ARCHAEOLOGICAL EXCAVATION REPORT:

LAND AT MOSS HEY STREET, SHAW, OLDHAM, GREATER MANCHESTER

NGR: SD 94153 08576
AAL Site Code: SHMH 20
Planning Reference: PA/344572/20
OASIS Reference Number: allenarc1-433595

Report prepared for Mulbury Homes

By
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Cover image: Boiler House, looking northeast

Executive Summary

- Mulbury Homes commissioned Allen Archaeology Limited to undertake an archaeological strip map and sample on the site of the former Moss Hey Mill, off Moss Hey Street, Shaw, Oldham, as a condition of planning consent for the erection of 65 dwellings and associated works (Planning reference PA/344572/20).

- The archaeological fieldwork was preceded by an archaeological desk-based assessment (ARS 2020) in respect of the proposed development site.

- Moss Hey Mill is attested historically from 1789, when the mill was in the ownership of Matthew Newton (Gurr and Hunt 1989), when it was most likely water powered. The installation of a steam engine around 1822 may be associated with the construction of the main northeastern range of mill buildings, where the walls were built from handmade brick, and engine and boiler houses were present. A second engine was supplied to Moss Hey Mill in June 1836.

- The earliest phases of the spinning mill were represented by the southwestern of the two main ranges of buildings investigated. The walls were of sandstone and the floor surfaces comprised irregular sandstone flagging. It is possible that this range of buildings represents a smaller initial phase of the spinning mill, pre-dating the introduction of steam power, although no evidence for water power was recorded, as part of the structure was located beyond the limit of excavation to the northwest.

- The main range of buildings investigated was located to the northeast of the possible earlier building, and comprised an extensive structure that included the main ground floor of the spinning mill, with a stair tower attached on the southwestern side, with the engine house and boiler house to the southeast of the main spinning block. The construction of the buildings in this range utilised mortar bonded handmade common brick, with extensive use of firebrick in the boiler houses. The engine bed was of sandstone. The floors throughout the main spinning block comprised large, well dressed flags of Lancashire stone, pierced in many places for machine fixings.

- The form of the engine house suggested that it was built to house a beam engine. There was no obvious evidence to suggest substantial alteration of the engine house to convert it for the installation of a horizontal engine. It is thus possible that the power plant of the spinning mill was based on a beam engine until the electrification of the mill in the mid-20th century.

- The boiler house was of twin bay design. The northwestern bay contained the well preserved remains of a boiler setting for a Lancashire boiler, whilst the other had undergone extensive alteration, possibly associated with the installation of a different type of boiler. It is likely however that the southeastern bay originally housed the setting for a second Lancashire boiler.

- The southeastern bay of the boiler house also contained the *in-situ* remains of the bottom boxes of a Green's Economiser, used to pre-heat water entering the boilers to aid with fuel efficiency. The flue system, including the base of the chimney, associated with the power plant of the mill were also investigated.

- Overall the fieldwork undertaken at Moss Hey Mill recorded the well preserved remains of a small to medium cotton spinning mill constructed largely in the 19th century, although with possible 18th century elements. The mill represented cotton yarn manufacture on a scale which has been under represented in terms of archaeological recording, much of which has concentrated on extant, much larger late 19th/ early 20th-century mill structures.

1.0 Introduction

1.1 Mulberry Homes commissioned Allen Archaeology Limited to undertake an archaeological strip map and sample on the site of the former Moss Hey Mill, off Moss Hey Street, Shaw, Oldham, as a condition of planning consent for a residential development.

1.2 The fieldwork, recording and reporting was carried out in a manner consistent with current national guidelines, as set out in the Chartered Institute for Archaeologists '*Standards and guidance for archaeological field excavations*' (CIfA 2014), the Historic England document '*Management of Research Projects in the Historic Environment (MoRPHE)*' (Historic England 2015) and a specification prepared by Archaeological Research Services Ltd (ARS 2020b).

1.3 The documentary and any physical archive generated by the evaluation was assembled in accordance with national guidelines in '*Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation'* (AAF 2011). The area is not covered by a receiving museum. The digital archive, including the site records and the report, will be deposited with the Archaeology Data Service and all the finds apart from the ceramic fuse carrier have been recommended for discard.

2.0 Site Location and Description

2.1 The proposed development site is located in Shaw, Oldham, Greater Manchester, in the administrative district of the Metropolitan Borough of Oldham. It is situated 4km north-northeast of Oldham town centre. The site is centred at NGR SD 94153 08576. (Figure 1).

2.2 The bedrock geology comprises mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Formation overlain by superficial alluvial clay silt and gravel deposits and peats deposits on the western side of the site (http://mapapps.bgs.ac.uk/geologyofbritain /home.html).

3.0 Planning and Project Background

3.1 A planning application has been submitted for *'the erection of 65 no. dwellings and associated works'* (Reference PA/344572/20) associated with an Outline Planning Approval (PA/331731/11). The proposed houses include 12 x 2 bed, 38 x 3 bed and 15 x 4 bed houses. It provides 44 affordable rent or shared ownership and 21 open market houses.

3.2 Planning permission was granted with a number of conditions, including Condition 13, which states:

> *No development groundworks shall take place until the applicant or their agents or successors in title have secured the implementation of a programme of archaeological works. The works are to be undertaken in accordance with a Written Scheme of Investigation (WSI) submitted to and approved in writing by Oldham Planning Authority. The WSI shall cover the following:*
>
> *1. A phased programme and methodology of investigation and recording to include: i) - archaeological desk-based assessment ii) - targeted evaluation trenching iii) - (dependent upon the evaluation results) targeted open area excavation and recording.*
>
> *2. A programme for post investigation assessment to include: i) - analysis of the site investigation records and finds ii) - a detailed analysis of the fieldwork records iii) -*

production of a final report on the significance of the archaeological and historical interest represented.

3. Deposition of the final report with the Greater Manchester Historic Environment Record and dissemination of the results in a manner commensurate with their significance. This may include production of a volume in the Greater Manchester's Past Revealed series, and a report in a more academic journal.

4. Provision for archive deposition of the report and records of the site investigation.

5. Nomination of a competent person or persons/organisation to undertake the works set out within the approved WSI. Reason - To record and advance understanding of heritage assets impacted on by the development and to make information about the archaeological heritage interest publicly accessible and having regard to Policy 24 of the Oldham Local Plan.

3.3 The approach adopted is consistent with the recommendations of the National Planning Policy Framework (NPPF), with the particular chapter of relevance being *'Section 16: Conserving and enhancing the historic environment'* (Ministry of Housing, Communities and Local Government 2021), and with '*Policy 24: Historic Environment'* of the Oldham Local Plan (Oldham Council, 2011), which states:

Oldham has a rich historic environment with many significant and valuable features, structures and characteristics. The council will protect, conserve and enhance these heritage assets and their settings which adds to the borough's sense of place and identity.

Development proposals must have regard to:

- *National and local guidance and policies on the historic environment.*
- *Oldham Rochdale Housing Market Renewal Pathfinder Heritage Assessments.*
- *Greater Manchester and Oldham Urban Historic Landscape Characterisation Study.*
- *Conservation Area Appraisals and Management Plans, where appropriate*.

When allocating sites and determining applications for planning and advertisement consents, the council will seek to protect, conserve and enhance the architectural features, structures, settings, historic character and significance of the borough's heritage assets and designations including:

a. Listed buildings.

b. Conservation areas.

c. Registered parks and gardens (their historic character and setting).

d. Scheduled ancient monuments (their archaeological value and interest).

e. Significant archaeological remains.

f. Locally significant buildings, structures, areas or landscapes of architectural or historic interest (including non-designated locally significant assets identified in the local lists compiled by the council).

The council will support heritage-led regeneration, including the reuse of historic buildings such as mills, to achieve economic, community and regeneration objectives, where appropriate.

4.0 Archaeological and Historical Background

4.1 An archaeological desk-based assessment was prepared for the site prior to submission of the planning application (ARS 2020). Some of the information presented below is a summary of this report.

4.2 No prehistoric activity was recorded within the study area of the DBA. Within the wider area, Shaw Moss to the west of the site has been identified as an area where paleoenvironmental deposits may be present. The nearest recorded find of prehistoric date, a Bronze Age palstave, is located at Crompton Moor to the northeast of the proposed development area.

4.3 The study area also lacked any identifiable Roman heritage assets, the closest from the period being the possible route of a Roman road between Manchester (*Mamucium*) and Castleshaw (poss. *Rigodunum*) c.3.5km to the south of the proposed development area.

4.4 No specific sites or other heritage assets from the medieval period were identified within the study area.

4.5 The south Lancashire region, in which the site is located, became primarily associated with the manufacture of cotton textiles. The origins of the Lancashire textile industry lie within the latter part of the medieval period, originally based on woollen cloth (Miller and Wild, 2007). The development of textile manufacture in the district was driven by a number of factors, including the necessity of by-occupations for a population in an area with much marginal agricultural land, and the abundant availability of sources of water power for processes such as fulling.

4.6 The textile manufacture in south Lancashire expanded in the early post-medieval period, with some manufacture of linen from the 14th century. By the beginning of the 17th century the textile manufacturing area was roughly divided into areas producing woollen cloth in the eastern part of the district, including Oldham and Shaw, with linen production concentrated in the western part (Wadsworth and Mann, 1931).

4.7 The Oldham area subsequently became associated with the production of mixed textiles (fustians, checks and smallwares), which became predominant in an area between the woollen districts (Rose ed., 1996). In the 18th century the cotton industry developed in the area, gradually displacing the older textile manufactures to become dominant by the end of the century.

4.8 The south Lancashire cotton industry is popularly seen as being strongly associated with the development of the factory system in the late 18th and early 19th centuries. Although earlier precedents exist in other industries and areas (Pacey, 1992), and domestic production, especially in weaving, survived longer than is sometimes appreciated, the mechanisation of production and concentration of the workforce seen particularly in the spinning industry in the cotton district remain historically significant.

4.9 Although the cotton textile industry became concentrated in southeastern Lancashire as a whole, there were sub-divisions within the cotton producing area, with certain districts specialising to a greater or lesser extent in different branches of cotton manufacture. The Oldham district became known for spinning, mainly coarse counts. Throughout the later 19th

and 20th centuries Oldham, which included Shaw, consistently had the largest number of spindles of any of the Lancashire cotton towns; for example possessing c. 9,311,000 spindles in 1893, with the next highest figure being Bolton with c. 4,086,000 spindles, less than half of those in Oldham. At around this time Oldham had 12.4% of all the cotton spindles in the world, c.23.8% of all those in the UK (Williams and Farnie 1992).

4.10 Dating the establishment of the factory system in cotton spinning in south Lancashire is contested, being dependent of the definition of what constitutes a factory, but it seems reasonable to say that spinning mills on a reasonably large scale were a product of the last quarter of the 18th century. Moss Hey Mill is historically attested from *'sometime earlier than 1789'* (Gurr and Hunt, 1989), when it is said to have been occupied by a Matthew Newton. Butterworth records a '*Mr. Newton, Shaw'* in a list of the earliest possessors of 'Dutch wheels', an early type of multiple spindle spinning machine, around the 1770s (Butterworth 1981 (1856)). Thus the construction date of Moss Hey spinning mill is not precisely known, although it is an early example for the Shaw district.

4.11 The mill is recorded as extant in 1789, which pre-dates the earliest use of steam power in the Lancashire cotton district, which is thought to have begun with the use of an engine to raise water for a waterwheel at Shudehill Mill in 1783 (Miller and Glithero, 2016). The first spinning mill in the district to have been powered directly by a rotative steam engine is thought to have been the Piccadilly Mill, Manchester, from 1790. In the Oldham district steam power is said to have been first introduced at Lees Hall Mill in 1794 (Butterworth, *op. cit.,* Gurr and Hunt *op. cit.*). This suggests that the motive power in the original Moss Hey Mill was of animal or water origin.

4.12 Steam power is recorded as being introduced to Moss Hey Mill in 1822 (Gurr and Hunt), when Alexander Petrie and Co. of Rochdale provided for the sum of £600 an engine of 24 (Gurr and Hunt) or 25 (Graham, 2009) nominal horsepower to the mill, by now in the occupation of Joseph Wild. Further engines are recorded in the Petrie engine list (Graham, 2009) as being installed at the mill in 1836 (£1000, 40 nhp, 32 hp boiler) and 1862 (30 nhp, to J Wild and Brothers).

4.13 In 1839 Moss Hey Mill was still in the ownership of Joseph Wild, according to an article in the Manchester Times reporting the death of James Woodhead, 24, a piecer at the mill who was killed when he was caught by a strap that he was piecing, and was '*carried round a shaft at fearful rate, and was most dreadfully mangled*' (Manchester Times 15/06/1839).

4.14 The proprietors of the mill from around 1870-1889 were William Menzies and Co. (Gurr and Hunt) and during this period the mill was involved in the spinners strike of 1885 (Guardian, 22/07/1885). The sale of the mill presumably followed the death of James Wild in c.1862 following which an announcement was made for the sale by auction of the cotton spinning machinery and other equipment from the mill (Guardian 12/04/1862).

4.15 On 14th February 1882, an advertisement appeared in the Guardian, the text of which reads:

> *FOR SALE, a BOILER, 30ft. by 7ft. 6in., with two flues and all mountings: may be seen working at Moss Hey Mill, Shaw, near Oldham. Apply to SEVILLE WILD, joiner and builder, Shaw*

This confirms that Lancashire boilers were used at the mill and provides dimensions for the boilers used in the late 19th century. Additionally, the sale of the boiler, probably one of a pair, may directly relate to alterations made to the boiler house, described in the results section below. It is not clear whether the Seville Wild mentioned is related to the Wild family who had previously been proprietors of the mill.

4.16 The partnership between William Menzies, William Reid Corson and James M^{c}Monies was dissolved on December 31st 1882 due to the retirement of Corson (Guardian 13/01/1883). The partnership between William Menzies and James M^{c}Monies was dissolved in 1886 (The Huddersfield Chronicle and West Yorkshire Advertiser 12/07/1886).

4.17 In 1914 it was reported that the Moss Hey Mill, described as '*one of the oldest mills in the district*' had been sold to '*a Middleton gentleman*' and that it was to be demolished and the building materials reused in the Lilac mill adjacent (Guardian 21/05/1914). However, the outbreak of the First World War delayed the construction of the Lilac Mill until after 1918, and so this plan was abandoned. In 1915 the mill had 18,792 spindles, presumably all mule spindles.

4.18 The Ivor Mill Company purchased Moss Hey Mill in 1917 (Gurr and Hunt) but the mill must have been sold on again, as in 1957 the Ivor Mill was in the ownership of Bolton Textile Mills Co. of Farnworth (Guardian, 03/08/1957). The company controlled 263,200 mule spindles, 3,000 ring spindles and 26,436 doubling spindles at two sites, the Ivor Mill and the Suez Mills in Farnworth. The same company had owned the mill in 1930, when a fire had broken out on the second storey of the mill but was brought under control (Guardian 30/12/1930).

4.19 The mill ceased yarn production in 1959, and by 1962 the site had been taken over by a cotton waste firm. The mill burned down in 1972 and was demolished shortly thereafter. The site was most recently occupied by P D Northern Steels Ltd.

5.0 Aims and Objectives

5.1 The purpose of the fieldwork was to provide preservation by record of the archaeological resources present on the site.

5.2 Evidence was gathered to establish the presence/absence, nature, date, depth, quality of survival and importance of any archaeological deposits to enable an assessment of the potential and significance of the archaeological remains, and to assess the impact of the development upon the archaeology.

6.0 Methodology

6.1 The fieldwork was undertaken by a team of experienced field archaeologists, supervised by Alan Telford. Fieldwork was undertaken between 20th July and 11th September 2020.

6.2 The excavation area was surveyed using a Leica ZENO 20 GPS. Across the excavation area non-archaeological deposits were removed in spits no greater than 100mm in thickness, using a tracked 360^{o} excavator fitted with a toothless ditching bucket. The process was repeated until the first archaeologically significant or natural horizon was exposed, with all further excavation of archaeological deposits and features carried out by hand. Machine excavation was monitored by an experienced field archaeologist.

6.3 A full written record of the archaeological deposits was made on standard AAL context record sheets. Each deposit, layer or cut was allocated a unique three digit identifier (context number) and accorded a written description. Cut numbers are presented within square brackets. A summary of all contexts has been included in Appendix 1.

6.4 Archaeological deposits were drawn at an appropriate scale (usually 1:20 or 1:50). Photography formed an integral part of the recording strategy using digital cameras, with

scales, an identification board and directional arrow included as appropriate. A selection of photographs has been included in this report.

7.0 Results (Figures 2-10)

General

7.1 Due to the lack of substantive evidence for distinct phasing recorded during the fieldwork, the results are presented spatially rather than chronologically, with an assessment of the evidence for phasing reserved for the discussion section below.

7.2 The nature of the site meant that there was contamination present. Although all necessary measures were taken to mitigate the risks present, including the use of appropriate PPE and the removal of contaminants, particularly asbestos, by ADM Regeneration Ltd, some areas of the site were judged to be too heavily contaminated for hand excavation. These areas could therefore not be recorded in detail.

The Western Building (Figure 3: Plates 1-14)

7.3 The western range of buildings recorded during the fieldwork differed in constructional method from the buildings of the main spinning mill to the east, formed of walls of roughly dressed sandstone masonry rather than predominantly hand pressed brick. This variation in construction materials may therefore represent an earlier phase of building, perhaps even the earliest phase of the spinning mill itself.

7.4 The northeastern wall of the range 210 was constructed of roughly dressed and faced sandstone blocks ranging in size from 270mm x 180mm x 30mm to 430mm x 180mm x 100mm, bonded with light whitish grey lime mortar. The wall was abutted to the northeast by the stone setts 106 forming the surface of the road between the two ranges of buildings.

7.5 At the southeastern end, wall 234 returned to the southwest to form the southeastern wall 235 of the southwestern range of the buildings (Figure 4). Wall 235 was of very similar construction to 210 and 234 and part of the original construction of the building.

Plate 1: Southwest facing elevation of sandstone wall 234, showing internal render, looking northeast, 2m and 0.30m scales

7.6 A northeast-southwest aligned internal partition wall 212 was recorded in plan abutting the southwestern face of wall 210. The wall was also of sandstone construction, but was not tied into the northeastern external wall of the building, and so may represent a later alteration.

Plate 2: Partition wall 212, looking north, 2m scale

7.7 Another internal partition 236 bonded to the southwestern face of wall 234 was recorded towards the southeast end of the range. The wall was built from hand pressed red brick measuring 220mm x 110mm x 80mm, bonded with lime mortar, and may represent a later alteration to the original structure. The construction materials of the wall were very similar in character to those used in the construction of the main spinning block to the northeast, and the partition may indicate a change of function in the southwestern range associated with the construction of the main spinning block in the early 19th century.

Plate 3: Brick partition wall 236 with sandstone wall 234 in foreground, showing central flagged surface 215 and later concrete floors, looking southwest, no scales

7.8 To the southwest a series of walls (206, 209 and 211) created a partition on the long axis of the building to designate a number of rooms on the southwest side of the road. To the northwest wall 209 was of sandstone construction and probably contemporary with the external walls of the range. Built into the wall was a worn sandstone threshold 208 measuring 1.27m x 0.33m x 0.08m, indicating the position of a doorway within wall 209.

Plate 4: Northeast facing elevation of wall 209, looking southwest, 1m and 0.30m scales

Plate 5: Threshold 208 set into wall 209, looking southwest, 1m and 0.30m scales

7.9 To the southeast of wall 209 the partition was formed by a brick built wall 206 which survived to a maximum height of 5 courses (0.45m) and was bonded with lime mortar and limewashed on the faces. The brick wall abutted wall 209 to the northwest and to the southeast it abutted a pair of concrete steps 207, with which the brickwork was probably associated. The steps were made of poured concrete on a concrete base and were 1.40m wide with a tread width of 0.30m and a riser height of 0.20m. The steps and associated brick wall represented a later alteration to the original structure.

Plate 6: Concrete steps 207 and brick wall 206 to the right, looking southwest, 1m and 0.30m scales

7.10 To the southeast of the concrete steps a northeast-southwest internal partition wall 213 was recorded in plan. At its northeastern end the wall had been demolished to floor level, like the southwestern end of wall 212, although it was not clear whether this had taken place during the demolition of the mill building or whether the wall had been removed whilst the building

was still in use. The wall was likely to have been contemporary with 212, although they were slightly offset from one another.

Plate 7: Sandstone partition wall 213 to the southeast of concrete steps 207, looking southwest, 1m and 0.30m scales

7.11 The earliest floor surface within the room defined by walls 210 to the northeast, 209 to the southwest and 212 and 213 to the southeast comprised a flagged floor 215, consisting of rectangular flags of local Lancashire stone, smaller and less regular than the flagging used in the main spinning block to the northeast. The floor surface was in poor condition with many of the flags broken and evidence in places of subsidence of the floor.

Plate 8: Flagged floor surface 215 at northwestern end of southwestern range of mill buildings, looking northwest, 2m and 1m scales

7.12 There was some evidence for machinery having been housed in the flagged area of the building. One of the flagstones 216 making up the floor had an incised square notch which may indicate the former presence of a machine base (Plate 9).

Plate 9: Flagstone 216 with shallow square notch, 1m and 0.30m scales

7.13 Immediately to the southeast of partition wall foundation 212 was an iron anchor bolt which may also have been related to the presence of machinery in the building. In comparison with the flagged floor surface recorded within the main spinning block, however, there was little evidence for machine fixings within the southwestern range of buildings.

7.14 To the southeast of partition wall 213, flagging 215 abutted a threshold comprising two green sandstone blocks each measuring 1.37m x 0.28m x 0.07m, to form a threshold 214 with an overall length of 2.74m. At either end of the threshold stones, sockets measuring. 0.28m x 0.11m were recorded and interpreted as the sockets for timber door or gates posts for a double leaf door. At the junction of the two threshold stones bolt holes were recorded cut into flagging 215. The threshold was built into wall 211, which represented a continuation of wall 209, although cartographic evidence suggests that at the location of threshold 214 wall 211 represents the external wall of the southwestern range of mill buildings, whereas to the northwest it represents a partition wall within the range.

Plate 10: Flagging 215 and threshold 214, looking southwest, 2m scale

7.15 To the southeast of walls 212 and 213 the flagging 215 continued and abutted the southeastern wall 235 of the southwestern range of buildings. To the southwestern end of the range a number of later floor surfaces had been inserted to the northeast and southwest of the flagging, which existed only as a 0.88m wide strip at the southeastern end of the range. Surface 244, to the southeast of brick partition 236 and probably contemporary with it, comprised a concrete floor, the upper surface of which was at the same level as the flagging (Plate 3).

7.16 To the northwest of brick partition 236, concrete floor surface 243 was very similar in character to floor 244, and probably represents part of the same alteration to the floor of the southwestern range of buildings.

7.17 Opposite concrete floor 244 to the southwest of the strip of flagstones 215, the earliest floor surface revealed comprised a single 5.88m x 3.12m layer of unmortared bed-laid hand pressed bricks 247 laid on a sub-base of orange coarse sand (Plate 11). It is possible that this represents the original floor of this part of the southwestern range and that the flagging did not formerly extend across the width of the building. The brick surface abutted the flagging to the northeast and was heavily disturbed in some areas and was overlain by a 0.08m thick deposit of concrete 240, the upper surface of which was higher than the surface of the flagstones to the northeast.

Plate 11: Brick floor surface 247 below concrete surface 240, looking southeast, 2m and 1m scales

7.18 To the northwest of brick surface 247 was another concrete floor surface 239 measuring 7.35m x 4.22m. This surface was similar in character to 243 and 244, and probably contemporary with those deposits and had a ceramic drain 246 built into the surface.

7.19 At the north-western extent of concrete surface 239 surface 237 comprised a mixture of brick and flagstones, measuring 4.14m northeast-southwest by 1.25m northwest-southeast. This surface is very likely to pre-date the concrete surface to the southeast but may represent an area of repairs to the original flagging 215 of the southwestern range.

Plate 12: Mixed flagstone and brick floor surface 237 and wall 233 to right, looking southwest, 2m and 1m scales

7.20 The northwestern extent of surface 237 was defined by wall 233, comprising sandstone blocks measuring up to 1.05m x 0.44m x 0.11m, representing an internal partition wall within the

southwestern range of buildings. The southwestern end of wall 233 was truncated by a modern intrusion associated with the installation of services.

7.21 To the southwest of the wall represented by 209 and 211, considerable truncation to the range of buildings had been caused by the demolition of the mill in 1972, and so features recorded comprised disturbed areas of possible flooring, which were not recorded in detail due to their fragmentary nature.

7.22 A number of later floor surfaces were recorded within the southwestern range of buildings, all of which are likely to represent 20th century alterations to the structure. Examples of these later floor surfaces were recorded in plan. Floor 202 comprised square blue non-ceramic tiles on a concrete sub-base. Floor 221 consisted of 2 layers of poured epoxy flooring, again on a sub-base of concrete.

Plate 13: Example of late floor surface 221 and wall 210 to right, looking northwest 1m scales

Plate 14: Example of late floor surface 202, looking southwest, 2m and 1m scales

The Main Spinning Block (Figure 4, Plates 15-30)

7.23 The main spinning block was recorded as a rectangular building measuring >43.79m northwest-southeast by 14.21m northeast-southwest.

7.24 At the northwestern end of the northeastern wall, the main spinning block was defined by wall 116 (Plate 15 and 16). A 6.44m length of the wall was recorded with a maximum width of 0.75m and height of 0.28m. The wall was built from hand pressed red brick measuring 235mm x 110mm x 70mm and bonded with moderately soft light whitish grey lime mortar.

Plate 15: Wall 116, looking north, 2m and 1m scales

Plate 16: Wall 116, looking northwest, 2m and 1 m scales

7.25 At the southeastern end of the wall the internal corner comprised bullnose bricks, suggesting that the end of the wall represents the northwestern side of an entrance into the building. Built into the wall were two inverted relieving arches (Plates 15, 16) later filled with deposit

121 of concrete. The width of the arches was approximately half of the width of the wall, and the length of the features was recorded at c.1.18m.

7.26 To the southwest of the wall a timber joist 117 measuring >6.14m in length and 0.17mwide was recorded. The timber joist was associated with the construction of concrete floor surface 118.

Plate 17: Relieving arch in Wall 116 showing concrete infill, looking northeast, 2m scale

Plate 18: Entrance ramp 153, looking northeast, 2m and 1m scales

7.27 The continuation to the southeast of the northwestern wall of the main spinning block was represented by wall 157. The wall was once again of handmade brick construction and had a maximum width of 0.54m and was recorded for a length of 19.77m. At the southeastern end of the wall an entrance to the main spinning block was indicated by a c. 2.70m wide gap into which a concrete ramp 153 had been inserted to allow vehicular access. The ramp measured

4m northeast – southwest and 2.70m northwest – southeast, and had steel joists set into both long edges.

7.28 Ramp 153 was interpreted as a 20th century alteration to the spinning block. It replaced an earlier ramp 192, which was probably also inserted in the 20th century to facilitate vehicular access. Ramp 192 measured 1.88m northeast – southwest and was 1.35m in width.

Plate 19: Entrance ramp 192, looking northeast, 2m and 1m scales

7.29 The southwestern extent of the main spinning block was defined by wall 156, which was very similar in form to the northeastern wall, and probably of contemporary construction date. The wall had a maximum width of 0.57m and survived to a maximum height of >0.85m (Plate 4)

Plate 20: Elevation of Wall 156, looking southwest, 1m and 0.30m scales

7.30 To the northwest of ramp 132 on the southwestern side of the main spinning block, the mill building was defined by wall 138, a continuation of brick wall 156. An 8.12m length of this wall was recorded, to a point where it was truncated by the foundation cut for the modern PD Northern Steels building to the northwest. As with the other walls of the main spinning block, the construction of the wall was of hand pressed red brick bonded with light whitish grey lime mortar.

7.31 The original floor surface 158 within the main spinning block comprised large rectangular flags of green laminated Lancashire sandstone (Plates 21-23). The average size of the flags was c.0.90m^2 although there was some variation in the size of the flags, which were not uniform.

Plate 21: General shot of flagged floor surface 158, 2m and 1m scales

Plate 22: Detail shot of flagged floor surface 158, 2m and 1m scales

Plate 23: Detail shot of flagged floor surface 158 showing timber inserts, 2m and 1m scales

7.32 Set into the flagstone floor 158, a double row of cast iron column bases (164, 166, 167, 168, 169, 171, 172, 175, 191, 197, 198 and 199) was recorded. The settings were c.3m apart in each row, and the two rows c6.30m apart and 6.28m from the southwestern wall of the building, thus creating two bays of c.6.30m width running the length of the main spinning block. The distance between the northeastern row of column bases and the northeastern wall of the main spinning block was c.1.50m.

7.33 The form of the column bases was the same in all recorded cases, comprising a circular cast iron base plate 0.20m in diameter, with a raised cruciform flange on the upper surface acting as a tenon for the column proper, the purpose of which is described thus: *'a raised cross is formed on the top of the plate fitting into the socket of the column, and turned on the ends of its arms to size, so that the column is kept quite steady*, *being practically fixed'* (Nasmith, 1895) (Plate 24). The cast iron base plates were set into cement (174) with a shallow concave depression on the upper surface in which the base was set. The concrete deposits overlay large rectangular sandstone foundation stones (eg. 349) measuring c. 1.02m x 0.95m to bear the weight of the mill superstructure. There was no evidence of tie-beams or joists between the stone piers.

Plate 24: Column base plate 175, 0.30m scale

Plate 25: Concrete base 174 and stone pier 349, 1m and 0.50m scales

7.34 Throughout its extent, flagged floor surface 158 was pierced by frequent cut and drilled holes associated with fixing machinery to the floor. In some cases the fixing holes were open and in other cases still either retained parts of iron fixing bolts/rods or were plugged with timber inserts, presumably indicating that they were no longer in use. Also present were depressions cut into the surface of the flags, either rectangular or semi-circular in plan that did not pierce the flag (Plate26).

Plate 26: Example of features associated with machine bases, cut into flagged floor 158, 0.50m scale

7.35 The flagged floor was overlain by concrete floor surface 118 reinforced with steel rebar at the base (Plate 27). As the concrete floor surface sealed the features cut into the flagged floor below that were associated with the ground floor machinery of the mill, it is reasonable to assume that the insertion of the concrete floor surface coincided with a change to the layout and function of the ground floor of the main spinning block. The floor, which comprised very hard light whitish grey concrete with an average thickness of 0.23m may be associated with the introduction of mechanical handling plant such as forklift trucks to the mill in the 20th century.

Plate 27: General shot of concrete floor surface 118, 2m and 1m scales

7.36 A number of fittings associated with machinery were set into the concrete floor surface. These include the base of an industrial scale 141 at the northwestern end of the main spinning block. This comprised an iron or steel plate set in a steel frame and connected to a second,

pierced plate to the southwest (Plate 28). It was not clear whether the scale was associated with the mill when it was still producing yarn, or whether the concrete floor was laid after the conversion of the mill to a cotton waste factory in c. 1960.

Plate 28: Base of scale 141, 2m and 1m scales

7.37 Three cast iron columns 142 (Plate 29), 143 and 148 were recorded set into the concrete floor 118. They were of circular section and 150mm in diameter. The columns may have been associated with supporting a roof, although the two main rows of cast iron columns that had supported the first floor during the original phase associated with the flagged floor had been concreted over, demonstrating that the laying of concrete floor 118 probably coincided with much more extensive alterations to the interior of the structure of the main spinning block, and this in turn suggests that the alterations may be associated with the change in use of the mill buildings in c. 1960, when they were converted for use as a cotton waste factory.

Plate 29: Base of column 142 set into concrete floor 118, 0.5m scale

7.38 Another possible machine base 154 was recorded at the southeastern end of the main spinning block (Plate 30). The feature included both iron and concrete elements and its exact use was unclear.

Plate 30: Possible machine base 154 set into concrete floor 118, 2m and 1m scales

The Stair Tower (Figure 5: Plates 31-36)

7.39 Attached to the southwestern side of the main spinning block, a structure measuring c.3.5m x 3m internally was recorded (Plate 31). The structure represents the stair tower that is clearly visible in aerial photographs of the mill.

7.40 The external wall 126 of the structure was built from hand pressed red brick laid in running bond and bonded with light grey lime mortar. The wall was 0.35m in width and survived to a maximum height of 0.52m (7 courses). Wall 126 defined the southeastern and southwestern sides of the structure, the northeastern side being defined by the southwestern wall 138 of the main spinning block, and the northwestern side by wall 128.

Plate 31: General shot of interior of stair tower showing wall 126 and flagging 125, 2m and 1m scales

7.41 The interior of the stair tower was paved with substantial flagging 125 very similar to that used in the main spinning block, and probably laid as part of the same constructional phase. The flagging survived partially, and it is possible that it was partly removed during later alterations to the structure. The flagging abutted the exterior wall 126 and also the outer brickwork 129 of a 1.36m x 0.96m rectangular feature situated centrally within the stair tower (Plate 32). The feature comprised a half brick thick outer wall 129, infilled with a mixture of crushed brick and mortar 130. The structure is likely to represent the foundation for the newel within the stair tower. There was no evidence of the form of the newel above foundation level, or of the staircase itself. In particular there was no evidence for stone steps within the interior of the stair tower, perhaps suggesting that the staircase may have been of cast iron construction.

Plate 32: Foundation 129, 130 of newel within stair tower, 1m scale

7.42 Access to the stair tower was from the northwest side. At its northwestern end the southwestern wall 126 of the stair tower makes a slight return to the northeast before terminating in a jamb for the entrance with a curve formed on the interior side by bullnose bricks (Plate 34). Another similar jamb forms the terminal of the part of wall 128 forming the northwestern side of the stair tower, which is bonded into the wall of the main spinning block at its northeast end (Plate 33). The entrance thus formed is 0.95m in width. Abutting the northwestern faces of both brick jambs were sandstone inserts also forming part of the door jambs. The sandstone elements extended beyond the brick walls by c.0.10m, and in the angle between the stone and brick elements on the northeastern side of the entrance there was an iron fixing set into mortar which is likely to represent the base of a hanging post for a door. No fixing was recorded on the opposite side of the entrance, suggesting the door was single leaf.

Plate 33: Detail of door jamb, northeastern side of entrance to stair tower, 0.5m scale

Plate 34: Detail of door jamb, southwestern side of entrance to stair tower, 0.5m scale

7.43 Wall 128 was of brick construction with elements of sandstone. The wall was aligned northeast-southwest, although this section was heavily truncated by 127. At the southwestern end, where the door jamb was located, the wall returned to the northwest, the southeast-northwest part of the wall defining one side of an entrance ramp 123 (Plates 35-36) which probably represents a later alteration to the structure, although wall 128 is likely to predate the latest phase of the ramp. The southwestern side of the ramp was defined by a northwest-southeast extension 137 to wall 126, of mixed brick and stone construction which was straight jointed to wall 126 at the southeastern end, thus representing a later addition to the structure. This suggests that the walls flanking the ramp were added to the entrance to the stair tower, although the original entrance was probably in the same position.

Plate 35 Entrance to stair tower showing ramp 123 and concrete capped service trench 127, 2m and 1m scales

Plate 36 Entrance to stair tower showing ramp 123, 1m and 0.5m scales

7.44 The latest phase 123 of the ramp leading into the stair tower was of poured concrete construction, with a 'crazy paving' design on the upper surface to improve grip. The concrete abutted the walls to the northeast and southwest. Below the concrete ramp surface a layer of dolerite setts 124 similar to those used for the surface of the road between the main ranges of buildings was recorded. It is likely that the setts were contemporary with the road surface.

The Road between the main ranges (Figure 6, Plates 37-38)

7.45 The area between the southwestern and northeastern buildings was taken up with a number of phases of road surface, detailed below.

7.46 Directly above the natural clay 110 was a deposit 139 of dark grey ash, sand and clinker that served as a bedding layer for a cobbled road surface 106=120, comprising roughly squared, tightly packed basalt setts measuring c. 250mm x 150mm x 170mm, but with considerable variation (Plates 37, 38). The largest area of setts recorded measured 6.65m NW-SE by 2.13m NE-SW. This part of the road surface was truncated to the NW by the foundation cut for the modern building associated with P & D Northern Steels Ltd. The northeastern and southwestern extents of the road surface were defined by the walls 138, 210, 234 of the two main ranges of mill buildings, and the southeastern extent by the concrete ramp 132 leading into the main spinning block.

Plate 37: Road surface 106, looking northwest, 1m and 0.50m scales

Plate 38: Road surface 120, looking northwest, 2m and 1m scales

7.47 The kerbs of the roadway where they abut the walls of the two main ranges of mill buildings were laid in a distinct linear form, and were probably laid before the main road surface was laid (Plate 38).

7.48 At the northwestern end of the roadway, the stone setts were overlain by a layer 103 of edge set predominantly machine pressed bricks, measuring c. 230mm x 115mm x 80mm, but including partial bricks. This seems to represent a localised resurfacing of the road surface as it was recorded only in an area measuring 5.70m x 3.05m at the northwestern end of the road/lane.

7.49 The stone setts road surface was overlain by a number of deposits of concrete 101 and 119, which likely represent a single resurfacing of the road. The deposits all comprised hard light grey concrete reinforced with steel rebar at the base of the deposit. The thickness of the concrete was up to 0.18m. The concrete surface 101 adjacent to the edge set brick surface 103 was contiguous with the brick surface, but probably post-dates it.

The Engine House (Figure 7: Plates 39-46)

7.50 To the southeast of the main spinning block was the engine house that housed the steam engine powering the mill (Plate 39).

7.51 The engine house was largely of sandstone ashlar construction with occasional brick elements. The overall dimensions of the structure were c.11.70m northeast-southwest by 5.25m northwest-southeast.

Plate 39: Pre-excavation shot of engine house, 2m and 1m scales

7.52 The engine house was formed from a number of distinct elements, but little evidence of phasing was recorded, suggesting that the surviving remains of the engine base were of contemporary construction.

7.53 The southwestern extent of the engine house was defined by wall 176, which was built from hand pressed unfrogged red brick, measuring on average 235mm x 110mm x 70mm and bonded with friable light whitish grey lime mortar. The wall was 3.66m in length NW-SE x 0.51m wide NE-SW, and survived to a maximum recorded height of 0.66m (8 courses). The wall abutted sandstone masonry 177 to the southeast and was built on a sandstone foundation and may thus represent a later alteration to the original fabric of the engine house Plate 40).

Plate 40: Post excavation shot of pit with masonry 178 to the left and wall 176 to the right, looking southeast

7.54 Between masonry 178 and wall 176 the masonry elements formed a rectangular pit measuring 3.36m in length and 0.46m wide. The pit was backfilled with a deposit of dark grey ash and clinker 159 which was 0.69m thick and overlay a very compact deposit 350 of very dark grey ash with frequent large angular sandstone inclusions. At the base of the pit four conduits around 0.30m in height and of varying width thought to be the base of masonry 178 were recorded, presumably associated with pipework/gearing for the engine. Between the conduits large blocks of sandstone masonry formed the base of the pit.

7.55 Masonry 177 comprised mixed roughly dressed and rubble green and yellow sandstone blocks measuring up to 760mm x 390mm, random coursed and bonded with hard light whitish grey lime mortar. It formed part of the southeastern wall of the engine house and measured 2.55m NE-SW x 0.58m NW-SE. It was abutted to the northwest by masonry 179 which was distinct from 177, comprising roughly dressed yellow sandstone measuring 240mm x 190mm x 70mm, laid in regular courses and bonded with moderately hard light whitish grey lime mortar. It was not clear whether this masonry was later than wall 177 or of contemporary construction.

7.56 To the northwest of masonry 179 was another distinct block of sandstone masonry 178, comprising lime mortar bonded slabs of 110mm-130mm thick green and yellow sandstone laid in regular courses. The block measured 3.40m x 1.36m and had a maximum height of 1.40m. On the upper surface of the masonry block four steel fixing bolts 40mm in diameter and set in square sockets measuring c.100mm^2 formed a square 0.86m^2. The anchor bolts were interpreted as possibly being associated with the low pressure cylinder of the engine.

Plate 41: Masonry 178 within engine house showing fixing bolts in upper surface and wall 176 to the right, 1m scale

7.57 Around 0.65m to the northeast of the northeastern ends of masonry elements 177 and 179 a single large sandstone green slab 180, measuring c. 1.24m x 0.60m x 0.39m was recorded. To the southwest of this a half brick thick, heavily mortared wall 189 separated the block from a space that had clearly been the location of a similar large sandstone block that had been disturbed, with the two blocks positioned at the southeastern end of a pit formed between masonry 178 to the southwest and masonry 183 to the northeast. The massive nature of the blocks suggest that they were designed to bear a considerable load. Two further large green sandstone blocks were set into masonry 181 to the northeast. The blocks 184, 185 were similar in form to 180, measuring c1.25m x 0.60m x 0.40m, and were worked into mouldings on the northwestern sides. The two slabs are on the southeastern side of a pit formed by masonry 181 to the southeast and masonry 183 to the southwest. The function of the blocks will be discussed in a later section of the report.

Plate 42: Masonry 181 within engine house showing sandstone slabs 184 and 185, looking northwest

7.58 To the northwest of masonry 181 and the southeast of masonry 183 the elements of the engine house formed a rectangular pit measuring 6.33m in length and 1.15m in width, aligned northeast to southwest. The large sandstone blocks 184 and 185 were set into the masonry on the southeastern side of this feature. The pit was filled by a deposit 160 of demolition material deriving from the demolition of the engine house and comprising brick and stone rubble in a matrix of sand, silt and ash. The fill included large angular fragments of sandstone clearly deriving from the superstructure of the engine house building.

7.59 At the southwestern end of the pit two parallel wrought iron joists 351 and 352 were set into the masonry on the NW and SE sides of the feature. The joists were 0.18m in height x 0.09m in width and were set 0.80m apart from centre to centre. Anchor bolts were attached to the joists at their southeastern ends. One of the large sandstone bearing blocks 184 had been cut to accommodate the fixing bolt of the northeastern joist, suggesting that the joists and anchor bolts were a later addition to the original form of the engine house. The arrangements of joists and anchor bolts at the southwestern end of the condenser pit/cold well may have been associated with the installation of a high pressure cylinder during the process of 'McNaughting' the engine (see discussion).

Plate 43: Pit between masonry 181 to the left and 183, 184 and 186 to the right, showing wrought iron joists and anchor bolts at southwestern end, looking southwest, 2m and 1m scales

7.60 On the northwestern side, two conduits through the base of the masonry were recorded at the southwestern end of the pit, which were 0.80m wide and >0.32m in height and were presumably associated with the pipework/gearing of the engine. At the northeastern end of the pit the ends of two iron pipes were recorded (Plate 45), one set into a conduit through the masonry on the northeastern side of the pit, and another at a lower level, with an external diameter of 0.20m set into a conduit through the masonry on the northwestern side of the pit immediately adjacent to the northeastern end wall. Detailed recording of the base of the pit could not be undertaken due to the ingress of groundwater into the feature. The depth of the pit was >2m.

Plate 44: Detail of pipework at northeastern end of cold well, looking northeast, 1m scale

7.61 The pit was interpreted as being the part of the engine bed that would have housed the condenser and associated pipework for the engine. The later alteration recorded at the southwestern end of the pit may be associated with the addition of a high pressure cylinder used to compound the engine.

7.62 To the northeast of slab 180 masonry 181 represents a continuation of the southeastern wall of the engine house (or part of the engine bed?). It comprised roughly dressed, regularly coursed green and yellow sandstone blocks bonded with very hard light whitish grey lime mortar. To the northwest this masonry was abutted by a substantial masonry element 183, which formed a considerable proportion of the engine bed. The construction of 183 was of coursed green and yellow sandstone slabs measuring c. 730mm x 590mm x 150mm and bonded with very hard lime mortar. At the southwestern end of the masonry element two iron anchor bolts measuring 40mm diameter and set in sockets measuring 140mm x 110mm were set 1.10m apart. To the northeast a further four similar anchor bolts were set in a line of overall length 1.51m, in 2 pairs 0.41m apart with 0.65m between the adjacent bolts of the two pairs. These are likely to represent the fixing points for the bearings of the flywheel, the wheel pit for which was located immediately to the northwest of the anchor bolts.

Plate 45: Masonry 183 within engine house showing fixing bolts in upper surface, no scale

7.63 The flywheel pit was backfilled with a deposit 189 of soft black greasy material that smelled strongly of hydrocarbons, suggesting the pit had been used as an oil sump subsequent to the decommissioning of the engine. The backfill was removed by machine until the ingress of groundwater made further excavation futile. A number of finds were recovered from the fill, including a number of hand tools including two ball peen hammers. The wheel pit measured 4m in length and c.0.65m wide, and had a depth in excess of 1m.

Plate 46: Post excavation shot of flywheel pit, 2m and 1m scales

The Boiler House (Figure 8; Plates 47-61)

7.64 To the southeast of the engine house the boiler house associated with the engine was recorded. The boiler hose was divided into two areas, that to the northwest comprising the base for a Lancashire boiler and a similarly sized area to the southeast, which may have originally housed a second Lancashire boiler, but which had been considerably altered in the late 19th-20th century.

7.65 The bricks used in the construction of the Lancashire boiler house to the northwest comprised a mixture of common bricks and firebricks with firebrick predominating, averaging 230mm x 110mm x 75mm in size. The brickwork was all mortar bonded generally with hard dark grey sandy mortar, although some variation was observed. None of the variation in mortar type could be definitely linked to different constructional phases of the structure.

7.66 The main elements of the Lancashire boiler base comprised the northwestern wall 182=296, adjacent to the engine house, the southeastern wall 297 between the Lancashire boiler base and the southeastern part of the boiler house, and the northeastern wall 225, all of which were of predominantly firebrick construction. The southwestern wall of the boiler base was formed by returns on walls 296 and 297 with an opening 1.76m wide between the terminal ends of the returns.

Plate 47: General view of Lancashire boiler base, looking southwest, 2m and 1m scales

7.67 The floor 290 of the boiler base comprised edge set firebrick which was unbonded, although any original mortar bonding may have become degraded. To the northwest and southeast the floor abutted brick built benches 298 to the northwest and 300 to the southeast, built from common brick but with a facing course of firebrick, much of which had collapsed on bench 300. The benches measured 8.39m in length by c. 0.90m in width, and were 1.40m in height. The uppermost course on the internal face of the northwestern bench 298 comprised a single course 299 of refractory boiler mounting blocks, most of which were incomplete. On the southeastern side of the boiler base the boiler mounting blocks were absent due to the collapse of the inner face of the bench, although many fragmentary and some complete blocks were recovered from the fill 355 between the benches. The mounting blocks measured 430mm x 300mm x 220mm and were stamped ACME and SHORT and also with batch numbers. The stamp suggests that the boiler supports were products of the Acme brick company, founded as the Acme Pressed Brick Company in Texas, USA in 1891. If this is the case it would suggest that the boiler mounting blocks represent a late, probably 20th century, alteration to the boiler house, although it would be standard practise to replace elements of the structure subject to deterioration at regular intervals.

Plate 48: Bench 298 showing boiler mounting blocks 299 to the right, looking northeast, 2m and 0.5m scales

7.68 At the northeastern end the base of the boiler was split by spine wall 228 into two flues. The spine wall was of firebrick construction and was one brick thick and 1.34m in length. At the southwestern end of the wall bullnose bricks were used to create a curved terminal end.

Plate 49: Detail of twin flues at northeastern end of boiler base, showing spine wall 228, looking southeast

7.69 At the southwestern ends of the benches within the boiler house two areas 288 and 289 of inclined brick masonry were recorded. The inclined surfaces were made from firebrick and measured 0.97m x 0.74m. The inclined masonry was very similar to features recorded in other Lancashire boiler houses, for example that excavated at A & G Murray's mill in Ancoats, Manchester (Miller and Wild 2007).

Plate 50: Detail of inclined brick masonry 288 at southwestern end of boiler base, no scales

Plate 51: Flagged floor 301 of charging platform at southwestern end of boiler base, looking northeast, 2m and 1m scales

7.70 To the southwest of the Lancashire boiler base the charging platform was recorded in plan. This comprised an area of flagging 301 consisting of large well-dressed rectangular flagstones each measuring approximately 0.89m^2.

7.71 The flagged floor of the charging platform was bounded to the northwest and southwest by a number of brick walls, not all of contemporary construction, and thus demonstrating a series of alterations to the basic structure of the boiler house. Wall 305 to the northwest, which is 2.04m in length and 0.48m wide, returning to the southeast at its southwestern end for 0.68m, is built from hand pressed brick bonded with lime mortar and probably represents the earliest masonry element at the southwestern end of the boiler house, as it is similar in form and construction to other elements of the original mill. Wall 305 was abutted to the northeast by wall 304 which was built from machine pressed brick stamped NEWHEY PLASTIC. The Newhey brickworks were established in 1899 and were operative until the 1930s, suggesting that wall 304 represents an early 20th century alteration to the structure of the boiler house. To the southwest of wall 305 a further section of brickwork 306, bonded with hard dark grey sandy mortar, probably also represents a later alteration to wall 305. Walls 304, 305 and 306 together define the northwestern extent of the charging platform.

7.72 The southwestern extent of the charging platform was defined by two large stone kerbs 308, each measuring c. 1.75m x 0.36m x 0.25m. To the southeast the flagged floor of the charging platform was abutted by concrete surface 268, which comprised two distinct layers of light grey concrete, 0.12m and 0.16m in thickness and represents a 20th century alteration to the southeastern bay of the boiler house.

Plate 52: Flagged floor 301 of charging platform at southwestern end of boiler base showing kerb 308 and walls 306, 305 and 304 from left to right, and concrete surface 268 in foreground, looking northwest, 2m and 1m scales

7.73 In the southeastern bay of the boiler house (Plate 53) the earliest recorded deposits comprised brickwork at the base of the area which were interpreted as probably representing the remains of a second Lancashire boiler base. These areas of brickwork 317 and 318 were not fully investigated due to the presence of overlying deposits and structures, but were similar in character to the masonry of the boiler base in the northwestern bay of the boiler house, and may thus represent the truncated remains of a second Lancashire boiler base.

Plate 53: General post-excavation shot of southeastern bay of boiler house, looking northeast, 2m and 1m scales

7.74 If the interpretation of the southeastern bay of the boiler house as formerly the base of a second Lancashire boiler is correct, and it can be assumed that the second boiler was situated at the same level as that recorded in the northwestern bay, then the brickwork 317 and 318 must have been considerably reduced during subsequent alterations to the structure.

7.75 In the easternmost corner of the southeastern bay of the boiler house, the remains of a fuel economiser/feed water heater 230 was recorded in plan and section (see Figure 12, section 12.11-12.12). The economiser was probably a Green's economiser, first developed by Edward Green from 1845 onwards, or a direct copy manufactured by a different company.

7.76 The remains of the economiser comprised the bottom branch pipe with 12 pipes, all cut off, representing the bottom boxes, as well as the drain valve mechanism, feed pipe and levers controlling the door between the soot chamber and the rake-out pit. The cut off bottom boxes were inclined at a slight angle from the horizontal, the reason for which was not clear, although it may have aided with draining the economiser during maintenance.

Plate 54: Bottom header pipe and cut off bottom boxes of fuel economiser 230, looking southeast, 2m, 1m and 0.5m scales

7.77 To the northeast of the surviving remains of the economiser the soot chamber was defined by wall 229, which was predominantly of firebrick construction, laid in English bond and bonded with hard dark grey sandy mortar. The wall survived to 6 courses (0.48m) in height. The part of wall 229 between the soot chamber and rake out pit had an additional course of firebrick laid on edge supporting the bottom boxes of the economiser. The opening between the soot chamber and the rake-out pit was 0.48m wide, with bullnose bricks on the jambs on the northeastern side. Set into the opening was a cast iron frame for a circular door, which was recovered from the fill of the rake-out pit.

Plate 55: Cut off bottom boxes of fuel economiser 230 overlying wall 229, showing opening between soot chamber and rake-out pit, with cast iron door frame, looking southwest, 2m, 1m and 0.5m scales

7.78 The floor of the soot chamber comprised bed-laid firebrick which abutted wall 229 on all sides. The floor surface continued through to the rake out pit, although the floor 313 here was edge-laid rather than bed-laid, perhaps for greater resilience. The northeastern side of the rake-out pit was defined by wall 229. The northwest and southwest sides of the pit were defined by wall 312. The wall was one brick thick (0.23m) and survived to a height of >8 courses (0.67m). The southeastern end of the wall was straight jointed to wall 325=223 (not shown on the plan), which represents the southeastern wall of the boiler house.

7.79 To the southwest of the economiser, a rectangular brick built structure 315 was recorded in plan. The structure as recorded appeared to represent two distinct phases, with the brickwork of the lower 5 courses of the structure distinct from that of the upper 3, both in the bricks employed and the bonding material and finish of the brickwork (Plate 56).

Plate 56: southwest facing elevation of structure 315, showing distinct constructional phases, 1m and 0.5m scales

7.80 The brickwork of the upper 3 courses included machine pressed bricks stamped NCB GADBURY. These bricks were made at the Gadbury brickworks associated with Gibfield Colliery in Atherton, Lancashire. The brickworks closed in or slightly before 1964, and the NCB prefix dates the brick to after the nationalisation of the coal industry on Vesting Day in 1947. The construction of the upper part of the structure is therefore likely to have taken place in the mid-20th century, the lower part is potentially earlier although it may be roughly contemporary. The structure was built directly on older, handmade brickwork interpreted as possibly part of a second Lancashire boiler base. Within the structure a fill 316 comprising demolition rubble in a matrix of sand, silt and ash was removed. No pipework was recorded associated with the structure, and thus interpretation of the function was uncertain. It may have formed the housing for a tank to which pipes were attached at a level above which the structure survived. The structure may be associated with the substructure of a modernised boiler installed to replace the second Lancashire boiler. The exact type and form of this would be unclear, as the superstructure has been removed.

Plate 57: Post excavation shot of structure 315, 1m and 0.5m scales

7.81 Another rectangular brick structure 319 was recorded on the northwestern side of the bay, approximately central on the northeast-southwest axis. This comprised a square structure measuring c. 1.25m^2 externally and 0.60m internally, surviving to a maximum height of 8 courses of brick. Within the structure iron pipe 338 ran between the northern corner, where the pipe was vertical, and the western corner, where the horizontal pipe 335=338 was set in a conduit in the southeastern wall of the structure. The pipe ran between structure 319 and the southeastern wall of the boiler house 223=325, which it was conducted through via another conduit in the masonry. The pipe was not traced beyond the southeastern wall of the boiler house, although it is assumed to be connected to a large reservoir to the south of Moss Hey Mill, constructed between 1851 and 1894, and represents a water inlet pipe.

Plate 58: Post excavation shot of structure 319, showing pipe 335, 1m scales

7.82 Other recorded pipes in the southeastern bay of the boiler house include the outlet pipe 334 from the economiser, which ran in a south-westerly direction from the bottom header pipe of the economiser for a distance of 6.93m, passing adjacent to the northwestern side of structure 315 and the southeastern side of structure 319. The pipe appeared to have been deliberately cut during the insertion of pipe 337, which ran from south to north through a conduit in the southwestern wall of the boiler house, turning to the northwest through wall 295 between the northwestern and southeastern bays of the boiler house. The brickwork surrounding the pipe where it came through the southwestern wall of the boiler house was clearly a later alteration, demonstrating that the insertion of the pipe post-dated the construction of the main structure of the boiler house. As this feed pipe was also demonstrably later than the outlet from the economiser, this demonstrates that the economiser had gone out of use prior to the installation of pipe 337. The exact function of pipe 337 was unclear, as it was not traced beyond the southeastern bay of the boiler house.

7.83 A further pipe 336 entered the southeastern bay of the boiler house through the southwestern wall. The pipe ran from the southwestern wall on a southwest-northeast alignment to a point where it had been removed and blocked by brickwork 330, which constituted part of a poorly preserved wall. It is likely that pipe 336 represents the southwestern extension of pipe 334, associated with the economiser at the northeastern end of the southeastern bay of the boiler house, with part of the pipe between the two sections having been removed during the later alteration of the boiler house.

7.84 The pipework and brick built structures recorded in the southeastern bay of the boiler hose were overlain by a backfill deposit 332 comprising brick and occasional stone rubble in a matrix of silt and ash. The deposit was interpreted as a deliberate dump of made ground deposited when some of the pipework was still in use. The made ground was overlain by a concrete floor 328 across the entire southeastern bay of the boiler house, which abutted the upper courses of brickwork associated with structure 315, and the flagging of the charging platform to the southwest of the northwestern bay of the boiler house. This suggests that structure 315 may have still been in use when other elements of the southeastern bay of the boiler house had become redundant.

Plate 59: Boiler house showing concrete floor surface 328 within southeastern bay, 2m and 1m scales

7.85 Overlying the concrete floor surface in the southeastern bay of the boiler house a layer 269 of unbonded bricks, predominantly bed-laid, was recorded. The deposit comprised a double layer of bricks across the southeastern half of its extent as well as at the northeastern end, and a single layer elsewhere, although it is likely that it was originally a double layer across the whole extent.

Plate 60: Boiler house showing unbonded brick surface 269 within southeastern bay, looking northeast, 2m and 1m scales

7.86 Incorporated into the unbonded brick surface was a northwest-southeast aligned feature 281 comprising a row of re-used boiler mounting blocks identical to those recorded in the northwestern bay of the boiler house. It was thought that the re-used refractory blocks were intended to form a crude drainage gully within the brick surface.

Plate 61: Detail shot of reused boiler mounting blocks 281 within unbonded brick surface 269, looking southeast, 2m and 0.5m scales

7.87 The unbonded brick surface 269 included bricks stamped NEWHEY, NEWHEY ROCHDALE, SMETHURST GRIMBIES and D.H.B.C^{o} CROMPTON. The first two stamps indicate products of the Newhey brickworks which was operational between 1899 and the 1930s. The Smethurst brick is a product of S & J Smethurst, Grimbies Brick Works, Rochdale Road, Oldham, operative from the 1890s at the latest, until 1906. The last stamp indicates a product of the Dagger Hey Brick Company which was established after 1895 and closed by 1930. The stamped bricks within the surface were therefore datable to the early part of the 20th century, although there is a strong possibility that the bricks were reused from elsewhere and that the construction of the brick surface may post-date the production of the bricks by some years. It was not clear whether the brick deposit was intended to serve as a floor surface in its own right, or whether it was used as a make-up layer for a floor surface that has been removed by the demolition of the boiler house. Either way it is likely that the brick deposit post-dates the point that the boiler house had ceased to be used for its original purpose, probably when the mill was converted to electric power between 1909 and 1930.

Chimney and flue (Figure 9: Plates 62-70)

7.88 The base of the chimney 249 and horizontal flue 250, 251 and 252 associated with the power plant of the mill were recorded in plan. The chimney base was built from predominantly handmade common brick and had an overall external diameter of c.4.50m and an internal diameter of c. 2.30m. The chimney consisted of three blocks of brick masonry c.1.10m wide forming parts of a circular structure, with openings to the northwest, south and east, each c. 0.75m in width. The central part of the structure and the three flues were filled with brick rubble 261, which is likely to have derived from the demolition of the mill in 1973. The flues to the northwest and south were blocked with brick walls 266 which were bonded with lime mortar. The blocking of the flues was interpreted as a later alteration to the original chimney structure. The blocked flues in the chimney base did not have external flues leading to or from them and may have originally been air intake flues to assist the draw of the chimney.

Plate 62: General shot of Chimney 249 and flue system leading to boiler house beyond, looking north, 2m and 1m scales

Plate 63: Detail shot of blocking of northwestern flue of chimney, 0.3m scale

Plate 64: Detail shot of blocking of southwestern flue of chimney, 0.3m scale

7.89 The flue leading from the boiler house was bonded into the flue on the eastern side of the chimney. The flue system showed evidence of more than one phase of construction. The northeastern wall 250 of the main flue was bonded to one side of the chimney flue with a straight joint. The wall was aligned SW-NE, returning after 2.55m to a NW-SE alignment 251, with an internal curve at the corner where the wall returns. The NW-SE orientated section of the wall has a length of 7.35m and is 0.35m in width. Wall 250 was built from handmade common brick and bonded with light whitish grey lime mortar.

Plate 65: Chimney base 249 showing straight joint with northeastern flue wall 250, 2m and 1m scales

Plate 66: Overall view of flue system connected to chimney 249, 2m and 1m scales

7.90 The southwestern wall of the main flue was defined by wall 252. The wall was of similar construction to wall 250 and was 6.75m in length and 0.35m wide. The southeastern end of the wall was truncated by the construction cut for a later flue 253. The width of the main flue connected to the eastern intake in the chimney base was 0.80m. Three transverse walls 357, 358 and 359 were built across the flue and straight jointed to the main walls at either side. The southeastern wall 357 was half a brick thick (0.11m), whilst those to the northwest 358, 359 were one brick thick (0.23m). The walls were bonded with hard dark grey sandy mortar and were interpreted as a later addition to the structure, possibly acting as baffles or associated with dampers in the flue.

Plate 67: Post-excavation shot of flues connected to chimney 249, 2m and 1m scales

7.91 To the southwest of the main flue a second flue structure was recorded in plan. Part of the base of the flue 256 adjacent to the chimney comprised lime mortared hand pressed brick measuring 230mm x 110mm x 80mm. The character of the brickwork suggested that it was roughly contemporary with the main flue attached to the chimney to the northeast. The side walls of the second flue, however, showed evidence of later alteration. Both the northeastern 252 and southwestern 253 walls were at least partially constructed from machine pressed engineering brick, distinct from the brickwork of the base of the flue. Similar brick was used in the construction of a rectangular structure 255, through which the southwestern flue ran. The structure measured 3.35m by 3m and was divided into two chambers by a northwest-southeast aligned spine wall 360.

Plate 68: Pre-excavation shot of structure 255, looking southeast, 2m and 1m scales

7.92 The structure 255 was filled by a layer of very dark grey ash 263 overlying a deposit of mixed ash and brick rubble 258=260. The base of the structure comprised a mixture of bed-laid

partial bricks 361 and moderately soft light yellowish grey concrete, probably representing more than one phase of the structure, the spine wall of which had been realigned as a later alteration. The function of the structure was unclear, although it possibly housed an economiser or pre-heater associated with a later boiler in the southeastern bay of the boiler house.

Plate 69: Post-excavation shot of southwestern part of structure 255, looking south, 1m scales

7.93 The flue associated with structure 255 continued beyond it and entered the boiler house through the southeastern wall 325 into the southwestern part of the structure for the Green's Economiser.

Plate 70: Southwestern flue exiting boiler house through wall 325, looking south

8.0 Discussion and Conclusion

8.1 During the recording of the Moss Hey Mill, two main ranges of buildings were investigated. The range to the northeast, comprising the ground floor of the main spinning block, the stair tower, the engine and boiler houses with associated flues and flue stack was not closely dated in terms of its construction, but is likely to have been of 19th century date, perhaps built when the first steam engine was installed in 1822. The range of buildings was certainly extant by 1845, when it is depicted on the Crompton Tithe Map.

8.2 To the southwest of the main mill buildings a further range of buildings was investigated. This was distinct from the main mill building in terms of construction materials, being walled with sandstone masonry rather than handmade brick and floored, where floors survived, with much more roughly finished flagging, in contrast to the regular, well dressed flags of the main spinning block. Dating evidence for the construction of the southwestern range was again scant, although its general character gave the impression of a much more basic structure which possibly pre-dates the main range of buildings. The difference in construction materials and methods certainly suggests that the two ranges of buildings were not built contemporaneously as parts of the same industrial complex. It was thought possible, therefore, that the southwestern range, which aerial photography suggests was a two storey structure, represents an earlier part of the mill complex. It is likely that subsequent to the construction of the main mill buildings the southwestern range was employed as warehousing or ancillary buildings, but there is a possibility that the range represents an earlier phase of the mill.

8.3 Moss Hey mill is historically attributed to having been built in or before 1789. As this pre-dates the first historically recorded use of steam power for a mill in the area, it can reasonably be assumed that the original mill, one of the first ten in the Shaw area, was driven by water or animal power. Early cotton spinning factories in the region tended to be small in scale, sometimes originally based on converted cottages. It is possible therefore that the 18th century mill was built on a modest scale and thus the stone built southwestern range of buildings may in part represent the original mill building. Unfortunately the northwestern end of the range lay beyond the limit of excavation, and it was at the northwestern end that cartographic evidence suggests may have been the location of a culverted stream that potentially drove a waterwheel adjacent to the north wall of the range.

8.4 The original floor of the main spinning block comprised well-dressed regular flagging of locally sourced Lancashire flagstones. Aerial photography shows that the main spinning block was a four storey structure with 14 bays, 7 on each side of the stair tower, located centrally in the southwest façade of the main spinning block. The stair tower projected beyond the roofline of the main spinning block. The flagging of the ground floor of the main spinning block was pierced by a large number of holes associated with the fixing bolts of machinery associated with the cotton spinning process. In 19th century mills it was usual for the mule frames to be located on the upper floors of the mill, with the ground floor normally housing machinery employed in the preliminary stages of spinning such as openers, scutchers and carding engines (Taggart 1921; Williams and Farnie 1992). It is therefore likely that the ground floor of Moss Hey mill housed such machinery, and that the fixing points piercing the flagged floor of the main spinning block were associated with it.

8.5 The upper floors of the main spinning block were supported by the external brick walls and by a double row of columns, the bases of which were recorded during the fieldwork. The columns themselves were likely to have been of cast iron and of circular section, and would probably have supported brick arches carrying the floor surfaces of the upper storeys, although no evidence was recorded for the form of the upper floors.

8.6 The engine house recorded during the fieldwork appears on aerial photography (Plate 71) as a tall, narrow building that rises to the same height as the four storey main spinning block, but has a flat roof, rather than a pitched roof as on the spinning block. A single tall round-headed window in the southwestern wall of the engine house demonstrates that the building does not have upper storeys, and that internally it would have comprised one large space. The form of the engine house is consistent with housing a beam engine, for which it was undoubtedly originally designed. If the engine house represents the original engine house associated with steam power at the mill, the date of construction may have been around 1822, when historical evidence suggests that an engine was supplied by Petrie of Rochdale to Joseph Wild of Moss Hey mill at the cost of £600. The same company provided a more powerful engine in 1836, and possibly a third engine in 1862. The original engine would certainly have been a single cylinder beam engine, the engine base as recorded during the fieldwork displayed some evidence of alteration, although not the kind of extensive reconstruction that would probably have been necessitated by the later introduction of a horizontal engine.

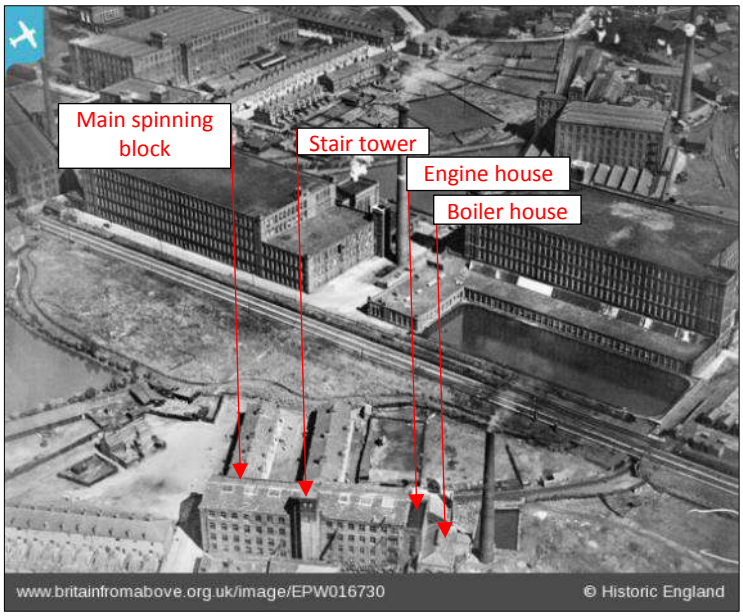

Plate 71: Aerial photograph showing part of Moss Hey Mill

8.7 One definite alteration to the engine base was the insertion of fixing bolts at the southwestern end of the condenser pit, which involved cutting through one of the large sandstone bearing blocks in the engine bed. This alteration may be associated with 'McNaughting' the beam engine; that is adding a second, high pressure cylinder to convert the engine to a compound engine. This practice was common in textile mill engines, and was based on the 1845 patent of William McNaught of Glasgow. This alteration is likely to post-date the introduction of Lancashire boilers at the mill, as it was the capacity of Lancashire boilers to produce steam at sufficient pressure that allowed the compounding of engines to be successfully introduced.

8.8 Cartographic evidence shows that the engine house structure was extended to the southwest between 1909 and 1930. Evidence from the site suggests that this extension was associated with the conversion of the mill to electric power and included the construction of a substation to the southwest of the engine house. The extension to the engine house was not recorded in detail during the fieldwork although enough detail was observed to confirm its purpose.

8.9 The earliest evidence recorded during the excavation of the boiler house, to the southeast of the engine house was in the northwestern of two bays where the well preserved base for a Lancashire boiler was recorded. The Lancashire boiler was patented in 1844 by William Fairbairn and John Hetherington (Hills 1989), although it is known that boilers of a similar type had been in existence for some time before this patent. There is historical evidence that two different engines had been supplied to Moss Hey Mill by Petrie and Co. prior to the date of the patent, and if the engine house was constructed to house the first of these engines, then it can be reasonably assumed that the original boiler, or boilers, were not of the Lancashire type, and the boiler house may have been altered when the installation of Lancashire boilers was carried out.

8.10 The southeastern bay of the boiler house is likely to originally have housed a second Lancashire boiler, as it was very unusual for spinning mills to operate with a single boiler, as failure would have halted production until repairs to the boiler had taken place. This interpretation is perhaps supported by historical evidence for the sale of a Lancashire boiler by the owners of the mill in 1882, as the boiler was offered for sale in working order, and it is therefore unlikely that the sale related to the replacement of a decommissioned boiler. It is possible that the Lancashire boiler offered for sale was one of a pair, and the sale may relate to the later alteration of the southeastern bay of the boiler house. Alterations in the southeastern bay to the southwest of the Green's economiser had removed most of the masonry associated with the original Lancashire boiler base, and pipework and masonry structures of uncertain function were installed. It was apparent that the economiser also went out of use at the time the alterations were carried out, as the outlet pipe from the bottom boxes was cut during the installation of the pipework. Interpretation of the change in function of the southeastern bay of the boiler house was not straightforward, as it presumably represented the substructure of plant that had since been removed. It is possible that the Lancashire boiler in the southeastern half of the boiler house was replaced with a boiler of a different type such as a Babcock or similar water tube boiler, which would have had little in terms of substructure and would also have not required the economiser to improve fuel economy. Alternatively, the alterations to the southeastern bay of the boiler house may not have taken place until the mill had been converted to electric power in the first half of the 20th century.

8.11 Although the mill is historically attested as a late 18th century structure, and thus most likely originally powered by water, its continuous use into the late 20th century meant that alterations to the structure may have obscured the original parts of the mill, and so no concrete evidence was recorded for a construction date. The construction materials differed between the stone built southwestern range and the brick built range to the northeast, suggesting that they may not have been of contemporary construction. Despite the lack of concrete dating evidence, the character of the smaller southwestern range suggests that it may be older than the brick mill building, and there is a possibility that the southwestern range of buildings represents the initial phase of mill buildings on the site.

8.12 The brick built main range of buildings to the northeast may be a later addition, possibly purpose built in the early 19th century when steam power was first used at Moss Hey Mill. Certainly there is a suggestion that late 18th century mills in the Oldham area were smaller in scale than those built around Manchester, and a mill building on the scale of Moss Hey may be more likely to date to the early 19th century. The original power plant of the main spinning block seems to have been based on a beam engine with a pair of boilers. The earliest evidence for the type of boilers suggest that Lancashire boilers were in use, although it is possible that evidence for earlier types of boiler has been truncated. Evidence was also recorded for the use of a fuel economiser situated within the boiler house, and possibly a second, external

preheater or economiser. The use of such plant was standard in Lancashire cotton mills by the mid-19th century. Green's Economiser was developed from 1845, the date of Green's patent, onwards, although commercial success came after the Great Exhibition of 1851 (Fowler 1895). The installation of the economiser must therefore represent a later alteration to the original boiler house if the boiler house is dated to the conversion of the mill to steam power in the 1820s.

8.13 Parts of the mill complex within the excavation area could not be fully investigated due to contamination and other health and safety issues, these areas include the reservoir to the northeast of the chimney and a structure measuring c. 13m x 10m to the northeast of the boiler house, where subsequent to machine clearance the excavation was too deep and unstable to be safely entered. Other parts of the mill complex lay outside of the excavation area, notably the north westernmost parts of the two main ranges of buildings and an annexe measuring c. 24.5m x 8.5m to the northeast of the main spinning block.

9.0 Effectiveness of Methodology

9.1 The strip, map and record methodology was appropriate in mitigating the impacts of the proposed development on archaeological remains of the mill buildings.

10.0 Acknowledgements

10.1 Allen Archaeology Limited would like to thank Mulbury Homes for this commission, and ADM Regeneration for their assistance on site.

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Appendix 1: Pottery

By Alice Forward

Introduction

A small assemblage of 48 pottery sherds weighing 614g was collected during excavations at Shaw, Oldham. The group is early modern in date, ranging from the late 18th to early 20th century.

Methodology

The assemblage has been recorded in line with the *Standards* (Barclay et al 2016). The sherds have been identified by eye and details recorded in an excel spreadsheet. This includes the context they were recovered from and the count, weight and fabric of the sherds. Decoration has also been noted.

Results

The group is mostly 19th to 20th century in date with whitewares and stonewares forming the large majority of the fabrics found. These include a mocha decorated sherd as well as decorated tableware forms such as a whiteware saucer with three parallel copper alloy parallel bands, blue sponge decorated sherds and a floral transfer printed jug. These are all typical 19th and early 20th century decorative styles.

There are however two vessels recovered from context 107, a slip-decorated bowl with a yellow swirling pattern and an all-over brown glazed jug. These two vessels are probably towards the earlier date range, late 18th to early 19th century.

From context 104 is what appears to be a plain redware jar. There are a couple of splashes of green glaze on the body of the vessel but this appears accidental rather than the remnants of a purposeful glaze. The vessel is probably earlier in date and its function is not clear.

Table 1 Pottery archive

Context no.	No sherds	Weight (g)	Fabric name	Form	Dating	Decoration
104	3	53	Post-medieval Redware	Jar	16th – 18th century	Splash of green glaze but appears accidental from the kiln
107	2	102	Staffordshire Slipware	Dish	18th - 19th century	Slipped internal decoration
107	6	199	Staffordshire Slipware	Jug	18th - 19th century	Brown internal and external glaze
139	10	65	Whiteware	Various - tablewares	19th - early 20th century	Various decorative elements representing various vessels. Printed decorative motifs and some sherds with copper gilding and one with moulded relief external dec.
139	1	8	Stoneware	Unknown	19th century	Brown external glaze and pale

Context no.	No sherds	Weight (g)	Fabric name	Form	Dating	Decoration
						greyish brown internal
160	2	28	Whiteware	Unknown	18th - 19th century	Plain white glaze with moulded ribbed external surface
161	1	7	Whiteware	Saucer	19th - early 20th century	Three parallel gilt bands towards the rim
245	1	12	Stoneware	Unknown	19th century	Cream internal and external glaze
245	1	19	Stoneware	Unknown	19th century	Brown external glaze and grey internal
245	4	12	Whiteware	Unknown	18th - 19th century	Blue sponge painted floral decoration
245	1	1	Mocha ware	Unknown	18th - 19th century	Black and blue banding
302	1	8	Whiteware	Plate	19th - early 20th century	Willow pattern style decoration
302	15	100	Whiteware	Jug	19th - early 20th century	Bluey black transfer printed floral motif. Joining sherds all from the base and lower body of the vessel

Discussion

Overall the assemblage is a typical group of 19th to 20th-century tableware forms. It is of note that there is an absence of utility-type vessels that might be expected within a mill. There are however the two slightly earlier slipware and overall glazed redwares of a slightly earlier date and unusual vessel from 104.

The group has been fully recorded and no further work is necessary.

References

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Appendix 2: Metalwork

By A Telford

Introduction

An assemblage of metal finds were sampled from a range of contexts during fieldwork on land off Moss Hey Street, Shaw, Oldham, Greater Manchester.

Methodology

The material was counted, then examined visually to identify any diagnostic pieces and the overall condition of the assemblage.

Results

Table 2 Metal finds

Context	Material	Object	Date (century)	Measurements (mm)	No.	Comments
161	Fe	Fitting	19th-20th	127 x 127	1	Amorphous mass of carding roll teeth
161	Fe	Fitting	19th-20th	124 x 123	1	Amorphous mass of carding roll teeth
161	Fe	Fitting	19th-20th	128 x 123	1	Amorphous mass of carding roll teeth
161	Fe	Fitting	19th-20th	104 x 102	1	Amorphous mass of carding roll teeth
161	Fe	Fitting	19th-20th	226 x ? x 51	1	Fe strip with 2 bolts, corroded
161	Fe	Fitting	19th-20th	46 x 34 x 32	1	Amorphous mass of carding roll teeth
161	Fe	Fitting	19th-20th	96 x 38 x 19	1	Steel bolt
161	Fe	Fitting	19th-20th	36 x 32 x 20	1	Amorphous mass of carding roll teeth
161	Fe	Fitting	19th-20th	52 x 49	1	Amorphous mass of carding roll teeth
160	Fe	Fitting	19th-20th	135 x 53 x 25	1	Steel/ iron rod or corroded bolt
160	Fe	Fitting	19th-20th	62 x20 x 5	1	Steel/ iron washer
160	Fe	Fitting	19th-20th	179 x 46 x 22	1	Square headed iron/ steel bolt
160	Fe	Fitting	19th-20th	184 x 30 x 5	1	Length of perforated iron/ steel strip
160	Fe	Fitting	19th-20th	79 x 65 x 20	1	Iron bracket and plate
160	Fe	Fitting	19th-20th	129 x 64 x 7	1	Iron plate
160	Fe	Fitting	19th-20th	244 x 53 x 26	1	Unidentified iron/ steel object

Context	Material	Object	Date (century)	Measurements (mm)	No.	Comments
189	Fe	Hammer	20th	386 x 120 x 40	1	Steel/ wood ball-peen hammer
189	Fe	Hammer	20th	390 x 118 x 45	1	Steel/ wood ball-peen hammer
189	Fe	Spanner	20th	653 x 113 x 31	1	Steel/ iron spanner, single head
311	Fe	Fitting	19th-20th	112 x 84 x 84	1	Chimney of gas lamp
311	Fe	Fitting	19th-20th	188 x 122	1	Iron bracket
311	Fe	Fitting	19th-20th	149 x 72	1	Iron bracket
311	Fe	Fitting	19th-20th	112 x 88 x 44	1	Steel valve housing?
311	Fe	Fitting	19th-20th	114 x 94 x 47	1	Steel valve housing?
311	Fe	Bar	19th-20th	426 x 33	1	Perforated iron bar
311	Fe	Spike	19th-20th	324 x 32 x 5	1	Iron spike
311	Fe	Fitting	19th-20th	211 x 40	1	Iron object
311	Fe	Fitting	19th-20th	96 x 30	1	Iron bracket
311	Pb	Fitting	19th-20th	72Ø x 15	1	Lead disc
311	Fe	Fitting	19th-20th	97 x 46	1	Iron bracket
311	Cu alloy	Fitting	19th-20th	103 x 73 x 56	1	Brass valve housing
311	Cu alloy	Fitting	19th-20th	127 x 70 x 27	1	?Part of gas lamp
302	Fe	Fitting	19th	204 x 137 x 40	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Fitting	19th	71 x 118 x 36	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Fitting	19th	141 x 124 x 42	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Fitting	19th	78 x 121 x 40	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Fitting	19th	154 x 139 x 43	1	Fragment of wrought iron/ steel soot scraper, heavily corroded
302	Fe	Fitting	19th	66 x 127 x 33	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Fitting	19th-20th	106 x 99	1	Fragment of iron/ steel pipe
302	Fe	Fitting	19th	117 x 123 x 41	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Bar	19th-20th	210 x 52	1	Iron object

Context	Material	Object	Date (century)	Measurements (mm)	No.	Comments
302	Fe	Fitting	19th-20th	92 x 64	1	Iron object
302	Fe	Fitting	19th-20th	65 x 60	1	Iron object, heavily corroded
302	Fe	Bar	19th-20th	231 x 26 x 5	1	Perforated iron bar with 6 countersunk holes
302	Fe	Sheet	19th-20th	260x 219	1	Fragment of iron/ steel sheet
302	Fe	Fitting	19th	282 x 100 x 46	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Bar	19th-20th	333 x 50 x 50	1	Iron bar, circular section with rectangular section heads at either end
302	Fe	Fitting	19th-20th	149 x 128	1	Fragment of iron/ steel pipe
302	Fe	Fitting	19th-20th	167 x 58	1	Fragment of iron/ steel pipe
302	Fe	Fitting	19th-20th	212 x 102	1	Fragment of i19th-20thron/ steel pipe
302	Fe	Fitting	19th	97 x 96 x 46	1	Fragment of wrought iron/ steel soot scraper
302	Fe	Plate	19th-20th	199 x 53 x 32	1	Iron plate with bolt
302	Fe	Bar	19th-20th	267 x 36 x 8	1	Fragment of iron/ steel bar
302	Fe	Bar	19th-20th	199 x 36	1	Fragment of iron/ steel bar
302	Fe	Bar	19th-20th	133 x 40 x 5	1	Fragment of iron/ steel bar
302	Fe	Sheet	19th-20th	330 x 151	1	Fragment of iron/ steel sheet
302	Fe	Fitting	19th	209 x 158	1	Iron object: ?fragment of scraper lifting frame
302	Fe	Bar	19th-20th	294 x 95	1	Fragment of iron/ steel bar
302	Fe	Fitting	19th-20th	219 x 84	1	Fragment of iron/ steel bar
302	Fe	Fitting	19th	140 x 99 x 36	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	143 x 84 x 32	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	155 x 85 x 30	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	135 x 86 x 31	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	138 x 86 x 38	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	158 x 98 x 39	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	148 x 84 x 45	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	142 x 73 x 25	1	Fragment of scraper lifting frame

Context	Material	Object	Date (century)	Measurements (mm)	No.	Comments
302	Fe	Fitting	19th	121 x 88 x 40	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	129 x 94 x 40	1	Fragment of scraper lifting frame
302	Fe	Fitting	19th	137 x 99 x 36	1	Fragment of scraper lifting frame
Unstrat	CU Alloy	Plate	19th-20th	117 x 41 x 2	1	Manufacturers name plate marked *HOWORTH STEEL PLATE FAN SIZE NO 42 ORDER NO ??83 JAMES HOWORTH & CO LTD VICTORIA WORKS FARNWORTH - BOLTON*

Discussion

The assemblage is largely modern in date comprising a mix of metal objects of likely industrial use including various fittings, plates and bars of indeterminate precise function. The assemblage also included a number of hand tools, including 2 ball-peen hammers recovered from context 189, the fill of the flywheel pit within the engine house of the spinning mill, along with a single ended spanner designed for a 1 3/8 inch bolt, from the same location.

Three groups of objects were of particular note among the metal finds assemblage. A group of heavily corroded lumps of iron comprising angular u-shaped wire objects was recovered from fill 161 within the engine house, a sample of which was retained. The objects possibly represent unused wire teeth designed for use with carding rolls. The average size of the corroded lumps was c. 100mm$^{2.}$

A group of 9 wrought iron or possibly steel objects recovered from fill 302 within the boiler house of the mill represent elements of the soot scrapers associated with the fuel economiser associated with the boiler house. The scrapers comprised a flat iron bar averaging 41mm in width with a curved head measuring up to 139mm in width, tapering toward the ends. Each of the scrapers represents one third of the circumference of the economiser tube. The outer edges of the scrapers were flat rather than angled, and no cutting teeth were present, so they most closely resemble the scrapers from Green's patent of 1870, rather than the toothed scrapers of the 1886 patent or the interlocking scrapers of the 1892 patent (Fowler, 1895).

The same location also produced elements of the lifting frame for the scrapers of the economiser, comprising 11 roughly U-shaped lugs of the frame to which the scrapers would have been attached. The lugs measured 140.54mm x 88.72mm x 35.54mm on average.

A manufacturer name plate was recovered from an unstratified context. The object comprised a brass plaque, rectangular with rounded corners, measuring 117mm x 41mm x 2mm and weighing 55g. The inscription was in relief capital letters and read:

HOWORTH STEEL PLATE FAN
SIZE NO 42 ORDER NO ??83
JAMES HOWORTH & CO LTD VICTORIA WORKS
FARNWORTH – BOLTON

The figures inserted for the size and order numbers were die-struck, rather than part of the casting. The first two figures of the order number were not legible. The plate was pierced by two screw-holes

of 4mm diameter. The face of the nameplate, where there was not raised lettering or areas for numbers to be struck, was decorated with cross hatching. The nameplate indicates that

At some point the mill was ventilated, at least partially, by plant produced by Howorth and Company of Farnworth. The company was founded in 1858 by James Howarth and the firm survives to the present day, now known as Howorth Air Tech. Ventilation was of utmost importance in cotton mills, especially in the vicinity of the opening and scutching machinery, both for the respiratory health of the workforce and to reduce the risk of fire.

Recommendations for further work

Such a limited assemblage of predominantly modern material offers little opportunity for further study, with the material all suitable for discard.

References

Fowler, W H, 1895, *Fifty Years History of the Development of Green's Economiser.* Manchester: George Falkner and Sons Limited

Appendix 3: Context Summary

Trench 1

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
101	Layer	Indurated, light whitish grey concrete	1.9	1.64	0.1	External concrete surface
102	Layer	Indurated, light whitish grey concrete, occasional medium fragments of CBM	6.84	3	0.18	External concrete surface
103	Structure	Machine pressed edge set red brick surface	5.65	2.9	0.11	Brick surface
104	Structure	Drain inspection chamber constructed with brick and iron collar for missing lid	2.3	110	0.8	Inspection chamber for drain
105	Structure	Drain constructed with from fired clay	0.28	0.21	-	Drain
106	Structure	Basalt setts measuring eg. 250mm x 170mm x 150mm, forming road and constructed from roughly squared hard igneous stone	>2.85	>1.6	0.17	Basalt setts forming road
107	Layer	Indurated, light whitish grey concrete	3.01	>0.87	0.12	Concrete surface abutting road
108	Layer	Moderately hard, light whitish grey concrete	3.38	1.83	0.14	Concrete surface
109	Layer	Loose, dark grey silty clay made ground	79.47	43.4	0.65	Made ground
110	Layer	Compact, mid grey clay	-	-	>1	Natural clay
111	Cut	Landfill/reservoir with straight steep sides, base not excavated	>16.62	>11.59	n/a	Cut of reservoir
112	Fill	Loose, dark grey backfill mixture of stone, glass, bricks and asbestos	>16.62	>11.59	n/a	Backfill of [111]
113	Fill	Loose, dark grey fuel ash	3.38	0.44	0.62	Backfill in [115]
114	Fill	Compact, light yellowish grey demolition rubble, comprising large fragment of sandstone in a matrix of crushed mortar	3.38	0.44	1.07	Backfill in [115]

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
115	Structure	Rectangular pit formed by masonry 176, 178, 179 and 187	3.40	0.44	>1.70	Masonry formed pit within engine house
116	Structure	Northwest-southwest external wall of mill constructed from 4 courses of brick with stretcher coursing and mortar bonding	6.5	0.75	0.24	External Wall of Mill
117	Wood	Horizontal well preserved wooden beam with straight grain	6.5	0.18	0.08	Wooden beam
118	Layer	Hard light grey concrete	>48.08	14.20	0.23	Mill internal concrete surface
119	Layer	Hard light grey concrete	6.71	2.55	0.15	Concrete slab
120	Structure	Surface constructed from igneous stone sett measuring eg. 250mm x 170mm x 100mm	6.71	2.55	0.17	Basalt setts
121	Layer	Hard light grey concrete	1.2	0.4	0.07	Concrete slabs
122	Structure	Surface constructed from igneous stone sett measuring eg. 250mm x 170mm x 100mm	1.81	1.76	0.18	Basalt setts
123	Layer	Hard light grey concrete	1.56	0.97	0.05	Access ramp
124	Structure	Foot path constructed with faced igneous stones	0.82	0.52	0.18	Footpath
125	Structure	Flagstone floor constructed from dressed Lancashire stone flags measuring eg. 1220 x 890 x 50mm	3.77	3.11	0.05	Flagstone floor
126	Structure	Northwest-southeast turning to northeast-southwest oriented wall, constructed from red brick with a dark grey mortar running bond	3.95 + 3.70	0.35	0.47	External wall of mill stair tower
127	Layer	Hard mid grey concrete	1.3	1.05	0.06	Drain cover

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
128	Structure	Northwest-southeast turning northeast-southwest oriented wall, constructed from faced brick and stone with mortar bonding	2.02 + 1.80	0.37	0.15	External wall of stair tower/ access ramp
129	Structure	Foundation constructed from brick with mortar bonding	1.2	0.82	≥0.07	Brick foundation
130	Fill	Compact red brick and mortar	1.11	0.70	-	Fill of brick foundation 129
131	Fill	Friable black ash/charcoal with occasional medium brick and flagstone fragments	2.36	1.92	-	Made ground
132	Layer	Hard light grey concrete	5.26	2.55	-	Goods ramp
133	Layer	Hard light grey concrete	2.55	2.33	-	Repair/addition to ramp
134	Structure	Northwest-southeast oriented rectangular cast iron drain with grill	0.44	0.42	-	Cast iron drain with grill
135	Cut	Square cut for bricks	1.39	0.98	-	Cut for bricks
136	Fill	Friable dark brownish fuel ash with frequent small brick, concrete and stone fragments	1.39	0.15	-	Fill of cut [135]
137	Structure	North-northwest-South-southeast oriented linear wall, constructed from faced stones and bricks with concrete and drystone bonding	1.7	0.42	0.53	Entrance wall
138	Structure	Northeast-southwest oriented linear wall constructed from regular courses of brick with mortar bonding	>8.08	0.70	0.39	External wall of mill
139	Layer	Loose very dark grey ash and slag with occasional ash patches and medium brick fragments	3.65	0.9	-	Bedding for cobbles
140	Cut	Northeast-southwest oriented square with a square protrusion	2.5	2.44	-	Cut for scale
141	Structure	Northeast-southwest oriented linear steel weigh bridge	1.94	1.57	-	Steel base of industrial scale
142	Structure	Cylindrical metal ceiling support pillar	0.17	0.17	0.22	Metal ceiling support pillar

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
143	Structure	Cylindrical metal ceiling support pillar	0.13	0.13	0.18	Metal ceiling support pillar
144	Cut	Square drain with vertical sides for ceramic pipe	0.33	0.33	0.44	Drain
145	Structure	Linear iron fixing/fitting	0.43	0.1	0.16	Iron fixing/fitting
146	Cut	Square machine bed with steep straight sides and harp break of slope to a flat base	1.1	1.05	0.09	Machine bed
147	Cut	Square cut in concrete 118	1.53	1.53	0.23	Square cut in concrete
148	Structure	Cylindrical metal ceiling support pillar	0.15	0.15	0.05	Metal ceiling support pillar
149	Structure	Northeast-southwest linear buttress constructed from brick with mortar bonding	0.93	0.6	0.23	Brick buttress
150	Structure	Buttress constructed from concrete	2	0.93	0.62	Concrete buttress
151	Cut	East-west oriented rectangular foundations	1.24	0.66	-	Cut for foundations of office block
152	Cut	Linear foundation	6.5	0.54	-	Cut for foundations of office block
153	Layer	Light grey concrete	4.07	2.73	0.63	Ramp down to mill floor
154	Cut	Rectangular machine bed	2.72	1.66	-	Machine bed
155	Cut	Square cut for machinery component or buttress	0.4	0.33	-	Cut for machinery component or buttress
156	Structure	Southeast-northwest linear wall of regular brick courses in stretcher coursing with mortar bonding	15.06	0.52	>0.85	External wall of Mill
157	Structure	Southeast-northwest linear wall of regular brick courses in stretcher coursing with mortar bonding	>19.75	0.52	0.24	External wall of Mill
158	Layer	Hard mid grey sandstone	>48.04	14.21	0.12	Flagstone floor
159	Fill	Loose dark grey ash and clink in silt matrix with occasional small angular fragments of sandstone and CBM	3.28	0.46	0.69	Backfill

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
160	Fill	Compact mid brownish grey brick and stone rubble in a silt/ash matrix with very frequent medium CBM fragments and large angular fragments of sandstone	3.38	1.51	0.5	Backfill of condenser
161	Fill	Loose dark purplish grey fuel ash and tinker with very occasional medium fragments of sandstone and CBM	6.12	1.17	0.62	Backfill of pit
163	Layer	Square sandstone flagstone machine base	0.81	0.75	-	Machine base
164	Structure	Circular steel column fixing	0.14	0.14	0.05	Steel column fixing
165	Structure	rectangular machine fixing	0.98	0.90	-	Machine fixing
166	Cut	Circular column cut with vertical sides	0.17	0.17	-	Cut for column
167	Structure	Northwest-southeast sub-rectangular column foundation	0.19	0.19	0.13	Column support/foundation
168	Structure	Northwest-southeast oriented sub-circular column foundation	0.16	0.16	0.15	Column foundation
169	Structure	Circular steel column tenon	0.20	0.20	>0.05	Steel column tenon
170	Layer	Hard light grey concrete	0.92	0.76	0.05	Concrete patch
171	Structure	Circular steel column foundation	0.20	0.20	0.09	Column foundation
172	Structure	Circular column foundation	0.20	0.20	0.12	Column foundation
173	Layer	Hard light grey concrete	1.08	0.92		Concrete patch to floor 118
174	Layer	Hard light grey concrete	1	0.65	0.16	Pillar foundation
175	Structure	circular column foundation	0.20	0.20	0.05	Column foundation
176	Structure	Northwest-southeast oriented linear wall constructed from hand pressed common red brick with 8 courses and friable light whitish grey lime mortar bonding	3.66	0.51	0.66	Wall of engine house

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
177	Structure	Northeast-southwest oriented linear wall, constructed from roughly squared (some) yellow and green sandstone with very hard light whitish grey lime mortar bonding	2.55	0.58	0.25	Wall of engine house
178	Structure	Northwest-southeast oriented engine bed constructed from green and yellow sandstone slabs with regular coursing and very hard light whitish grey lime mortar bonding	3.40	1.36	>0.86	Engine bed
179	Structure	Northeast-southwest oriented linear wall, constructed from roughly squared yellow sandstone in regular coursing and with moderately compact light whitish grey lime mortar bonding	2.03	0.90	0.70	Part of wall 177
180	Structure	Northwest-southeast linear oriented linear wall constructed from a single course of squared green sandstone with very hard light whitish grey lime mortar bonding	1.24	0.60	0.39	Wall, part of engine base
181	Structure	Northwest-southeast oriented linear wall constructed from regular coursing of roughly squared green and yellow sandstone with very hard light whitish grey lime mortar bonding	2.14	0.59	-	Wall
182	Structure	Northeast-southwest oriented linear wall constructed from one visible course of fire brick	9.29	0.24	>0.70	Wall
183	Structure	Engine bed constructed from roughly dressed slabs of green and yellow sandstone with very	7.90	3.77	>1.98	Engine bed

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
		hard light whitish grey sandy mortar bonding				
184	Structure	Loading block constructed from a single block of squared green sandstone bonded with hard light yellowish grey sandy lime mortar	1.28	0.66	0.40	Loading block in machine base
185	Structure	Loading block constructed from a single squared block of green sandstone bonded with hard light yellowish grey sandy lime mortar	1.24	0.59	0.40	Loading block
186	Structure	Northeast-southwest oriented linear wall constructed from regular coursing of green and yellow sandstone slabs bonded with hard light yellowish grey sandy lime mortar	1.25	1.10	0.40	Wall
187	Structure	Northeast-southwest oriented linear wall constructed from 7 courses of hand pressed common brick and stone setts bonded with hard light whitish grey lime mortar	2.71	0.52	0.54	Wall
188	Structure	Northeast-southwest oriented linear wall constructed from a single course of squared fine grained green sandstone	9.43	0.75	>0.16	Wall
189	Fill	Soft, very dark grey grease or machine oil with occasional fragments of stone, CBM, modern glass…	4.00	0.69	>0.92	Fill of flywheel pit
190	Structure	Rectilinear conduits through wall 188	0.74	0.31		Conduits through wall 188
191	Structure	Circular steel column tenon	0.20	0.20	0.05	Steel column tenon
192	Structure	Indurated light grey concrete over crushed	1.88	1.43	0.33	Earlier phase of entrance ramp to

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
		brick and stone hardcore				main spinning block predating 153
193	Fill	Loose very dark grey silt with frequent CBM and stone inclusions	0.34	0.34	-	Service backfill
194	Timber	Group number for square/rectangular/circular wooden dowels set into floor 158	0.40 e.g.	0.20 e.g.	0.13 e.g.	Wooden dowels associated with fixing machinery to ground floor of the main spinning block
195	Layer	Flagstone with impressions associated with machine base	0.94	0.88	-	Machine base, part of floor 158
196	Layer	Flagstone with square hole measuring 0.28m^2	0.89	0.75	-	Flagstone, part of floor 158
197	Cut	Circular cut with vertical sides	0.22	0.22	-	Cut for steel column
198	Cut	Sub-oval cut with vertical sides	0.26	0.20	-	Cut for column
199	Cut	Sub-circular column hole with vertical sides	0.24	0.22	-	Cut for column
200	Layer	Indurated light whitish grey concrete	6.87	5.41	-	Concrete repair to floor 158
201	Structure	Foundation pier constructed from sandstone worked to have faces on all sides and a setting for a column base with cement bonding	1.03	0.93	0.30	Column foundation pier
202	Layer	Northwest-southeast oriented rectangular tile floor surface with concrete base	>2.33	>1.53	0.02	Floor surface
203	Layer	Northeast-southwest oriented rectangular concrete floor surface	>1.69	>1.62		Floor surface
204	Structure	Shuttering constructed from red brick with pink mortar bonding	1.53	0.12	0.08	Brick shuttering
205	Structure	Square ceramic drain	0.34	0.30	-	Ceramic drain
206	Structure	Northwest-southeast oriented linear wall constructed from 5 courses of stretcher bond brick with yellow mortar bonding	2.90	0.11	0.45	Brick wall
207	Structure	Indurated light whitish grey concrete	1.35	0.60	0.42	Concrete steps
208	Structure	Threshold or step constructed from 2 courses of sandstone with degraded gritty	1.27	0.33	0.08	Threshold/step

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
		lime mortar as bonding agent				
209	Structure	Northwest-southeast oriented linear wall constructed from faced sandstone with mortar bonding	2.92	0.48	0.34	External mill wall
210	Structure	Northwest-southeast oriented linear wall constructed from faced sandstone with mortar bonding	8.59	0.56	0.10	External wall
211	Structure	Northwest-southeast oriented linear wall constructed from faced sandstone with mortar bonding	3.78	0.49	0.07	Continuation ow outer mill wall 209
212	Structure	Northeast-southwest oriented linear wall constructed from 2 surviving courses of sandstone with mortar bonding	3.36	0.58	0.13	Internal wall
213	Structure	Northwest-southeast oriented linear wall constructed from 2 surviving courses of unfinished sandstone with mortar bonding	0.53	0.26	0.19	Internal wall
214	Structure	Northwest-southeast oriented threshold constructed from finished sandstone with mortar bonding	1.37	0.28	0.07	Threshold
215	Layer	Northwest-southeast oriented rectangular flagstone floor	30.65	7.94	0.10	Flagstone floor
216	Cut	Square indent in floor 215	0.22	0.17	-	Indent in flagstone floor 215
217	Layer	Compact dark grey ash and slag with moderate brick inclusions and moderate medium stone fragments	4.24	1.74	-	Rubble backfill
218	Structure	Steel fixing rod	0.20	0.20	>0.25	Steel fixing rod
219	Structure	Square ceramic drain	0.31	0.31	-	Ceramic drain
220	Layer	Northwest-southeast oriented rectangular flagstone floor	4.74	3.56	0.10	Flagstone floor

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
221	Layer	Northwest-southeast oriented rectangular "level lay" resin floor	7.83	6.10	0.03	"Level lay" resin floor
222	Layer	Compact very dark grey slag and ash backfill layer	4.74	3.56	0.15	Backfill layer over layer 220
223	Structure	Northeast-southwest oriented linear wall constructed from one visible course of fire brick	9.29	0.24	>0.70	Wall
224	Structure	Northeast-southwest oriented linear wall constructed from red brick with hard dark grey sandy mortar	2.30	1.10	0.70	Wall
233	Structure	Northeast-southwest oriented linear wall constructed from a single course of unfinished stone	1.05	0.44	0.11	Internal wall of mill
234	Structure	Northwest-southeast oriented linear wall constructed from a single course of unfinished stone	0.38	0.18	0.14	External wall of mill
235	Structure	Northeast-southwest oriented linear wall constructed from a single course of unfinished stone	9.63	0.49	0.64	End wall of mill
236	Structure	Northeast-southwest turning northwest southeast brick wall comprising 2 courses of hand pressed common red brick measuring 220mm x 110mm x 80mm bonded with lime mortar	2.99	0.34	0.18	Internal wall within southwestern range of buildings
237	Structure	Northeast-Southwest oriented rectangular brick and flagstone flooring	4.14	1.25	0.10	Flooring
238	Structure	Northwest-southeast oriented rectangular drain covering constructed from a single course of unfinished flagstone	12.41	0.94	0.13	Drain covering
239	Structure	Northwest-southeast oriented rectangular concrete floor	7.35	4.22	-	Concrete floor

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
240	Structure	Northwest-southeast oriented rectangular concrete floor	6.10	3.28	-	Concrete floor
241	Cut	Northwest-southeast oriented irregular modern truncation with steep sides, base unexcavated	0.82	0.63	-	Modern truncation
242	Cut	Northwest-southeast oriented rectangular cut with steep sides, base not excavated	1.85	1.00	-	Cut in floor 239
243	Structure	Concrete floor	4.52	3.03	-	Concrete floor
244	Structure	Northwest-southeast oriented rectangular concrete floor	6.22	2.87	-	Concrete floor
245	Layer	Compact very dark grey ash and slag occupation deposit	12.10	11.10	>0.23	Occupation layer
246	Structure	Square drain constructed from ceramic	0.31	0.31	-	Drain
247	Structure	Irregular shaped floor constructed from bed laid common brick	0.23	0.11	0.08	Brick floor
248	Structure	Northwest-southeast oriented rectangular floor constructed from a single course of common brick with mortar bonding	2.65	0.23	0.08	Brick floor
249	Structure	Chimney constructed from red brick with white and yellow mortar boning	4.61	4.53	>0.45	Chimney structure of old cotton mill
250	Structure	Corner structure of flue constructed from red brick with white and yellow mortar bonding	2.64	1.40	>0.38	Corner structure of flue
251	Structure	Wall constructed from red brick	>5.95	0.35	>0.32	Wall structure of flue
252	Structure	Northeast-southwest oriented linear wall constructed from red brick with yellow and white mortar bonding	5.69	0.65	>0.17	Part of southwestern wall of main flue
253	Structure	Wall constructed from red brick with white and yellow mortar bonding	2.37	0.35	>0.25	Wall, part of cotton mill flue
254	Structure	Wall constructed from red brick with white	2.86	0.28	>0.08	Wall, part of cotton mill flue

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
		and yellow mortar bonding				
255	Structure	Rectangular structure constructed from red brick	3.41	2.97	>0.43	Structure, part of cotton mill
256	Structure	rectangular surface constructed from red brick with white and yellow bonding	1.25	0.60	0.08	Brick surface inside flue
257	Layer	Compact black and red ash and red brick with very frequent yellow mortar inclusions	12.19	0.82	0.61	Layer of rubble
258	Layer	Compact black ash and red brick	>3.80	1.04	-	Layer of rubble
259	Layer	Friable black ash with occasional brick fragments	1.51	0.81	-	Layer of ash within chimney flue 252 and 253
260	Layer	Compact, black ash with very frequent red brick inclusions	2.58	1.54	0.43	Layer of rubble
261	Layer	Compact mid red and mid yellow brick	3.32	3.05	-	Layer of rubble
262	Layer	Friable black ash with occasional red brick fragments	0.74	0.48	-	Layer of ash
263	Layer	Friable black ash with occasional red brick fragments	2.20	0.79	0.08	Layer of ash
264	Layer	Compact mid red and black rubble layer	0.59	0.46	0.85	Layer of rubble
265	Layer	Hard mid grey concrete with occasional small stone inclusions	0.50	0.49	-	Concrete surface
266	Structure	Wall constructed from red brick with white and yellow mortar bonding	0.75	0.11	>0.25	Wall structure blocking old mill flue
267	Structure	Surface constructed from red brick with yellow and white mortar bonding	1.45	0.87	-	Flue brick surface
268	Layer	Hard light whitish grey concrete	9.65	3.78	-	Concrete slab
269	Structure	Unbonded bed laid brick, predominantly engineering and refractory brick, possibly re-used	11.57	5.21	0.15	Brick surface
270	Layer	Hard mid whitish grey concrete	4.46	0.28	-	Concrete slab

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
271	Structure	Surface constructed from brick with mortar bonding	0.76	0.68	-	Brick surface
272	Layer	Compact mid brownish orange bricks with occasional patches of compact grey clay	1.58	0.90	-	Layer of rubble
273	Structure	Northeast-southwest oriented linear wall constructed from 2 courses of unfinished bricks with mortar bonding	1.42	0.35	0.17	Brick wall
274	Structure	Northwest-southeast oriented linear of linear wall constructed from a single course of unfinished stone	3.39	0.46	0.16	Stone wall
275	Structure	Drain constructed from ceramic	0.31	0.31	-	Drain
276	Structure	Drain constructed from 1 course of unfinished brick with mortar bonding	1.23	1.23	-	Drain
277	Structure	Northwest-southeast oriented linear wall constructed from 2 courses of unfinished brick with mortar bonding	3.39	0.91	0.47	Wall
278	Structure	Northwest-southeast oriented rectangular structure constructed from walls of 3 courses of unfinished brick with mortar bonding	7.00	3.1	>0.25	Modern service access
279	Layer	Loose dark greyish brown gravelly silt with frequent brick inclusions	6.10	2.45	-	Fill of 278
280	Layer	Hard mid greyish white concrete	2.33	1.21	0.12	Concrete Slab
281	Structure	Re-used boiler mounting blocks, unbonded	3.65	0.58	0.23	Gutter formed from a row of re-used boiler mounting blocks
282	Structure	Rectangular brick wall structure	3.95	1.28	-	Modern rectangular brick structure post-dating use of boiler house
283	Layer	Compact black ash with frequent brick inclusions	8.19	3.08	0.88	Deliberate dumping

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
284	Fill	Compact black ash with frequent brick inclusions	3.75	1.08	-	Fill of 282
285	VOID	VOID	VOID	VOID	VOID	VOID
286	Structure	Northeast-southwest oriented concrete surface	11.55	4.10	-	Concrete floor
287	VOID	VOID	VOID	VOID	VOID	VOID
288	Structure	North-south oriented linear structure constructed from a single remaining course of unfinished brick with mortar bonding	0.97	0.74	0.08	Brick structure
289	Structure	East-west oriented structure constructed from a single course of unfinished brick with mortar bonding	0.80	0.74	0.08	Brick structure
290	Structure	Northeast-southwest oriented irregular shaped in plan floor, constructed from edge set fired brick	9.10	1.22	>0.11	Floor of boiler house
291	Structure	Northeast-southwest oriented rectangular floor constructed from bed laid unfinished brick	2.04	0.55	>0.08	Common brick floor of boiler 1
292	VOID	VOID	VOID	VOID	VOID	VOID
293	Structure	Northeast-southwest oriented rectangular step constructed from a single course of bed laid unfinished red brick	1.78	0.23	0.08	Step
294	Structure	Northeast-southwest oriented rectangular floor constructed from bed laid unfinished brick with mortar bonding	2.16	0.93	>0.08	Brick floor
295	Structure	Northwest-southeast oriented wall constructed from a single course of unfinished brick with mortar bonding	2.61	0.24	>0.17	Brick wall

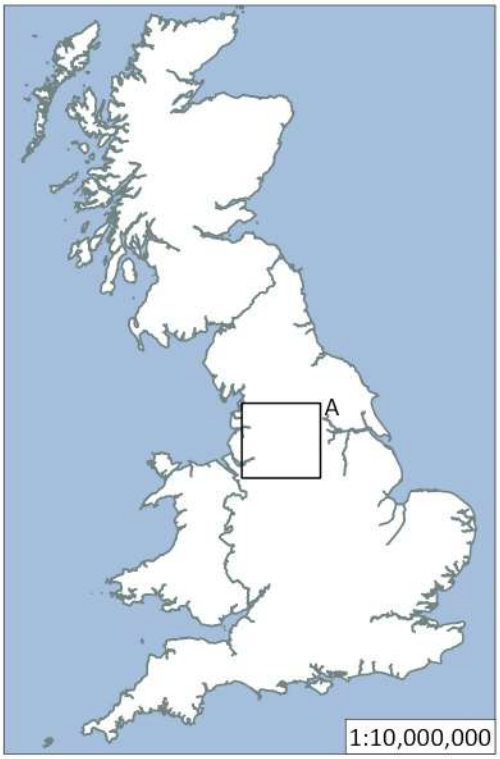
Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
296	Structure	Northeast-southwest oriented wall, constructed from a single course of common brick with mortar bonding	10.90	0.24	0.74	Brick wall=182
297	Structure	Northwest-southeast turning Northeast-southwest oriented linear wall constructed from brick with stretcher bond and mortar	9.78	0.66	0.73	Southeastern wall of boiler house 1
298	Structure	Northwest-southeast oriented linear wall constructed from firebricks with mortar bonding	8.39	0.94	0.74	Internal wall of boiler support
299	Structure	Northeast-southwest oriented linear boiler support constructed from fireclay boiler mounting blocks with mortar bonding	4.50	0.30	0.23	Boiler support
300	Structure	Northeast-southwest oriented linear wall constructed from unfinished brick with mortar bonding	8.23	0.91	0.75	Boiler wall
301	Structure	Surface constructed from rectangular cut stones	5.01	>2.98	0.12	Stone surface
302	Fill	Moderately compact purplish brown silty ash with frequent angular CBM and stone inclusions	2.34	>1.18	0.23	Demolition backfill of economiser pit
303	Fill	Soft very dark grey silty ash with occasional spent fuel inclusions	2.34	>1.18	0.15	Accumulated fill of economiser pit
304	Structure	Northwest-southeast oriented linear wall constructed from engineering brick with mortar bonding	1.76	0.50	>0.20	External wall of charging platform for Lancashire boiler, later alteration
305	Structure	Northeast-southwest oriented linear wall constructed from common brick with mortar bonding	2.04	0.48	>0.15	External wall of charging platform for Lancashire boiler
306	Structure	Northeast-southwest oriented linear wall constructed from	1.04	0.36	>0.15	External wall of charging platform for Lancashire boiler

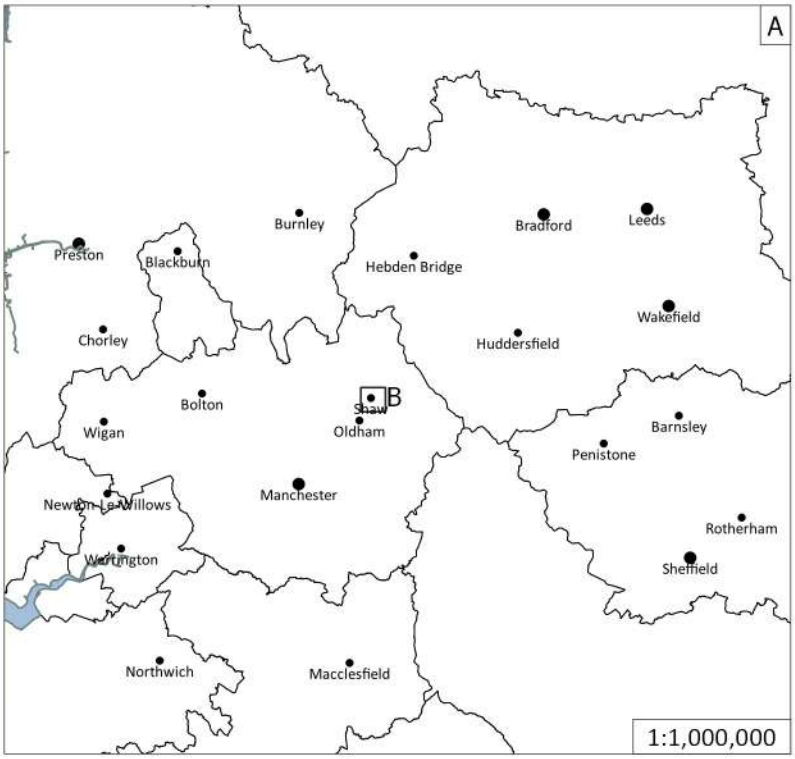
Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
		common brick with mortar bonding				
307	Structure	Iron spike	0.03	0.03	0.16	Iron Spike
308	Structure	Kerb constructed from faced stone	1.75	0.36	0.25	Kerb stone
309	Structure	Surface constructed from bricks with mortar bonding	0.99	0.62	>0.08	Brick surface
310	Structure	Drain constructed from brick and flag stone with mortar bonding	>1.99	0.54	-	Drain
311	Fill	Loose orange brick with occasional patches of ash	2.86	1.24	0.68	Fill of structure 312
312	Structure	Northwest-southeast turning northeast-southwest oriented English garden wall constructed from fired brick with cement based mortar bonding	2.69	0.24	0.68	L shaped wall for super heater
313	Structure	Surface constructed from edge set fired brick with mortar bonding	2.86	1.24	>0.11	Brick floor of 312
314	Structure	Surface constructed from unbonded common brick	3.89	1.15	0.08	Floor
315	Structure	Northeast-southwest oriented linear wall constructed from 2 courses of unfinished brick with mortar bonding	2.63	1.27	0.73	Wall part of rectangular structure
316	Fill	Loose ash with frequent brick and stone inclusions			0.73	Deliberate dumping
317	Structure	Surface constructed from unfinished brick with mortar bonding	2.21	1.07		Floor
318	Structure	Surface constructed from unfinished brick	2.24	0.64		Floor
319	Structure	Square wall constructed from a single course of unfinished brick with mortar bonding	1.37	1.28	0.74	Square structure
320	Fill	Compact greasy black ash with frequent brick and stone inclusions	1.37	1.28	0.42	Fill of 319

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
321	Structure	Northeast-southwest oriented linear wall, constructed from unfinished brick with mortar bonding	2.29	0.36	0.08	Dividing wall within southeastern boiler house bay, poorly preserved
322	Structure	Surface constructed from unfinished bricks	1.82	1.60	≥0.08	Floor
323	Structure	Surface constructed from unfinished brick	7.60	0.40	≥0.08	Floor
324	Structure	Surface constructed from a single course of soap bricks, no bond	1.48	0.23	≥0.08	Floor
325	Structure	Northeast- southwest oriented linear wall constructed from 3 courses of common brick with mortar bonding	11.8	0.42	>1.30	Southeastern wall of boiler house
326	Layer	Compact black ash with frequent brick and stone inclusions	2.58	0.45	0.46	Ash layer
327	Layer	Compact, mid brownish grey stone	7.25	>0.85	-	Made ground
328	Layer	Compact, grey concrete	1.00	0.70	-	Concrete layer
329	Layer	Compact, mid	2.75	1.35	-	Dumped material
330	Structure	Northwest-southeast oriented linear rectangular wall constructed from 2 courses of brick with mortar bonding	3.66	0.47	0.26	Internal wall of Boiler house 2
331	Structure	Pillar constructed from common brick with mortar bonding	0.62	0.48	1.04	Brick pillar
332	Layer	Compact, mid grey clay with flagstone fragments	4.02	1.73	-	Layer of possible redeposited natural
333	Fill	Loose, dark grey ash with bricks	14.70	4.28	0.85	Backfill of boiler house
334	Structure	Iron steam pipe	8.35	0.12	0.12	Iron steam pipe
335	Structure	Iron pipe	2.80	0.14	0.14	Iron pipe
336	Structure	Iron pipe	2.99	0.33	0.33	Iron pipe
337	Structure	Iron pipe	5.70	0.23	0.23	Iron pipe
338	Structure	Iron pipe	0.74	0.22	0.22	Iron pipe
339	Structure	Northeast-southwest oriented rectangular levelling layer constructed from bed set brick and stone with mortar bonding	2.42	0.4	-	Levelling layer

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
340	Structure	Northeast-southwest oriented rectangular floor constructed from edge set brick with mortar bonding	2.42	0.31	≥0.11	Floor
341	Fill	Loose black engine grease	0.60	0.60	0.12	Fill of 319
342	Fill	Soft orange sand	0.60	0.60	0.10	Fill of 319
343	Fill	Loose dark grey ash with brick and sandstone fragments	0.60	0.60	0.10	Fill of 319
344	Structure	Northeast-southwest oriented linear wall constructed from brick with mortar bonding	9.78	0.22	0.57	External wall of boiler house
345	Structure	Northwest-southeast oriented linear wall constructed from brick with mortar bonding	1.56	0.43	≥0.52	Rebuilt wall
346	VOID	VOID	VOID	VOID	VOID	VOID
347	VOID	VOID	VOID	VOID	VOID	VOID
348	VOID	VOID	VOID	VOID	VOID	VOID
349	Masonry	Single block of sandstone beneath column foundation	1.21	1.18	0.32	Sandstone pier
350	Fill	Very compact very dark grey ash with frequent large angular sandstone inclusions	3.28	0.46	1.01	Backfill of pit within engine house
351	Iron	Wrought iron joist within masonry 183	>1.41	0.1	0.18	Iron joist supporting cylinder of stationary engine
352	Iron	Wrought iron joist within masonry 184	>1.25	0.11	0.18	Iron joist supporting cylinder of stationary engine
353	VOID	VOID	VOID	VOID	VOID	VOID
354	VOID	VOID	VOID	VOID	VOID	VOID
355	Fill	Loose very dark grey ash and demolitions rubble comprising angular CBM and stone fragments	8.80	2.05	0.7	Demolition backfill of main flue of Lancashire boiler setting
356	Fill	Soft very dark grey ash	8.8	2.05	0.19	Accumulated fill of main flue of Lancashire boiler setting
357	Structure	Handmade red common brick measuring c. 240mm x 120mm x 80mm, bonded with hard dark grey mortar	0.82	0.15	0.18	Transverse wall across main flue of chimney stack

Context	Type	Description	Length (m)	Width (m)	Thickness/ depth (m)	Interpretation
358	Structure	Handmade red common brick measuring c. 240mm x 120mm x 80mm, bonded with hard dark grey mortar	0.64	0.24	0.17	Transverse wall across main flue of chimney stack
359	Structure	Handmade red common brick measuring c. 240mm x 120mm x 80mm, bonded with hard dark grey mortar	0.73	0.24	0.48	Transverse wall across main flue of chimney stack
360	Structure	Wall comprising frogged engineering bricks eg. 240 x 120 x 80 bonded with hard dark grey sandy mortar	2.57	0.35	>0.26	Spine wall within structure 255
361	Structure	Floor surface comprising bed-laid handmade bricks and soft light yellowish grey concrete	2.52	>1.52	≥0.08	Floor surface within structure 255





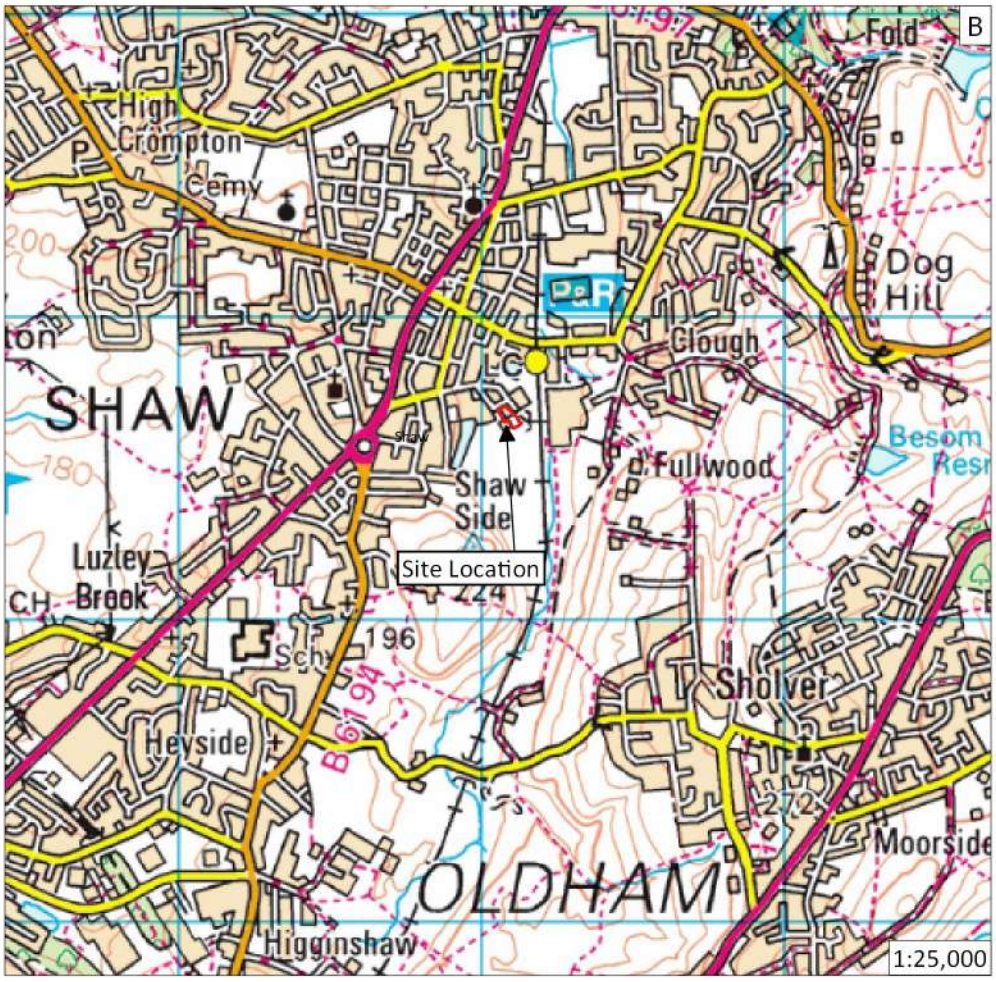


Figure 1: Site location outlined in red

Site Code	SHMH 20
Scale	1:10,000,000 1:1,000,000 1:25,000 @ A4
Drawn by	A Telford
Date	18/08/2021

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Figure 2: Composite plan of excavated features overlaid on 1907 OS mapping, site outline in red

Figure 3: Plan of western range of mill buildings, showing main features recorded

Figure 4: Plan of main spinning block, showing main features recorded

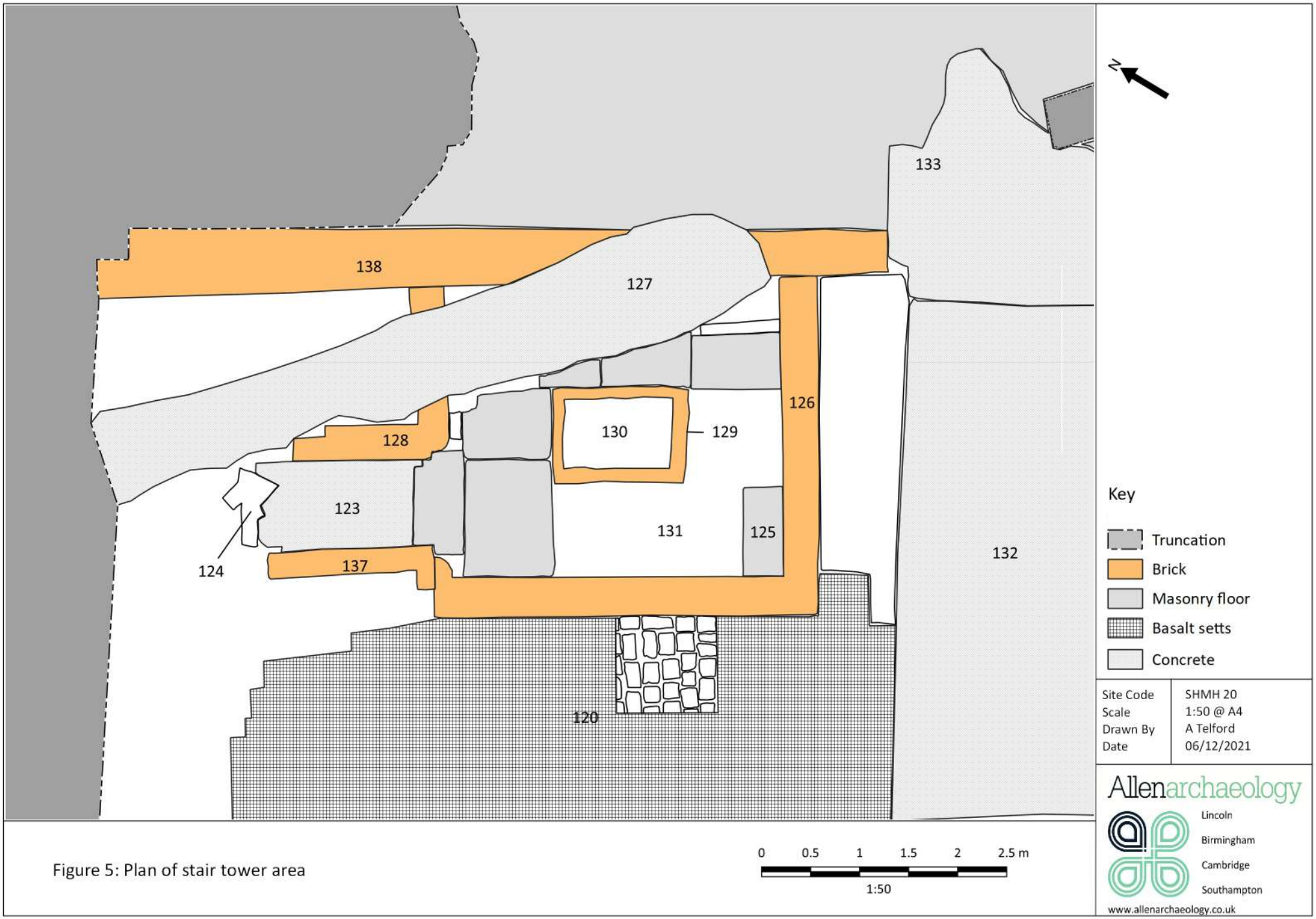


Figure 5: Plan of stair tower area

Figure 6: Plan of roadway between two main ranges, showing main features recorded

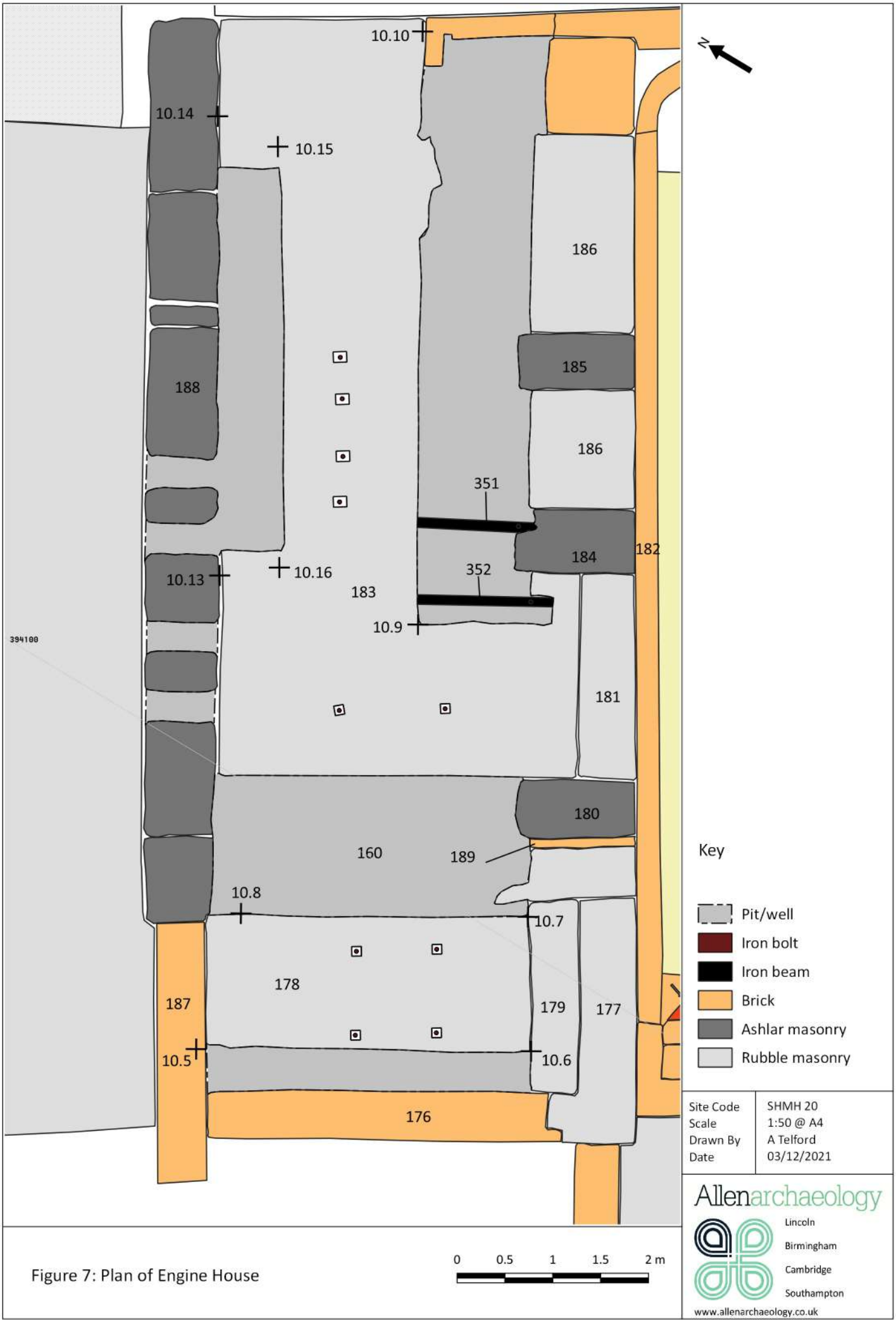


Figure 7: Plan of Engine House

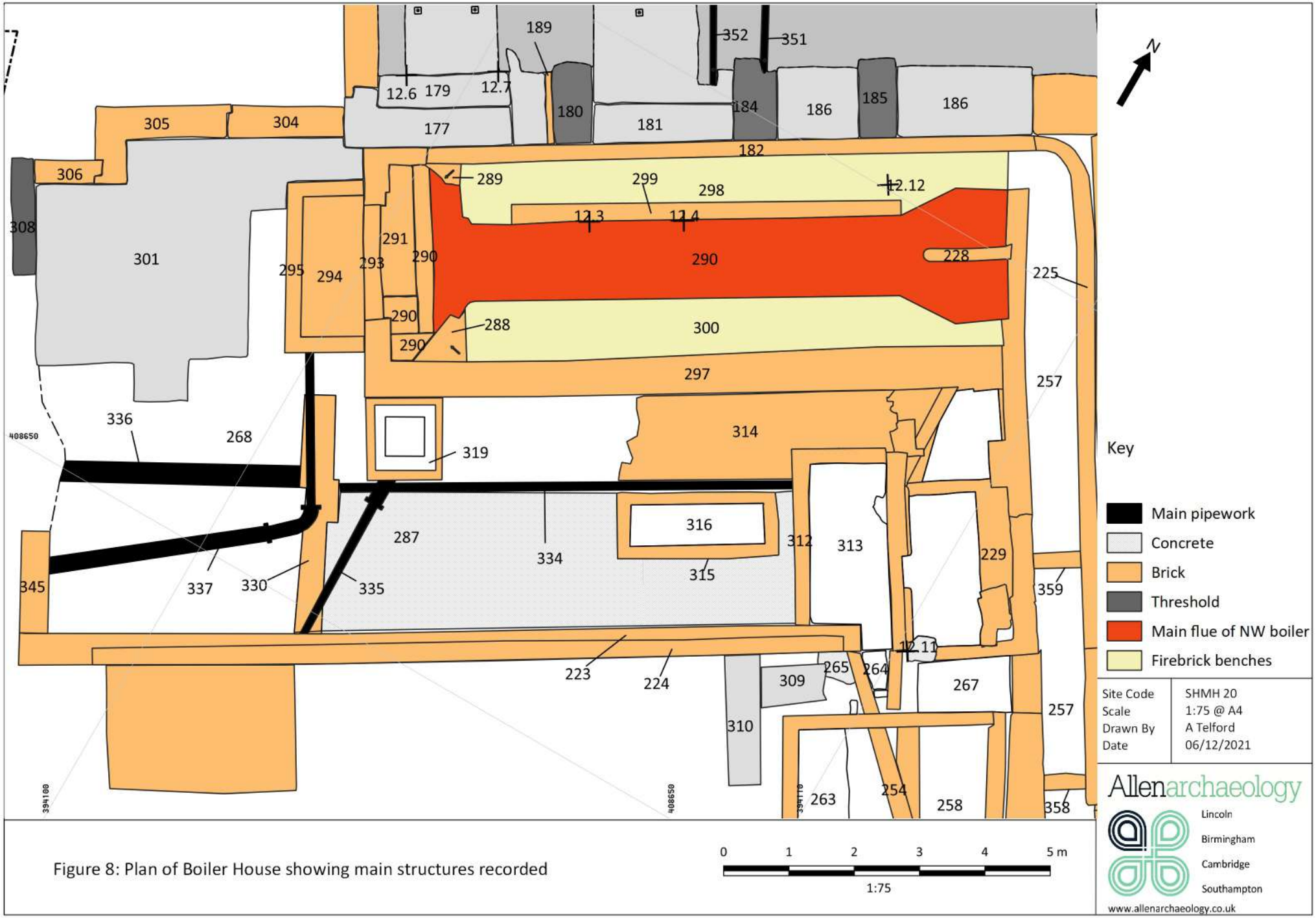


Figure 8: Plan of Boiler House showing main structures recorded

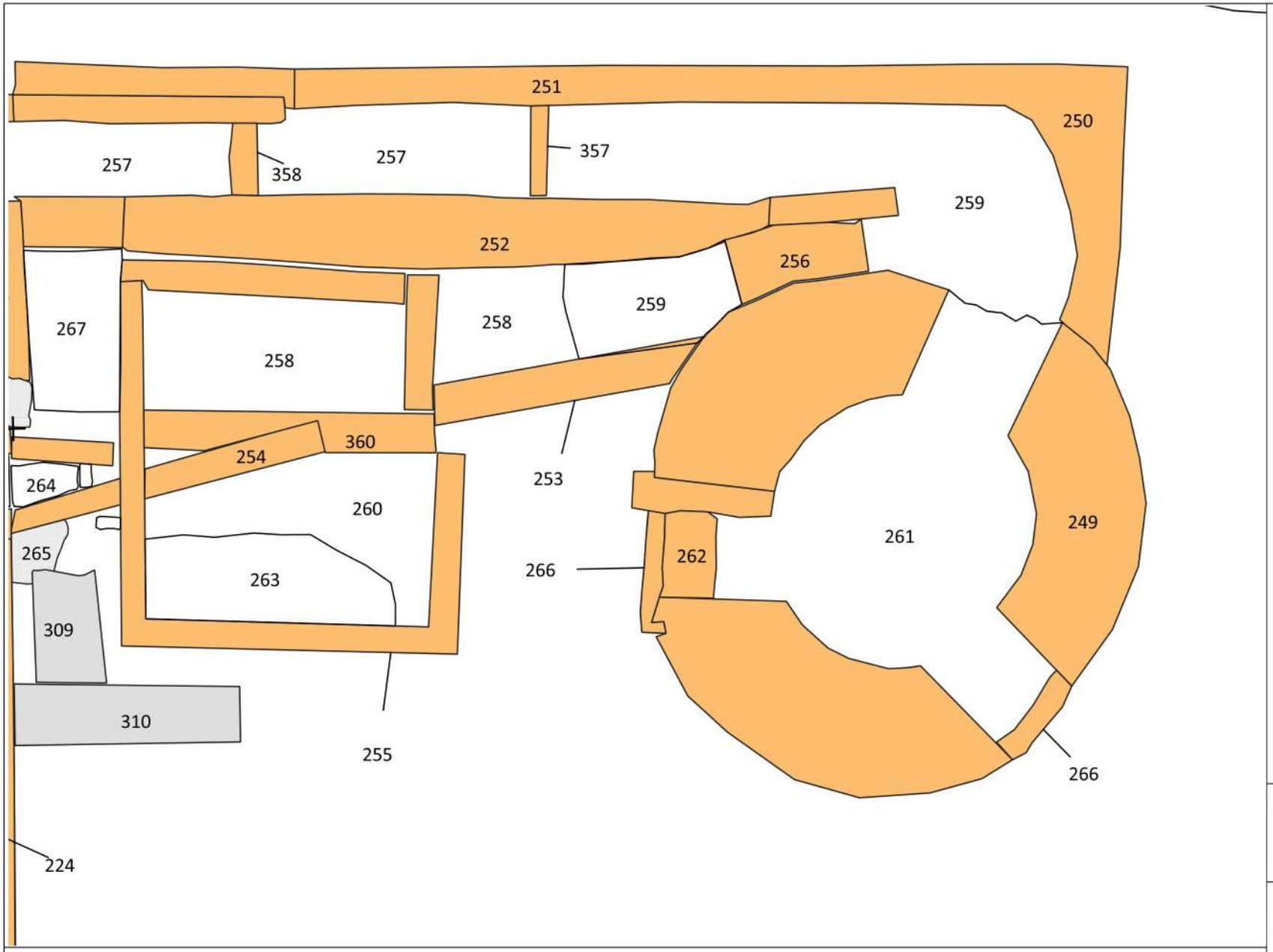
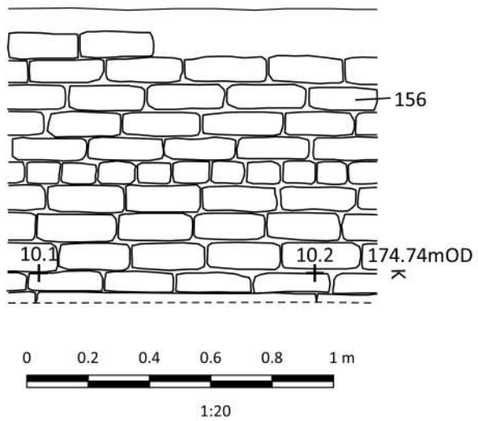
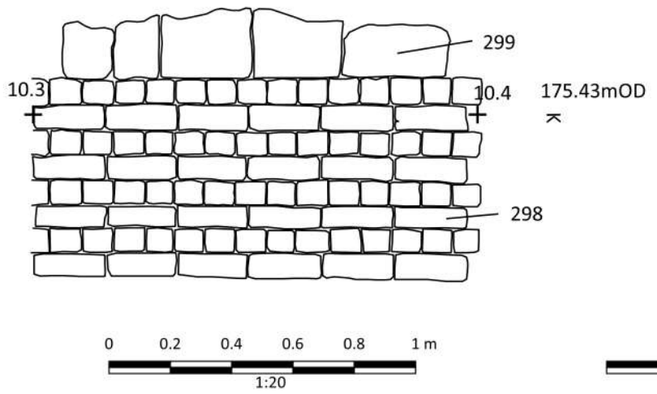
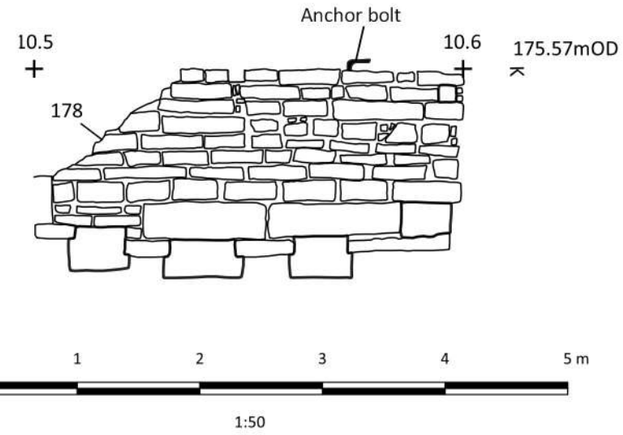
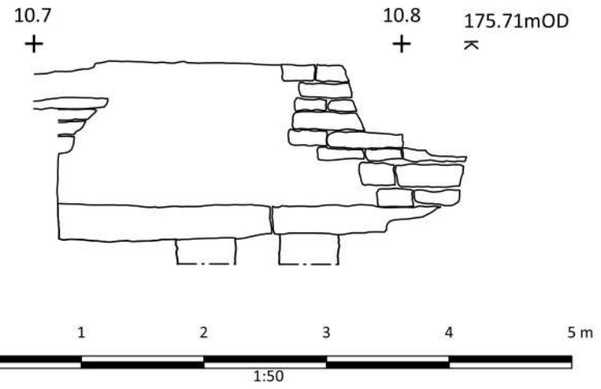


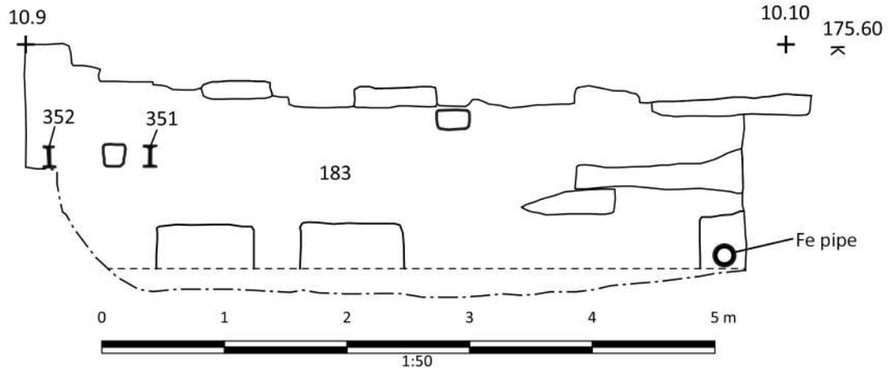
Figure 9: Plan of chimney and flues, showing main features recorded

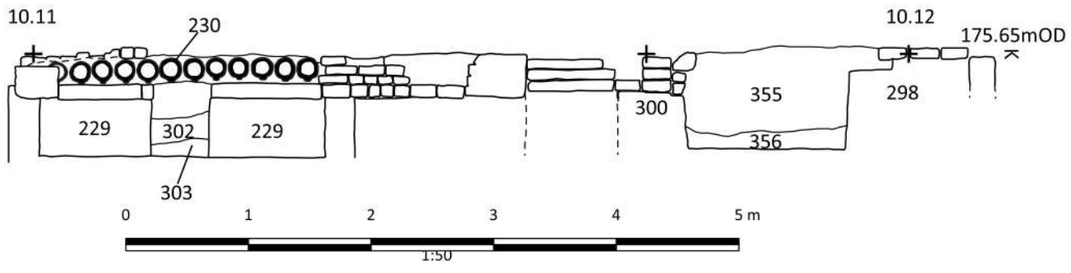


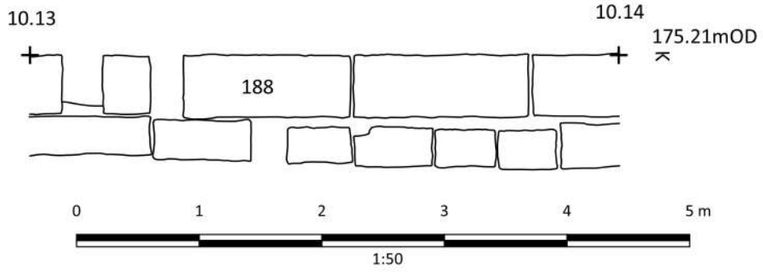












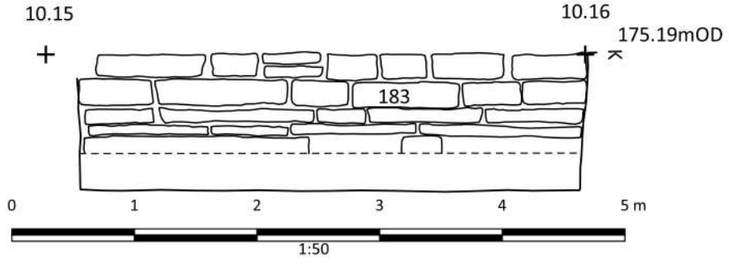


Figure 10: Sections

Key

Conduit

Water level

Iron

Site Code	SHMH 20
Scale	1:20 and 1:50 @ A3
Drawn By	A Telford
Date	03/12/2021

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