



# HELMSHORE MILLS TEXTILE MUSEUM, HELMSHORE, LANCASHIRE

## Archaeological Evaluation

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## SUMMARY

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Lancashire County Museums Service has recently secured a grant from the Heritage Lottery Fund to facilitate improvements to the interpretation and access at the site of Helmshore Mills Textile Museum, Helmshore, Lancashire (SD 77821 21541). The site incorporates two multi-storey textile mills, the earliest of which (Higher Mill) was built in 1789 as a water-powered fulling mill, and the second was erected in c1828 as a woollen weaving mill (Whitaker's Mill). Both mills and associated structures are collectively designated a Scheduled Monument (LA143).

Amongst a suite of minor modifications and improvements to the mills, it has been proposed that an element of the grant funding be used to create an accessible space between Higher Mill and Whitaker's Mill. It is envisaged that this new structure would form an accessible space in the centre of the site linking the two mill buildings, whilst highlighting their detached nature. It is proposed that the new building will be erected on the footprint of a former boiler house, which was demolished during the 1970s, and will necessitate the demolition of a small modern building that links Higher Mill with Whitaker's Mill.

In order for the proposed development to proceed, Lancashire County Museums Service need to obtain Scheduled Monument Consent. Following discussions with English Heritage, it was recommended that a two-stage process was implemented; the first stage comprised an application for Scheduled Monument Consent to undertake an archaeological evaluation, the results of which could be used to support and inform a second application for Scheduled Monument Consent to proceed with the proposed development. An initial archaeological evaluation was undertaken in July 2006, and revealed considerable *in situ* remains of the former boiler house. Following on-site discussions with representatives of Lancashire County Museums Service, Lancashire County Council Property Group, English Heritage and Lancashire County Archaeology Service, it was recommended that a programme of further archaeological recording was activated to allow a detailed record to be made of any structures exposed within the footprint of the former boiler house. This stage of work was carried out by Oxford Archaeology North in September and October 2006, allowing a detailed record of the former boiler house to be compiled, and an assessment of historic fabric that will be disturbed by the proposed development.

The evaluation concluded that some of the buried walls of the former boiler house would require reducing by a maximum of six courses to allow for the implementation of the current design proposals, and a detailed mitigation record of this historic fabric has been produced. All surviving internal features will be unaffected, and will be preserved *in situ* beneath the proposed new concrete floor slab. The only possible exception is the series of boiler mounting blocks, the upper surface of which will protrude above the proposed slab, offering some potential as an interpretative feature.

In addition to these works, Oxford Archaeology North were invited to record structural remains pertaining to the original 18th century tail race from Higher mill, in the form of an arch located across the roof of the tail race within the former boiler house and the footprint of the proposed development. This work was undertaken in May 2007.

## ACKNOWLEDGEMENTS

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Oxford Archaeology North would like to thank the staff of Helmshore Mills Textile Museum and Lancashire County Museums Service, particularly Ian Gibson, for sharing his extensive knowledge of the site, and to Anthony Pilling and John Bellwood of Lancashire County Council Property Group, for their advice and guidance throughout the course of the project. Thanks are also expressed to Lucy Dean of Turner & Townsend Project Management Limited for logistical support, Jennie Stopford of English Heritage for providing considerable support and advice, and to Doug Moir of Lancashire County Archaeology Service for his support and advice. Thanks are also due to Stan Hargreaves, a former employee of Higher Mill, and Frank West, a former employee of Whitaker's Mill, who both provided invaluable background information.

The evaluation and watching brief was undertaken by Sean McPhillips, who also compiled the report. The survey requirements were completed by Chris Wild, and the illustrations were produced by Marie Rowland. The report was edited by Ian Miller, who was also responsible for project management.

## 1. INTRODUCTION

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### 1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 In January 2005, Lancashire County Museums Service submitted an application to the Heritage Lottery Fund to obtain a grant to facilitate improvements to the access and interpretation of Helmshore Mills Textile Museum (centred on SD 77821 21541; Fig 1), which is a designated Scheduled Monument (LA 143). Amongst a suite of minor modifications and improvements to the mills, it was proposed that an element of the grant funding be used to create an accessible space between Higher Mill and Whitaker's Mill. It is envisaged that this new structure would form an accessible space in the centre of the site linking the two mill buildings, whilst highlighting their detached nature. The new building would also be used to introduce the visitor to the fundamentals of cloth manufacture, highlighting the differences between wool and cotton.
- 1.1.2 It is proposed that the new building is erected on the footprint of a former boiler house, which was built in the early 20<sup>th</sup> century to generate the steam used for the heating of the mills. The boiler house was demolished during the 1970s, and the depth and extent of buried remains was uncertain, although it was anticipated that the foundations of the exterior walls would survive. A small, single-storey building was built partially across the site of the former boiler house in the 1980s, and it is envisaged that this building will be demolished as part of the proposed development.
- 1.1.3 The area of the former boiler house lies within the Scheduled Monument, and therefore Scheduled Monument Consent is required prior to the commencement of the development. Following negotiations with English Heritage, it was recommended that the application for Scheduled Monument Consent took a two-stage process. In the first instance, it was recommended that Scheduled Monument Consent was obtained to undertake a limited programme of archaeological investigation, primarily to establish the depth and nature of any buried remains that may be affected by the development proposals. The results obtained from this evaluation could then be used to inform and support a later application for Scheduled Monument Consent.
- 1.1.4 In May 2006, Lancashire County Museums Service commissioned Oxford Archaeology North (OA North) to devise a project design for an archaeological evaluation, which comprised the close archaeological monitoring and supervision of the excavation of geo-technical test pits within the area of the former boiler house. The project design was submitted to English Heritage for formal approval, and Scheduled Monument Consent to undertake the evaluation was obtained. The evaluation was completed during July 2006, and demonstrated that substantial *in situ* remains of the former boiler house survived immediately beneath the modern ground surface. Following discussions with English Heritage, it was recommended that the existing Scheduled Monument Consent was extended to allow for an

additional programme of archaeological evaluation. This was undertaken in September and October 2006, and involved the excavation of the area beneath the footprint of the proposed new building, across the entire site of the former boiler house, in accordance with the updated project design (*Appendix 1*). In addition, test pits were placed in front of bank lodge north of the fulling mill, and the garage loading bay of Whitaker's Mill.

- 1.1.5 In May 2007, Oxford Archaeology North were contacted by Lancashire County Council to identify and record structural remains which had been uncovered by groundworkers. The remains were localised along the western edge of the former boiler house within the footprint of the new building. Further recording work was also requested to record the southern wall of the range of buildings forming the southern part of Higher Mill. This comprised a drawn, written and photographic record, prior to modifications to the wall necessitated by the erection of the new structure to the south.

## 2. METHODOLOGY

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### 2.1 EVALUATION TRENCH AND TEST PITS

- 2.1.1 A programme of machine and hand-excavated trenches was implemented to establish the presence or absence of any below-ground archaeological deposits (Fig 2). A single trench was excavated across the footprint of the proposed building, including part of the alley between Whitaker's Mill and the 1980s link building extension, and beneath the floor of the extension. A second trench, measuring 1m<sup>2</sup>, was located in front of the loading bay within Whitaker's Mill, in order to detect current drainage. A third trench of a similar size was excavated along the proposed route of a new drain located along the northern edge of the bank lodge.
- 2.1.2 An additional trench measuring 4m long by 3m wide, was machine and hand-excavated along the western edge of the main trench, across the proposed building footprint.
- 2.1.3 The trenches were excavated in a stratigraphical manner by a mechanical excavator under the supervision of an OA North archaeologist, except for the trench extension across the former boiler house. All structural remains encountered were cleaned manually, and retained *in situ*, and all arisings were scanned for artefacts. The maximum depth of excavation varied, but did not exceed 1.2m.
- 2.1.4 The recording comprised a full description and preliminary classification of the features and materials revealed, on OA North *pro-forma* sheets. A plan was produced showing the location of all the trenches and features, with representative sections being drawn at a scale of 1:10. A photographic record, using monochrome and colour slide formats, was maintained.

### 2.2 BUILDING RECORDING

- 2.2.1 Proposed alterations to the south range of Higher Mill required archaeological building recording as part of an addition to the Scheduled Monument Consent. It was undertaken to English Heritage Level II standards (English Heritage 2006), and comprised the production of drawn elevations of both faces of the southern gable wall, accompanied by a photographic and descriptive record. The elevation was created using reflectorless EDM tacheometry using a total station linked to a pen computer data logger. This process will generate scaled plans within AutoCAD, to allow the efficient generation of accurate digital drawings showing features of both archaeological and architectural significance.

### 2.3 ARCHIVE

- 2.3.1 The results of the fieldwork will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects, 2nd edition, 1991*) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage*



(UKIC 1990). 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.

- 2.3.2 The archive for the archaeological work undertaken at the site will be deposited with Lancashire County Museums Service. A synthesis (in the form of the index to the archive and a copy of the publication report) will be deposited with the Lancashire Sites and Monuments Record. A copy of the index to the archive will also be available for deposition in the National Archaeological Record in London.

### 3. BACKGROUND

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#### 3.1 SITE LOCATION AND GEOLOGY

3.1.1 Helmshore Mills Textile Museum is located within the township of Haslingden, in Rossendale, Lancashire (centred on SD 77821 21541). It lies to the south-west of Haslingden town centre, and is bounded by Holcombe Road and a railway viaduct to the west and east respectively (Fig 1).

3.1.2 The solid geology of the Haslingden and Ramsbottom region comprises coarse-grained sandstones ('gritstone'), which are generally horizontal and separated by softer mudstone and siltstone beds (Countryside Commission 1998, 107). In broad terms, this has created a terraced landscape of plateaux and interlocking escarpments corresponding to the layers of sandstone and mudstone (*ibid*).

#### 3.2 HISTORICAL BACKGROUND

3.2.1 The following section presents a summary historical and archaeological background of the study area, and has been compiled in order to place the results of the evaluation into a wider archaeological context. Much of the historical background derives from a Conservation Statement compiled by Lancashire County Museums Service, and little recourse to primary sources has been undertaken as part of the present project.

3.2.2 The study area incorporates two former textile mills: Higher Mill and Whitaker's Mill. Higher Mill is the earlier of the two, dating to the late 18<sup>th</sup> century, and was built as a water-powered fulling mill. The fulling of woollen cloth after weaving was the earliest textile process to be mechanised and power driven (Ashmore 1969, 37-8). The fulling process involved beating the woollen cloth in water and treating it with fuller's earth, which cleaned and scoured the cloth and also resulted in thickening and shrinking. Water-powered fulling mills were active in Burnley, Colne, Manchester and Salford by 1300 (Cossons 1975, 255), and were numerous in all woollen-manufacturing area by the late 18<sup>th</sup> century; Baines' *Directory* of 1825 lists 12 fulling mills in Rossendale alone, although Higher Mill at Helmshore was one of the first.

3.2.3 The importance of the woollen-manufacturing industry to the local area during this period is alluded to by Aikin during his tour of Lancashire in the late 18<sup>th</sup> century: '*Haslingden has been greatly improved within the last twenty years, chiefly from the increase of the woollen manufacture. The town and hamlets of Haslingden are reckoned now to contain about 3000 inhabitants, which is triple the number they contained forty years since*' (Aikin 1795, 276). Despite the regional importance of fulling mills, however, their surviving physical remains are rare, as many were developed into larger spinning factories with the advent of powered spinning and carding machinery. Indeed, Higher Mill at Helmshore has been regarded as the best surviving example in the country (Ashmore 1969, 39), hence its Scheduled Monument designation.

- 3.2.4 **Higher Mill:** the mill was built in 1789 by William Turner, who had two other mills in Helmshore, and was the largest Lancashire woollen manufacturer of his day (Aspin 1995, 119). It comprises a three-storey structure (Plate 1) of sandstone rubble construction with timber beams, but without columns. The original mill building appears to have been constructed on a simple rectangular plan along an east/west axis, with a square stone-slatted roof. A long narrow mill pond was constructed to the north of the mill, drawing water from the Ogden brook. A smaller mill pond was also built on the west bank of the river in order to trap land drainage water under the terms of a water right granted in 1792; the pond was later exploited as a source of water for the steam-power plant associated with Whitaker's Mill.



Plate 1: The south-facing elevation of Higher Mill

- 3.2.5 Higher Mill is believed to have been water-powered from its inception, and the present pitch-back waterwheel is the third known to have been fitted; the positions of the earlier waterwheels are visible as blocked arched apertures in the wall of the mill. The present wheel was installed in Higher Mill in c1830 (Ashmore 1969, 39), and has an iron axle, iron hubs and rims, wooden spokes and buckets. It has a diameter of 17ft, and could develop an estimated 50hp (UMAU 2005). The power from the waterwheel was transmitted via rim gearing and a shaft that ran along the north side of the fulling stocks on the ground floor of the mill, with drive to the floor above to power raising machines (Ashmore 1982, 206). Despite the conversion of much of the machinery in Higher Mill to electric drive during the 20<sup>th</sup> century, the waterwheel continued in operation to drive the fulling stocks.
- 3.2.6 Having passed over the waterwheel, the water was channelled back to Ogden brook via a tailrace. This lies beneath the yard to the east of Whitaker's Mill, crossing below the area of the former boiler house that forms the focus of the present study, and links into a earlier tailrace that was associated with the original waterwheel.
- 3.2.7 Relatively little modernisation to the mill was carried out during its working life, although the construction of a railway viaduct at the eastern end of the building during the late 1840s necessitated the demolition of 10m from the eastern end of the mill. As part of the agreement to demolish this element of the mill, the East Lancashire Railway Company paid the mill owners approximately £5000 compensation, and offered two railway arches for storage.

- 3.2.8 Higher Mill closed as a commercial enterprise in June 1967, and was advertised for sale. However, members of Helmshore Local History Society lobbied the then Secretary of State, which resulted in the mill obtaining Scheduled Monument designation. The Higher Mill Museum Trust was then formed, and bought the mill by private treaty. In November 1975, the Higher Mill Museum Trust leased Higher Mill to Lancashire County Council for a period of 99 years.
- 3.2.9 **Whitaker's Mill:** dating to the 1820s, this mill was similarly built by William Turner as a woollen mill. It comprised a three-storey building of stone construction (Plate 2), and was intended to house the newly-developed power looms, which were rapidly being adopted across Lancashire at that time (Hopwood 1969). Whilst Whitaker's Mill is of less architectural and technological significance than Higher Mill, it was nevertheless added to the Scheduled Area due to its proximity to Higher Mill.
- 3.2.10 A large part of the mill was destroyed by fire in 1858 and, consequently, the eastern end of the present structure is all that survives of the original mill. It was rebuilt on a larger scale in 1860, constructed of random stone and a multi-pitched roof. At the same time a remote, square plan, stone chimney was built along the western side of the Ogden brook, connected by an underground flue that that ran north-west from beneath the two mills, and below Holcombe Road. Whilst it is uncertain precisely what type of steam engine was used in the mill, the steam-raising plant utilised Lancashire boilers fitted with economisers. Internally, clear evidence for the early power for the mill has been preserved; cast-iron wall boxes on each floor denote a vertical shaft up through the mill, which in turn powered line shafts on the three floors.



Plate 2: South-west-facing elevation of Whitaker's Mill

- 3.2.11 In 1922 the mill was taken over by L Whitaker and Son, who installed condenser cotton spinning plant. This included eight pairs of Taylor Lang three speed condenser cotton mules made in 1903/5, that were situated on two 1000m<sup>2</sup> floors.
- 3.2.12 Whitaker's Mill continued in commercial use until December 1978, but was purchased subsequently by Lancashire County Council. The mill today has one carding and spinning floor with operational Tatham carding engines and four Taylor Lang mules (totalling 2856 spindles). The ground floor contains the original hopper and scutcher machines.



- 3.2.13 It is uncertain precisely when the boiler house was erected, although it is likely to have been during the early 20<sup>th</sup> century, and was probably contemporary with a single-storey extension linking the two mills (Plate 3). The erection of these buildings necessitated the demolition of a detached rectangular building, which is depicted on Ordnance Survey mapping published in 1891 (Plate 4). During its operational life, the boiler house contained a single Cornish-type boiler, which had been manufactured by Yates and Thoms, a Blackburn-based firm, and was installed around 1911. Boilers of this type typically measured 16ft by 6ft, which is consistent with the dimensions of the boiler house. The boiler, however, was not connected with the mill's steam-power plant, but was intended to generate the steam for heating the working floors in the mill.



*Plate 3: The boiler house (on the left) prior to demolition*

- 3.2.14 The boiler house was used until at least 1960, although by 1947 the boiler had begun to deteriorate, and was finally removed in 1969. One of the reasons the boiler fell into disrepair was the continued use of caustic chemicals during maintenance, although tannin was later used to unclog some of the boiler pipes (pers comm Frank West).

### **3.3 ARCHAEOLOGICAL INTERVENTIONS**

- 3.3.1 The two textile mills were the subject of a recent archaeological building survey, undertaken by the University of Manchester Archaeological Unit (UMAU) between December 2004 and February 2005. This work was commissioned by Lancashire County Museums Service, and was intended to inform the renovation and refurbishment of the mills. The archaeological work comprised a photographic survey of the standing buildings and their setting, the annotation of architect's plans to show the form and location of any structural features of historic significance, and measured cross-sections of both mill buildings. This survey was completed, and whilst an interim statement was released in January 2005 (UMAU 2005), the final report is still in production.

## 4. RESULTS

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### 4.1 INTRODUCTION

- 4.1.1 The entire footprint of the proposed new building was uncovered, exposing three phases of archaeological activity (Plate 5). Phase 1 represented the construction of a stone arch that may be contemporary with the construction of the tail race from Higher Mill sometime during the late 18th century. Phase 2 comprised the construction of the rectangular building as shown on the 1891 OS map (Plate 4). The remains were exposed along the northern part of the excavated area, within the footprint of the former boiler house. Phase 3 represents the construction and use of the boiler house. Additional remains pertaining to this phase include the insertion of a stone drain placed along the foundation of the eastern wall of the link building. The drain overlaid a stone block that may have been part of the retaining wall for the stone arch. Phase 4 pertains to the abandonment and demolition of the building in the 1960s, and the subsequent construction of the link building extension.
- 4.1.2 In addition, two test pits each measuring 1m<sup>2</sup> were excavated. Test Pit 1 was located in front of the loading bay of Whitaker's Mill, and was excavated to determine if there was sufficient fall for a waste water drain that will lead from the new build to a drain on the north-east corner of the boiler house. No archaeological remains were encountered, although a sewer pipe of probable early 20<sup>th</sup>-century origin was revealed. Test Pit 2 was located to the rear of bank lodge within the disused and infilled headrace to the original waterwheel. The pit was excavated manually in order to inform the design of a new drainage scheme, and assess the repairs required to the bank lodge retaining wall. Well-preserved structural remains of the headrace was observed, although significant damage to the bank lodge retaining wall had resulted in a breach. This allowed water into the pit, precluding further excavation.
- 4.1.3 An additional test pit measuring 2.58m long by 1.75m wide, was excavated in the covered area between the eastern wall of Higher Mill and the railway bridge wall at the northern part of the site. The excavation was undertaken prior to resurfacing of the within the cobble set road around the eastern side of Higher Mill in preparation of a disabled chair lift installation.

### 4.2 PHASE 1

- 4.2.1 The earliest archaeological remains encountered during the evaluation predated the construction of the boiler house in the early 20<sup>th</sup> century. These remains comprised the construction of a stone arch (*I*) aligned east/west across the roof of the original tail race. It measured 2m long by 0.56m wide, and 0.32m deep, and was recorded at a height of 0.42m above the tail race roof (Fig 9) within a hand excavated sondage place beneath the width of the arch. The gap between the top of the tail race roof (*03*) and beneath the arch was filled with firm orange stony clay (*02*). The arch (Plate 16) was constructed



foundation for the flame-end of the boiler, or served as a capping over one of the tail races that is known to run below the boiler house.

- 4.2.3 Stone wall foundation **06** comprised a row of four regular sized thin stone blocks each having a thickness measuring 0.10m with two courses visible (Plate 17) over a distance of 1.8m and overall width of 0.45m. Part of the southern end of wall **06** overlaid the eastern end of the stone arch. The blocks were laid flush with the brick surface along a north/south alignment positioned along the surface western edge, similar stones were observed along the eastern edge of the surface that were tentatively described as a 'wall' during the 2006 evaluation. It is therefore probable that each row of stone blocks may have provided the foundation for the seating wall for each side of the boiler (of probable Cornish type-pers.comm. Ian Gibson). The demolition of the building and construction of the later boiler house (*Phase 4 below*), had eradicated each wall at the southern end of the brick surface. However, a row of five north./south aligned small stone blocks (**17**) each measuring 0.20m by 0.10m were retained along a similar height as foundation **06**, butting the south eastern edge of the stone arch. The stones overlaid a very mixed mottled clay, and possibly represented a residue of the southern extent of wall **06**.
- 4.2.4 Foundation **06** was overlaid at the northern end by a split level brick structure (**05**) that possibly represented upper section of the northern seating wall for the boiler. The structure measured 1.6m long by 1.2m wide and comprised common bricks (dimensions; 250mm x 110mm x 80mm) bonded with mid grey lime speckled cement mortar, which perhaps suggests a late 19th century construction. The structure survived to a maximum height of three courses above foundation **06**. Remnants of heavily sooted bricks was observed along the eastern face of the structure (Plate 17) at the northern end, which possibly indicated proximity to the flame end of the boiler.
- 4.2.5 A spread of cobbles were observed across the line of the wall, representing an uneven and poorly-sorted surface (**103**) measuring 0.50m by 0.30m. The cobbles (Plate 7) possibly represented the remains of a threshold into the original building, although this could not be ascertained with confidence.
- 4.2.6 Remnants of two stone floor surfaces (Fig 3) were also observed along the eastern and western face of wall **114** (*Phase 2 below*) within the link building extension. The surfaces (**115** and **116**) comprised Yorkstone flags, that each measured on average 0.86m by 0.37m, and may represent the remnants of a surface prior to the construction of the link building. Most of the debris had been removed from the western side of the link building exposing loose brown soil, which constituted made-ground laid directly above natural deposit of stony sandy-clay.

### 4.3 PHASE 3

- 4.3.1 The buried remains of the boiler house comprised a north/south-aligned brick wall (**114**) and a stone wall (**113**), which represented the western and eastern extent of the building respectively, the boiler seating wall (**101**), an ash pit



(107), the flame-end/rake-out area (106), a coal store area (112), and a flue (108). The surviving boiler foundation measured a total length of 5.70m.

- 4.3.2 Wall 113 was aligned north/south with a short return to the west at the southern end, which had been built into the toilet block wall, and was possibly of a contemporary build to the rest of the boiler room. The wall survived to a height of 0.40m above the flagged floor, comprising four courses of variable sized stone blocks bonded with lime/ash mortar.
- 4.3.3 The western wall of the boiler room (114) was exposed at a distance of 1.60m west from the eastern wall of the link building between the two mills. Wall 114 measured 0.65m wide, and followed a north-east/south-west alignment for a distance of 4m (Plate 8). It comprised 11 courses of locally-manufactured, machine-made Accrington and Clatton bricks laid in an English Garden bond, with traces of lime wash along the eastern face. The wall was originally three brick strings wide, but at some point two brick skins had been added along the east and west face, widening the wall to five brick thick in width. The wall survived to a maximum depth of 0.76m below the 1980s concrete foundation of the link building extension.
- 4.3.4 A substantial east/west-aligned wall (101), measuring 6m long by 1.10m wide, was bonded to the eastern face of wall 114, representing a seating for the boiler. Wall 101 was lined along its southern edge by refractory bricks, with a further five skins of mould-thrown bricks across its breadth, that was in turn bordered by a single skin of Accrington bricks along its northern edge, and a stepped foundation along the south-west corner within the link building extension. The wall survived to a height of 0.60m, comprising seven courses above the ash pit floor (107), and 11 courses in height within the link building. The western end of the wall curved sharply to the south, forming the terminal end of the ash pit (Plate 9), although the construction of the link building during the 1980s obliterated much of the remains in this area.
- 4.3.5 A series of nine boiler mounting blocks survived *in situ* on top of the second seating wall, which also formed the southern edge of the ash pit floor. Each mount measured 0.40m in height by 0.30m wide, and were constructed of refractory material. The underlying boiler seating wall was similarly constructed of refractory bricks, and survived to a height of eight courses (Plate 10). No mounts survived along the northern edge of the ash pit on top of wall 101. The floor of the ash pit comprised nine strings of well-laid mould-thrown bricks, laid in Stretcher bond. The floor was overlaid by abundant fuel waste and frequent large fragments of boiler mounts, which had presumably been discarded into the pit after the boiler was removed.
- 4.3.6 The eastern end of wall 101 was butted by a single skin wide wall (109) that partitioned the south-east corner of the room. The wall was exposed for a distance of 1.70m, doglegging slightly at the eastern section where it butted a north/south-aligned wall (111) bordering the coal store area. This partitioned section represented the flame-end (106) of the boiler, which comprised an almost entirely fire-brick split level surface with a small 0.40m long, by 0.30m wide and 0.15m deep rake-out pit surrounded by a two-string arch forming the coal feed area (Plate 11). The boiler pit was surrounded by a confluence of

iron water pipes that were seemingly fed from the mill pond north of the fulling mill. One of the pipes lay along the western face of the wall bordering the flame-end of the boiler, before returning sharply to the west toward the former location of the boiler. Another pipe was observed directly above this pipe. It bordered the western supporting wall (*111*) of the coal store area (*112*), with a 1m vertical section protruding at the end of the flue, the 0.07m diameter pipe continued north beyond the boiler foundation, then doglegged sharply to the west passing along the northern part of the room beneath the link building and cutting through the west wall of the boiler house. This pipe was used as the overflow for the water tank (pers comm Frank West). An east/west-aligned 0.11m diameter pipe, with a 0.12m diameter by 0.10 m wide flange, lay directly below the flue floor, before heading east below the flagged floor at the eastern end of the room and seemingly beyond the limit of the excavated area. It was unclear what function this pipe served, although the thickness of the flange implies that it was intended to carry pressurised water. A north-west/south-east-aligned pipe of a probable 20<sup>th</sup>-century date was cut through the flagged yard surrounding the northern part of the trench, heading toward the original link building. It is possible the pipe was installed around the same time as the construction of the link building extension in the 1980s.

- 4.3.7 The flagged surface in the coal store (*112*) area of the room measured 4.40m by 2.70m, bordered by stone wall (*113*) representing the eastern limit of the room (Plate 12). The surface comprised irregularly-sized thin flags, which sealed mixed clay, sand and fuel debris. Two large iron plates were positioned within the southern part of the surface, presumably to provide an easy surface from which to shovel coal into the boiler hopper.
- 4.3.8 The flue (*108*) leading from the boilers to the mill chimney was located along the southern part of the boiler room attached to the north wall of Whitaker's Mill, continuing west up the alley that accessed the annexe between the buildings (Plate 13). The flue was lined along the southern edge by a single skin thick refractory brick wall, surviving to a height of 0.35m, which sat above a surface of mould-thrown bricks. The entire flue measured 0.86m overall wide from the fire-brick wall to a line of boiler seating mounts along the northern edge. The heavily-sooted flue floor comprised two stretchers laid side-on bonded with light grey lime-ash rich mortar. The floor at the western end of the flue stepped up to 0.21m in height, and was exposed at a depth of 0.60m below the concrete foundation across the base of the access door. The raised area of the floor sealed the refractory wall lining the ash pit, widening the surface to 1m and four brick strings in thickness. It is possible the bricks in this section were laid after the boiler was removed in order to create a level surface prior to the installation of the flag-stoned alley. The eastern end of the flue was bordered by a 1m wide 45-degree angled ramp representing the upward draught at the flame-end of the boiler. The ramp comprised entirely of refractory brick, which was at least three courses thick, and eight strings wide. An iron water pipe was exposed running east/west below the flue floor for a distance of 1.2m heading west up the alley. It is probable the pipe provided the heated water from the boiler, thus providing heat for rooms inside the mill.

- 4.3.9 Other remains pertaining to this period were represented by remnants of a stone flag base (**12**) of a drain contained within an east/west aligned cut (**14**) along the northern edge of the link building. The drain survived for a distance of 1m and 0.40m in width. The northern edge of the cut had been destroyed although much of its sticky silty clay fill (**13**) was retained to a depth of 0.4m beneath the flags. The structure continued to be used as a drain demonstrated by the insertion of a large 0.25m diameter ceramic pipe (**10**, Plate xx), placed directly above the stone flags.
- 4.3.10 The excavated area along the eastern side of Higher Mill revealed foundation evidence of machinery that at some stage during the early 20th century, power assisted the flow of water driving the mill's water-wheel. Other remains associated with this machinery comprised a stone lined pit, bordered by an east/west aligned brick wall which contained the engine room. The remains were generally located within the cobble set road that formerly led to the mill owners cottage prior to the construction of the railway in the mid 19th century.
- 4.3.11 The concrete machine base measured 1.75m long by 1.16m wide and 0.62m deep, sitting above the floor of a stone floored pit. The upper surface of the machine base contained evidence of several small metal ties vertically protruding above the surface that probably functioned as restraints for a diesel powered engine. Evidence of this fuel source survived across the floor of the pit with remnants of compacted diesel waste coating the floors upper surface. The pit floor was seemingly constructed from one large stone fragment, and was partially overlaid with a 0/13m thick rectangular stone slab measuring 0.75m by 0.54m, which butted the base of the concrete machine bed. A function of the slab was unknown although it probably related to a support for the engine apparatus. The pit measured 1.93m long by 1.43m wide bordered in the north by a five course high stone wall sealed by cobble road sets, representing a corner return of a possible earlier building which predated the road. The pit was bordered along the southern edge by an east/west aligned brick wall. The wall was constructed from handmade brick (measuring 220mm by 100mm by 80mm) married with lime speckled ash rich mortar. The single brick thick wall measured 2.5m long by 0.25m wide and survived to a maximum height of six courses above the floor, laid in English Garden Wall bond, sealed with a single course of stretcher bricks laid side-on. The northern elevation was lime washed with traces of light blue paint retained across the wall's surface. The wall was built over a flight of two stone steps that represented access from the south-eastern corner of the room. Each step measured 0.63m long by 0.32m wide with a tread drop of 0.22m, supported by a brick base.
- 4.3.12 The entire room was back filled with loose rubble, much of which comprised large lumps of masonry, suggesting the material was deposited from nearby. The material contained fragments of 19th century pottery, pieces of iron tenter frame and glass bottles, along with 20th century plastic gutter.

#### 4.4 PHASE 4

- 4.4.1 It would appear that the boiler room went out of use shortly before the mill was closed. This is suggested by the extension to the link building during the 1980s, which overlaid much of the northern part of the former boiler house, and comprised glazed brick perimeter walls that were attached to the stone fabric of the original link building. The construction trenches for these walls were filled with concrete.
- 4.4.2 Other additions to the room include a small brick partition wall (**117**) located along the north-eastern corner of the room, abutting wall **113**. Wall **117** was exposed for a distance of 2m, and comprised loosely-stacked frogged bricks of late 20<sup>th</sup>-century manufacture. Other 20<sup>th</sup>-century additions include a small brick-lined man-hole (**118**) that had been cut through the flagstone surface within the coal store area (**112**). The man-hole, survived to a height of 0.50m, its upper course sealed by the flagstone yard (**102**) around the northern edge of the trench. The eastern edge of drain **12** had been truncated by the insertion of the link building extension, a residue of this disturbance is represented by a section of rubble mixed with clay which sealed the top of stone block **09**. This rubble was in turn overlaid by the concrete foundation for the link building extension. The western part of the excavated area was back filled by large amounts of mixed yellow and orange clay and stones (**15**) measuring approximately 0.50m in thickness that had been used for levelling material above the tail race roof, prior to the installation of the flagstone surface. The clay also butted the western edge of brick wall **05**.

#### 4.5 TEST PITS

- 4.5.1 **Test Pit 1:** the pit was placed across the central area of the loading bay entrance associated with Whitaker's Mill (Plate 14), and was excavated to a maximum depth of 1m. Yellow-red natural stony-clay was encountered at a depth of 0.50m below a stone block, which was located across the entrance. A north-east/south-west-aligned ceramic water pipe of a 20<sup>th</sup>-century date had been cut into the natural clay, and seemingly connected with an upright drain pipe attached to the wall at the south side of the loading bay entrance. The pipe was overlaid by gravel and fuel waste measuring 0.36m in thickness that was used as made-ground below the present track running along the eastern side of Whitaker's Mill. The made-ground was in turn sealed along the western edge of the pit by sandstone flags and slate, which provided bedding layers for the stone block. No significant archaeological features were encountered.
- 4.5.2 **Test Pit 2:** the pit was placed directly to the north of the steps along the southern side of bank lodge, against the turf bank (Plate 15). It was excavated manually against the upper surviving wall course of the headrace, which extended 0.35m above the present flagstone surface. The headrace wall was exposed to a depth of 1.10m, forming the eastern edge of the test pit. It comprised two large sandstone blocks, each measuring at least 0.50m in depth, although full dimensions were not exposed due to the large amounts of stone and clay-silt backfill butted against it. Remnants of an east/west-aligned stone

wall survived partially across the breadth of the headrace, along the northern edge of the test pit. The wall survived to a depth of 0.40m below the turf bank, and comprised three irregularly-laid stone and brick courses bonded with grey lime mortar. The wall was probably constructed during the 20<sup>th</sup> century as a part of a landscaping exercise, effectively sealing the backfill of the disused headrace. A backfilled deposit, measuring at least 0.60m thick, was encountered below the wall and spread across the test pit. A full depth of the deposit was not observed due to the ingress of water into the pit from the lodge. This hindered further excavation, and precluded an examination of the floor of the headrace.

#### **4.6 BUILDING RECORDING**

- 4.6.1 **Higher Mill:** the end wall of the range of buildings forming the southern end of Higher Mill was recorded prior to alterations during the implementation of new disabled access within this part of the mill complex. The multi-phase wall forms the southern gable of a single storey range associated with the main mill structure at its northern end. It is of local sandstone rubble construction, bonded in a pale lime mortar, similar to other structures within the complex.
- 4.6.2 Examination of the wall, most notably after the many layers of whitewash and paint had been removed for the purposes of this programme of recording, most strikingly revealed a roofline scar in the western part of the wall (Fig). Its presence on both elevations of the wall denotes that it does not represent the scar of a structure butting the existing wall, but appears to form the gable wall of an original, narrower structure. At the western end of the elevation the scar is 0.45m lower than the present wall height, and the structure was 5.15m wide, as opposed to the 7.2m width of the present structure. The roof-line was on a similar angle to that present, but given the narrower width, the structure was approximately 0.90m lower. On the northern side of the wall, the scar of the original return of the eastern elevation is visible, revealing the wall to have been 0.45m thick.
- 4.6.3 The structure was evidently extended to the east, using similar materials. The original eastern end of the gable wall was remodelled to form the western jamb of a 1.45m wide doorway. A window was included within the increased height of the gable wall, with flush stone sill, suggesting that, as large windows were also included in the new eastern elevation and the existing western elevation, the upper part of the structure was partitioned into a loft, presumably for storage. The fact that the eastern elevation of the present range of buildings formed part of this extension, and is, therefore, of later date than the western elevation, as is the roof structure, appears from the available documentary sources and mapping, to have previously been unknown.
- 4.6.4 Further alterations to the wall followed with the narrowing of the doorway by 0.45m, visible most clearly on the external northern face (Fig). The entire doorway was subsequently blocked completely with stone, as was the upper gable window, presumably when the loft was removed. A central doorway was also added into the gable wall, the ragged brick infilling around it suggesting a



late date, most probably contemporary with the late twentieth century construction of the link block between Higher Mill and Whittaker's Mill.

- 4.6.5 On the internal, northern face of the wall, a large area of brickwork (approximately 2.5 x 2.0m) filled the majority of the lower wall to the west of the present door (Plate). The external face comprises stone in the corresponding position, although this remains heavily whitewashed, not allowing for interpretation as to its originality. However, it is quite plausible that the internal blocking represents the position of a possibly original aperture, which was subsequently blocked in stone on the external face, for appearance, and brick on the inner face which was of less importance and most probably obscured. The edge-set nature of the internal brickwork also suggests that it formed a packing, bringing the blocking flush with the wall face. A similar disparity of quality was employed above this aperture, where an approximately 0.3m<sup>2</sup> aperture, with a flush single-piece sill and jambs, most probably part of the original construction, is blocked with two sandstone blocks externally, but retains an exposed metal pipe within rough render and stone blocking internally.

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## 5. IMPACT OF THE PROPOSED DEVELOPMENT

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### 5.1 IMPACT

- 5.1.1 There are several areas of the Scheduled Monument that would be subject to ground disturbance as part of the proposed development. The most significant of these is the area of the former boiler house, which has formed the focus of the present programme of works. Other areas include the edge of the present access track to Helmshore Cottages, and a short section of the original headrace channel on the northern side of Higher Mill.
- 5.1.2 **The Former Boiler House:** the current design proposals allow for the laying of a new floor slab across the footprint of the former boiler house. It is proposed that the base of the new slab will lie at a height of 49.31m aOD, which will have a negative impact on surviving buried elements of the boiler house. In particular, the external walls of the former boiler house (**101**, **104**, and **113**) and flue **108**, may incur a direct negative impact. The levels of the other remains, namely the original floor surfaces and the boiler seating walls, are such that they will not be affected by the proposed development, and can be preserved *in situ*.
- 5.1.3 The eastern wall (**113**) of the boiler house will have to be reduced by a maximum of 0.49m (Fig 5), and the south wall will have to be reduced by up to 0.3m, equating to two courses of masonry (Fig 4). The greatest impact is likely to be upon the surviving fabric of the original western wall (**114**) of the boiler house, the uppermost surface of which lies at a height of 49.89m. The design proposals will necessitate the removal of six courses of this brick wall to allow for the construction of a new floor slab at a height of 49.31m (Fig 6; Fig 7). Similarly, five courses of bricks will require removal from elements of the southern wall of the boiler house, which presently lie beneath the alley between Whitaker's Mill and the 1980s link building (Fig 8). The uppermost surface of the boiler mounting blocks that survive *in situ* along the eastern part of this wall also protrude above the level of the proposed floor slab. However, it is envisaged that these blocks will remain *in situ*, whilst the exposed elements may serve beneficially as interpretative features within the proposed new visitor centre.
- 5.1.4 The archaeological evaluation has provided a detailed mitigation record of the significant buried remains that would be affected by the development proposals. Moreover, the data generated from the archaeological work could be used to aid an interpretation of the former boiler house for future visitors to the site. These factors reduce the negative impact on the buried remains of the proposed development. It should also be noted that the reduction of any historic fabric will not remove the walls in their entirety, and will not detract from a broader understanding of the Scheduled Monument.
- 5.1.5 **The Loading Bay:** the evaluation has demonstrated that there are no buried remains of archaeological significance beneath the loading bay within Whitaker's Mill, or the adjacent access road to Helmshore Cottages.

Development proposals are therefore unlikely to have an archaeological impact in this part of the Scheduled Monument.

- 5.1.6 ***The Original Headrace:*** the point at which the headrace from the millpond to the original waterwheel entered Higher Mill is marked in the northern elevation of the mill by a blocked arched aperture, the crown of which is presently visible above ground level. The archaeological remains encountered in Test Pit 2 demonstrated well-preserved remnants of the eastern headrace wall surviving to a depth of at least 1.10m. It is not envisaged that the development proposal will have a negative impact on the remains of the headrace.



## 6. BIBLIOGRAPHY

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### 6.1 CARTOGRAPHIC SOURCES

Yates, W, *The County Palatine of Lancaster*, 1<sup>st</sup>: 1 mile, surveyed 1786

Ordnance Survey 25<sup>th</sup>: 1 mile, surveyed 1891

### 6.2 SECONDARY SOURCES

Aikin, J, 1795 *A Description of the County from Thirty to Forty Miles Round Manchester*, London

Ashmore, O, 1969 *Industrial Archaeology of Lancashire*, Newton Abbot

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

Cossons, N, 1975 *Industrial Archaeology*, Newton Abbot

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

Department of the Environment (DoE), 1990 *Planning Policy Guidance Note 16*, London

English Heritage, 1991 *Management of Archaeological Projects*, 2nd edition, London

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

Hopwood, E, 1969 *A History of the Lancashire Cotton Industry and the Amalgamated Weavers' Association*, Manchester

UMAUI, 2005 *Higher Mill, Helmshore, Lancashire, Interim Report*, unpubl rep

UKIC, 1990 *The Preparation of Archives for Long-Term Storage*, London

Zonca, V, 1607 *Novo Treatro di Machine ed Edificii per Varie e Sicure Operationi*, Padova

## APPENDIX 1: PROJECT DESIGN

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**HELMSHORE  
TEXTILE  
HELMSHORE,**      **MILLS  
MUSEUM,**  
Lancashire

### **Archaeological Investigation Updated Project Design**



**Oxford Archaeology North**

August 2006

**Lancashire County Council**

OA North Project No: L9734

NGR: SD 77821 21541

## 1. INTRODUCTION

- 1.1 In May 2006, Lancashire County Museums Service commissioned Oxford Archaeology North (OA North) to devise a project design for an archaeological evaluation, which comprised the close archaeological monitoring and supervision of the excavation of geo-technical test pits within the area of a former boiler house associated with Whitaker's Mill. The project design was submitted to English Heritage for formal approval, and Scheduled Monument Consent to undertake the evaluation was obtained, with the intention that the archaeological results could be used to inform a later Scheduled Monument Application for the new build. The evaluation was completed during July 2006, and revealed considerable *in situ* remains of the former boiler house. These included the original north wall of the building, the internal floor, a boiler-seating wall, and *in situ* boiler mounting blocks. Elsewhere, a test pit excavated to the north of the boiler house exposed the remains of a culvert that appeared to breach the roof of a tailrace, whilst a further test pit confirmed that the area to the east of the boiler house did not contain any buried remains.
- 1.2 The results obtained from the evaluation indicated a probability that other buried remains pertaining to the boiler house would survive. In particular, it was considered likely that elements of the flue from the boiler house would remain intact, and could be disturbed by ground-works associated with the proposed development. Following on-site discussions with representatives of Lancashire County Museums Service, Lancashire County Council Property Group, English Heritage and Lancashire County Archaeology Service, it was recommended that an application to DCMS was made to extend the current Consent for additional archaeological evaluation, which would further inform a later Scheduled Monument Application for the new build. It was recommended that this would include a provision to allow for the extension of the existing trenches within the footprint of the boiler house so that a detailed archaeological plan can be compiled.
- 1.3 The development proposal allows for the provision of wheelchair access from the northern end of the new build, incorporating a narrow alley between the Whitaker's Mill and the 1980s extension and beneath part of the floor within the 1980s building (Fig 1). It is important to establish if there are any extant archaeological structures within this area that would impede the establishment of a uniform, downward sloping ramp before the new build design can be finalised. It is therefore proposed to evaluate the area to establish the existence, and the upper levels of any archaeological remains. In addition, it is proposed to excavate a single evaluation trench in front of the loading bay to determine if there is sufficient fall for a waste water drain that will lead from the new build to a drain on the north-east corner of the boiler house, and place a third trench at the rear of the bank lodge to inform the design of a proposed new drainage scheme and repairs to the retaining wall. This trench will be targeted upon the disused and infilled headrace to the original waterwheel, with an academic objective of established the form of the waterwheel in addition to informing an application for Scheduled Monument Consent.

## 2 METHOD STATEMENT

- 2.1 **Strategy:** it is proposed that a phased approach is taken to complete the additional scheme of works. In the first instance, the existing test-pits will be backfilled with an appropriate medium to ensure no damage is wrought to the exposed remains. This will allow access into the 1980s building, and the narrow alley alongside Whitaker's Mill, for the excavation of the first additional trench. Once this has been completed, the original test-pits can be re-excavated and extended to allow for the detailed recording of the entire boiler house. The trenches to the rear of the bank lodge and in front of the loading bay will then be excavated. The evaluation will be undertaken by OA North, and will utilise two experienced archaeologists.
- 2.2 The programme of archaeological evaluation completed to date has demonstrated that the boiler house was loosely backfilled with demolition material of little archaeological value. It is anticipated that this can be removed from site, once checked for any artefacts or building materials of note, that will be retained and incorporated with the project archive.
- 2.3 **Methodology:** the three proposed additional evaluation trenches will be placed in the positions shown on Figure 1. The first trench will be placed in the alley between Whitaker's Mill and beneath the floor of the 1980s extension. The portion of the trench that lies within the alley will be excavated using exclusively manual techniques, as it is envisaged that *in situ* remains may lie immediately below the modern ground surface, notwithstanding the restricted space for the use of machinery. Elsewhere, modern concrete surfacing and associated levelling material will be removed using a mechanical excavator, operating under close archaeological supervision. Thereafter, excavation will proceed using exclusively manual techniques to the upper level of any significant archaeological structures or deposits. All archaeological structures and deposits will be left *in situ*. Once completed, the original test pits will be re-excavated and extended, using the same methodology.
- 2.4 The second additional trench will measure 1m x 1m, and will be placed front of the loading bay within Whitaker's Mill. The modern surfacing will similarly be removed by a mechanical excavator, after which manual techniques will be employed. The third trench will be placed along the proposed route of a new drainage scheme/repairs to a retaining wall to the rear of the bank lodge. This will also measure approximately 1m x 1m, and will be excavated entirely by hand. It is envisaged that this trench will expose the side walls and floor of the headrace for the original waterwheel.
- 2.5 All information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage, with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features.
- 2.6 Results of the evaluation will be recorded on *pro-forma* context sheets. The site archive will include both a photographic record and accurate large-scale plans and sections at an appropriate scale (1:50 and 1:20). All artefacts and

ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration.

- 2.7 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the evaluation will be generated. Photography will be undertaken using 35mm cameras on archivable black and white print film as well as colour transparency, and all frames will include a visible, graduated metric scale. Extensive use of digital photography will also be undertaken throughout the course of the fieldwork for presentation purposes. Photographs records will be maintained on special photographic *pro-forma* sheets.
- 2.8 The position of the trenches will be located precisely with respect to Ordnance Datum, and the plan will be merged with that from the earlier evaluation (OA North 2006).

## APPENDIX 2: CONTEXT LIST

<b>Context</b>	<b>Phase</b>	<b>Description</b>
<b>01</b>	1	Stone arch possibly associated with the edge of the 18th century tail race
<b>02</b>	1	Orange clay fill between the base of arch <b>01</b> , and the roof of the tail race <b>03</b>
<b>03</b>	1	Stone roof of 18th century tail race
<b>04</b>	2	Brick surface/pit boiler base
<b>05</b>	2	Brick seating wall along the northern edge of surface <b>04</b>
<b>06</b>	2	Stone wall foundation for the boiler seating wall <b>05</b>
<b>07</b>	2	Upright cast iron water feed pipe located at the northern end of wall <b>05</b>
<b>08</b>	2	Stone block (lower), possibly part of the retaining wall for arch <b>01</b>
<b>09</b>	2	Stone block (upper), possibly part of the retaining wall for arch <b>01</b>
<b>10</b>	3	Ceramic drain pipe
<b>11</b>	2?	Stone block/cap located at the northern end of surface <b>04</b>
<b>12</b>	2	Stone drain beneath pipe <b>10</b>
<b>13</b>	2	Mixed clay fill of cut <b>14</b>
<b>14</b>	2	Construction cut for drain <b>12</b>
<b>15</b>	2/3	Clay build up/levelling overlying roof <b>03</b>
<b>16</b>	3	Rubble demolition/disturbance sealing block <b>09</b>
<b>17</b>	2	Row of five small stone blocks, possibly representing part of foundation <b>06</b>
<b>101</b>	2	Brick boiler seating wall
<b>102</b>	2	Stone-flagged floor around the northern part of the boiler house
<b>103</b>	1	Cobbled surface along the western end of surface <b>100</b>
<b>104</b>	2	Not used
<b>105</b>	1	Stone foundation for the building shown on the 1891 map
<b>106</b>	2	Flame-end of boiler foundation
<b>107</b>	2	Ash pit
<b>108</b>	2	Flue
<b>109</b>	2	North wall of the foundation <b>105</b>

<b>110</b>		Not Used
<b>111</b>		North/south-aligned wall bordering the coal store area of the boiler room
<b>112</b>	2	Coal store area
<b>113</b>	2	East wall of the boiler room
<b>114</b>	2	West wall of the boiler room
<b>115</b>	2	Stone floor surface along the eastern edge of wall <b>114</b>
<b>116</b>	2	Stone floor surface along the western edge of wall <b>114</b>
<b>117</b>	3	Brick wall in the north-east corner of the boiler room
<b>118</b>	3	Man-hole

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Plate 5: General view of the excavated boiler house, looking west



Plate 6: Wall *105* and brick surface *100* looking west





Plate 7: Cobble surface *103* at the western end of surface *100*, looking east



Plate 8: Western wall (*114*) of the boiler room





Plate 9: Western end of boiler seating wall *101* within the link building extension



Plate 10: Refractory brick wall below boiler mounts lining the ash pit *107*





Plate 11: Flame-end *106* of the boiler foundation



Plate 12: Coal store *112* and wall *113* at the eastern end of the boiler foundation





Plate 13: Flue *108*, and ash pit *107*, looking east



Plate 14: View of pipe in Test Pit 1



Plate 15: View of the headrace wall in Test Pit 2





Plate 16: Stone roof arch *01*, looking south



Plate 17: Stone wall foundation *06*, looking south