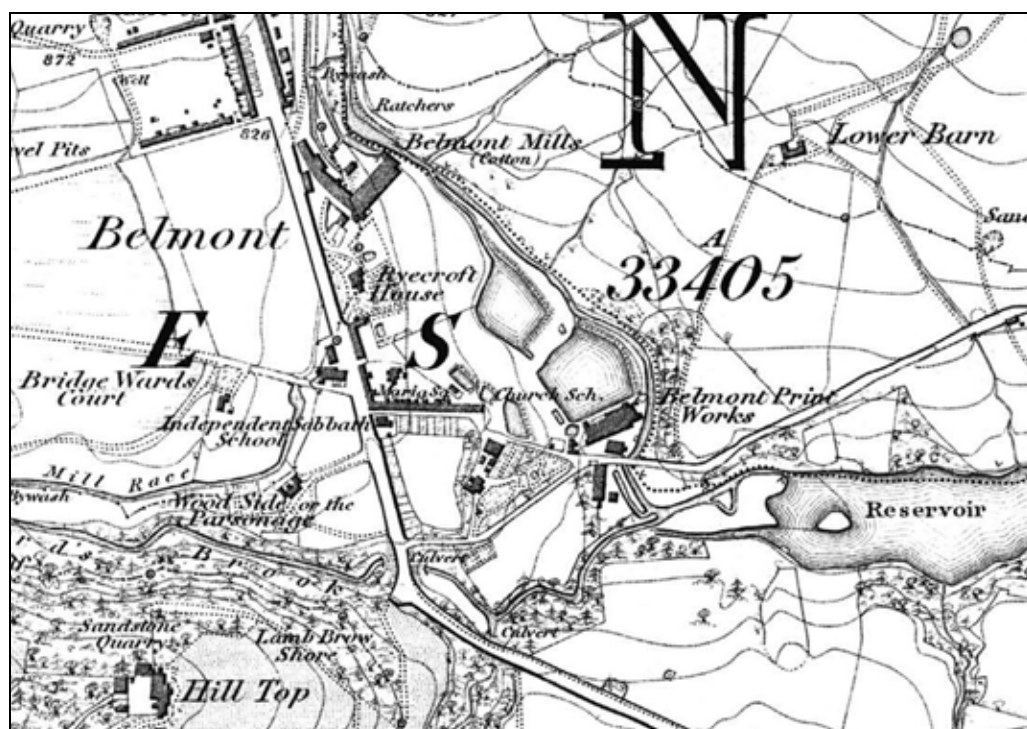


Plate 3: Extract from the Ordnance Survey map of 1849

- 1.3.7 Messrs Dewhurst and Walker are named as the occupants of the Belmont Works in 1855, when a fire broke out in the drying room, causing damage estimated at £200 (*Preston Guardian*, 10 February 1855). Shortly after this fire, the partnership between Edward Dewhurst and Robert Walker, carrying on business as calico printers at Belmont under the trading name of Dewhurst, Walker & Co, was dissolved by mutual consent in mutual 1857 (*London Gazette*, 15 May 1857). The business was carried on thereafter by Edward Dewhurst.
- 1.3.8 A destructive fire at Belmont Mill ultimately caused the closure of the print works in 1869, although it was purchased in 1870 by Edward Deakin. It is uncertain whether Deakin continued the works for the printing of textile goods, although in March 1882 he entered into partnership with Henry Taylor Deakin to carry on the business of bleachers and dyers under the name of H & E Deakin at Belmont Bleachworks and at Ryecroft Dyeworks at Belmont (BA ZDEH/36/3). This represented the conversion of the print works for use as a bleach works, although the partnership appears to have been relatively short-lived, as it was dissolved by mutual consent in March 1893 (*London Gazette*, 12 May 1893).
- 1.3.9 Part of the works at approximately this date is captured on a photograph that provides a view looking west towards Belmont along Egerton Road (Plate 4). A second photograph provides a view looking south-eastwards across the reservoir and part of the works, and shows a square-stack chimney occupying the eastern part of the print works complex (Plate 5).



Plate 4: A late nineteenth-century photograph, showing part of the Belmont Works



Plate 5: A late nineteenth-century view looking south-eastwards across the reservoir towards Belmont Works

- 1.3.10 The layout of the entire works at the close of the nineteenth century is shown on the Ordnance Survey 25": 1 mile map of 1894 (Fig 2). This annotates the site as Belmont Bleach Works, and shows the complex to have expanded relative to the 1849 edition of Ordnance Survey mapping, with new buildings having been erected on both sides of Egerton Road.
- 1.3.11 The next edition of Ordnance Survey mapping, published in 1910, identifies the site as the Belmont Bleach and Dye Works (Fig 3). This shows that most of the buildings retained the same footprint as shown on earlier mapping, although a new large building had been added to the south-eastern side of the works on previously undeveloped land. The resultant layout of the works is shown unaltered on the next editions of Ordnance Survey mapping, published in 1929 (Fig 4), 1955 and 1963 (Plate 6).
- 1.3.12 The works was taken over subsequently by the Belmont Bleaching & Dyeing Co Ltd. It closed as a textile-finishing works in the late twentieth century, and the tall detached chimney (Plate 7) was demolished. The buildings forming the original core of the print works, situated on the north side of Egerton Road, fell into disuse and are currently in a very poor state of repair. The buildings to the south of Egerton Road, however, have been remodelled for use as light industrial and commercial units.



Plate 6: Extract from the Ordnance Survey map of 1963



Plate 7: Twentieth-century view of the reservoir above the bleach works

1.4 BACKGROUND TO THE CALICO-PRINTING INDUSTRY

- 1.4.1 Calico printing is a term applied generically to the printing of any textiles, although it originated to describe specifically the printing of cotton cloth (Murphy 1911, 2). The first printed cotton cloth, known as chintz, was introduced into England from India during the seventeenth century. At that time, clothes in Britain were made from wool, linen, or silk, and plain dyed with natural colours. Indian chintz was very fine cotton, brightly coloured with exotic patterns (O'Brien 1792). It quickly became fashionable and English printers, based primarily in London, began to manufacture copies (Chapman and Chassagne 1981).
- 1.4.2 The popularity of the Indian chintzes, and the English copies, alarmed the established wool and silk manufacturers, who successfully lobbied parliament for legislation to protect their trade; the use of Indian chintz was prohibited by law in 1701, whilst a further Act of Parliament in 1721 banned the use of all printed, painted or dyed calicos (Turnbull 1951). In Lancashire, weavers produced an alternative cloth, with a linen warp and cotton weft known as fustian (Aspin 1995). This was exempt from the law, and dyers and printers found ways of copying the Indian chintz using fustian. When public demand led to the regulations against cotton cloth being removed, British printers and dyers were able to produce their own chintz. This quickly became more popular than the imported material.
- 1.4.3 The oldest method of printing was block printing, which employed engraved wooden blocks in a similar manner to reproducing book illustrations by woodcuts. It was invented in China in 2500 BC, but is not known to have been used in Europe until the seventeenth century. The block was made of layers of wood sandwiched together, one side of which had a raised printing surface that varied depending on the type of cloth and the pattern to be printed. Three types of block were commonly used to print on cotton cloth: line blocks for printing outlines and small details; blotch blocks with felted surfaces for large areas of colour; and ground blocks, also felted, for small areas of colour. Each colour was applied with a different block, and there could be over a 100 blocks in a set (Miller 2012).
- 1.4.4 During the nineteenth century, it became commonplace for a print works to form part of a larger bleaching and dyeing concern, providing a cloth-finishing service to the textile trade. A large print works would employ a few hundred hand-block printers, each man with his own printing table, and many firms even had their own block-making department. A block printer frequently worked with a tierer, usually a child, who pushed a trolley of printing colour along the printing table (Plate 8).

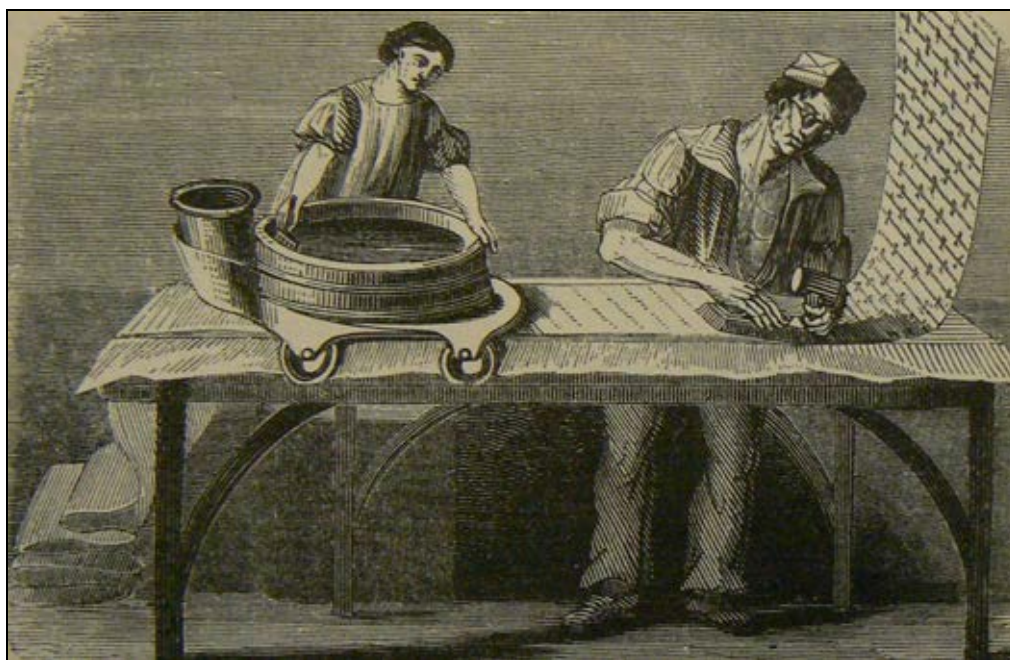


Plate 8: An early nineteenth-century engraving of a block printer and tierer at work

- 1.4.5 The introduction of the machine printing of cloth by roller or cylinder can be traced to 1772, when a patent (no 1007) was granted to Charles Taylor, Thomas Walker, and Joseph Adkin, all of Manchester, for printing by engraved wooden rollers (Turnbull 1951). This was improved upon by engraving the pattern on copper rollers, which was introduced in the 1780s when Thomas Bell of Walton-le-Dale took out a patent in 1783 (no 1378) for a copper-covered roller engraved on its curved surface. This worked in the reverse manner to hand blocks, *ie* the engraved lines were the printing area, and smooth areas were kept clear of colour. Instead of the pattern being on a flat surface, it was engraved around a copper roller. There were many ways of making the pattern on the copper roller: hand engraving; mill engraving where the pattern is pressed into the copper; or etching, where the pattern is cut into the copper surface by acid. There were attempts to mechanise block printing, but they could not compete with the speed of roller printing machines, which gradually superseded hand-block methods during the first half of the nineteenth century (Ashmore 1969).
- 1.4.6 On a printing machine, cloth was passed continuously from an overhead roller through the nip between the engraved roller and a plain roller called a pressure bowl (Plate 9). The lower part of the engraved roller dipped into a colour trough, and as it revolved its surface was wiped clean by a doctor knife before the cloth reached it. Colour was thus left only in the engraved lines, which transferred the pattern onto the cloth. At first, only single colours were printed, but soon multi-colour machines were invented with several rollers, each carrying part of the pattern and fitted with its own colour trough and doctor knife. The cloth passed each roller in sequence, building up the final multi-coloured design (Baines 1825).

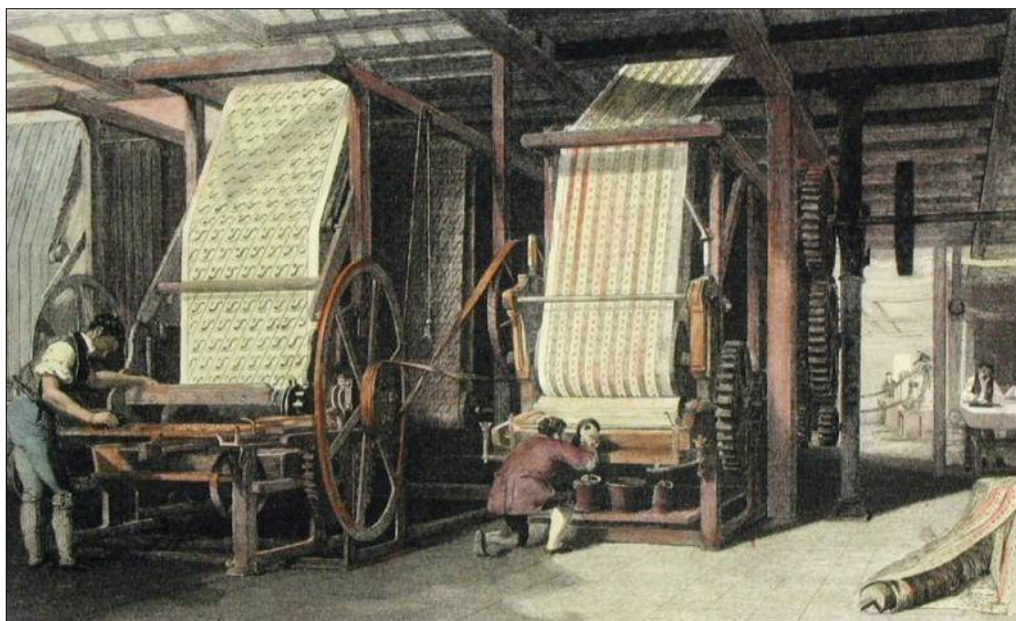


Plate 9: The mechanised calico-printing process in the 1830s, showing on the left a machine with engraved copper rollers transferring the pattern onto the cloth, and on the right is a block printer using a hand-carved wooden block.
(drawn by T Allom and engraved by J Carter)

- 1.4.7 Once printed, the inks had to be fixed to the cloth, and any excess mordant or other chemicals needed to be removed. The first process, known as ageing, aimed to remove the mordants and acetic acid used to fix the dyes to the cloth during the printing process. This process was only really understood after c 1800, when it was realised that moisture was also required during the drying of the cloth in order to ‘age’ (fix) the colour (Turnbull 1951, 62). In the humid atmosphere of England, it had been sufficient for ageing rooms to be placed near rivers or ponds (*ibid*). These rooms were originally heated by flues from fires, and later by steam pipes, but as it became necessary to reduce the ageing time, which had previously been about four days (*ibid*), whilst increasing the quantities of cloth, the amount of steam required in the ageing rooms soon became too great for men to work within (*op cit*, 64).
- 1.4.8 The first enclosed steaming machine was invented by John Thom in 1849, and was further developed by Walter Crum in 1856. Uptake by the major print works ensued, culminating in the highly successful ‘Rapid Ager’, patented by Mather & Platt in 1879, which comprised an enclosed metal steaming chamber with rollers for continuous running. This revolutionised the processing of prints and long outlived the types of colour (mordents and vegetable colourings) for which it was first devised (Mather & Platt 1958).
- 1.4.9 After the cloth had been aged, it still contained several impurities: excess mordant rendered insoluble by steaming; surplus insoluble compound; and thickening matter (gums and starches) used during printing (Turnbull 1951, 66). It was discovered in the mid-eighteenth century that cow dung, mixed with water, was an efficient agent for removing these residues, and its use in the process, which became known as ‘dunging’, continued well into the twentieth century (*ibid*).

- 1.4.10 The calico-printing trade remained prosperous until the 1880s, machines increasingly replaced the old block tables and capacity expanded greatly. However, there were 25 failures of firms between 1889 and 1892, largely as a result of inefficiency, bribery, price cutting and long credit (Turnbull 1951, 121). The solution was amalgamation and, between 1897 and 1899, some 90 per cent of the printing trade grouped itself into three associations: F Steiner & Co; the United Turkey Red Co; and (the largest) the Calico Printers' Association (CPA).

1.5 BACKGROUND TO THE BLEACHING INDUSTRY

- 1.5.1 In order for cloth to be dyed or printed successfully, it had to be freed from any impurities by bleaching, which was an old-established industry in Lancashire (Ashmore 1969, 60). The traditional method was to boil the cloth in an alkaline ley made from plant ashes and to sour it in buttermilk. The equipment was very simple comprising boiling 'kiers' and troughs or becks of stone or wood, with bleaching being achieved by exposing the cloth to the sun for long periods in bleach crofts. Towards the end of the eighteenth century, however, it was becoming increasingly clear that a more efficient means of bleaching cloth was needed to keep pace with the major improvements in other branches of the textile industry.
- 1.5.2 The adoption of the factory system allowed bleaching to become a continuous process, which was carried out in specialised factories, or dedicated departments within print works. An essential initial stage in the process was to remove any fibre remaining on the surface of the cloth, such as frayed filaments from weaving, in order to obtain a perfectly smooth surface (Ashmore 1969, 61). This was achieved by singeing the cloth over red-hot copper plates in a singe house, which would contain a singeing machine heated by either gas flames or a stove underneath. Once it had passed over the heat source, the cloth was fed immediately through a trough of water to extinguish any sparks. Another prerequisite of the bleaching process was to sew numerous lengths, or pieces, of the cloth together, forming a continuous rope of cloth that could be up to eight miles long (Dodd 1844, 47). The cloth could then be moved between the various bleaching processes by winches, which drew the rope of cloth through overhead porcelain eyes.
- 1.5.3 The cloth was passed to the bleach croft and subject to the 'grey wash' process. The bleach croft was one of the largest areas within the bleach works and contained many items of machinery, including steam engines, washing machines, a liming machines, a high-pressure kiers, and cisterns. Initially, the cloth was alternately impregnated with scouring liquor, washed in a dash wheel, and squeezed dry through rollers (Plate 10). This process removed through chemical action any dirt and size that had been applied during the weaving process. The cloth was then boiled for several hours in a kier, a large iron vessel filled with a solution of caustic soda. Boiling in lime, or 'bowking', circulated the solution continuously through the cloth at a high temperature.



Plate 10: Dash wheels at the Dukinfield bleach works of Thomas Hoyle & Sons in 1843

- 1.5.4 The cloth was then subject to the ‘grey sour’, which involved treating the cloth with a weak solution of hydrochloric acid to dissolve any vestiges of lime, and was then washed thoroughly. Cloth was frequently boiled twice in kiers with soda and washed again. The next process was the bleaching, or chemicing, process that was intended to destroy what remained of the natural colouring matters in the fibre. This was achieved by passing the cloth through a clear solution of chloride of lime, or bleaching powder. It was then allowed to lie for several hours whilst the necessary chemical reactions took place. The cloth was passed through a dilute solution of sulphuric acid, a process known as the ‘white sour’, followed immediately by a final washing in clean water, which rendered the cloth perfectly pure. The cloth was then passed through padded squeezing rollers and drying cylinders. The drying process was completed in the ‘hanging stove’. Stretching machines rectified any shrinking in the cloth. The finishing process also required the cloth to be evenly and finely damped, fulfilled by the damping machine.
- 1.5.5 Bleachers had always established their operations close to plentiful water, but with the introduction of steam power to drive the machines they also required access to coal. By the early nineteenth century, the Bolton area had developed as a major centre for the textile-bleaching trade, with another concentration of works emerging around Stockport, although there were bleach works in most of the East Lancashire parishes (Phillips and Smith 1994, 176).
- 1.5.6 These changes speeded the process and made it possible to work all year round. By 1860 the bleaching trade had virtually completed its transition to an indoor chemical-based operation, the cloth being wound quickly through the crofts by steam power. In tandem with this technical evolution of the bleaching industry was the growth of textile engineering, which had become a recognised branch of the engineering industry by the mid-nineteenth century, resulting in the general improvements of bleaching plant (Sykes 1926, 15).

2. SURVEY METHODOLOGY

2.1 METHODOLOGY

- 2.1.1 The building investigation was carried out in October 2014. It aimed to provide an understanding of the historic fabric and key architectural features of the former mill complex, and to provide an archive record of the component structures. It has provided a drawn, photographic and textual record of the buildings to English Heritage (2006) Level II/III standard. Records were made of all principal structural elements, both internal and external, as well as any features of historical or architectural significance. Particular attention was paid to the development and alteration of the building.
- 2.1.2 **Photographic Survey:** a photographic archive of the buildings was compiled, consisting of both general and detailed interior photographs, which were captured using digital formats
- 2.1.3 **Instrument Survey:** floor plans of the buildings were surveyed by means of hand-measured survey to enhance existing block plans. The drawings were used as a basis for annotation to illustrate the phasing and development of the buildings. Detail captured by the annotation included features such as window and door openings, and changes in building material and phasing. The final drawings are presented through an industry standard CAD package (AutoCAD 2004).
- 2.1.4 **Interpretation and Analysis:** a visual inspection of the buildings was undertaken, and a description maintained to English Heritage (2006) Level II/III. These records are essentially descriptive, and provide a systematic account of the origin, development and use of the mill complex.

3. RESULTS

3.1 INTRODUCTION

- 3.1.1 The majority of the surviving buildings were concentrated to the east of the bleach works complex, lining the bank of the Eagley Brook, although two further structures lay to the west, separated from the main block of buildings by an open area of hard-standing. This area had been occupied by additional buildings previously, but these had been demolished some time prior to the archaeological building investigation. All of the remaining buildings were constructed primarily of sandstone, although in several instances patching and in-filling had been carried out in red brick. Several buildings also retained part or all of their slate roof coverings, with others being replaced in modern corrugated plastics and cement-based products.
- 3.1.2 All of the buildings to the east were in a very poor condition, with extensive water ingress, dry rot and invasive vegetative growth. Unfortunately, due to health and safety considerations, part of Building A had been demolished prior to the present survey. In this instance, a previous survey of the structure was used to inform descriptions of the building before its demolition.
- 3.1.3 The sequence of construction was complex and, to ensure the descriptions of the buildings were coherent, a certain degree of interpretation has been carried out at this stage in an attempt to attribute each wall to a specific building. For ease of discussion, each building has been assigned a letter from A to L.

3.2 BUILDING A

- 3.2.1 Building A was a large rectangular structure, aligned north/south, and constructed of light yellow sandstone (Plate 11). The building had been partially demolished, and only the northern and eastern walls remained to their approximate full height, with the northern end of the western wall and the southern wall surviving only as fragmentary remains. The roof had apparently collapsed, and had been removed to make the site safe.
- 3.2.2 ***The northern wall:*** this wall doubled as the retaining wall, dividing the site from the bank of the reservoir to the north and, as such, only its southern elevation and the upper portion of its northern elevation were exposed. Both faces were constructed of sandstone rubble and although its uppermost portion had been taken down the original pitch of its gable, it could still be clearly identified.
- 3.2.3 Four battered red brick buttresses projected south from the face of the wall, with evidence for a blocked rectangular opening at the western end. The opening had a shallow arch over with an inserted but substantial iron pipe projecting south from its eastern half. Given its location, its original function presumably related to water management between the bleach works and the adjacent reservoir.



Plate 11: Building A looking north into the interior after demolition of the western wall

- 3.2.4 At the eastern end of the wall were two narrow openings above head height (Plate 12). The function of these openings was not immediately evident, but they probably related to a removed internal structure.
- 3.2.5 The northern elevation contained no surviving openings, but a single piece projecting stone sill at the top of the remaining wall indicated the former location of a window (Plate 13).
- 3.2.6 **Eastern Wall:** the eastern elevation of Building A had been incorporated into the later Building B, and therefore formed an internal wall dividing the two structures (Plate 14). Its relationship with the remaining fragment of Building A's southern wall clearly indicated that originally this had been an external wall.
- 3.2.7 The wall contained just a single extant rectangular, square-headed, opening at the centre of the elevation, which once served as a large through doorway but had been converted to a pedestrian doorway subsequently by being partially in-filled with concrete blocks. A second large opening with an arched head formed in regular voussoirs and formal quoins lay at the southern end of the wall, but it had been in-filled by rubble stone work (Plate 15). A pintel hinge survived towards the top of its southern jamb, suggesting the doors were hung externally.

- 3.2.8 A narrow window with a similar arch lay immediately to the north of this doorway, with another identical opening towards the centre of the elevation and a third to the north of the only surviving doorway (Plate 16). All three had been blocked with rubble stone work, but had no formal sill. A fourth opening at the northern end of the wall had also been blocked with rubble, but its character varied in having no discernible arch or lintel (Plate 16). Instead, a single-piece stone sill identified it as a window. At the head of the wall were several small square blocked openings, three of which retained cast-iron end bearing housings (Plates 14-16).
- 3.2.9 **Southern Wall:** the southern elevation of the southern gable had been reduced to first-floor height, and the central portion removed to leave a fragment of walling on either side (Plate 17). That they belonged to the same wall was established by their use of water-shot coursing laid in regular sandstone blocks, and this was confirmed by the photographic evidence prior to the walls removal (Plates 18 and 19). A single vertically arranged rectangular window with a tapered single-piece sandstone lintel and projecting stone sill survived at the eastern and western ends (Plate 20). Both had been in-filled with a hard red brick.
- 3.2.10 Prior to demolition, a large arch-headed doorway lay to the east of centre with a window identical to those just described immediately to the west and a pedestrian doorway beyond this (Plate 19). At least one first-floor window was also present, directly above the ground-floor window. Only the lower eastern jamb of the large opening to the east and the western jamb of the pedestrian doorway to the west remained at the time of the present survey.
- 3.2.11 **Western Wall:** only the northern end of the western wall survived. Notably, this was rubble built rather than being constructed of coursed rectangular blocks as to the south (Plate 20). No extant openings were observed, but a tall narrow blocked opening at the southern end of the remaining wall had presumably facilitated the transfer of power through the wall. To its north there was a small square opening at about head height, which probably housed a bearing box. It too had been in-filled in brick (Plate 20).
- 3.2.12 The fragment adjoined the retaining wall to the north, while a line of quoins at its southern end indicated the former presence of a doorway. The previous survey that was carried out prior to demolition identified a large second doorway with an iron lintel and formal stone jambs at the southern end of the wall.



Plate 12: Water pipe with blocked opening to left in north-east corner of Building A



Plate 13: External elevation of northern wall of Building A, showing surviving window sill. 0.5m scale



Plate 14: Original external elevation of Building A, facing north-west



Plate 15: Large opening at southern end of western wall, facing west. 0.5m Scale



Plate 16: Northern end of the eastern wall. Note the blocked window to the right of the present doorway. A change in the character of the stone work at the northern end of the wall indicates the position of another window



Plate 17: Remains of southern gable wall, facing south-east



Plate 18: Remains of western end of southern gable wall, facing north. 0.5m scale



Plate 19: Southern elevation prior to partial demolition (Griffiths, 2014)



Plate 20: Remaining fragment of northern end of western wall, facing west

- 3.2.13 ***The Interior:*** little of the internal decoration, fixtures or fittings survived and any equipment that had remained had been removed during the initial demolition works. The floor appeared to be of concrete, but was much obscured by rubble, and only traces of the internal wall plaster finish survived.
- 3.2.14 The remnants of a mechanical press mounted upon a concrete platform stood against the eastern wall just to the north of the extant doorway (Plate 21). Two steel gears and a drive wheel remained in place, but the rest of the press had been removed prior to demolition. The owner of the complex commented that this press had been in operation up until the closure of the bleach works in 2006.
- 3.2.15 An ammeter and two electrical operating switches were mounted upon the eastern wall immediately to the north of the remains of the press (Plate 22). The ammeter recorded the names Broad, Mather, Platt across its top. A large diameter metal water pipe projected from the eastern end of the northern gable wall, running south above head height along the internal elevation of the eastern wall (Plates 11 and 12). A second concrete mounting platform situated in the north-western corner of the building denoted the former location of a second item of now scrapped mechanical equipment (Plate 23).



Plate 21: Remains of mechanical press, facing south



Plate 22: Wall-mounted ammeter on eastern wall of Building A



Plate 23: Concrete platform in north western corner of Building A, indicating the location of a now removed piece of equipment. 0.5m scale

3.3 BUILDING B

- 3.3.1 Building B was a narrow rectangular structure situated to the east of Building A, with which it shared its alignment and utilised this building's eastern wall as its western wall. All of the building's original external walls had been enclosed by subsequent additional structures, and no mechanical fixtures or fittings survived.
- 3.3.2 **Southern Wall:** the original external elevation of the southern wall was constructed of sandstone, laid in coursed rectangular blocks in water-shot fashion (Plate 24). A butt joint at the western end of the wall clearly established the building's relationship with Building A (Plate 25). The eastern end of the wall continued up to a height that could comfortably have accommodated a first floor (Plate 26).
- 3.3.3 A rectangular, vertically set window with a single-piece tapered stone lintel and projecting stone sill was recorded at the western end of the wall (Plate 25). It was similar in form to those described on the southern elevation of building A, and had also been blocked, perhaps at the same time, using identical red brick. Its eastern jamb was formed of the western jamb of a large double doorway, and their uncomfortable proximity might indicate the doorway to be a later insertion. The doorway was surmounted by a metal H-section lintel, but the upper jambs were constructed in red brick in contrast with the single-piece sandstone lower jambs, suggesting the height of the opening had been raised (Plate 24).



Plate 24: Southern wall of Building B, facing north

- 3.3.4 Above the window there was a small square opening with sandstone surrounds, which must once have facilitated power transfer between this building and Building G (Plate 25). It had been bricked up, but to the west of the window a slightly smaller less formal opening remained unblocked.
- 3.3.5 At the eastern end of the elevation there was a second and much altered window of approximately the same dimensions as the first. Its lintel had been replaced with a later concrete one, and its width narrowed by partial in-filling in brick to the west (Plate 26).
- 3.3.6 Above this window there was a large diameter metal pipe embedded in the wall, which presumably once carried water into Building F to the south. Immediately above the pipe was a second square power transfer aperture, which had also been blocked up with red brick.
- 3.3.7 The internal elevation was rubble faced with traces of plaster surviving in places. The outline of a blocked first-floor window could be traced immediately above the doorway (Plate 27).



Plate 25: Butt joint between southern walls of Building B and A, facing north. 0.5m scale



Plate 26: South-eastern corner of Building B, looking north-west, with blocked window to left and pipe and square aperture above



Plate 27: Internal elevation of southern wall of Building B. Note the outline of a first-floor window above the central doorway

- 3.3.8 **Northern Wall:** the northern wall formed part of the northern retaining wall, with most of its northern elevation hidden from view. However, a small portion of upper gable was noted from the north, projecting above the bank (Plate 28). The internal elevation was rubble built, with a centrally placed square window topped by a metal lintel and in-filled with red brick (Plate 29). There was a small, square, stone-lined opening beneath this window with a cast-iron bearing box to the east and another small square opening to the west. The bearing box remained open, but the other two openings had been blocked with red brick.
- 3.3.9 At approximately head height two iron beam-ends projected south from the face of the wall, perhaps being designed to support a low mezzanine floor or platform (Plate 30). The eastern end of the wall was hidden behind a corrugated steel sheet, and the presence of asbestos prevented close inspection.



Plate 28: External elevation of Building B's northern wall, facing south-east



Plate 29: Internal elevation of Building B's northern wall, facing north

- 3.3.10 **Eastern Wall:** the eastern wall divided Building B from Building E to the east, and at least three phases of construction could be identified (Plate 30). A butt joint towards the eastern end of the wall and a slight change in the walls width denoted an apparent change in construction (Plate 31). To the south of the joint there was a large double doorway with a semi-circular headed arch of very similar character to that described on the opposing western wall. It had been blocked with rubble, and a later square aperture punched through at about head height, which had itself been blocked subsequently with brick.
- 3.3.11 To the south of this blocked arched doorway the wall turned east at right angles to the remaining wall for a short distance before turning south again and joining up with the southern wall. This created an awkward shallow bay at the southern end of the wall, which presumably resulted from the addition of overlapping buildings. At the back of the bay, and high up the wall, there was the outline of a blocked square opening, slightly larger than the previously noted drive transfer openings. It had been blocked up using hard red brick.
- 3.3.12 Beyond the butt joint to the north, and at the approximate centre of the eastern wall, there was a second large double doorway, with a metal lintel and tooled stone jambs, which led into Building E (Plate 30). There were three square openings to the south of this doorway, one at head height with a timber frame and two more above (Plate 31). Beneath the lower opening a horizontal iron beam with a recessed channel in its centre was embedded in the wall. Above the double doorway there was a cast-iron power transfer bracket incorporated into a large blocked square bearing housing (Plate 32). From here power could have been transmitted via a bevel gear along the length of the building.
- 3.3.13 To the north of this bearing housing, the upper third of the wall had clearly been rebuilt or raised in brick and there was evidence for five more square or rectangular openings along its length. The first of these lay just to the north of the central doorway, with a pair at the far northern end and a second pair mid-way between these and the double doorway (Plate 33). The function of these openings was not immediately obvious until an inspection of the eastern elevation revealed the remnants of timber boards lying across at least three of the apertures. From what survived, it appeared that each of the boards had at least one small circular hole cut through them, which had probably held an eyelet (Plate 34).
- 3.3.14 The eastern elevation was also rubble built and included a narrow opening, high up the wall, at the extreme northern end which was not visible on the opposing elevation (Plate 35). The presence of asbestos again prevented close inspection.
- 3.3.15 **Roof:** the roof structure was divided into six bays by five king post trusses, with raking struts projecting from the base of each side of the king post to intersect the underside of each primary rafter (Plate 30). Wrought-iron straps had been employed at the major joints, and two purlins lay at thirds along the backs of each primary rafter. The common rafters were fastened to the back of the purlins with the modern sheet roofing screwed to these. The upper third of the roof on each pitch employed a transparent corrugated plastic covering, forming a continuous skylight.



Plate 30: Internal elevation of Building B's eastern wall, facing north-east



Plate 31: Southern end of internal elevation of Building B's eastern wall, facing east. The blocked arch can be seen to the right of centre with a butt joint immediately to its left



Plate 32: Drive transfer bearing box above doorway between Buildings B and E



Plate 33: Northern end of the eastern wall facing north-east. Note the rectangular apertures towards the head of the wall



Plate 34: Western elevation of the eastern wall facing north-west. The remains of a circular eyelet can be seen in the closest rectangular aperture towards the head of the wall



Plate 35: Northern end of the eastern wall of Building B facing north-west. The high narrow opening to the left of the corner was not visible on the opposing elevation

3.4 BUILDING C

- 3.4.1 Building C lay in the north-eastern corner of the complex, adjoining Building D to the south and overlooking Eagley Brook to the east. Externally, only the eastern wall and the northern gable were visible, with its western wall forming part of the reservoir retaining wall. No formal partition wall existed between Buildings C and D.
- 3.4.2 **Northern Wall:** the northern gable wall was partly obscured by vegetation and the lower portion of its western end was terraced into the bank of the brook. It was constructed in uncoursed rubble with roughly dressed alternating quoins at the eastern corner, and included a raised central parapet to provide room for a clerestory along each side of the roof (Plates 36 and 37). No extant or in-filled openings were noted.
- 3.4.3 **Eastern Wall:** the eastern wall was also of uncoursed rubble construction and its southern limit was indicated by a butt joint and the presence of alternating quoins where it joined Building D (Plate 38). A single tall narrow window, also with alternating quoins at the jambs, lay at the centre of the elevation. The window's timber frame survived, and although the glazing was lost the upper portion retained its two-over-two lights (Plate 39). Immediately above the window there was small square opening fitted with a cast-iron bearing box, and a just to the north a similar stone-lined opening had been blocked up. The proximity of the river prevented a more detailed inspection of the elevation.



Plate 36: External elevation of Building C's northern gable wall, facing south



Plate 37: Northern gable wall, facing south. The raised central parapet can just be seen behind the foliage



Plates 38 and 39: Eastern wall of Building's C and D with butt joint to centre and blocked window immediately to left. The narrow window to the right is located within the centre of Building C's eastern elevation

- 3.4.4 **Interior:** the interior of Building C was subdivided in to a northern and southern cell by an east/west-aligned cross wall erected towards the centre of the structure. Although externally the limits of the southern cell were indicated by the presence of quoins on the eastern elevation internally, there was no distinction between Building C and D.
- 3.4.5 **Northern Wall:** the northern gable wall was constructed of rubble and had been given a coating of white paint, which survived in places (Plate 40). An iron beam projected southwards from the centre of the wall, presumably once forming some structural function, perhaps relating to a low mezzanine or platform. Two small rectangular sockets located at eaves height and at thirds across the length of the wall might have related to an earlier roof structure. In the western corner of the wall the ghost of a small gabled structure, perhaps similar in height and width to a garden shed, were recorded where the paint had been omitted from this portion of the wall.
- 3.4.6 **Western Wall:** the western wall was constructed in the same manner as the northern wall, but its head sloped gradually from north to south. At the northern end three equally spaced, square, stone-lined bearing housings were recorded just below eaves height, and an iron beam projected east from the southern end of the elevation, approximately 3m above the floor (Plate 41). A low section of stone wall projected south from the northern wall, running parallel across the base of the western wall for a distance of approximately 4m, but with no obvious explanation as to its purpose. A culvert ran beneath an arch at the base of this walls northern end.
- 3.4.7 At the southern end of the wall, a joint had been formed with the northern wall of Building E, leaving an awkwardly formed obtuse corner constructed of stone quoins in its lower (Plate 42). The upper half was brick built, and over-sailed the lower half, being supported upon a projecting stone corbel.



Plate 40: Northern gable wall of Building C facing north. Note the empty beam sockets just below eaves height and the roof line of the gable structure to the left



Plate 41: Northern end of the western wall of Building C, facing west



Plate 42: Southern end of the western wall of Building C, facing north-west. An awkward corner joint to the left of frame connects Buildings C and E

- 3.4.8 **Eastern Wall:** the internal elevation of the eastern wall was also rubble built and included two iron beams, identical to that discussed on the western wall, projecting from the northern end of the wall face (Plate 43). Two pairs of empty joist sockets were identified just beneath the present tie beams at thirds along the length of the wall. The square stone lined aperture noted externally was record at a similar height near the centre of the wall (Plate 44), with a smaller rectangular opening immediately to its south, which had not been identified from outside.
- 3.4.9 The narrow window noted externally was located just to the south of the partition wall. It had an iron lintel, alternating quoins and had been blocked with a hard red brick (Plate 45). There were several addition rough sockets towards the base of the northern half of the wall, but much of its surface retained a thick coating of white paint, potentially obscuring all other details. The joint between Buildings C and D recorded externally was not visible from the interior but, in plan, it coincided with the northern wall of the internal leat partition.



Plate 43: Northern end of the eastern wall of Building C facing north-east. Two projecting iron beams can be seen at mid-height, with empty sockets above



Plate 44 Blocked square aperture just to the north of the partition wall in Building C



Plate 45: Internal view of blocked narrow window at centre of eastern wall

- 3.4.10 **Northern Partition Wall:** the northern partition wall was rubble built and appeared to be a later insertion, based upon the absence of substantial through bonding at the junction between its eastern end and the eastern wall of Building C. The relationship at the western junction was more difficult to determine, but may also have been only partly bonded. The wall included a large centrally placed rectangular doorway with an iron lintel above, and although the jambs were hidden by thick white paint they appeared to include at least some dressed quoins (Plate 46).
- 3.4.11 To the east and west of the doorway and above lintel height there was a single large square window-like opening, although neither aperture retained any type of frame. Three empty sockets were noted at eaves height towards the centre of the wall, one offset slightly to the east (Plate 46). The two central sockets appeared to align with those previously described on the northern elevation.



Plate 46: Partition wall in Building C, looking south-east

- 3.4.12 **Roof:** the roof over the northern cell was composed of two identical queen post trusses (Plate 47), bolted together with wrought-iron straps and bolts, while the two trusses to the south of the partition wall were of king post design. The faces of the two southern trusses tie beams were tied together by a series of short longitudinal beams resting within iron sockets. Each end of the four tie beams rested upon a projecting curved stone corbel. The remaining roof construction details were identical to those described in Building B, with a continuous covering of corrugated plastic sheeting forming a roof light across the upper third of both pitches.



Plate 47: Queen post truss in northern cell of Building C

3.4.13 **Fixtures and Fittings:** Building C had a flagstone floor with a thick coating of paint applied to each wall except the western one. A two-way pivoting iron turntable was set into the floor towards the centre of the room's southern end, with tracks leading north and west into Building D (Plate 48). At several points the flagstone floor had been lifted to reveal a culverted drain, which entered the building from below the arch in the north-western corner of the northern cell. It continued east parallel with the northern gable wall before turning south at the eastern corner and following the line of the eastern wall (Plate 49). The drain passed beneath the east/west-aligned partition wall and continued south to enter the covered leat within Building D (Plate 50).



Plate 48: Turntable at southern end of Building C, facing north. 0.5m scale



Plate 49 and 50: Culverted drain running alongside the eastern wall of Building C, looking north. Drain passing beneath the partition wall to right. 0.5m scale in both

3.5 BUILDING D

- 3.5.1 Building D lay to the south of Building C and to the west of Building E, with no internal division between either structure. It was divided from Building F by its original external southern wall, although only the eastern end of this southern wall and the entire eastern wall remained external.
- 3.5.2 **Eastern wall:** the eastern wall was rubble built and included six low and equally spaced rectangular openings, each topped by a heavy stone lintel (Plate 51). The northernmost opening abutted the quoins at the southern end of Building C and, together with the three southern openings, had been bricked up (Plate 38). A timber sluice gate with a top-mounted cast-iron operating wheel survived in the second-most northerly opening, from which it was possible to inspect the enclosed leat (Plate 41). The remaining opening retained its four-by-five light cast-iron framed window (Plate 53).
- 3.5.3 **Southern Wall:** only the extreme eastern end of the southern wall could be seen from the exterior, but it included a rectangular opening at its western end with an iron lintel at its head and tooled alternating quoins on its eastern jamb (Plate 54). It had been in-filled with concrete block work and above it there was a small square stone-lined aperture blocked in brick.



Plate 51 and 52: Eastern wall of Building D, looking north with blocked window to left. Sluice gate to right with 0.5m scale



Plate 53 and 54: Cast-iron window frame on eastern wall of Building D, looking south. 0.5m scale.
External elevation of southern wall of Building D to right

- 3.5.4 **Interior:** internally, Building D had a row of five, north/south-aligned, cast-iron columns along the centre of floor (Plate 55). The northern four columns had been mounted upon concrete bases, but the southern example was not, perhaps suggesting the remainder had been modified. The columns were 6" in diameter, with splayed flanges rising from their heads to intersect the underside of the head plate. The surfaces of each column were heavily corroded. Five more columns, each encased in concrete, lay upon the dividing line between Buildings D and E, and the roof tie beams rested upon both rows (Plate 55). The wall surfaces were coated in thick paint and the floor was laid in concrete.



Plate 55: Interior of Building D, looking north with cast-iron columns to centre of picture and concrete columns to left

- 3.5.5 **Eastern Wall:** the internal face of the eastern wall was largely obscured by the internal partition wall, which ran along the eastern side of the building and divided the room from the covered leat.
- 3.5.6 **Southern Wall:** the northern elevation of the southern wall was thickly coated in green and white paint, but nevertheless retained evidence for several openings, including a large semi-circular headed doorway at the centre of the elevation (Plate 56). The opening had tooled stone jambs and its arch was formed in voussoirs. A large, shallow, rectangular niche to the east of the doorway suggested the former presence of a blocked ground-floor window, while above and to the west of the central opening there was a substantial rectangular cast-iron bearing box (Plate 57). The bearing box was lined with large stone blocks, and had been mounted at a slightly slewed angle to direct the drive to the north-east. A second cast-iron bearing housing lay to the west and at the foot of the large central opening, but its exact function was not clear, while a third bearing box was recorded high up the wall above the eastern recess (Plate 58). Just below the height of this third bearing box the wall stepped back slightly, leaving a shallow shelf with a batter.

- 3.5.7 The southern elevation of the south wall was visible from the interior of Building F, and confirmed the presence of a blocked window on the opposing face of the recess (Plate 59). Although again heavily obscured by paint, the projecting sill of a second window at first-floor height was noted (Plate 60).
- 3.5.8 The large central doorway could also be seen on this elevation, but here it had a projecting keystone and prominent imposts suggesting this elevation had begun as an external wall (Plate 61). The western end of the wall had been slightly disturbed where Buildings B, D and F met, but there were slight traces of a lintel indicating the position of a second ground-floor window. The large bearing box noted on the northern elevation was also visible to the south, but had a small timber doorway in front of it.



Plate 56: Interior of Building D, looking south towards southern wall. Blocked arched doorway to centre and blocked window to left



Plate 57 and 58: Cast-iron bearing box on southern gable wall, looking south. Note the intentional slew in its positioning. Smaller bearing box to right, retaining the lower half of its pillow block



Plate 59: Southern elevation of Building D's southern wall



Plate 602 and 61: Projecting sill at first-floor level of southern elevation indicating former position of a window. Blocked doorway at centre of southern wall of Building D to right. The projecting keystone is visible at the centre of the arch, suggesting an external elevation

- 3.5.9 **Covered Leat:** the covered leat was composed of a north/south-aligned wall running along the eastern side of the room, which turned east at its northern end to join the external wall (Plate 62). There was a low rectangular opening at the centre of the northern wall topped by an iron lintel, and a small square aperture above, approximately mid-way up the wall.
- 3.5.10 The western wall of the leat was covered in thick paint, but appeared to be of rubble construction, although it showed signs of patching and numerous alterations in brick (Plate 63). A series of redundant stone corbels approximately three quarters of the way up the wall showed it had certainly been raised in height.
- 3.5.11 A series of five square iron wall ties were recorded upon the western elevation of the leat partition, presumably tying the wall to the exterior face of the eastern wall of Building D. At the southern end of the leat wall there was a very narrow doorway with stone surrounds from which it was possible to inspect the interior of the covered leat (Plate 64).
- 3.5.12 The area enclosing the leat was a long narrow space with a low ceiling supported on timber joist (Plate 65). Its limited access prevented a detailed record, but from what was observed it appeared that much of the pipe work and plumbing relating to the bleach works survived. The water was channelled along a stone-lined drain along the western side of the space, where it continued, to exit the building at its southern end (Plate 66). The floor above supported at least one stone tank.

- 3.5.13 ***Fixtures and Fittings:*** immediately in front of, and running parallel to, the western wall of the leat there was a low brick wall with an east/west-aligned return at the northern end (Plate 67). The western elevation of this wall contained evidence for a series of demolished partition walls projecting westwards to from what must have been four large rectangular tanks. Surviving white glazed bricks on the face of the surviving section of the tanks indicated that the northern three tanks had been lined with these, while the southern tank appeared to have been lined with sandstone slabs (Plate 67). The only remaining slab was heavily eroded, perhaps suggesting continued exposure to corrosive chemicals. Each tank coincided with the flanged fitting of an iron pipe, which projected from approximately one quarter of the way up the face of the leat partition wall (Plate 68).
- 3.5.14 In the south-western corner of Building D, at the intersection with Buildings B, E and F, there was a shallow east-facing bay containing a raised brick and stone platform (Plate 69). An iron mounting bracket was bolted to the upper surface of the platform, suggesting the former presence of an engine or some other piece of mechanical equipment. At the rear of the bay a large semi-circular headed arch was visible, the reverse side of the blocked arch described in Building B. The platform obscured the lower half of the archway, and its insertion may have prompted the blocking of the arch. A rectangular cast-iron housing had been inserted into the blocked archway subsequently, visible from Building B as bricked-up aperture.



Plate 62: Interior of Building D with covered leat to left of frame



Plate 63: Western wall of leat with redundant corbels towards the head of the wall



Plate 64: Narrow opening at the southern end of the western wall of the leat. 0.5m scale



Plate 65: View into covered leat, looking south from the northern opening



Plate 66: View into covered leat, looking north from the external sluice gate



Plate 67: Low brick wall in front of western wall of leat. The partition walls have been removed, but their locations can still be identified



Plate 68: Flanged pipe projecting from western wall of leat. 0.5m scale resting upon the top of the remnants of the heavily eroded stone-lined tank



*Plate 69: Shallow east-facing bay with raised platform inserted and blocked archway behind.
0.5m scale*

3.6 BUILDING E

- 3.6.1 Building E lay to the east of Building B, with which it shared its western wall, and was divided from Building D by a series of four substantial concrete pillars (Plate 70). It constituted just a single wall at its northern end, the remainder having been described above within Sections B and D.



Plate 70: Looking north from Building D, with Building E beyond the concrete pillars

- 3.6.2 **Northern Wall:** the northern gable wall formed part of the reservoir retaining wall, and only its upper gable was exposed above ground. It was rubble built with tooled alternating stone quoins and, as with Building C, it had a raised parapet to allow room for a clerestory along the length of the roof (Plate 71). The roof, however, had since been reduced in height and replaced with a standard gable. Although partly obscured by vegetation, a large square window was noted at the centre of the wall. It had been blocked-up using a hard red brick.



Plate 71: Raised central gable of northern wall of Building E, largely obscured by vegetation

- 3.6.3 **Interior:** internally, the wall was of rubble and retained traces of white paint across its surface (Plate 72). The window recorded externally was also visible internally, where it was revealed as a rectangular opening rather than a square one. There was a small, square, cast-iron bearing box towards the western end of the wall and a short distance below eaves height, while a rough low plinth extended from the base of the elevation.
- 3.6.4 **Roof:** the roof consisted of four king post trusses, which diminished in size to the south. The tie beams rested upon the partition wall between Buildings B and E to the west and upon the tops of the concrete pillars to the east. It was covered in slates, but where these had been lost they had been replaced with plastic corrugated sheets.
- 3.6.5 **Fixtures and Fittings:** a substantial iron pipe with multiple connection points projected south for a distance of approximately 1.5m, from the western end of the northern wall. A cast-iron wheel mounted upon the top of the pipe would have allowed the flow of water to be controlled.



Plate 72: Internal elevation of northern wall in Building E

3.7 BUILDING F

- 3.7.1 Building F was a rectangular structure lying to the south of Building D and overlooking Eagley Brook to the east. Its southern and western elevations had been enclosed subsequently by the erection of Buildings G and J respectively.
- 3.7.2 **Eastern Wall:** the only fully external elevation lay to the east, and was built of stone rubble to first floor ceiling height (Plate 73). It included two rectangular ground-floor windows separated by a stone tank affixed to the face of the wall and raised above the height of the leat.
- 3.7.3 The northern window had a single-piece stone lintel and flush sill, both tooled to a picked finish (Plate 74). Two of its original four vertical, elongated rectangular lights survived in place, while a short cast-iron post had been inserted into the southern half of the opening.
- 3.7.4 The southern window had a single-piece tapered stone lintel and projecting stone sill (Plate 75). A small, square, stone-lined aperture lay immediately above the window, but it had been in-filled with stone rubble.
- 3.7.5 Both windows had a corresponding rectangular first-floor window above with a projecting stone sill and single-piece stone lintel. The northern window opening had been bricked up but the southern window retained its three-by-three light frame complete with glazing (Plate 73).



Plate 73: Eastern wall of Building F, looking north



Plate 74: Four-light window on eastern wall of Building F, with inserted cast-iron column replacing the two southern lights. Note the stone tank to the left of the window suspended above the leat



Plate 75: Southern ground-floor window, with tank to right. 0.5m scale

- 3.7.6 **Interior:** the internal elevation of the eastern wall was coated in white paint and three of the openings noted externally were clearly evident (Plate 76). The fourth and blocked first-floor opening to the north appeared only as a hollow in the face of the wall, and had a cast-iron mounting bracket bolted to the wall in front of it. The function of the bracket was not clear.
- 3.7.7 The western wall was constructed of coursed sandstone blocks laid in water-shot fashion, reflecting its original external character (Plate 77). Only the ground floor had been enclosed, and it had a large ground-floor doorway at the northern end with a flat H-section iron lintel. The southern jamb had no formal quoins, but the northern jamb was constructed using alternating quoins and, in fact, the entire northern end of the ground floor beyond the southern jamb had been rebuilt in rubble. At the southern end of the elevation there was a large vertically set rectangular window with a single-piece tapered stone lintel and a plain stone sill beneath (Plate 77). The opening had been in-filled with hard red brick. A shorter window with a projecting stone sill and tapered stone lintel was recorded at first-floor level directly above the ground-floor window, with a second of identical character to the north (Plate 78). A circular iron clamp was bolted to the first-floor exterior face at the southern end of the wall.
- 3.7.8 Internally, the western wall was constructed of uncoursed rubble, and it appeared that the rebuilding at the northern end may have related to the partial in-filling of a larger doorway (Plate 79). The present doorway had a top rail mounted sliding timber door. Above the doorway, a cast-iron joist bracket had been bolted to the face of the wall, but the end of the joist had sheared off leaving the first-floor structure in a precarious state. Internally, it was evident that the southern first-floor window retained its three-over-three light timber frame, but that the northern window had not.



Plate 76: Western internal elevation of eastern wall of Building F, facing north-east. The cast-iron bracket can just be seen in the top left hand corner of the photo



Plate 77: Western elevation of western wall of Building F, facing north-east



Plate 78: Building F, with western elevation to left and southern gable elevation to right, facing north. The first-floor window of the southern elevation is just visible to the right of the chimney stack



Plate 79: Building F, internal elevation of western wall, facing west

- 3.7.9 The southern wall was constructed of uncoursed sandstone, but a vertically set rectangular ground-floor window with a tapered stone lintel and single-piece stone sill at the centre of the elevation demonstrated it had been built as an external elevation (Plate 80 and 81). The window had been blocked, and a small rectangular brick chimney constructed immediately to its west, projecting from the centre of the elevation and obscuring the western jamb of the blocked window. A doorway with rubble jambs and a timber lintel lying to the east of the window may have been a later insertion, judging by its proximity to the window and slightly awkward surrounds.
- 3.7.10 Above the roof line of Building G there was a second window at first-floor height, and directly above the ground-floor window to which it was identical in form (Plate 78). At the western end of the elevation an iron pulley hoist, clearly predating the erection of Building G, was bolted to the wall (Plate 78).
- 3.7.11 **Roof and First-Floor Structure:** the roof structure included four substantial trusses, the three to the south being of king post design, while that at the northern end was of crown post form. Although no formal floor remained, the presence of first-floor windows suggested one may once have been present and four joists remained *in-situ*. A central east/west-aligned joist was accompanied by a second joist on the same alignment at the northern end of the building. A small first-floor platform in the north-western corner with a timber step ladder rested upon the latter joist (Plate 82). Two diagonally set joists extended from the southern wall to the western end of the central joist at the southern end.



Plate 80: Building F, southern elevation, facing north-east



Plate 81: Building F, southern elevation, facing north. Note the blocked window to the right of the inserted chimney breast



Plate 82: First-floor platform with timber ladder, in north-western corner of Building F

3.8 BUILDING G

- 3.8.1 Building G was a single-storey triangular structure with a gable roof located in the south-eastern corner of the complex, abutting Building F to the north and Building J to the west.
- 3.8.2 **Exterior:** the only external wall lay to the south-east, where it followed the alignment of the brook as it curved round to the south-west. This wall was constructed of sandstone rubble and had a vertically set rectangular window at the northern and southern ends, both with a tapered stone lintel and projecting stone sill. Although boarded-up, the northern window retained its three-by-three light timber frame with at least some of its original glazing intact (Plate 83). The southern window had been bricked-up. The butt joint between Building G and F was clearly visible at the northern end of this wall, with the alternating quoins of Building F extending to the north (Plate 84).
- 3.8.3 At the southern end of the wall, a large doorway with a steel H-section lintel provided access to the covered southern cell of Building G via a footbridge over the brook from the road. The entrance contained no doorway, but led onto a second doorway with a set of modern double doors from which the northern cell of the building could be accessed (Plate 85).



Plates 83 and 84: Northernmost window on eastern elevation of Building G, with butt joint between Buildings G and F to right

- 3.8.4 **Interior:** internally, the building was divided into an enclosed northern cell and a covered southern cell with an east/west-aligned partition wall between. It could be accessed via a doorway in the southern wall of Building F, or through the double doors within the east/west-aligned partition. A third entrance lay in the north-western corner via a short corridor formed between the western wall of Building F and the western wall of Building G. No original fixtures or fittings survived, with the exception of the brick chimney described in relation to Building F, and the floor was laid in concrete.



Plate 85: Southern entrance into Building G from the footbridge

- 3.8.5 Internally, the eastern wall had been coated in white paint but, apart from the two windows described externally, displayed no other features of historical note (Plate 86).
- 3.8.6 The western wall was constructed of sandstone rubble and retained traces of an internal plaster finish. The only features of interest were a small, square, stone-lined aperture near the base of the centre of the wall, which had been infilled with brick and a small circular iron tie clamp at the base of the southern end of the wall (Plate 87).
- 3.8.7 **Roof:** the roof was composed of a single off-centre king post truss at the southern end of the northern cell (Plate 88). Purlins, extending from the southern elevation of the northern wall, were carried upon the back of the trusses principal rafters. The roof was covered with slates, although a number of these had been lost.



Plate 86: Internal elevation of the eastern wall, showing blocked windows at either end



Plate 87: Internal elevation of the western wall, with blocked aperture to centre and wall clamp to left



Plate 88: King post truss at the southern end of Building G, facing south-west

3.9 BUILDING H

- 3.9.1 Building H was a single-storey rectangular building, aligned east/west, and lying at the southern end of the complex where it bordered the main road (Plate 89). It was abutted to the north by Building I and to the east by Building J, with its western gable wall facing the open yard at the entrance to the site.
- 3.9.2 **Exterior:** externally, the western gable, eastern end wall and southern elevation were visible, although the partial demolition of Building I had exposed the surviving upper gable of the northern elevation.
- 3.9.3 The southern elevation of the southern wall was laid in coursed sandstone blocks laid in water-shot fashion, but contained no visible openings of any kind (Plate 90). Its lowest 1m had been stained and eroded by roadside pollution. The western end of the wall projected past the south-western corner of the building slightly, suggesting that originally the structure was longer than at present.
- 3.9.4 The western gable wall was built in uncoursed sandstone rubble, and included a raised parapet at its head (Plate 91). At the southern end of the wall there was a blocked pedestrian doorway, abutting the projecting southern wall to the south, but with quoins on its northern jamb (Plate 92). The character of the quoins suggested these may have been reused from elsewhere. A series of blocked joist sockets were noted across the length of the wall at eaves height, indicating the former presence of a first floor or attic space, but the remainder of the wall was obscured at the time of survey by a large skip (Plate 93). At its northern end, the wall could be seen to abut its northern elevation rather than forming a corner, and although truncated and refaced subsequently, it appeared that the northern wall had continued west beyond the limit of the western wall (Plate 94).



Plate 89: Building H, facing east along Egerton Road



Plate 90: Building H, southern external elevation (Griffiths, 2014)



Plate 91: Building H, western external elevation, partially obscured by skip



Plate 92: Blocked doorway at southern end of western gable wall. 0.5m scale



Plate 93: Blocked joist sockets on western gable wall. 0.5m scale

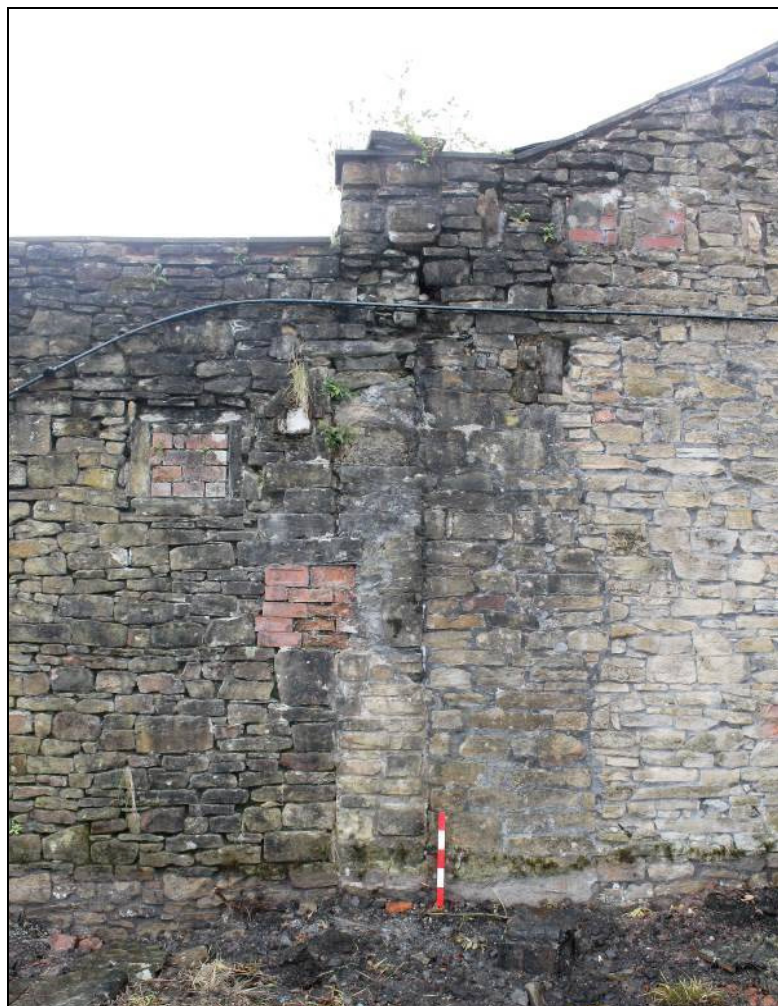


Plate 94: Butt joint at northern end of western gable wall with 0.5m scale

- 3.9.5 Only the upper gable of the northern wall of Building H remained, with the surviving masonry resting upon an iron lintel supported at its centre by a cast-iron column set upon a concrete pad (Plate 95). Although enclosed subsequently, the coursed sandstone blocks suggested that this had originally been an external elevation, and this was confirmed by the presence of four equally spaced rectangular windows along the length of the wall.
- 3.9.6 The upper portions of the eastern and westernmost windows had been truncated during works to remodel the wall to accommodate a gable roof, but the single-piece lintels survived in the two central examples. All of the windows had been blocked-up and a series of joists, and purlin sockets had been cut into the face of the wall.
- 3.9.7 The eastern wall of Building H was shared with the later Building J, but is discussed here in relation to Building H. Externally, the wall was constructed in rough sandstone rubble upon a north-north-eastern alignment (Plate 96). From the centre of the elevation, the wall altered its alignment slightly to the north-east, adjoining the south-eastern wall of Building G at its north-eastern end. A large loading doorway within the north-eastern half of the elevation had rough stone quoins, and was topped by an iron lintel. It was fitted with a timber door constructed in narrow vertical planks.



Plate 95: Remaining section of northern elevation of Building H

- 3.9.8 **Interior:** the partial removal of partition walls between Building I to the north and Building J to the east had resulted in a single continuous floor space, divided by a masonry pier to the east and a cast-iron column to the north (Plate 97).
- 3.9.9 The internal elevation of the southern wall contained no visible openings, but its upper half was coated in white paint, which may have obscured some detail. The lower half of the wall was clearly suffering from damp ingress, reflecting its use as a retaining wall against the road surface to the south.



Plate 96: Eastern elevation of Building H, with loading doorway to right



Plate 97: Looking north-west across Building H, with Building I beyond

- 3.9.10 The blocked doorway at the southern end of the western wall recorded externally was also visible internally, but appeared to be a taller doorway. This perhaps suggests that the ground surface to the west of the building has been raised since its construction (Plate 98). Just to the north of the doorway and at lintel height there was a cast-iron bearing box set into the wall, with another near the centre of the elevation at approximately 1.5m from the ground.
- 3.9.11 Internally, the eastern wall was rubble built and coated in thick white paint. With the exception of the large opening at the north-eastern end, it contained no other visible openings. The remaining portion of the northern wall was rubble faced and, with the exception of those windows described externally, contained no other openings.
- 3.9.12 **Roof:** The roof structure relied upon two substantial queen post trusses carrying purlins upon their backs, which in turn supported the common rafters and battens on to which the slates were hung. Two half trusses projected eastwards from the face of the eastern truss to form the hipped eastern end of the roof.
- 3.9.13 **Fixtures and Fittings:** the building retained no machinery or related equipment, but at several points the flagstone floor had been lifted to reveal a substantial system of stone-lined drains beneath, suggesting the management of large quantities of water.



Plate 98: Western wall of Building H, facing west. The blocked doorway can be seen to the left of the frame with the bearing box in the centre

3.10 BUILDING I

3.10.1 Building I was a sub-rectangular, single-storey structure, aligned broadly north/south and located within the angle between Building A to the north, Building H to the south and Building J to the east. Its western wall faced onto the present open yard.

3.10.2 **Exterior:** the western wall was the only external wall, and comprised roughly squared sandstone blocks brought to very rough courses. It abutted the northern wall of Building H at its southern end, and the southern wall of Building A to its north (Plate 99). A pedestrian doorway with a concrete lintel and jambs roughly rendered in concrete was located at the northern end of the wall (Plate 100). It had been blocked-up with rough sandstone blocks. Immediately above the doorway there was a small square opening with stone surrounds, and a second at the southern end of the wall (Plate 101). Both had been blocked-up with red brick. Near the head of the wall at the centre and northern end of the elevation were two smaller stone-lined openings.

3.10.3 **Interior:** internally, the western wall was as described externally, but the southernmost square opening retained a cast-iron bearing box. The eastern wall was constructed in sandstone rubble and retained traces of its internal plaster finish (Plate 101). It contained a single cast-iron bearing box near the head of the wall at the southern end, corresponding to the bearing box noted on the opposite wall. At the centre of the elevation there was a low pedestrian doorway with a timber lintel and rough stone jambs. The wall was of patched and repaired appearance, and the loss of the plaster finish had revealed the only surviving wall of a low gabled structure (Plate 101). The outline of this building's gabled roof could be identified on both elevations, indicating that the entire wall had been fossilised within the later wall above. Given its position and height, it is probable that the doorway described above belonged to this original building rather than to Building I. The eastern elevation appeared much the same as the western elevation but a small, square, stone-lined aperture at the base of the wall's western end was noted and the lintel over the central door was a single piece of sandstone. The roof had been taken down prior to the present survey, and all fixtures and fittings removed from the interior. The floor had been laid in concrete.



Plate 99: Western wall of Building I, facing east.



Plate 100: Blocked doorway at northern end of western wall, facing east. Stone-lined aperture above. 0.5m scale



Plate 101: Internal elevation of eastern wall of Building I. The outline of an earlier single-storey gabled building can be seen

3.11 BUILDING J

- 3.11.1 Building J was an elongated rectangular structure, aligned north/south and covered with a gabled slate roof (Plate 102). It was enclosed on all four sides, with Buildings F and G to the east, Building B to the north and Buildings H and I to the west. The building represented a later development and, as such, had no walls constructed specifically for its own purpose.
- 3.11.2 **Interior:** the floor was laid in concrete, except at the northern end where an area of flagstones had been retained, possibly relating to an earlier courtyard area. No internal fixtures and fitting survived.
- 3.11.3 **Roof:** the roof structure was formed of four trusses, the two to the north being of king post design and the two to the south employing king rods. The southernmost example had been altered, with additional posts and a collar taking the place of the king rod, presumably to provide additional strength to support equipment (Plate 103).
- 3.11.4 At the northern end of the building, the flagged area had been covered by a section of roof, hipped to the east and supported on two king post trusses, which had been inserted into the remaining awkward space between Buildings J, B and F.



Plate 102: Interior of Building J, looking southwards



Plate 103: Interior of Building J, looking northwards. Modified southern truss in foreground

3.12 BUILDING K

- 3.12.1 The natural topography rose from east to west, and the western end of the yard appeared to have been terraced into the slope in order to maintain a consistent level on which to build. Building K lay at the western end of the yard, and was a five-sided sub-rectangular structure with an entrance at road level, built upon a lower retaining wall. This effectively created a structure a single-storey high to the south west, where it faced the road, and two storeys high to the north and east, where it overlooked the yard. Building L abutted Building K to the west, sharing its north-east/south-west alignment (Plate 104).



Plate 104: Buildings K and L, from the east across the open yard

- 3.12.2 **Exterior:** the southern wall formed the primary elevation, and was constructed in coursed sandstone blocks laid in water-shot fashion (Plate 105). It had a large loading doorway at the western end with a steel lintel over. Above the western end of the lintel there was a small square aperture inserted into what appeared to be a blocked first-floor window. The aperture had also been blocked on its northern elevation, and a timber frame had been fitted to the exterior.
- 3.12.3 At the centre of the eastern end of the elevation there was a vertically set rectangular window with a tapered stone lintel and single-piece projecting stone sill (Plate 106). An identical first-floor window lay immediately above, but the upper third of the opening had been cut away when the building was reduced in height. To the east of the large opening a small section of low stone wall projected south for a distance of approximately 1m, and was topped by a flat coping stone. Scarring on the face of the main wall behind suggested this wall may once have been taller.
- 3.12.4 The coursed masonry blocks continued round onto the upper half of the eastern wall, suggesting it had been constructed as an external elevation, although the lower half was constructed of un-coursed rubble masonry (Plate 106). There was a centrally placed window at road level with a single-piece splayed stone lintel and projecting stone sill (Plate 107). This window had been blocked, and the diagonal scar of a roof pitch ran across its middle. A second window opening directly above had been truncated and was missing its lintel, demonstrating again that the building had been reduced in height. At the southern end of the elevation, there was the southern jamb and lintel of what appeared to have once been a road-level doorway (Plate 106). The northern jamb had been removed and the opening blocked.
- 3.12.5 At yard level, there was a centrally placed doorway with a splayed lintel over, identical in form to that of the window above (Plate 108). It had been blocked and the northern end of its lintel had been cut away by the insertion of a second doorway, with a timber lintel over. This doorway had been blocked-up subsequently. Above and to the right of this doorway lay a small stone-lined horizontal rectangular opening of unknown function (Plate 109). It too had been blocked with masonry.
- 3.12.6 The eastern wall was of rubble construction, and had a road-level doorway towards the north-western end of the elevation (Plate 110). It had been blocked and its surrounds removed making it more difficult to identify externally. At the opposing end there was a large cast-iron bearing box housing projecting from the face of the wall, but this had also been blocked-up (Plate 111).
- 3.12.7 The northern wall was of uncoursed rubble and contained a single road-level window at the centre of the elevation (Plate 112). It retained its fixed two-over-two light glazed timber frame and had a narrow projecting stone sill. The lead flashing of a removed roof ran across the elevation, just beneath the window, rising to an apex at the western end before continuing across the north-eastern elevation of Building L (Plate 112).



Plate 105: Southern elevation of Building K

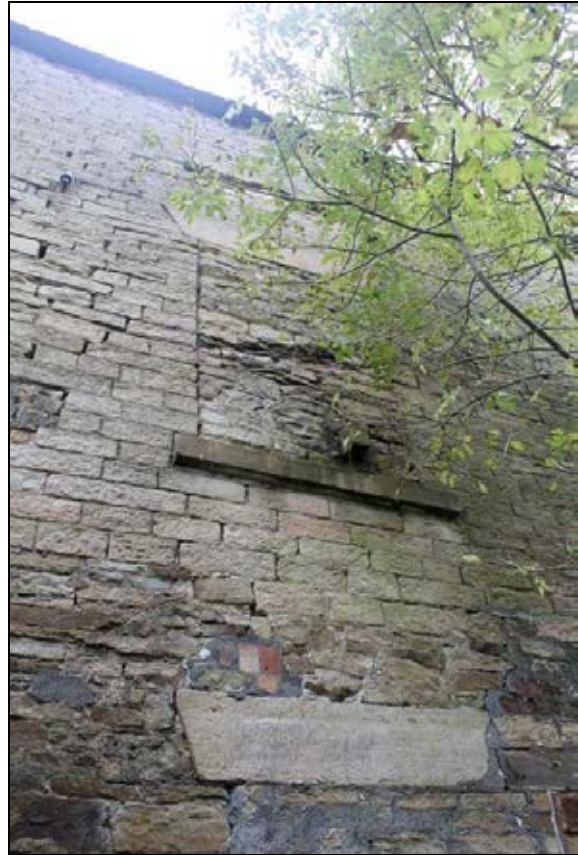


Plate 106 and 107: Upper half of south-eastern elevation from Egerton Road to left. Looking up to ground-floor window from level of open yard to right



Plate 108 and 109: Blocked doorways at yard level on south-eastern elevation, 0.5m scale. The photograph to the right shows the northernmost doorway again but with the blocked rectangular aperture above



Plate 110: South-western elevation of Building K to left with eastern elevation to right. The blocked doorway can just be seen to the left of centre



Plate 111: Blocked cast-iron bearing housing on south-eastern elevation



Plate 112: North-eastern elevation with two-over-two window and diagonal line of lead flashing running beneath it from left to right

- 3.12.8 **Interior:** the interior comprised a single undivided room at road level, with a floor of flagstones and concrete (Plate 113). A vehicle inspection pit had been inserted in the western side of the room, whilst a stone dog-leg staircase leading down to the external yard, was located in the south-eastern corner. The staircase had been covered over with heavy timber planks (Plate 114). Internally, the southern, south-eastern, eastern and northern walls were as described externally, with the majority of the openings described externally visible internally despite a thick coating of white paint. No other fixtures or fittings survived. The western elevation of the western wall had been enclosed by the construction of Building L, but it was constructed of roughly coursed masonry and retained evidence of several openings across its length (Plate 115). At the northern end of the north-western wall there was a large vertically set rectangular window with a splayed single-piece stone lintel and projecting stone sill (Plate 116). To its right lay a low doorway with alternating stone jambs and single-piece stone lintel. Both openings had been blocked with brickwork. A second and also blocked window of identical form to the last lay to the east of this doorway, with a second doorway beyond this retaining its plain stone surrounds (Plate 117). The latter had been blocked using rubble masonry. Above the northernmost window there was a small square blocked aperture with stone surrounds, which presumably once held a bearing box (Plate 116). A second blocked bearing box was noted at the opposing end of the elevation and a third lay at the centre of the wall. This last aperture had substantial single-piece stone surrounds and its cast-iron bearing box was still visible on the eastern elevation (Plate 118)
- 3.12.9 **Roof:** the slate roof was hipped and supported by a pair of king post trusses spanning the south-eastern and north-western wall plates (Plate 119). Raking struts projected from the base of each king post to join the underside of each principal rafter with half trusses supporting the roof to the north and south.



Plate 113: Interior of Building K looking north from the southern entrance



Plate 114: Doorway at base of staircase in south-eastern corner of room



Plate 115: North-western wall of Building K, facing south-east from within Building L. Several blocked openings visible across its length

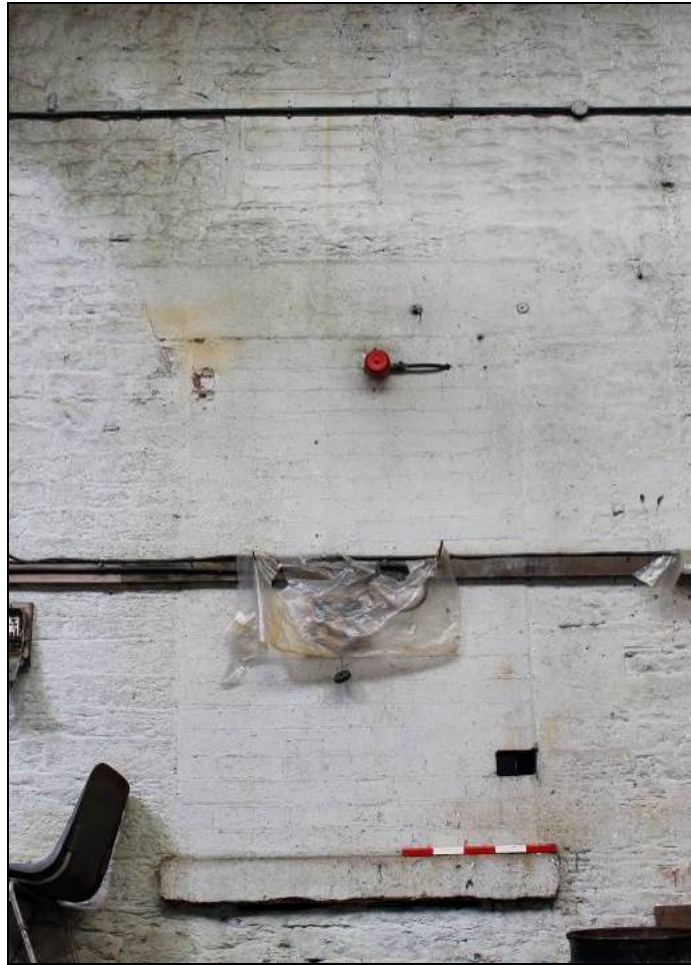


Plate 116: Northernmost window on north-western wall of Building K, facing east. 0.5m scale



Plate 117: North-western wall of Building K facing north-west. Blocked openings visible across its length



Plate 118: Central bearing box with substantial single-piece stone surrounds, looking west



Plate 119: King post roof truss in Building K

3.13 BUILDING L

- 3.13.1 Building L was located at the western end of the complex, abutting Building K to the east and sharing its north-east to south-west alignment. Like Building K, it was a five-sided structure, two-storeys high on its north-eastern side but only a single-storey to the north, north-west and south-west. The building was constructed of roughly coursed rubble sandstone with alternating quoins at the corners.
- 3.13.2 **Exterior:** the south-western wall faced onto the lane continuing on from Maria Square and had a large loading doorway at its south eastern end (Plate 120). The south-eastern jamb was formed by the north-western wall of Building K and the opposing jamb was constructed using alternating quoins. The opening was topped by a narrow gauge iron lintel and fitted with a rail mounted sliding timber door with a pedestrian doorway at its centre (Plate 121).
- 3.13.3 Only the upper half of the north-western wall was exposed externally and this was largely obscured by vegetation (Plate 122). The only opening observed was a large square vent at the centre of the wall.
- 3.13.4 The northern wall was also partly obscured by vegetation, but had a mid-sized loading doorway at its eastern end with a narrow gauge iron lintel and alternating quoins to the east (Plate 123). The western jamb had been much altered, and its original form was not determined, although a large vertically set rectangular window lay immediately to the west of the doorway. The window had been blocked with red brick. The doorway was fitted with an internally opening timber door, hinged to the east.
- 3.13.5 The north-eastern wall had no windows or doorways, but at the base of the wall there were at least two square stone-lined apertures, one to the south-east and another near the centre of the elevation (Plate 124). Both were blocked with brick, but presumably once served as end bearing boxes for a now demolished structure to the east. Additional evidence of this structure survived in the horizontal scar of its former roof-line, approximately two thirds of the way up the elevation and extending across the full length of the wall (Plate 125).
- 3.13.6 **Interior:** with the exception of the north-western wall, internally, the walls revealed no additional features to those described externally and were coated in thick white paint (Plate 126). The floor was laid in concrete, except for the entrance area to the north where the original flagstones had been retained.
- 3.13.7 On the internal elevation, the central vent recorded externally was fitted with a timber surround and boarded up with a sheet of hardboard (Plate 127). Directly beneath it there was a steel shelf resting upon projecting steel beams which may have supported an air conditioning unit. The lower half of the wall was obscured by modern corrugated metal sheeting.



Plate 120: South-western elevation of Building L, looking east



Plate 121: South-western elevation of Building L, looking north with Building K to right of frame



Plate 122: North-western elevation of Building L, looking south-east with northern elevation to left of frame



Plate 123 and 124: Northern elevation of Building L, looking south. Note the blocked window to the right of the doorway. Frame to the right shows two blocked bearing boxes at the base of the north eastern wall



Plate 125: Looking south-east along the line of the north-eastern elevation of Building L. The roof scar of a demolished building can be seen at around mid-height

- 3.13.8 **Roof:** the slate roof was supported on four king post trusses similar in form to those used in Building K (Plate 128). At the hipped south-western end a series of three half trusses projected from the southern most king post truss to rest upon the south-western wall plate. The roof was in a poor condition with numerous slates missing, and a bank of central roof lights either side of the ridge-line had been provided by replacing the slates with corrugated plastic sheeting.
- 3.13.9 **Fixtures and Fittings:** although no original fixtures and fittings remained within the building, a low concrete platform was noted at the northern end of the south-eastern wall which may have formed a plinth for machine (Plate 129). A second plinth, probably performing the same function, lay to the west of the centre of the floor (Plate 130).



Plate 126: Interior of Building L, facing north



Plate 127: Blocked vent at centre of north-western wall



Plate 128: King post roof trusses supporting roof of Building L, facing north



Plate 129: Low concrete platform at northern end of southern eastern wall, 0.5m scale



Plate 130: Interior of Building L looking south. Note the low concrete platform at centre of western half of the building

4. DISCUSSION

4.1 INTRODUCTION

- 4.1.1 The surviving structures comprising the remnants of the Belmont Bleach Works demonstrate a complex pattern of development, which incorporate alteration spanning two centuries. The nature of the present survey and the poor condition of the buildings, however, meant that only broad phasing has been considered in the following discussion.

4.2 DEVELOPMENT

- 4.2.1 The earliest identifiable structure within the present study area was Building A, with its southern and eastern walls potentially dating from the early 1800s and the beginning of textile printing on the site. The architectural style employed in the remaining elements of the building is consistent with an early nineteenth-century construction date, and the footprint of the building corresponds with a structure depicted on the Ordnance Survey map of 1849.
- 4.2.2 The original building appears to have been a detached two-storey structure, aligned with Egerton Road to the south and the reservoir to the north. The quality of the southern elevation suggests that it originally faced directly onto the road, perhaps with an open yard immediately in front. The loss of the western wall prior to the present survey limits the interpretation of the building on this side, but it is nevertheless clear that the eastern elevation was external and included a large cart entrance at the southern end. This tentatively suggests that the building may have been intended, at least in part, as a warehouse, where grey cloth was stored after delivery to the works for printing. As such, it is possible that preparatory process such as singeing the cloth and sewing bundels together may also have been carried out in this building.
- 4.2.3 Evidence gathered from the archaeological survey indicates that Building B was added to the east of Building A, maintaining the southern façade both in character and alignment. The southern elevation of Building D also maintains this alignment and architectural character in its large semi-circular headed archway. Although the wall dividing Buildings B, E and D has been described above in relation to Building B, it has seen considerable alteration and it is possible that it was constructed originally as a part of Building D, incorporating Building E. The alignment of the walls at the south-eastern corner of Building B and the location of the blocked semi-circular headed archway in the partition wall would support this interpretation.
- 4.2.4 The construction joint on the eastern elevation between Buildings C and D clearly demonstrates that Building C is an earlier structure, although it retains almost no architectural details to lend support to this interpretation. Similarly, the paucity of original internal fixtures and fittings precludes a clear understanding of its intended function.

- 4.2.5 Building F was added to the southern elevation of Building D, creating a north/south-aligned range to enclose the eastern side of the open yard. Like Building A, this was also a two-storey structure and the windows to the west and south clearly demonstrate that the yard to the west was still open at this point.
- 4.2.6 The open yard was infilled with the construction of Buildings G, H, I and J during the second half of the nineteenth century, although they appear to have been altered extensively, and their relationships are difficult to determine precisely. The preserved gable wall, however, indicates that a low single-storey gabled structure existed prior to the erection of Building I or J.
- 4.2.7 The demolition of the intermediate structures prevents the phasing of Buildings K and L in relation to the remaining buildings, but it is clear from the shared partition wall that Building K predates Building L. It is also clear from the truncated windows that Building K once had at least a first floor, which was removed on the lowering of the roof.

BIBLIOGRAPHY

CARTOGRAPHIC SOURCES

Ordnance Survey first edition 6" to 1 mile map, published 1849

Ordnance Survey first edition 25" to 1 mile map, published 1894

Ordnance Survey second edition 25" to 1 mile map of 1910

Ordnance Survey third edition 25" to 1 mile map of 1929

PRIMARY SOURCES

Bolton Archives

ZDEH/36/3 Share certificate: Edward Deakin of Belmont, bleacher, 1896

Newspapers

London Gazette, 16 April 1808

London Gazette, 25 December 1810

London Gazette, 6 July 1813

London Gazette, 22 April 1845

London Gazette, 16 June 1847

London Gazette, 15 May 1857

London Gazette, 12 May 1893

Preston Guardian, 10 February 1855

SECONDARY SOURCES

Ashmore, O, 1969 *The Industrial Archaeology of Lancashire*, Manchester

Ashmore, O, 1982 *The Industrial Archaeology of North-West England*, Manchester

Aspin, C, 1995 *The First Industrial Society: Lancashire, 1750 – 1850*, Preston

Baines, E, 1825 *History, Directory and Gazetteer of the County Palatine of Lancaster*, 2, Liverpool

Barfoot, JR, 1840 *The Progress of Cotton*, London

Calico Printers' Association, 1949 *50 Years of Calico Printing*, Manchester

- Chaloner, WH, and Musson, AE, 1965 *Industry and Technology*, London
- Chapman, SD, and Chassagne, S, 1981 *European Textile Printers in the Eighteenth Century*, London
- Countryside Commission 1998 *Countryside Character Volume 2: North West*, Cheltenham
- Dodd, G, 1844 *Textile Manufactures of Great Britain*, London
- English Heritage, 2006 *Understanding Historic Buildings: A Guide to Good Recording Practice*, London
- Graham, J, 1846 *The Chemistry of Calico Printing 1790-1835 and History of Printworks in the Manchester District from 1760 to 1846*, Manchester
- Mather & Platt Ltd, 1958 *A History of Mather & Platt - Technical Invention and Business Enterprise*, Manchester
- Miller, I, 2012 *An Industrial Art: The Archaeology of Calico Printing in the Irwell Valley*, Greater Manchester's Past Revealed, **12**, Lancaster
- Murphy, WS, 1911 *The Textile Industries: A Practical Guide to Fibres, Yarns, and Fabrics in Every Branch of Textile Manufacture*, **8**, London
- OA North, 2010 *Lancashire Textile Mills Rapid Assessment Survey*, unpubl rep
- O'Brien, C, 1792 *A Treatise on Calico Printing*, London
- O'Neill, C, 1862 *A Dictionary of Dyeing and Calico Printing*, London
- Sykes, AJ, 1926 *Concerning the Bleaching Industry*, Bleachers' Association, Manchester
- Turnbull, JG, 1951 *A History of Calico Printing in Great Britain*, Altrincham
- Wadsworth, AP, and Mann, J, 1931 *The Cotton Trade and Industrial Lancashire, 1600-1780*, Manchester
- Wallwork, K, 1968 The Calico Printing Industry of Lancastria in the 1840s, *Trans and Papers Instit Brit Geographers*, **45**, 143-56

WRITTEN SCHEME OF INVESTIGATION

October 2014

**Oxford
Archaeology
North**

BELMONT BLEACH WORKS, EGERTON ROAD, BELMONT, LANCASHIRE



Recent view across Belmont Bleach Works

ARCHAEOLOGICAL BUILDING INVESTIGATION WRITTEN SCHEME OF INVESTIGATION

Proposals

The following Written Scheme of Investigation is offered in response to a request from Seddon Homes Ltd for an archaeological building investigation in advance of the proposed redevelopment of the site of the Belmont Bleach Works in Belmont, Lancashire.

1. INTRODUCTION

1.1 Project Background

- 1.1.1 Blackburn with Darwen Borough Council has granted planning permission for the redevelopment of part of the former Belmont Bleach Works on Egerton Road, Belmont (centred at NGR 367711 415805). The existing planning permission (Application No 10/08/0046) allows for the demolition of the existing buildings, and the erection of new houses with associated parking.
- 1.1.2 Belmont Bleach Works was established by M Ryecroft in the early nineteenth century as a textile-printing works. Ryecroft went into partnership at Belmont with a Mr Bains, although their business failed in 1812. The works was recommended by Parker, Ellison & Baron, although this firm failed in 1819. The works was then unoccupied for about six years before being taken over by Spencer & Co, who continued for about nine years and then failed. The works was taken over eventually by Edward Walker Dewhurst & Co. It was reported in 1846 that this firm had three machines and 80 printing tables (Graham 1846, 350). Messrs Dewhurst and Walker are named as the occupants in 1855, when a fire caused damage estimated at £200. The printworks closed in 1869, although it was purchased in 1870 by Edward Deakins, who carried on the business of bleachers and dyers under the name of H & E Deakin. The works is shown on historical mapping to lie astride the Egerton Road, although the principal buildings appear to have been situated to the north of the road.



Extract from the Ordnance Survey map of 1849, showing the approximate boundary of the proposed development

- 1.1.3 In order to secure archaeological interests, Blackburn with Darwen Borough Council has recommended that an appropriate programme of archaeological investigation of the works is carried out in advance of demolition. Following consultation with the Lancashire County Archaeology Service (LCAS), it was recommended that an archaeological building investigation commensurate with an English Heritage Level 2/3-type survey should be carried out. In accordance with this recommendation, Blackburn with Darwen Borough Council attached a condition to planning consent that stated:

'No works shall take place on the site until the applicant, or their agents or successors in title, has secured the implementation of a programme of building recording and analysis. This must be carried out in accordance with a written scheme of investigation, which shall first have been submitted to and agreed in writing by the Local Planning Authority.'

REASON: To ensure and safeguard the recording and inspection of matters of archaeological/historical importance associated with the building/site in accordance with Policy HD18 of the Blackburn with Darwen Borough Local Plan.'

1.2 Oxford Archaeology North

- 1.2.1 OA North has considerable experience of the interpretation and analysis of buildings of all periods, having undertaken a great number of small and large-scale projects during the past 24 years. Such projects have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. In recent years OA North also has extensive experience of archaeological work in Northern England. In particular, OA North undertook a rapid appraisal of the surviving structures of the Lancashire Textile industry, which identified all the surviving textile-manufacturing sites in the modern county of Lancashire (OA North 2010), and is presently carrying out a second, more detailed, study of the county's former textile mills.
- 1.2.2 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is **an Institute for Archaeologists (IfA) registered organisation, registration number 17**, and all its members of staff operate subject to the IfA Code of Conduct.

2. OBJECTIVES

2.1 The archaeological building investigation aims to provide a drawn, photographic and textual record of those elements of the Belmont Bleach Works within the proposed development area prior to their demolition. To achieve these objectives, the following listed specific aims are proposed:

- **Documentary Research:** a programme of documentary research will be carried out to place the results obtained from the building investigation into context;
- **Building Investigation:** to provide a drawn, photographic and textual record of all the buildings to English Heritage (2006) Level 2/3 standard, which will provide a lasting record of the structures in their present state. In addition, the investigation will ascertain if further archaeological investigation will be necessary, prior to or during any demolition work;
- **Report and Archive:** to complete a written report, which includes information about the buildings' age, fabric, form and function. This will be followed by a discussion of the sequence of development, process layout and use over time, and its relationship with other buildings in the vicinity, in terms of architecture and function. Suggested recommendations for additional archaeological investigation will also be included, where appropriate.

3. METHOD STATEMENT

3.1 Building Investigation

3.1.1 **Historical Research:** cartographic sources relating to the area will be consulted, in order to produce a map regression to provide an appraisal of the archaeological or historical significance and development of the complex. In addition, any relevant documents relating to the building will also be examined to provide a broad historical context for the building investigation.

3.1.2 **Photographic Archive:** a photographic archive will be produced utilising a high-resolution digital camera. A full photographic index will be produced and the archive will comprise the following:

- (i) The external appearance and setting of the buildings, including a mixture of general shots and detailed views taken from perpendicular and oblique angles;
- (ii) General shots of the surrounding landscape;
- (iii) The general appearance of principal rooms and circulation areas;
- (iv) Any external or internal detail, structural or architectural, which is relevant to the design, development and use of the buildings, and which does not show adequately on general photographs;
- (v) Any internal detailed views of features of especial architectural interest, fixtures and fittings, or fabric detail relevant to phasing the buildings.

3.1.4 **Site Drawings:** available historic plans will be checked and annotated on site to produce the drawings. These drawings will then be used as the basis of CAD drawings, which will be included within the final report as figures:

- (i) a ground-floor plan for each building;
- (ii) a cross-section through the short axis of the weaving shed;
- (iii) principal elevations.

3.1.5 Where plans are not available (*eg* for cross-sections and elevations), the following survey techniques will be applied as appropriate:

- (i) **Reflectorless Electronic Distance Measurer (REDM) survey:** the proposed elevations and cross-sections will be surveyed by means of a reflectorless electronic distance measurer (REDM). The REDM is capable of measuring distances to a point of detail by reflection from the wall surface, and does not need a prism to be placed. Detail captured by the instrument survey will include such features as window and door openings, evidence for power transmission, outline of decorative detail, evidence for machinery, an indication of ground and ceiling level, and changes in building material. The drawings will usually be produced at a scale of 1:50. The existing drawings will be digitised into an industry standard CAD package for the production of the final drawings;
- (ii) **Photographic Survey Techniques:** large elements of the principal elevation can be captured by a process of rectified photography. These photographs will be tied into the survey data produced by the instrument survey, to produce more a detailed elevation drawing;
- (iii) **Manual Survey Techniques:** hand-measured survey techniques will be utilised to record areas that are not accessible for instrument or photographic survey. The drawings will be tied into the remained of the survey through the use of a survey control established by the instrument survey;
- (iv) **CAD System:** the drawings will be manipulated in AutoCAD MAP. The advantage of a CAD system is that it allows for efficient manipulation and editing of drawings. The adoption of a layering system has significant benefits during the analysis stage as it allows for the display of information such as feature types, fabric and phasing as necessary to the requirements of the analysis, without the necessity to produce further drawings.
- (v) **Visual Inspection:** a visual inspection of the buildings will be undertaken utilising the OA North building investigation *pro forma* sheets. A description will be maintained to English Heritage (2006) Level 2/3 standard. The records will be essentially descriptive and provide a systematic account of the origin, development and use of the building, which will include a description of the plan, form, fabric, function, age and development sequence of the complex.

3.2 Report

3.2.1 **Report:** the content of the report will comprise the following:

- (i) A site location plan related to the national grid;
- (ii) A front cover to include the NGR;
- (iii) A brief account of the building investigation results. This will include a description of the buildings' layout, as well as their age, fabric, form and function. This will be followed by a discussion of the sequence of development, process layout and use over time, its relationship with other buildings in the vicinity, in terms of architecture and function;
- (iv) An explanation to any agreed variations to the brief, including any justification for any analyses not undertaken;
- (v) A description of the methodology employed, work undertaken and results obtained;
- (vi) Copies of plans, photographs, and other illustrations as appropriate;
- (vii) Recommendations for further archaeological investigation where appropriate;
- (viii) A copy of this project design, and indications of any agreed departure from that design;
- (ix) The report will also include a complete bibliography of sources from which data has been derived.

3.2.2 The report will be in the same basic format as this project design; a copy of the report can be provided on CD, if required. Two copies of the report will be supplied to the client as requested, and further digital copies will go to the appropriate repository.

3.2.3 **Archive:** the results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IfA in that organisation's code of conduct. OA North practice is to deposit the original record archive of projects with the County Record Office.

3.2.5 The Arts and Humanities Data Service (AHDS) online database project *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3.2.6 **Confidentiality:** all internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

4. HEALTH AND SAFETY

- 4.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties.

5. PROJECT MONITORING

- 5.1 **Access:** liaison for basic site access will be undertaken through the client. Whilst the work is undertaken for the client, LCAS will be kept fully informed of the work and its results and will be notified a week in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with LCAS in consultation with the client.

6. WORK TIMETABLE

- 6.1.1 **Historical Research:** two days will be required to complete this element.
- 6.1.2 **Building Investigation:** approximately one week in the field will be required to complete this element.
- 6.1.3 **Report/Archive:** the report and archive will be produced within eight weeks of completion of the fieldwork. OA North can execute projects at very short notice once a formal written agreement has been received from the client.

7. STAFFING

- 7.1 The project will be under the overall charge of **Ian Miller BA FSA** (OA North Senior Project Manager) to whom all correspondence should be addressed. Ian has considerable experience and particular research interests in Industrial Archaeology and, amongst numerous other projects, managed the Lancashire Mills Textile Survey.
- 7.2 The project will be directed in the field by **Andy Phelps BSc** (OA North Project Supervisor), who specialises in building recording, and is also involved presently in the Lancashire Textile Mill Survey.

ILLUSTRATIONS

LIST OF FIGURES

Figure 1: Site location

Figure 2: Extract from the Ordnance Survey 25": 1 mile map of 1894

Figure 3: Extract from the Ordnance Survey 25": 1 mile map of 1910

Figure 4: Extract from the Ordnance Survey 25": 1 mile map of 1929

Figure 5: Plan of the Belmont BleachWorks

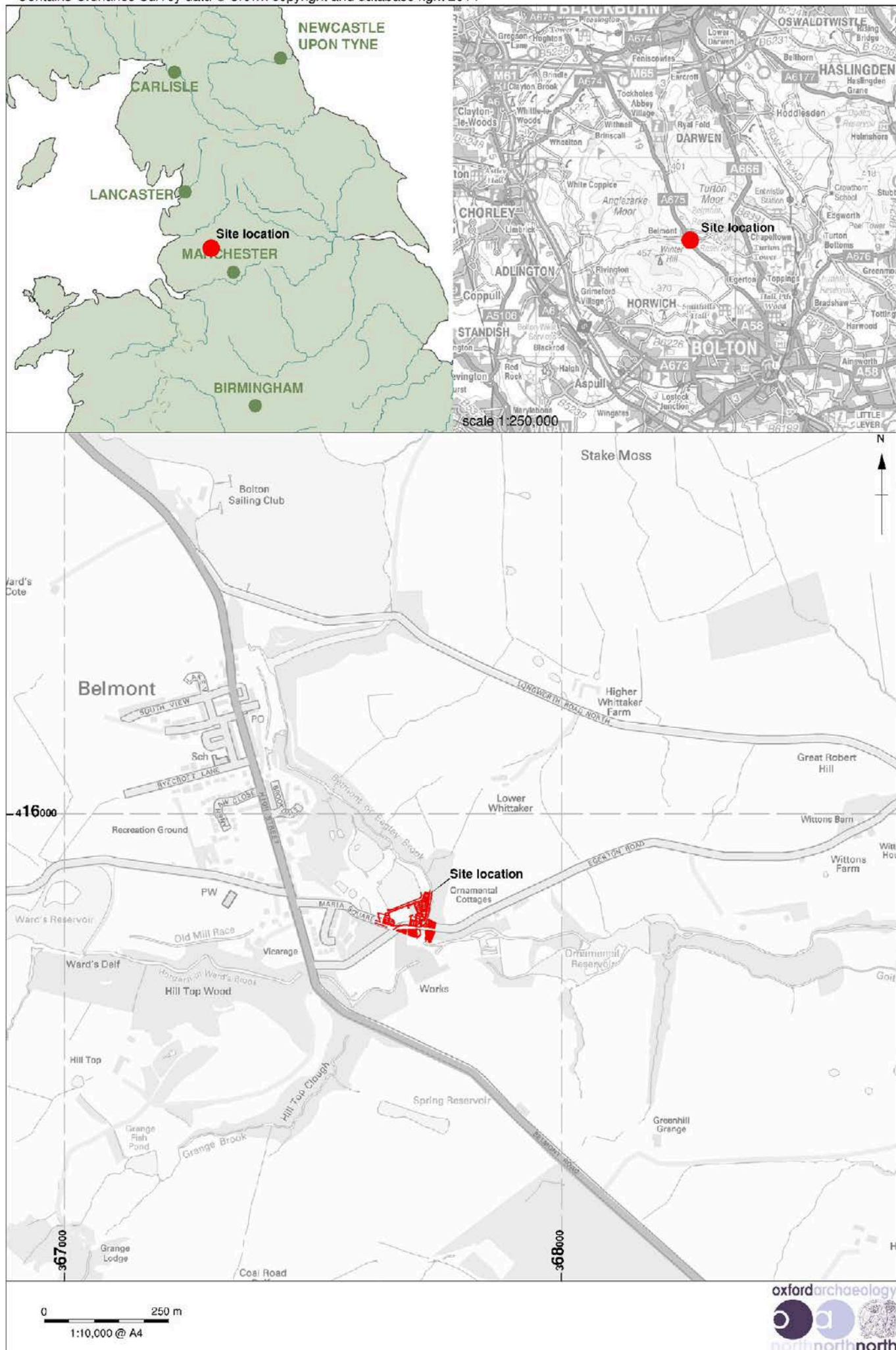


Figure 1: Site location

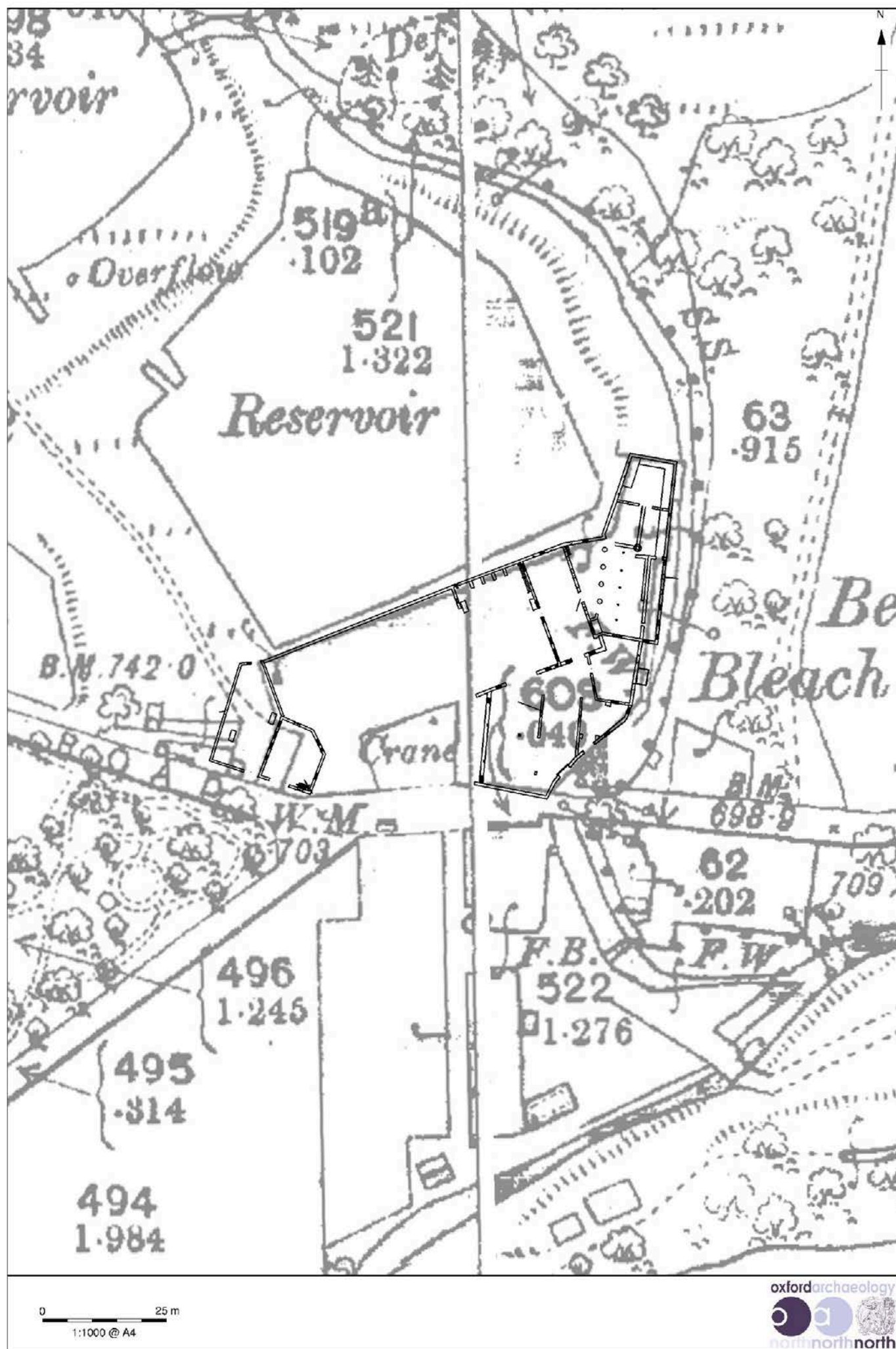


Figure 2: Extract from the Ordnance Survey 25":1 mile map of 1894

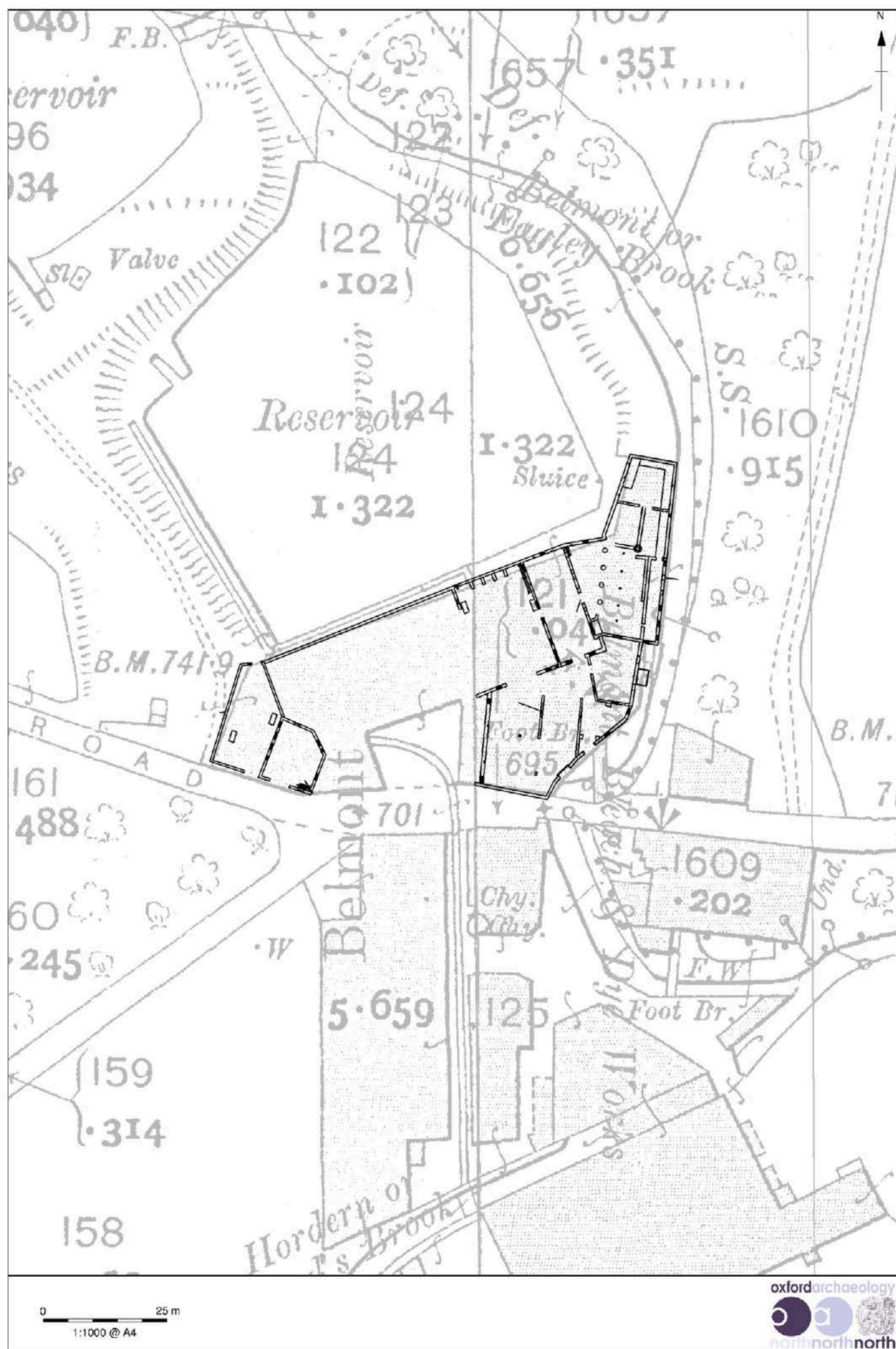


Figure 3: Extract from the Ordnance Survey 25":1 mile map of 1910

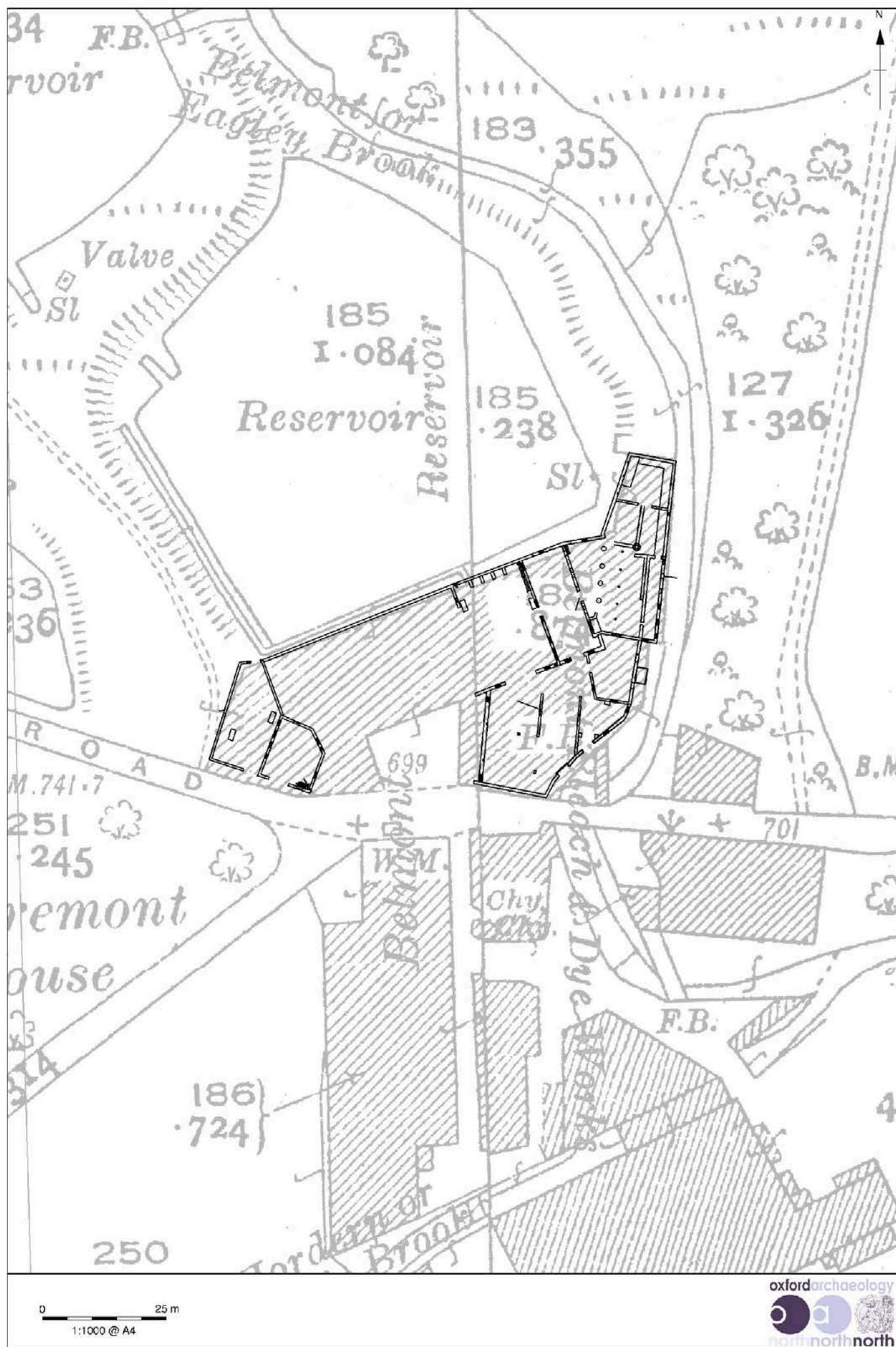


Figure 4: Extract from the Ordnance Survey 25":1 mile map of 1929

