



VICTORY WORKS, HEYWOOD, Greater Manchester

Archaeological Watching Brief and Building Investigation



Oxford Archaeology North

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SUMMARY

In response to a request from Scott Wilson Ltd, acting on behalf of Countryside Properties (Northern) Ltd, Oxford Archaeology North (OA North) undertook a programme of archaeological work at a former textile mill known as Victory Works, situated in Heywood, Greater Manchester (centred at NGR SD 84645 10660). In the first instance, this comprised a watching brief that monitored earth-moving works in the area of the former boiler house, situated immediately to the west of the main spinning block, and was carried out in June 2008. During the course of the watching brief, some additional measured survey of the spinning block was carried out to inform the results obtained from the watching brief. The second phase of archaeological work was carried out in November 2009, following the final demolition of the spinning block and clearance of the site, and comprised a 'strip and record' exercise. This was targeted on the western side of the spinning block, which had incorporated an internal engine house.

The watching brief revealed the well-preserved remains of two boiler beds, comprising three developmental phases of the steam-raising plant. The initial phase, representing the earliest use of the mill in the 1850s, utilised a Cornish-type boiler to generate the steam required by the engine situated in the main spinning block. Surviving features in the fabric of the building, coupled with the results obtained from the 'strip and record', demonstrated that the mill had been powered originally by a beam engine, which had almost certainly been compounded. The engine flywheel was placed centrally, and the power was transmitted via a pinion wheel to the primary drive shaft that was situated along the northern edge of the engine room. This shaft powered the weaving shed to the north of the engine room, and was translated through 90° into the spinning block at ground floor level via a bevel gear housed in the room to the south of the engine. This room also housed a footstep bearing for the vertical shaft, carrying power to the upper floors of the spinning block, where the line shafting was supported on the southern of the two rows of columns. The primary shaft also appears to have serviced a pump, located in a small structure to the south of the spinning block, which appears to have returned water to the reservoir from a culvert, aligned under the building to the engine room.

This system was augmented in the late nineteenth century with the addition of at least one Lancashire boiler to the west of the original Cornish-type boiler. The two boilers were seemingly used concurrently, and were connected to a new cylindrical chimney, erected at the southern end of the original boiler.

The final phase of development was probably associated with the conversion of the mill to electric drive in the early twentieth century, rendering the steam-power plant largely redundant. The Lancashire boiler was decommissioned, its foundation backfilled and the area flagged over to provide a storage area below offices at first-floor level in the boiler house. The original Cornish-type boiler, however, appears to have been retained, presumably used to heat the mill complex.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank Helen Lewis, of Countryside Properties (Northern) Ltd, and Laura Broughton, of Scott Wilson Ltd, for commissioning and supporting the project. Thanks are also due to Norman Redhead of the Greater Manchester Archaeological Unit for considerable support and advice. Further thanks are expressed to Sam Lane-Ryan, of Celtic Technologies, for logistical assistance.

The watching brief was carried out by Will Gardner, Ellen McInnes and Chris Wild, the strip and record by Sean McPhillips, Kelly Clapperton and Graham Mottershead, and the drawings were produced by Marie Rowland and Chris Wild. The report was compiled by Chris Wild and edited by Ian Miller, who was also responsible for project management.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 Countryside Properties (Northern) Ltd has submitted a planning application to redevelop a site for housing in Heywood, Greater Manchester. Until recently, the site was occupied by the Victory Works, which was established in the 1850s as an integrated spinning and weaving mill, known as Rose Hill Mill. The development proposal allowed for the demolition of the mill complex, and the complete clearance of the site.
- 1.1.2 In order to secure archaeological interests, Rochdale Metropolitan Borough Council (RMBC) requested that an appropriate scheme of archaeological investigation was implemented in advance of demolition to ensure that an adequate record of the mill complex was compiled to mitigate its ultimate loss. Following consultation with the County Archaeologist for Greater Manchester, who provides RMBC with planning advice on archaeological issues, it was recommended that demolition was preceded by a programme of building recording commensurate with an English Heritage Level 2-type survey.
- 1.1.3 The building recording was carried out by Scott Wilson Ltd on behalf of Countryside Properties (Northern) Ltd, and concluded that the mill had an unusual plan form, reflecting its piecemeal development (Scott Wilson Ltd 2008). However, as a result of fire damage, a former boiler house and part of the original spinning block were considered too dangerous to enter, and were excluded from the survey. Consequently, it was recommended that a watching brief was targeted on these areas during demolition and the subsequent removal of modern surfacing. This was intended to identify any archaeological remains that were exposed, and compile a mitigation record in advance of their ultimate destruction. The scope of the required archaeological works was presented in a project specification (*Appendix 1*), devised by Scott Wilson Ltd in consultation with the County Archaeologist for Greater Manchester.
- 1.1.4 In June 2008, Oxford Archaeology North (OA North) was requested by Scott Wilson Ltd, acting on behalf of Countryside Properties (Northern) Ltd, to carry out the specified programme of archaeological works during the demolition and clearance of the site. In the first instance, the watching brief monitored the removal of a modern concrete slab inside the former boiler house. Whilst undertaking the watching brief, significant archaeological detail was observed within the spinning block to the east and, consequently, this was also rapidly recorded, in order to more fully explain the nature of the power system within the complex. Following the demolition of the former spinning block, a second phase of archaeological works was implemented in November 2009. Following consultation with the County Archaeologist for Greater Manchester, this final phase of archaeological investigation comprised a programme of strip and record, and was intended to identify and record any archaeological remains of the former engine room that had been internal to the spinning block.

1.2 SITE LOCATION

- 1.2.1 Victory Works is situated in Heywood, Greater Manchester (centred at NGR SD 84645 10660). Heywood is situated on the south bank of the River Roch, between Bury and Rochdale, and some 12km to the north of Manchester.
- 1.2.2 The study area occupies a plot of land bounded by Bury Street, Moor Street, Rose Hill Street, and Regent Street, approximately 1km to the west of Heywood town centre (Fig 1; Plate 1).



Plate 1: Aerial view of Victory Works prior to demolition, showing the area of archaeological interest

2. METHODOLOGY

2.1 OBJECTIVES

2.1.1 The stated objectives of the archaeological works were:

- to identify and record the presence/absence, nature, extent, and date of any archaeological deposits or features associated with the mill. Specifically, the watching brief was intended to record any structures revealed during the removal of fire-damage debris and the floor surface;
- to identify areas associated with the original power sources of the original mill. These original power sources include the chimney base, flues, original boiler house and engine beds. It was intended that any evidence for the early power structures would compliment the existing buildings survey, and further enhance the current knowledge of this structure.

2.2 WATCHING BRIEF

2.2.1 A programme of field observation recorded the location, extent, and character of all surviving archaeological features and deposits within the proposed ground disturbance. The work comprised observations during the clearance of a former boiler house and spinning block that contained an internal engine room.

2.2.2 All excavation work was carried out using a mechanical excavator fitted with a toothless ditching bucket, which was operated under close archaeological supervision. Any subsoil horizons exposed during the course of the ground works were examined systematically, and all archaeological features and horizons were recorded on OA North *pro-forma* recording sheets.

2.3 ARCHAEOLOGICAL STRIP AND RECORD

2.3.1 A final phase of field observation provided for a rapid identification and recording of features below the floor level of the engine house. The work comprised the removal of overburden within a single trench. All excavation work was carried out using a mechanical excavator fitted with a toothless ditching bucket, which was operated under close archaeological supervision. Any subsoil horizons exposed during the course of the ground works were systematically examined, and all archaeological features and horizons were recorded on OA North *pro-forma* recording sheets.

2.4 ARCHIVE

- 2.4.1 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).
- 2.4.2 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3. BACKGROUND

3.1 INTRODUCTION

- 3.1.1 The following section provides an overview of the historical development of the site, and draws on the earlier assessment undertaken by Scott Wilson Ltd (2008, 4-8). The presentation of the historical background is intended to provide a context for the results obtained from the archaeological investigation.

3.2 HISTORICAL BACKGROUND

- 3.2.1 Throughout the medieval and post-medieval periods, Heywood almost certainly comprised little more than a small farming community. It is likely that the incomes derived from farming will have been supplemented by weaving woollen goods in the domestic system (Baines 1835). By the sixteenth century, the textile industries in south Lancashire were beginning to flourish. Woollen cloths made from fleeces were being produced on the Pennine slopes to the north and east of Manchester, including the area around Heywood, and coarse linens were being woven, and bleached and dyed, from locally-grown flax and hemp on the plain to the west (Winterbotham 1998, 22). During this period, Walloons fleeing the Low Countries and Huguenots escaping persecution in France sought refuge in England. They brought their looms and their weaving trade, and specialised in making complicated threads and tapes. They settled initially in the south, in Canterbury and London, but soon transferred their trade to the Manchester area, a move presumably stimulated by the lack of regulation and guilds (Wadsworth and Mann 1931, 102). This workforce, using complicated and expensive Dutch looms, gave to Manchester a skilled and industrialised workforce, and perhaps unwittingly helped to establish an industrial discipline needed with the turn to factory production that was to have a dramatic impact on the whole region.
- 3.2.2 By this time, the weaving of pure woollens in south Lancashire had started to decline in favour of mixed fabrics classed as smallwares and fustians, whilst the market for linen remained buoyant. Linen yarn formed the warp for both fabrics, and whilst worsted was usually selected for the weft in smallwares, cotton became frequently used in fustians; the earliest known reference to cotton in the region dates to 1601, when it was mentioned in the will of George Arnould, a Bolton fustian weaver (Wadsworth and Mann 1931, 15). Fustians were produced in a network of towns with Manchester at their hub, and the town became the principal commercial centre for the region (Winterbotham 1998, 40).
- 3.2.3 It was against this background that Heywood developed and expanded in the nineteenth century as one of the many satellite towns around Manchester engaged in the manufacture of textile goods. Heywood, situated on the River Roch, and with an abundance of local coal, was well suited to the new industry, and the first cotton-spinning factory, Makin Mill, was established in

the town in 1770 (Haynes 1997). The earliest factories were water-powered, and several were erected on sites in the Cheesden Valley (McNeil and Nevell 2000, 35). However, the industry developed only slowly during the early nineteenth century, with only ten mills in 1817, although by 1833 the total had risen to 27.

- 3.2.4 The industry expanded more rapidly following the improvement to the local transport network, primarily with the construction of the Heywood Branch Canal in 1834 (Hadfield and Biddle 1970), and, more importantly, the Lancashire and Yorkshire railway in 1848 (Nock 1969). The resultant ‘extraordinary growth of the cotton trade’ in Heywood during the mid-nineteenth century led to ‘an influx of strangers causing a very dense population’ (Lewis 1848). Indeed, Edwin Waugh, the Rochdale-born poet, was able to describe Heywood in the early 1880s as ‘almost entirely the creation of the cotton industry’. In 1881, the newly created Municipal Borough of Heywood included 67 cotton mills and weaving sheds, together with 75 cotton waste and other textile warehouses, and 67 engineering works, the bulk of which produced machines for the textile industry.
- 3.2.5 By the late nineteenth century, Heywood established itself as a centre for the production of low-grade cloth from cotton waste, a process which differed only in the preparatory phase from normal cotton spinning, and thus required little conversion for the existing mills. However, the limited amount of waste available restricted the trade and thus the size of the individual mills (Williams with Farnie 1992, 15). Nevertheless, in 1905, Plum Tickle Mill in Heywood began operation as the largest mule-spinning mill in the world under one roof (Haynes 1997).
- 3.2.6 Production in Heywood reached its zenith as a textile-manufacturing town in 1915, when the cotton-spinning mills in the town housed in excess of 1,000,000 spindles, making the town the fifteenth largest centre of cotton spinning in the region (Williams with Farnie 1992, 44-7). However, the last large weaving mill in the town was J Smith Hargreaves & Company, towel manufacturers.
- 3.2.7 As elsewhere in the region, decline in the subsequent decades was rapid, with many of the mills closing and being demolished. Plum Mill and its sister-mill, Unity Mill, were idled in the 1960s under the government reorganisation of the cotton industry. By the mid-1960s, only two spinning mills remained in operation (*The Rochdale Directory* 1966, 132). Since then, most of the former cotton mills in the town have been demolished, although the Mutual Mills, a complex of four spinning factories, are Grade II listed buildings, and provide a physical reminder of the importance of the textile industry to the town.

3.3 DEVELOPMENT OF VICTORY WORKS

- 3.3.1 The site of Victory Works lies on the margins of the town of Heywood, and as such was outside the initial industrial development of the town in the early nineteenth century. The site is depicted on the Ordnance Survey first edition 1:10,560 map of 1851 as enclosed agricultural land, situated to the south of Bury Street, the principal route between Heywood and Bury.
- 3.3.2 The mill had evidently been erected by 1858, as it is listed as Rose Hill Mill in a trade directory for that year. At that date, the mill was occupied by Charles Welsh, who is listed as a cotton spinner and manufacturer (Slater 1858, 158). However, by 1861, John Coupe had taken over operation at the mill, and by 1882 he had formed a limited company 'John Coupe & Co Ltd' (Slater 1882, 286). In 1888, John Coupe & Co, of Rose Hill Mill, was fined for running the mill after hours, in contravention of the Factory Act (*Manchester Times* 25 February 1888). The firm is listed at Rose Hill Mill in a directory for 1891, and accredits them with operating 9,996 spindles and 573 looms to produce twill, satins, and velvets (Worrall 1891, 107).
- 3.3.3 The complex is first depicted cartographically on the 1891 1:500 and 1893 1:2500 Ordnance Survey maps (Plate 2). The plan form of the mill complex is shown to be similar to the final layout; it is roughly rectangular in plan, with an alleyway projecting into the building from the east elevation, and a further structure projecting to the north. This represents a series of inter-linked buildings, and the complex is labelled 'Rose Hill Mill'. A chimney is located centrally along the south elevation, with two rectangular reservoirs situated in the south-east corner of the site.

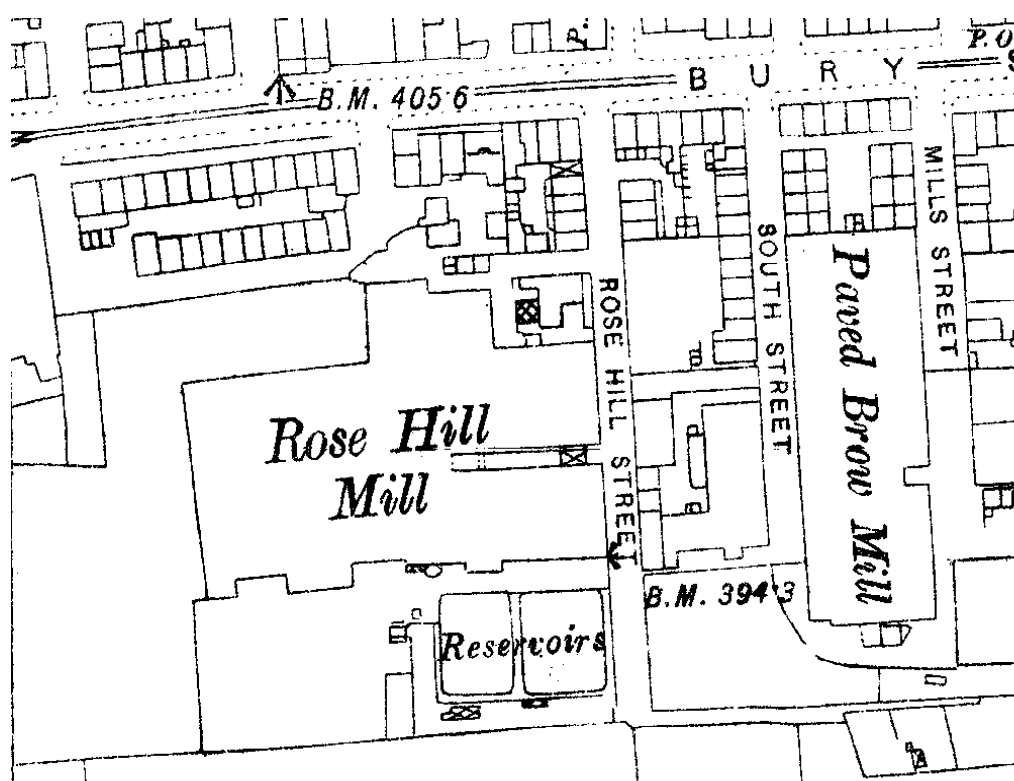


Plate 2: Extract from the Ordnance Survey first edition 1:2500 map of 1893

- 3.3.4 The subsequent Ordnance Survey editions of 1910 and 1929-30 1:2500 display the same plan layout within the complex. Although the surrounding area had been subject to some development, the mill remained close to the south-western limit of the town. Some detail is provided about the mill in Worrall's *Cotton Spinners' and Manufacturers' Directory* of 1918. This lists the mill under John Coupe & Co, and states that the mill housed 9,996 mule spindles and 635 looms, producing satteens, jeanettes, plains and proofing cloths, and representing an increase in the number of looms since 1891. The firm is also listed under cotton spinners and manufacturers in a trade directory for 1924 (Kelly 1924, 1692).
- 3.3.5 The Ordnance Survey third edition 1:2500 map of 1937 depicts the mill with largely the same plan layout, although the buildings are labelled as 'disused'. The site is divided into roughly two parts, along a north/south axis. This may reflect the division of the building into two discrete operational units, or simply the division between buildings on site (Scott Wilson Ltd 2008). Terraced housing is also shown to have been constructed on open land to the south of the site.
- 3.3.6 The 1955-56 1:10,560 Ordnance Survey map labels the mill as Rose Hill Mill. However, the 1956-1957 1:1250 Ordnance Survey map labels the majority of the mill as Victory Works (Paper Tubes), whilst the north-east corner is labelled 'Cotton Waste Mill'. The boundary between these two factories runs along the north/south division seen previously on the 1937 Ordnance Survey map. No division is shown between the two terraced properties to the north-east of the site, suggesting that these may have been interconnected at this point (*ibid*). An electricity sub-station had been erected along the east elevation of the building by that date, whilst a further square structure has been constructed to the south of the site.
- 3.3.7 The 1970 1:1250 Ordnance Survey map shows a similar arrangement to the site, which is still divided into the two operational units. However, by 1977, the central portion of the building to the west of the site has been demolished, so that an east/west-aligned alleyway now extends across the full extent of Victory Works. By this time the chimney along the southern elevation of the mill had been demolished, and the reservoirs had been infilled.

4. RESULTS

4.1 INTRODUCTION

- 4.1.1 The foundations of the boiler house (Building D), situated immediately to the west of the main spinning block (Building A; Fig 2), were exposed during the demolition and clearance of the standing structure in June 2008. All earth-moving works carried out in this part of the site subsequently were monitored by an archaeological watching brief. During the course of the watching brief, the buried remains of the boiler house were exposed directly beneath the modern floor in the eastern part of the former building.
- 4.1.2 The interior of Building D had been remodelled prior to demolition, and its latest flooring comprised a concrete slab, up to 0.3m thick (Scott Wilson Ltd 2008). This sealed a mixed deposit of brick rubble and fuel waste, which varied in depth from 0.2m to 2.0m. Extant brick-built remains were encountered at a depth of 0.5m below the top of the concrete slab. A 25-ton tracked excavator with a toothed bucket exposed the upper surfaces, after which all surviving buried structural remains were excavated by hand.

4.2 RESULTS OF THE WATCHING BRIEF

- 4.2.1 **Phase 1 (c 1858):** the earliest fabric within the boiler house pertained to the bed of a Cornish-type boiler (Plate 3). The remains were well-preserved, possibly as a result of its apparent continued maintenance into Phase 3, and comprised a floor of hand-made red brick, aligned broadly north/south, and measuring 31ft (9.44m) long by 10ft (3.04m) wide (Fig 3).



Plate 3: Bed of Phase 1 Cornish boiler

- 4.2.2 The bricks forming the floor of the boiler bed appeared to have been bonded with clay, rather than lime-based mortar, possibly to prevent moisture rising. The boiler benches survived to their full original height of 2ft (0.61m), and were constructed of hand-made red brick, faced with a single skin of yellow refractory brick (Plate 3), all bonded with a mid-brown lime-based mortar. The upper surface of the benches formed the base of the flues, which routed exhaust gases along the side of the boiler to link into the main flue to the chimney at the rear of the boiler. Numerous boiler-mounting blocks, moulded from refractory clay (Plate 4), survived *in-situ*, with further examples recovered from the demolition material that had been backfilled.



Plate 4: Detail of boiler mounting blocks and the side flue

- 4.2.3 Whilst the boiler was linked eventually into the base of the circular Phase 2 chimney by a flue at its southern end, this represented a remodelling of the original flue. This early structure turned eastwards into the original square-section chimney, placed in the south-west corner of the spinning block (Fig 3) and survived extant as a short cylindrical stack above the mill in the 1980s, when it was photographed (Plate 5) during the Greater Manchester Textile Mill Survey (Williams with Farnie 1992). Similarly, the boiler charging platform, steam pipe and blow-down, positioned at the northern end of the boiler, also represented later alterations to the features within the original boiler house.



Plate 5: Aerial photo of Victory Works dating from the 1980s (Williams with Farnie 1992)

- 4.2.4 **Phase 2 (late nineteenth century):** the mill complex was expanded considerably in the late nineteenth century, creating an increased demand for motive power. This led to the construction of at least one additional boiler, placed immediately to the west of the existing Cornish boiler (Fig 3). The base for this new structure measured 30 by 8ft (9.10 x 2.44m) and survived below a flagstone floor (Phase 3; *Section 4.2.7 below*), but in a much poorer state of preservation than the remains of the Phase 1 boiler to the east (Plate 6).



Plate 6: Foundation bed for the Lancashire boiler (Phase 2)

- 4.2.5 The benches supporting the boiler survived to a maximum height of two courses, and were faced with refractory brick and bonded with a mid-brown lime-based mortar. The partial survival of a full-brick thickness central dividing wall at the rear of the boiler (Plate 6) indicates that it was of a Lancashire type. It seems likely, from the above-ground structures recorded during the building recording (Scott Wilson Ltd 2008), that another Lancashire boiler lay to the west of the watching brief area, serving a new engine house (Building C; Fig 2), constructed to supply power to a new Phase 2 weaving shed (Building B; Fig 2).
- 4.2.6 The new boilers utilised a new cylindrical chimney (Plate 7), placed immediately to the south of the Phase 1 Cornish boiler (Fig 3), adjacent to the existing chimney, but projecting beyond the south wall of the mill, as shown on the Ordnance Survey edition of 1893 (Plate 2). It had an internal diameter of 5 ft (1.52m), constructed of red brick, and faced internally with a single skin of yellow refractory brick. Evidence for valves within the remodelled flue to the Phase 1 boiler was observed (Plate 7), but was only fragmentary in nature, and it was thus not possible to confirm its design.



Plate 7: Exposed remains of the Phase 2 chimney

- 4.2.7 **Phase 3 (early twentieth century):** Building D (the boiler house) was remodelled significantly during the early twentieth century, an episode which almost certainly related to the introduction of an electrical power supply to the majority of the mill complex. The Lancashire boiler in the western part of the building was removed and its flue decommissioned, with the base of the bed sealed with sandstone flags subsequently (Plate 8). A central wall of vertically set flagstones was incorporated within the re-floored boiler bed (Fig 4), suggesting that the area was converted to sub-floor storage tanks for powders or other solid materials.



Plate 8: Dividing wall within the Phase 3 floor over the site of the Lancashire boiler

- 4.2.8 The original Cornish boiler appears to have been retained in service, presumably to provide heat for the mill complex. The charging platform at the front of this boiler (Plate 9), and the associated 'blow down', were constructed using a dark ash-based mortar, indicating that they almost certainly dated from this period, replacing earlier examples.



Plate 9: Remodelled 'blow down' and charging platform of Cornish boiler

4.3 RESULTS OF ADDITIONAL BUILDING INVESTIGATION: BUILDING A

4.3.1 **Introduction:** during the watching brief, it was noted that additional information to that contained within the original building recording (Scott Wilson Ltd 2008), was visible within Building A. This structural fabric related directly to the power systems within the mill, and was thus considered relevant to the excavations of the associated boiler.

4.3.2 **Ground Floor:** the eastern eight bays of the ground floor comprised an open-plan preparation area, with the plastered ceiling supported by timber beams and cylindrical section cast-iron columns at each bay division. The beams were strengthened within each bay with channel-section cast-iron flitch plates, and deflection within their span suggests that they may have been jointed above the columns, with each bay division comprising three members. The columns were of typical mid-nineteenth century style, but also included integral load-transfer boxes for the timber beams within the column head (Plate 10), possibly to protect any such joint. At ground floor level, the columns did not incorporate castings for carrying the line shaft, which was positioned further to the south (see below). However, within the eastern part of the building, where the first floor had been removed, for the late insertion of a travelling hoist, line shaft hanger castings could be observed clearly on the southern faces of the southern of the two rows of columns at first-floor level (Plate 11).



Plate 10: Cast-iron column head detail, second floor, Building A



Plate 11: Line shaft hanger casting in column head, first floor, Building A

- 4.3.8 The western two bays of the spinning block contained significant detail of archaeological importance. The building recording noted apertures relating to the engine house in the brick wall dividing these two bays from the main mill area, and two large apertures to the south that were interpreted as housings for ventilation fans (Scott Wilson Ltd 2008, 13). However, these features almost certainly represented elements of the power transmission system.
- 4.3.9 The northern apertures, relating to the engine, were framed with substantial dressed sandstone blocks (Plate 12), and housed the framing and aperture for a pinion wheel located against the northern wall of the engine house. A large bearing box to the immediate north was partially obscured behind/above a late clinker block structure in the north-western corner of the main ground floor area of the building. To the south, immediately adjacent to the southern row of columns, a very large bearing box was placed at ceiling level. This bearing box was 5'4" wide (1.62m), and had iron sheeting behind a redundant bracket housing on its eastern face (Plate 13). Brick blocking was visible behind this sheeting and, unlike that blocking the apertures to the north, this utilised a lime-based mortar, indicative of a mid-nineteenth-century date, and was possibly contemporary with the original construction of the bearing box. Examination of the western face of the wall (*Section 4.3.5, below*) revealed that the box housed the footstep bearing of the upright driveshaft on its western side. It would have been impractical to include a shaft into the ground floor in this position, given the nature of the bevel gear involved to translate the driveshaft vertically through 90°, thus explaining the rationale of enclosing the rear of the bearing box.



Plate 12: Pinion wheel framing, and bearing box, ground floor, Building A



Plate 13: Rear of footstep bearing, ground floor, Building A

4.3.10 The smaller, 3'6" (1.07m) bearing box to the south, again placed at ceiling level, represents the position of the line shafting within the ground floor of the main mill. It is unusual for such a bearing box to incorporate shuttering on its eastern face, and whilst this does retain a central aperture which a small line shaft may have passed, it more probably represents a later addition to the box, as it includes apertures for both electrical cable ducting and water piping relating to the sprinkler system (Plate 14), both of which would probably have been introduced in the first two decades of the twentieth century.



Plate 14: Shuttering on bearing box

4.3.11 The southern half of the western two bays were of fireproof construction, with a north/south-aligned brick-vaulted ceiling (Figs 6 and 7; Plate 15). This was strengthened at regular intervals with iron tie-rods through the vaulting (Fig 5). The internal vaulting was carried on a cast-iron beam, probably T-section in profile, which was supported by a single cylindrical section column, similar to those within the main mill building, but placed centrally within the room and offset from those to the east. This had a line shaft carrier bracket on its western face (Plate 15), aligned with bearing boxes in the north and south elevations (Figs 5, 6, and 7), which would have housed the end bearings of a short line shaft, installed specifically for this room.



Plate 15: Brick-vaulted ceiling and line shaft carrier bracket, Building A



Plate 16: Main footstep bearing, blocked upright shaft aperture and drum cutaway

4.3.7 The north elevation contained two further apertures: a housing with a sandstone sill and lintel (Fig 6) for an engine mounting, located in the room to the north; and a larger, 3'6" (1.07m) bearing box, flush with the east elevation (Fig 8; Plate 15), which carried the primary shaft from the engine to the footstep bearing, positioned centrally in the east elevation (Fig 5). Both of these bearing boxes had cutaways within the wall face, for drums on the driveshaft, allowing it to be positioned as close to the wall as possible. Above the footstep bearing mount (Plate 16), a blocked aperture in the ceiling previously housed the upright shaft, distributing rotative power to the upper floors. A further bearing box in the east wall, to the south of the main bearing (Plate 17), would have housed a bevel gear, allowing the rotative power to be transferred

through 90° into the main mill block at ground floor level, whilst also allowing the main driveshaft to continue to the south, through the external south wall (Fig 7), where it was carried into a small structure to the south (Section 4.4.3, below).



Plate 17: Bearing box for bevel gear

- 4.3.8 Access into this room was originally at the southern end of the east wall, through a doorway from the main area of the ground floor (Fig 8). This had a segmental brick arch and a timber plank door, presumably replacing an earlier fireproof example. A doorway inserted at the western end of the southern elevation more recently provided external access into the room, with the original window above presumably being blocked at this time (Fig 7). To the west of this doorway, the wall had a boxed return to the west elevation. This housed the original chimney, the tapering cylindrical stack of which survived into the 1980s (Plate 5). No evidence for apertures into the flue were observed, although a void in the wall face (Fig 8) revealed that the chimney stack was of a single-brick thickness (Fig 9), and was infilled with rubble. In the north-west corner of the room, an aperture within the brick-vaulted ceiling originally led to the first floor. It had an iron-sheet lining (Plate 18) and was covered/sealed at first-floor level with a similar sheet, presumably serving originally as a ventilation shaft/flue.



Plate 18: Blocked aperture in vaulted ceiling

- 4.3.9 To the north of this room lay the engine house. It was arranged in a somewhat unusual style, with the engine aligned longitudinally within the mill, rather than the more common transverse position of an internal engine. No safe access was possible into the 2 x 1 bay structure, but details of the wall fixtures for the vertical engine it housed could clearly be identified from the stair tower, positioned in the north-west corner of the mill (Plate 19). A doorway in the south elevation at second floor level provided access to the room above the engine, whilst access to the engine house itself was afforded from the stairwell in the north-west corner, at ground floor level. Hoist rings survived within a badly burned ceiling beam, which had fallen into the debris of the engine house. These demonstrate how integral the structure of the engine house was to its support, rather than the almost free-standing, later engines. Various sandstone-lined apertures, mainly described above, were also observed within the walls of the engine house, demonstrating how it was largely supported by the structural fabric of the building.



Plate 19: View into damaged engine house from stair tower

4.3.10 The large central aperture in the east wall represented the housing for the framing for a pinion wheel (Plate 20). The two outer apertures would have supported the axle mount, whilst the central, much taller aperture, formed a partial cutaway into the wall, allowing the wheel to be positioned as closely as possible to the wall. The large bearing box observed to the immediate north of the pinion wheel housing (Plates 12 and 20) was of very similar style to that in the room to the south of the engine, suggesting that a bevel gear was also housed in this position, taking power from the primary shaft and translating it through 90° into the ground floor of the spinning block, providing a second line shaft, to power machinery in the northern part of the ground floor.



Plate 20: Pinion wheel housing within engine house

- 4.3.11 **First Floor:** access to the first floor was via a fireproof stair tower, placed in the north-west corner of the mill. It comprised sandstone flag floors and steps, and had a central rectangular-section brick newel, which housed a hoist (Plate 21). The first floor was partitioned by a brick dividing wall, where the engine house continued at this level. No safe access was afforded to the room on its southern side, which had a loading door in the southern elevation, suggesting materials were hoisted into this room. This room also housed the vertical driveshaft, and a large bearing box transferred power into the main floor area. The line shaft was carried on hangers attached to castings on the southern face on the southern row of columns, and presumably drove spinning mules placed transversely across the room. The room had a timber-plank floor and a whitewashed lath and plaster ceiling, and was partitioned from the extension to the ground floor at the eastern end of the building by a stud and chipboard partition.



Plate 21: Hoist within the stair newel

- 4.3.12 The water supply for the sprinkler system did not utilise the newel of the stair tower, but instead rose between the floors adjacent to the second column in the northern row of columns (Plate 22). Smaller-section pipes directed the supply around the floor at ceiling level, hung from hangers attached to the beams.

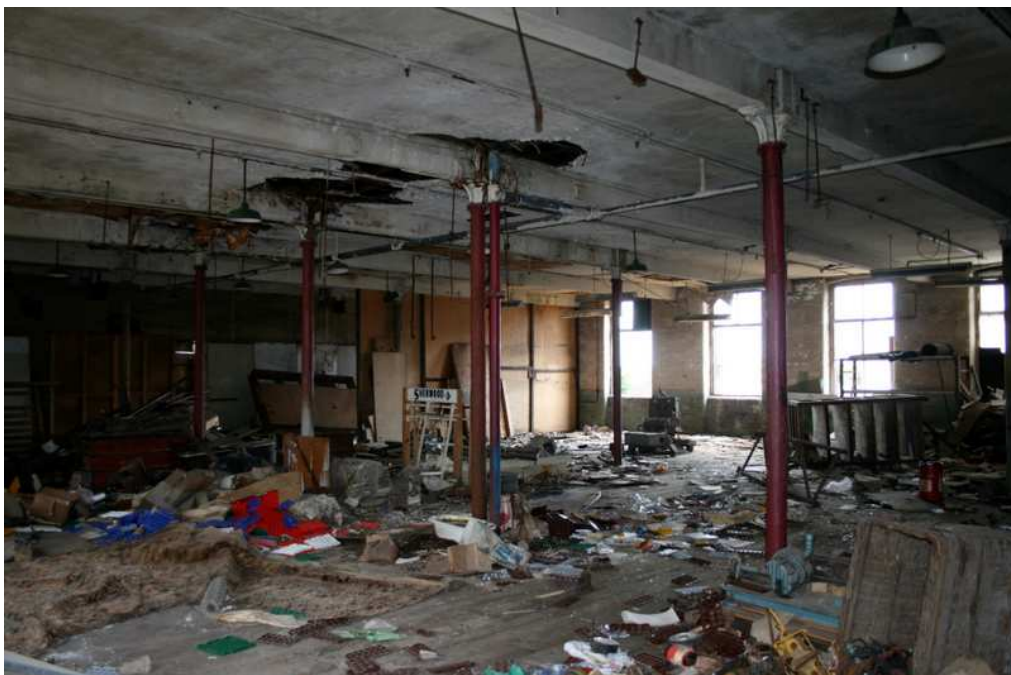


Plate 22: First floor, Building A, with sprinkler pipe arrangement

- 4.3.13 **Second Floor:** the upper floor of the mill was of a similar open plan to the first floor, although it remained intact at the eastern end, above the ground- and first-floor alterations below. The three-span, east/west-aligned roof had its valleys positioned above the two rows of columns. However, the entire ceiling was sealed with lath and plaster, covering the detail of the trusses, which were presumably simple collared trusses, as there were neither queen or king posts in the open raised sections above the beams (Plate 23).



Plate 23: Second floor, Building A,

- 4.3.14 The bay to the immediate south of centre had an inserted taking-in door in the southern elevation, in the position of the original window, extending the door to floor level. This had an I-section crane rail extending both externally, and to the southern column internally, where a large mechanical hoist was situated. This appears to have been almost certainly driven by the line shaft, which would have been placed along the southern side of the adjacent column.
- 4.3.15 As at first floor level, no safe access was afforded into the western two bays of the second floor, although it was possible to observe a doorway in a dividing wall, which extended above the south wall of the engine house at this level.

4.4 ARCHAEOLOGICAL STRIP AND RECORD EXCAVATION

- 4.4.1 **Introduction:** following the demolition of the mill, an archaeological strip and record exercise was undertaken in the footprint of the western two bays of Building A (Fig 10). Removal of the late twentieth-century concrete floors revealed the basal remains of the engine house, and associated culverts. All the structural walls observed within the building survey continued below ground level, and thus the results can be discussed in relation to the stair tower, engine house, and the preparation room in the south-west corner of the mill.
- 4.4.2 **Engine House:** the sub-floor remains of the engine house comprised two distinct areas. The western area had been significantly remodelled, housing a timber plank-capped machine-made brick culvert (Plate 24), whilst the eastern end retained large sandstone blocks pertaining to the original engine (Fig 10). Four such blocks survived, comprising dressed sandstone piers, each measuring approximately 4' (1.21m) square and 18" (0.46m) thick. The north-western of the four blocks survived to an additional block's height, level with the remodelled flagstone/concrete floors to the west. Bolts for tying down the engine to the bed, were cut flush with its upper surface, suggesting that it formed part of this later floor, whilst the lower remaining piers had twisted and bent bolts projecting significantly from their upper surfaces (Plate 25). The western two almost certainly supported the cylinders of the engine, whilst those to the east would have housed columns supporting the entablature beam of the engine. The western end of the engine house would have contained a void below floor level, providing an ideal space through which to place a later culvert.



Plate 24: Remodelled western part of engine house



Plate 25: Engine bed, showing fixing bolts

- 4.4.3 **Preparation Room:** very few archaeological remains were observed beneath the floor of the preparation room to the south of the engine house (Fig 10). Fragmentary wire-cut brick walls, bonded to a small expanse of concrete floor, were observed in the north-west corner of the room, and appear to relate to relatively late remodelling of the engine house. This overlay a north/south-aligned wall, of 1½ brick thickness, bonded with a black sooty mortar, indicative of a late nineteenth-century date. This formed the eastern wall of a conduit housing a 9" (0.23m) diameter cast-iron water pipe (Plate 26).



Plate 26: Cast-iron water pipe adjacent to the western wall

- 4.4.4 The pipe was probably associated with the water return from the engine to the reservoirs, which were located to the south of Buildings A and D, and perhaps replaced a culvert revealed in the south-eastern corner of the trench (Fig 10). This comprised an 18" (0.46m) wide curving channel, with walls turning towards the north-west at its northern end. Both walls were of hand-made brick, bonded in a pale lime-based mortar, but were of differing thickness; the western wall was of only a single skin, whilst the eastern wall was of a full-brick thickness (Plate 27).
- 4.4.5 The culvert was truncated at its northern end, possibly for the insertion of a lower, much narrower culvert, which appeared to have been constructed for drainage rather than relating to the water supply for the power plant. At its southern end, its passage through the external wall of the building was blocked with brick, bonded in a black sooty mortar, again suggesting that this related to a change in the water management of the engine, almost certainly relating to changes in use of the boilers. The culvert original led into an east/west-aligned chamber, immediately to the south of the spinning block, and this feature is possibly that shown on the Ordnance Survey plan of 1893 (Plate 2). The results of the building investigation suggest that this structure had a power supply, which probably drove a pump between the culvert and the reservoirs.



Plate 27: Truncated curving culvert below spinning block

- 4.4.6 **Stair Tower:** the foundation of a stair tower extended below floor level, and appeared to have had a flagstone base to the central newel (Fig 10). Whilst the north, east and south walls of the stair tower were of significant structural integrity to the main mill building, the west wall formed part of the stair tower only. This was reflected at foundation level, where a row of roughly dressed sandstone pads were observed below the basal course of the wall (Plate 28), whereas the bases of the other walls were not observed within the depth of the trench. The use of such sandstone pads reflects the height of the tower, as they appeared to have been intended to provide additional stability to its base.



Plate 28: Sandstone footings for stair tower

- 4.4.7 To the west of the stair tower, in the re-entrant angle beyond the engine house, a set of three brick and concrete steps were revealed (Plate 29). These afforded access into a small sub-basement, measuring 11½' x 8½' (3.51 x 2.59m). This appears to be of Phase 3 date, and was almost certainly used as a store, probably relating to the surviving boiler.



Plate 29: Steps into sub-basement adjacent to stair tower

5. CONCLUSION

5.1 WATCHING BRIEF

- 5.1.1 The location and typology of the original power source for the mill was identified during the initial phase of watching brief, carried out in June 2008. The initial boiler, placed immediately adjacent to the internal engine room, was of the Cornish type. This type of boiler became popular in the 1840s and utilised a three-flue system faced with refractory brick. These refractory brick surfaces would have provided a draw of air along the sides of the boiler complementing the space beneath. The convection currents created would have aided the efficiency of the boiler and prolonged its working life. The Cornish boiler contained a single fire tube immersed in water, which greatly increased the efficiency of thermal transfer. The exhaust from the boiler passed directly to the chimney, placed internally within the spinning block (Building A), in its south-west corner. This relationship was remodelled subsequently, and was therefore not observed during the watching brief.
- 5.1.2 The choice of a Cornish boiler over the more popular and larger Lancashire boiler, which was patented by Fairbairn and Hetherington in 1844 and soon became the most common in mills (Giles and Goodall 1992, 146), appears to have been taken on either size or cost. It would seem that the smaller boiler provided sufficient potential power for the initial mill complex, and it was not until the Phase 2 expansion, in the late nineteenth century, that additional steam capacity was required. The lack of an economiser within the power system, which utilised exhaust gases from the boiler to preheat the feed water, leading to much greater efficiency, suggests that either the initial construction of the complex was undertaken at the lowest possible cost, and thus the expense of building an economiser could not be justified, or that the quantity of power required was low enough to render the expense of an economiser not worthwhile.
- 5.1.3 An increase in the provision of steam was probably achieved by the installation of a new engine in the late nineteenth century. The size and configuration of the building erected to house this new engine, based on photographs of the structure (Scott Wilson Ltd 2008), indicate that it was probably a horizontal engine, which were commonplace by that time. A second boiler house (Building D) was erected adjacent to the existing Cornish boiler. The building recording showed this to have been a two-bay wide structure, with offices above, and the eastern of the two bays was excavated during the watching brief.
- 5.1.4 This new bay contained the bed of a Lancashire-type boiler, which incorporated two furnace tubes giving a larger surface area for heat transfer than the Cornish boiler. It is also possible that the boiler contained Galloway tubes, which would have not only strengthened the structure but would also increase circulation and surface area, again increasing efficiency. It is probable that the unexcavated bay to the west contained a similar boiler bed, the two

new boilers, and the Phase 1 Cornish boiler, cumulatively providing sufficient potential power for the newly expanded complex. It is clear that the Cornish boiler continued in use during this phase, as its flue was re-routed into a new cylindrical chimney, placed immediately to the south. This was almost certainly constructed to a greater height than the original chimney, not only to cope with the increased exhaust, but also to provide a more powerful draught to improve the function of the Lancashire boilers.

- 5.1.5 The final phase revealed in the initial watching brief related to further changes in the power supply to the mill complex, and almost certainly relates to the transfer of the production of power from steam to electricity. The Lancashire boiler that had been situated within the position of the excavated trench was decommissioned, and the area was remodelled with a flagstone floor. This was probably intended for storage space, and the fact that the floor was re-instated below ground level, and that a central, vertically-set flagstone wall was included in the new layout, strongly suggests that the boiler bed was used for sub-floor storage of loose material, probably powder.

5.2 ADDITIONAL BUILDING INVESTIGATION

- 5.2.1 The additional fabric recording undertaken concurrently with the watching brief has provided further important information about the complex, most pertinently regarding the power system within the spinning block. The recording of the size and arrangement of the engine house itself also informed greater certainty about details of the engine itself. The small length of the engine house, and its relative height, demonstrates that the engine was a vertical beam engine. The construction of Rose Hill Mill in the 1850s marks the start of a transitional phase from vertical engines, to more powerful horizontal engines, which became commonplace after 1860 (Hills 1970).
- 5.2.2 The engine house is also somewhat unusual for an internal engine, in that it was placed parallel to the main axis of the spinning block, on an east/west alignment, rather than the more common perpendicular arrangement, which has the advantage of placing the primary shaft from the engine on the correct alignment to drive machinery for the length of the ground floor. The disadvantage with the alignment of the engine at Rose Hill Mill is that the primary driveshaft ran north to south, and thus needed to be rotated by a bevel gear into the spinning block to the east. However, the placement of the cutaway for the pinion wheel in the eastern elevation of the engine house, and the placement of bearing boxes flush with the eastern elevation of the spinning block, explains why this layout was adopted; the more convoluted transmission into the spinning block was outweighed by the fact that the primary driveshaft passed through the north elevation of the engine house, through the redundant space to the east of the stair newel at ground floor level, and continued the entire length of the original weaving shed, Building F, placed on the northern side of the spinning block. This enabled the maximum amount of machinery to be driven from the least number of line shafts, making the system not only more efficient, but less prone to failure. The use of redundant parts of stair towers for driveshafts is not without precedent, with two such examples having been recorded in late-eighteenth and mid-

nineteenth-century power systems at Murrays' Mill, in Ancoats, Manchester (Miller and Wild 2007).

- 5.2.3 Examination of the bearing boxes to the south of the engine house, in the internal wall between the western two bays of Building A and the remainder of the structure, revealed how power was transferred to the machinery within the spinning block. The solution provided a separate line shaft in the room to the south of the engine, and also offset the ground floor line shaft in the main block to the south of the upper two floors, explaining the lack of hanger castings within the columns at this level.

5.3 STRIP AND RECORD EXCAVATION

- 5.3.1 The layout of the engine bed revealed during the final strip and record phase of the fieldwork, suggests that the engine was of 'compound' design, with the two western sandstone piers each supporting a cylinder; one utilising high-pressure, and the other utilising low-pressure steam, to increase the power of the engine. This type of engine, patented by McNaught in 1845 (Giles and Goodall 1992, 134), re-used exhaust steam, and provided much more powerful engines without the need for much larger structures to house them. The cutaway for the pinion wheel, observed during the additional building investigation was placed central in the eastern elevation of the engine house, demonstrating that the flywheel of the engine must also have been placed centrally, between the two rows of extant sandstone blocks. It is, therefore, inevitable that the two visible blocks within each such pair were joined by a much larger and more substantial blocks, presumably not far below the depth excavated, which housed the flywheel axle.
- 5.3.2 Evidence for water supply associated with the power system was also revealed during the strip and record phase of the project. An original culvert appears to have been placed underneath the mill, running into a chamber on the south side of the mill, where water was pumped back into the reservoir. As with the boiler house, significant alterations to the drainage and water supply system were undertaken during Phase 3, when the boiler capacity was significantly reduced.

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APPENDIX 1: PROJECT SPECIFICATION

1 Introduction

1.1 Scott Wilson Ltd has been appointed by Countryside Properties (Northern) Ltd to design and manage an archaeological watching brief during demolition at Victory Works in Heywood.

1.2 A programme of building recording has already taken place at the site, carried out by Scott Wilson. Due to extensive fire damage it was not possible to internally record building D and a portion of building A (see figure 2). As a result of this, it was recommended that a watching brief be carried out in these two areas during the demolition of the Victory Works to record any remaining archaeological features. Once the area has been recorded, the floor surface of the two areas will be removed under archaeological supervision and any archaeological features present, including the chimney base, will be recorded.

1.3 This specification details the methods that will be used for the watching brief, and has been approved by the County Archaeologist for Greater Manchester Archaeological Unit, Norman Redhead.

2 Site Location

2.1 The site is roughly square in shape, and located to the west of the town centre. It is bounded to the north by open ground and properties bordering the southern side of Bury Street, to the east by Rose Hill Street, to the south by housing clustered around Windsor Avenue and to the west by open land on the eastern side of Moor Street (Figure 1). The central grid reference for the site is SD 846106.

3 Planning Background

3.1 An archaeological planning condition was placed on this site (Application No. 07/D48972). The building recording was undertaken as part of this condition and the completion of the watching brief and subsequent report will fulfil the requirements of the planning condition and enable it to be signed off.

4 Historical Background

4.1 Throughout much of the 19th century, the development site comprised enclosed agricultural land. This is evident on the 1851 Ordnance Survey (OS) map which shows that the main east-west thoroughfare through Heywood. A number of industrial buildings are evident in the town, and the railway line runs at some distance to the south of the site. The mill appears in trade directories by 1858, with the Slater's Directory of Lancashire for that year listing 'Rose Hill Mill' as operated by one Charles Welsh. By 1861 John Coupe had taken over operation at the mill, and by 1882 he had formed a limited company; 'John Coupe & Co.' (Slater's 1882 Directory, 286).

4.2 The current buildings are first evident on the 1891 1:500 and 1893 1:2500 Ordnance (OS) Survey map (Figure 3): The plan form of the mill complex is shown to be similar to the present layout; it is roughly rectangular in plan, with an alleyway projecting into the building from the east elevation, and a further structure projecting to the north. This represents a series of interlinked buildings, and the complex is labelled 'Rose Hill Mill (Cotton)'. A chimney is located centrally along the south elevation, with two rectangular reservoirs situated in the southeast corner of the site. Two glass structures are situated to the south of the reservoirs. Two terraced buildings are already present to the northeast of the mill, fronting onto Rose Hill Street. These each display an L-shaped plan form, which interconnect, so that the northern property extends to the rear of the southern property. Each building has an outshoot to the west (rear), whilst a glass structure is also shown to the rear of the north property. The 1894 OS map includes both of these properties as part of the

mill complex. At this point, the mill is located on the outskirts of Heywood. Bury Street itself is mostly developed with terraces of workers housing, and there are a number of large mills in the area. There are, however, also large areas of undeveloped land nearby, especially to the immediate south and west of the site.

4.3 The 1905 Trade Directory describes the company as 'cotton spinners and manufacturers', supporting that the site was an integrated spinning and weaving mill. The 1910 and 1929-30 1:2500 OS maps display the same plan layout. Although some development has occurred in the area, the mill remains close to the southwestern limit of the town. Some structures have been constructed to the south of the site, including two schools and a bowling ground, although the area remains largely open overall. Some detail is provided about the mill in Worrall's 1918 Cotton Spinner's and Manufacturers Directory. This lists the mill under John Coupe & Co., and states that the site had 9996 Mule Spindles and 635 Looms. It produced Satteens, Jeanettes, Plains and Proofing Cloths. The 1924 Trade Directory still lists the site under John Coupe & Co. However, it is now listed as a 'cotton spinners' only, suggesting that the site by this point may no longer have operated as an integrated works.

4.4 Although the 1937 1:2500 OS map displays largely the same plan layout, the buildings are labelled as disused. The site is divided into roughly two parts, along a north-south axis. This may reflect the division of the building into two discrete operational units, or simply the division between buildings on site. Terraced housing is also shown to have been constructed on open land to the south of the site.

4.5 The 1955-56 1:10560 OS map labels the mill as Rose Hill Mill. However, the 1956-1957 1:1250 OS map (Figure 6) labels the majority of the mill as Victory Works (Paper Tubes), whilst the northeast corner is labelled 'Cotton Waste Mill'. The boundary between these two factories runs along the north-south division seen previously on the 1937 OS map. No division is shown between the two terraced properties to the northeast of the site, suggesting that these may have been interconnected at this point. A sub-station has been inserted along the east elevation of the building, whilst a further square structure has been constructed to the south of the site. Allotments are present to the west, whilst a substantial amount of housing has been constructed to the south.

4.6 The 1970 1:1250 OS map shows a similar arrangement to the site, which is still divided into the two operational units. However, by 1977, the central portion of the building to the west of the site has been demolished, so that an east-west aligned alleyway now extends across the full extent of Victory Works. By this point the chimney along the southern elevation of the mill had been demolished, and the reservoirs had been removed or infilled. The surrounding area appears fully developed.

4.7 In the 1980s, a number of aerial photographs were taken of the site as part of the Greater Manchester Textile Mills Survey. These show the mill buildings to have a similar form and layout as to today. A small chimney is evident in the southwest corner of the main mill building. By this point another square structure had also been constructed to the south of the mill, which is still evident on the 1992 and 2007 OS maps.

5 Project Objectives

5.1 The objective of the watching brief is, where possible, to identify and record the presence/absence, nature, extent, and date of any archaeological deposits or features associated with the mill. Specifically the watching brief will record any structures revealed during the removal of fire damage debris and the floor surface. The watching brief will take place during the demolition and clearance phase of the works.

5.2 The specific aims of this watching brief are to identify areas associated with the original power sources of the original mill. These original power sources include the chimney base, flues, original boiler house and engine beds. Evidence for these early power structures will compliment the existing buildings survey and further enhance our knowledge of this structure.

6 The Watching Brief Areas

6.1 The watching brief areas comprise building D and the western portion of building A. Figure 2 shows the areas under watching brief conditions. Demolition will have taken place across the site by the time the watching brief will have commenced, therefore the site should be clear of most of the upstanding buildings.

6.2 The watching brief areas have been designed to cover the areas associated with the original power sources within the mill. The scope of the watching brief areas is sufficient to identify the original power sources within the mill. Building C to the west of the watching brief area demarcates the western extent of any possible early power sources for the mill. In addition, building A, a portion of which is contained within the watching brief area is a part of the original mill and the majority of the ground floor was accessible at the time of the building survey. As building A is part of the original mill, any evidence of the early power sources would still be visible today, and would have been recorded as part of the buildings survey. Building D is a later infill building which was constructed over the site of the original engine house. Therefore it is likely that the evidence for original power sources in this area may be beneath the current ground surface.

7 Methodology

7.1 All work will be carried out in accordance with the Standard and Guidance for Archaeological Watching Briefs produced by the Institute of Field Archaeologists (2001 and subsequent variations), the IFA Code of Conduct and appropriate standard methodologies and national guidance (Appendix 2). This project design describes the methodologies to be used for the project.

7.2 A suitably qualified and experienced archaeologist should be present on site to monitor all excavation and/or soil disturbance within the development area. The archaeologist will monitor the area as it is being stripped and will, where possible and practicable, view any available trench sections after excavation is completed.

7.3 An approved Archaeological Contractor will carry out the work. The Archaeological Contractor will record the date, time and duration of all visits and the nature and extent of the works being monitored.

7.4 When necessary, an additional archaeologist will be present on site to assist with recording and cleaning.

7.5 Demolition will take place across the site, levelling all existing buildings prior to the commencement of the watching brief. The buildings in the watching brief area will be demolished and the majority of the debris will be cleared from the area. The lowest layers of debris will be removed under archaeological supervision in order to cause no damage to any potential archaeological features at ground level. The principal contractor will ensure that there is a safe distance between their works and the watching brief area.

7.6 Once the ground level features have been recorded, the machine will remove the floor surface of the watching brief areas under archaeological supervision. This area will include the former chimney base to allow for its recording. Any archaeological features identified will be recorded as per the methodologies detailed below.

7.7 Any archaeological deposits/features identified will be cleaned and hand excavated in an archaeologically controlled and stratigraphic manner sufficient to meet the aims and objectives of the investigation.

7.8 The areas of excavation/ground disturbance (even if they reveal no archaeological features) will be recorded on a suitable base map/development plan and the stratigraphy

and depth of excavation will be recorded.

7.9 A full written, drawn and photographic record will be made of all archaeological features. Hand drawn plans and sections of features will be produced at an appropriate scale (normally 1:20 for plans and 1:10 for sections). Drawings will include spot heights relative to Ordnance Datum in metres, correct to two decimal places.

7.10 Colour transparency and monochrome negative photographs will be taken at a minimum format of 35mm. In addition to records of archaeological features, a number of general site photographs will also be taken to give an overview of the site and the scope of the works taking place.

7.11 All non-modern artefacts will be retained and stored. If appropriate, the artefacts will be processed in accordance with standard methodologies and national guidelines (Appendix 2). If appropriate, 'small' finds will be recorded three dimensionally and a unique number sequence allocated. Bulk finds such as pottery, industrial waste or animal bone will be collected and recorded by context.

7.12 If delicate artefacts are recovered, appropriate measures will be taken to ensure they do not deteriorate. Following this, arrangements should be made for the finds to be sent to a laboratory for professional stabilisation.

7.13 Where necessary the artefacts will be stabilised, conserved and stored in accordance with the UKIC (United Kingdom Institute of Conservators) guidelines (Appendix 1).

7.14 The archive of finds and records generated during the fieldwork will be kept secure and in appropriate conditions at all stages of the project.

7.15 All ferrous objects and a selection of non-ferrous objects (including all coins) will be xrayed.

7.16 A metal detector should be used to check for the presence of metal artefacts within the spoil from the excavation, as there is potential for metal artefacts dating from the Roman period to occur.

7.17 Should human remains be discovered during the course of the excavations the remains will be covered and protected and left in situ in the first instance, and work will move to the nearest clear area. In such an event the Archaeological Contractor will notify Scott Wilson immediately. Any intercutting graves must be excavated stratigraphically. No human remains shall be partially excavated. In such an event the Archaeological Contractor will notify Scott Wilson immediately. Scott Wilson will inform the County Archaeologist for Greater Manchester and H. M. Coroner. Where human remains are encountered, it is important that the post-excavation assessment contains an analysis and statement for the future retention of the assemblage, including options for reburial.

7.18 The archive of finds and records generated during the fieldwork will be kept secure and in appropriate conditions and materials at all stages of the project.

7.19 Any artefacts which are recovered that fall within the scope of the 1996 Treasure Act will be reported to Scott Wilson immediately. Scott Wilson will inform the County Archaeologist for Greater Manchester and H. M. Coroner.

8 Reporting

8.1 Verbal progress reports will be provided to Scott Wilson on request.

8.2 Immediately after completion of fieldwork any finds and samples will be processed. A suitably qualified archaeologist or specialist will examine each category of find or environmental material.

8.3 A detailed report will be submitted within 4 weeks of the completion of fieldwork. The report will take account of the results of previous research and investigations at the site and will include the following:

a non-technical summary;

introduction (to include site code/project number, dates of field work/visits and grid references);

site location;

archaeological and historical background;

aims and objectives;

methodology;

results (to include full description, assessment of condition, quality and significance of remains. If archaeological remains are observed these will be described in the context of the known archaeology in the area);

discussion;

general location and detailed plans showing the areas of excavation/ground disturbance (to a known scale);

detailed plans and sections as appropriate (where archaeological deposits are exposed, with ground level, ordnance datum and vertical and horizontal scale);

a cross-referenced index of the project archive; and

general site photographs (a minimum of 35mm format), as well as photographs of any significant archaeological deposits or artefacts that are encountered).

8.4 One copy of the completed report will be submitted to Scott Wilson as a draft. In finalising the report the comments of Scott Wilson will be taken into account.

8.5 Six bound copies, one unbound copy and a digital version of the report will be required within one week of the receipt of Scott Wilson's comments on the draft report.

8.6 Electronic files will be provided in Word for Windows and pdf format.

8.7 Scott Wilson will submit one bound copy and a digital (pdf) copy on CD-ROM to Greater Manchester Archaeology Unit for inclusion on the Sites and Monuments Record.

9 Dissemination

9.1 The Greater Manchester Sites and Monuments Record (SMR) supports the Online Access to Index of Archaeological Investigations (OASIS) Project. The overall aim of the OASIS project is to provide an online index to the mass of archaeological grey literature that has been produced as a result of the advent of large-scale developer funded fieldwork.

9.2 The Archaeological Contractor must therefore complete the online OASIS form at <http://ads.ahds.ac.uk/project/oasis/> within 3 months of the completion of the fieldwork. When filling out the form the Archaeological Contractor must make reference to the Regional Research Framework. The Archaeological Contractor is advised to ensure that adequate time and costings are built into their tenders to allow the forms to be filled in.

9.3 Technical advice should be sought in the first instance from OASIS (oasis@ads.ahds.ac.uk).

9.4 Once a report has become a public document by submission to or incorporation into the Greater Manchester SMR. Greater Manchester SMR will validate the OASIS form thus placing the information into the public domain on the OASIS website.

9.5 The Archaeological Contractor must indicate that they agree to this procedure within this specification submitted to Greater Manchester Archaeology Unit for approval.

10 Archive Deposition

10.1 The archive of finds and records generated during the fieldwork will be kept secure at all stages of the project. All records and materials produced will be archived to the standards outlined in Appendix 3 of English Heritage's Management of Archaeological Projects MAP2 (1991).

10.2 The Archaeological Contractor shall, prior to the start of fieldwork, liaise with an appropriate Museum to obtain agreement in principle of the Museum to accept the archive for long-term storage and curation. The Archaeological Contractor shall be responsible for identifying any specific requirements or policies of the museum in respect of the archive, and for adhering to those requirements.

10.3 The deposition of the archive forms the final stage of the project. The Archaeological Contractor shall provide copies of communication with the recipient museum and written confirmation of the deposition of the archive.

ILLUSTRATIONS

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- Figure 2: Site plan showing building identifiers (after Scott Wilson Ltd 2008)
- Figure 3: Plan of Phases 1 and 2 boiler house
- Figure 4: Plan of Phase 3 boiler house
- Figure 5: Plan of the power train in the preparation room on the ground floor in the south-west corner of the spinning block
- Figure 6: North internal elevation of the preparation room on the ground floor in the south-west corner of the spinning block
- Figure 7: South internal elevation of the preparation room on the ground floor in the south-west corner of the spinning block
- Figure 8: East internal elevation of the preparation room on the ground floor in the south-west corner of the spinning block
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PLATES

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- Plate 5: Aerial photo of Victory Works dating from the 1980s (Williams with Farnie 1992)
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- Plate 10: Cast-iron column head detail, second floor, Building A
- Plate 11: Line shaft-hanger casting in column head, first floor, Building A
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- Plate 28: Sandstone footings for stair tower
- Plate 29: Steps into sub-basement adjacent to stair tower



Figure 1: Site location

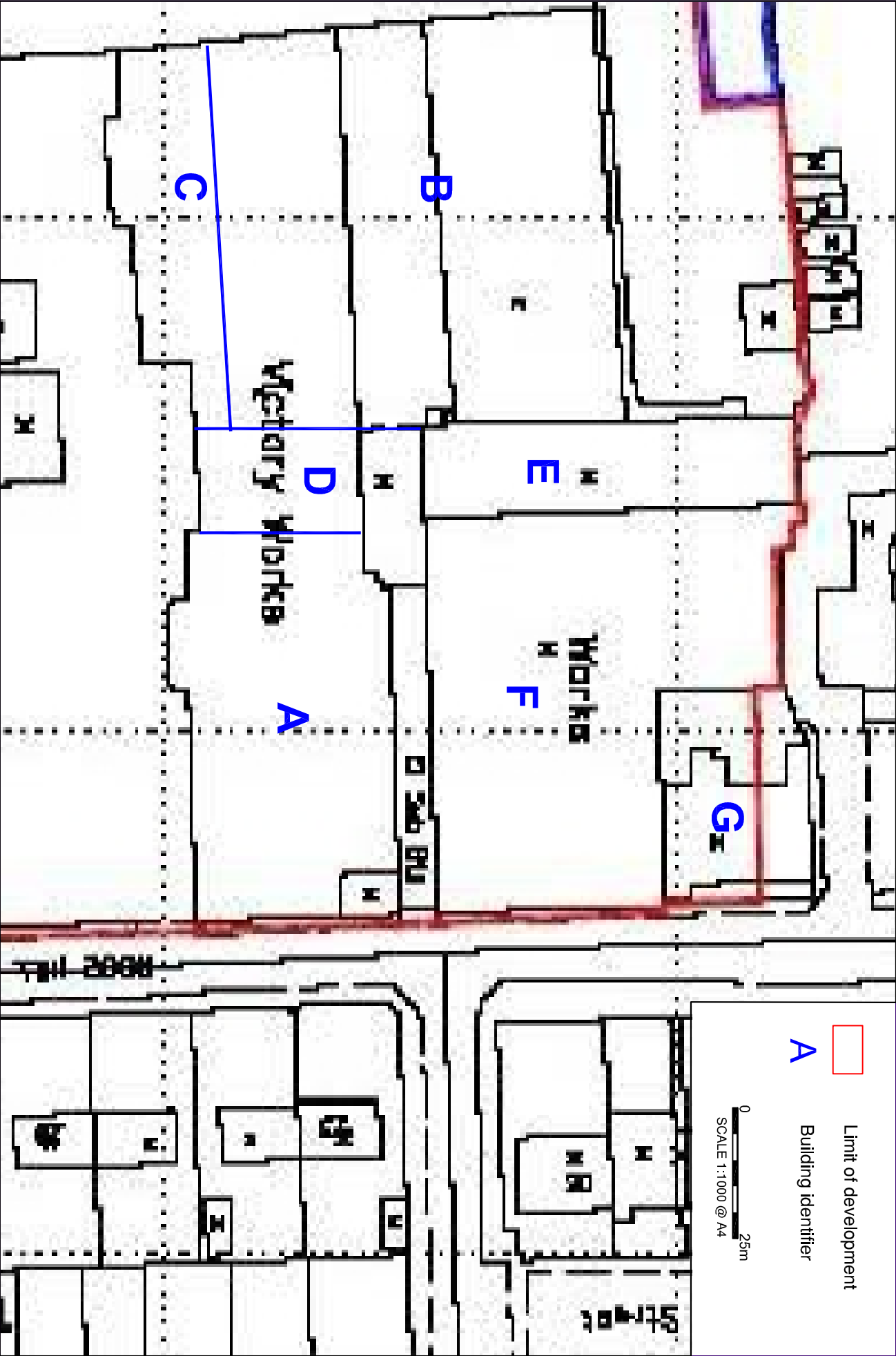


Figure 2: Site plan prior to demolition, showing building identifiers (after Scott Wilson Ltd 2008)

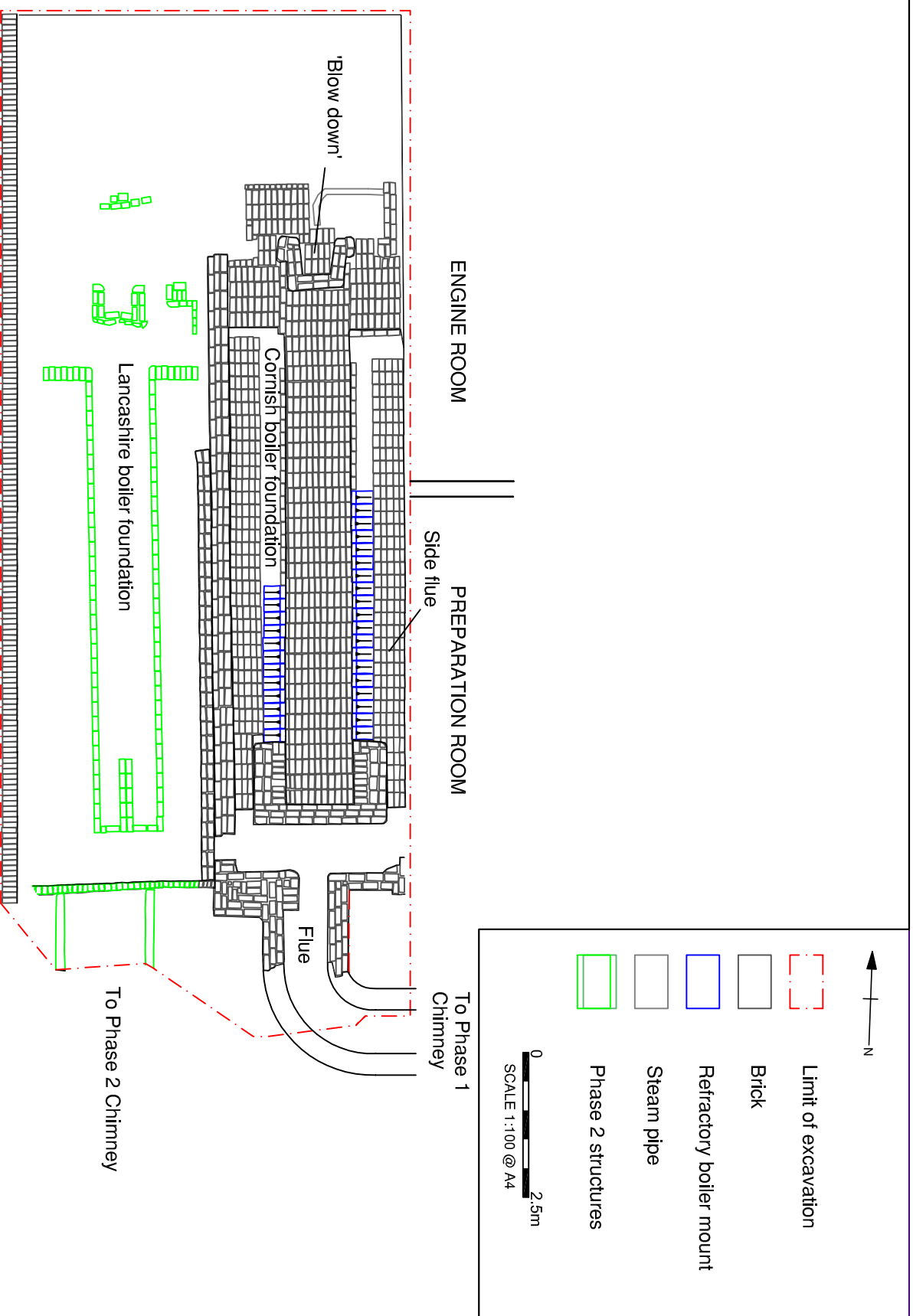


Figure 3: Phases 1 and 2 plan of boiler house

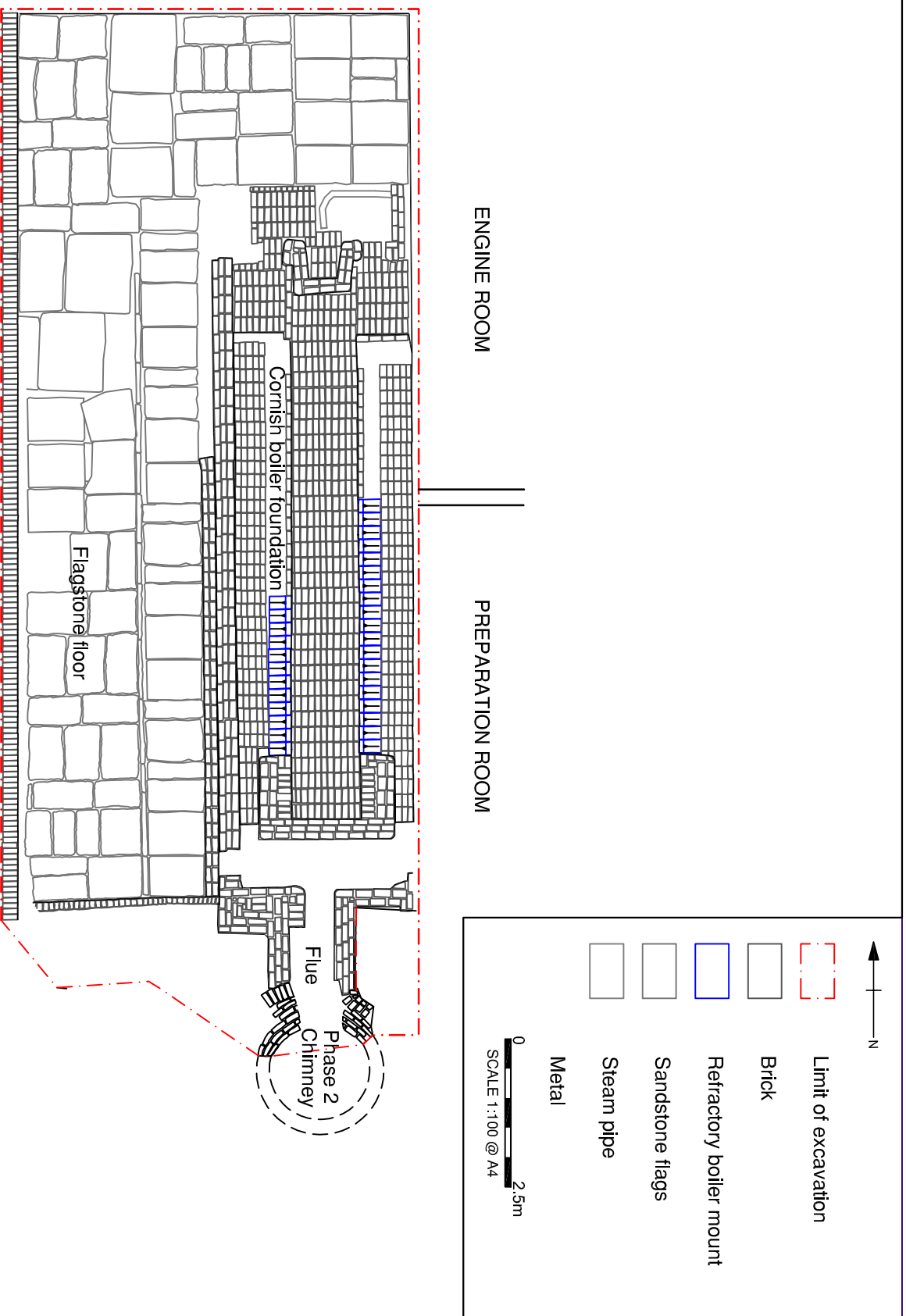
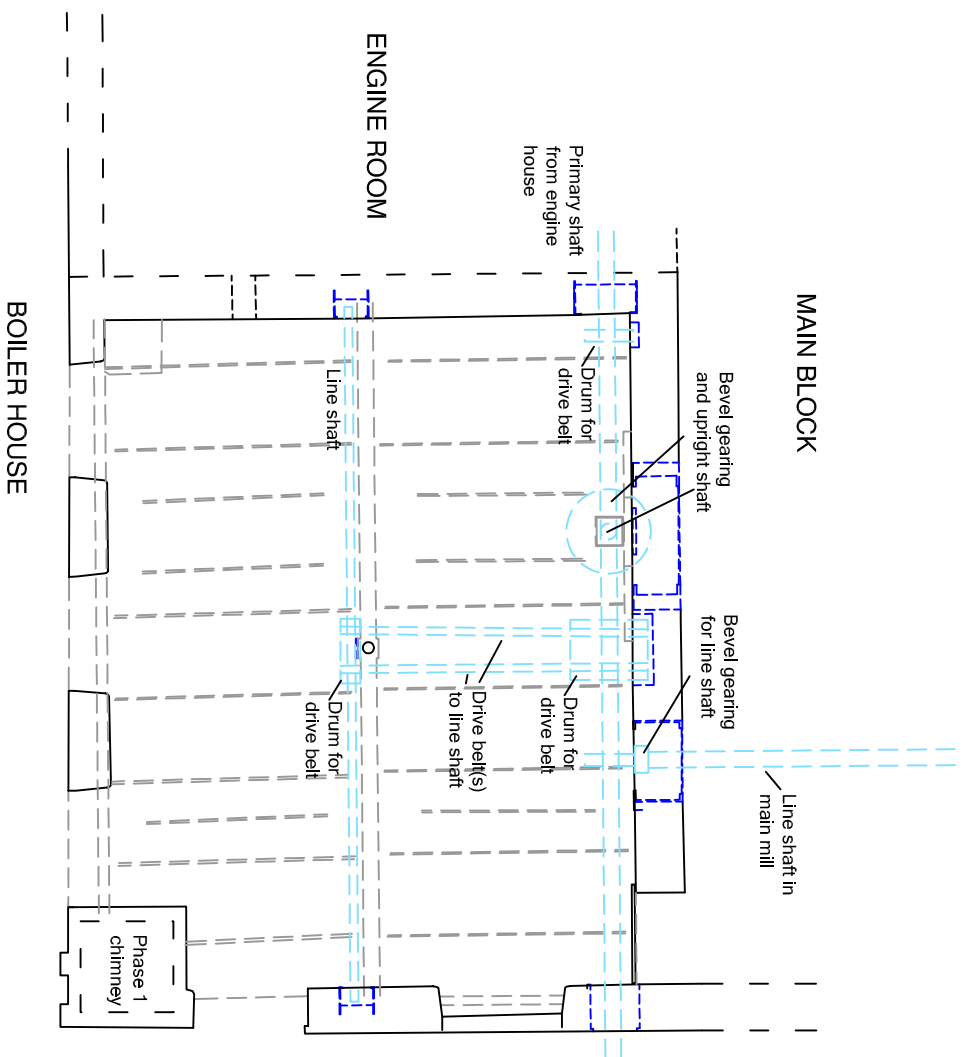


Figure 4: Phase 3 plan of the boiler house

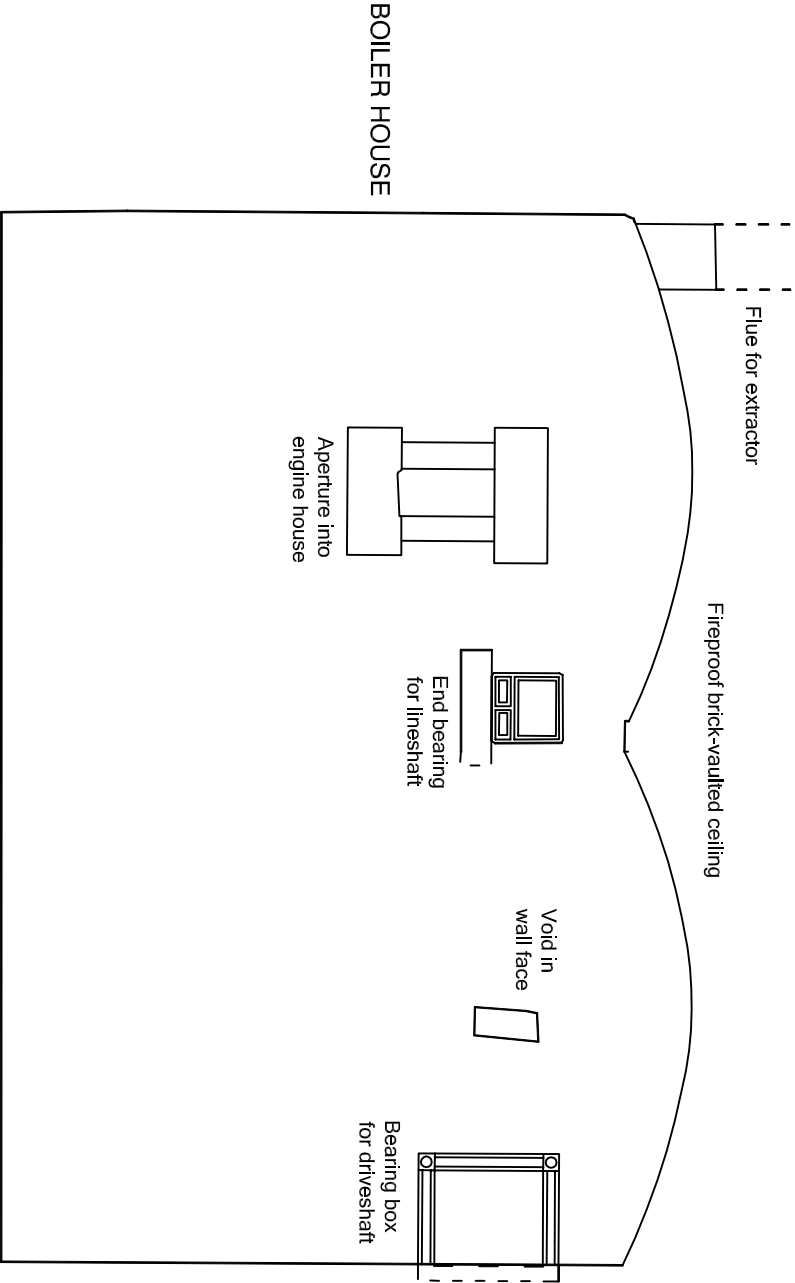


North arrow pointing up, labeled 'N'.

- Wall (solid line)
- Iron ceiling beam/bar (dashed line)
- Extant bearing boxes (blue dashed line)
- Extrapolated power train (red dashed line)

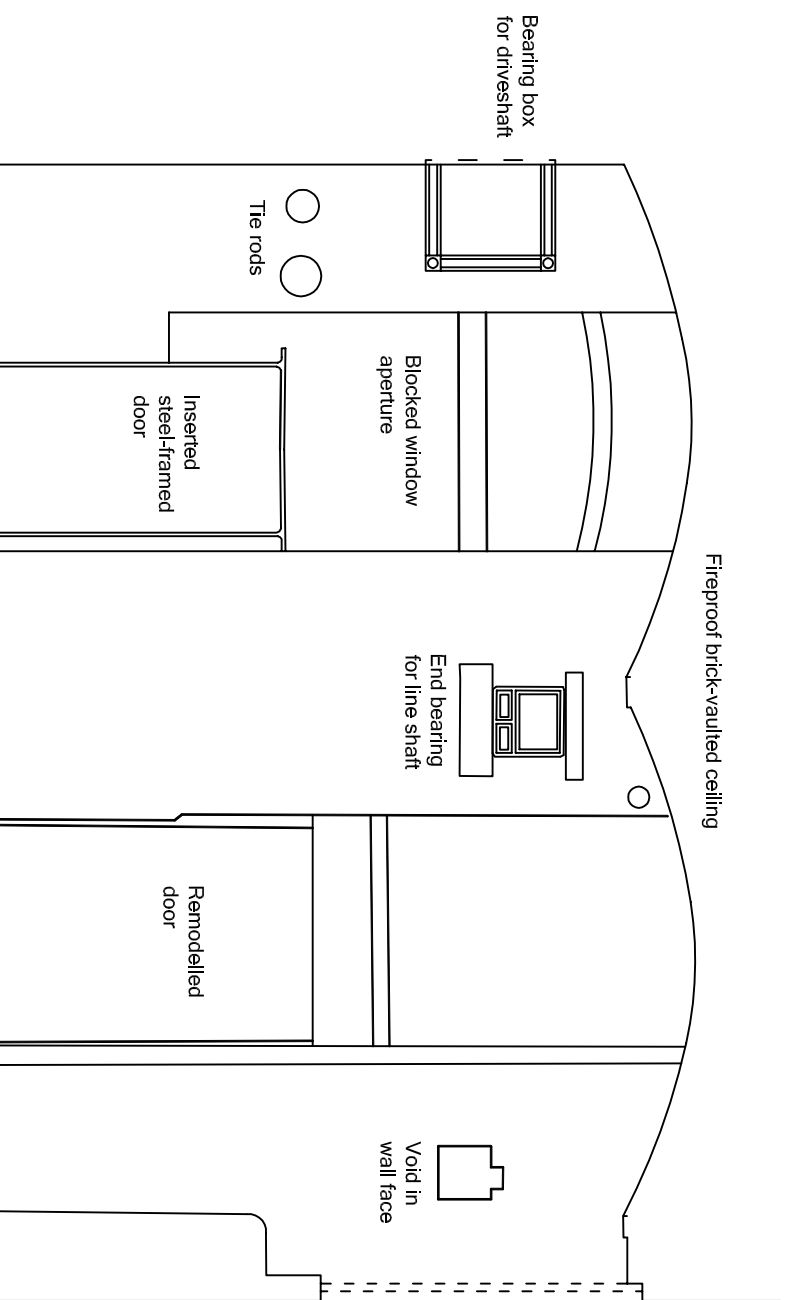
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Figure 5: Plan of the power train in the preparation room, on ground floor in the south-west corner of the spinning block



0 1m
SCALE 1:50 @ A4

Figure 6: North internal elevation of the preparation room on the ground floor in the south-west corner of the spinning block



0 1m
SCALE 1:50 @ A4

Figure 7: South internal elevation of the preparation room on the ground floor in the south-west corner of the spinning block

0 1m
SCALE 1:50 @ A4

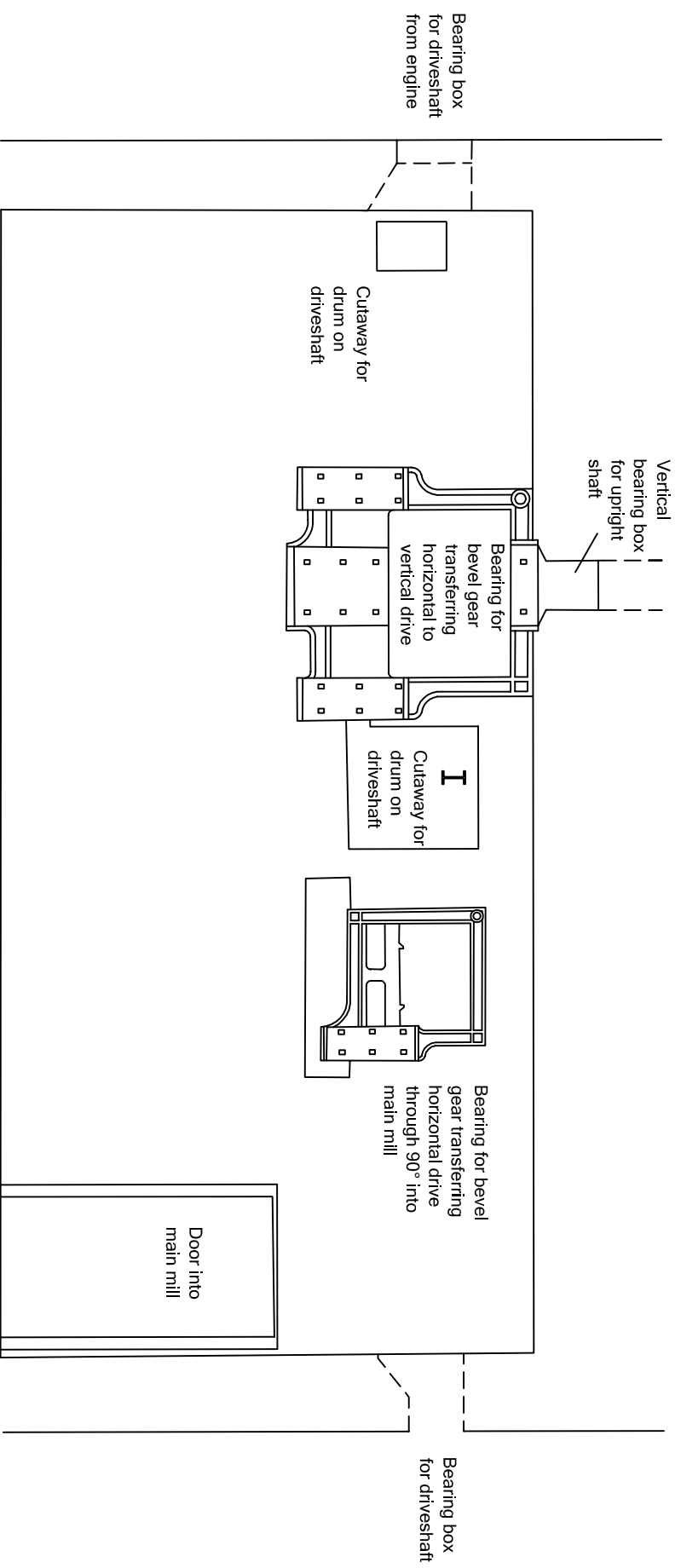
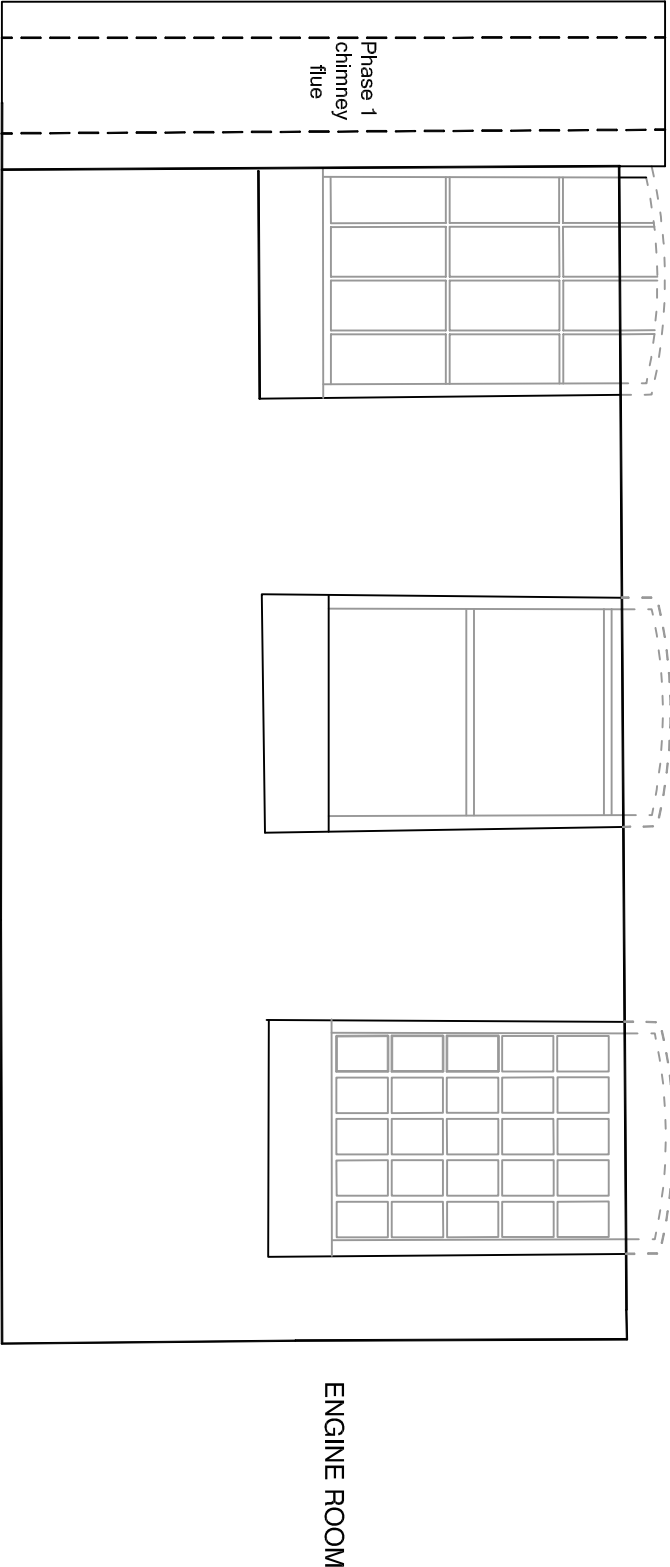


Figure 8: East internal elevation of the preparation room on the ground floor in the south-east corner of the spinning block



0 1m
SCALE 1:50 @ A4

Figure 9: West internal elevation of the preparation room on the ground floor in the south-east corner of the spinning block

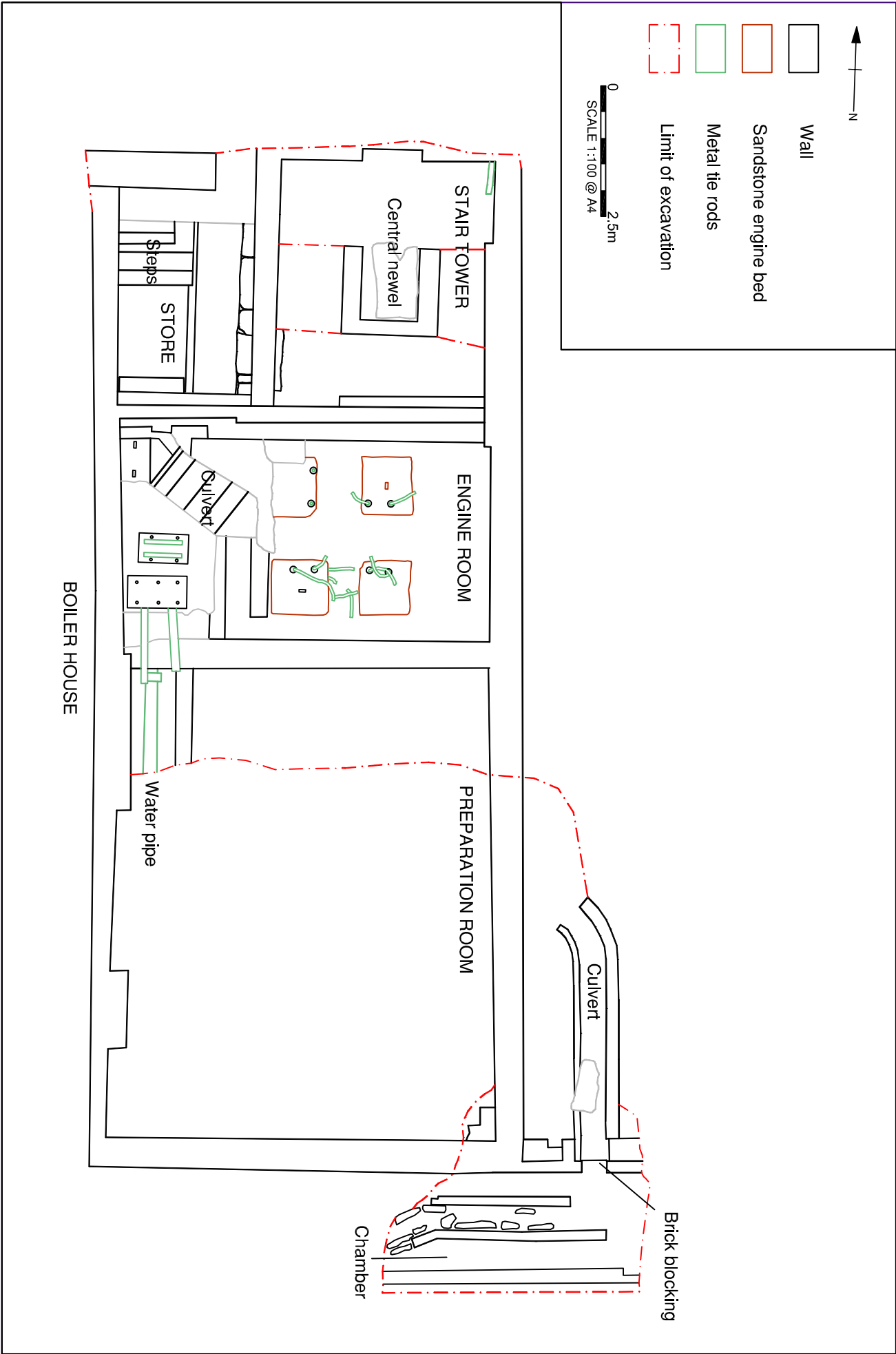


Figure 10: Plan of engine bed and base of stair tower in the boiler house