

India Mill, Mosley Street, Preston, Lancashire

Archaeological Evaluation Report



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Mulbury Homes Ltd

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SUMMARY

Mulbury Homes Ltd recently submitted a planning application to Preston City Council (Planning Application 06/2014/0117) for the redevelopment of a former industrial site off New Hall Lane in Preston (centred on NGR 355195 429815). The proposals allow for a residential development and associated infrastructure and landscaping works, which will inevitably necessitate considerable earth-moving works.

The application site was undeveloped land on the fringe of Preston until 1864, when William Calvert established an integrated cotton spinning and weaving mill. Known as India Mill, this formed one of a concentration of textile mills in this part of Preston. Established at the height of the Lancashire 'Cotton Famine', India Mill was reputedly the last textile mill to be built in Preston for a period of some 30 years. The mill had ceased textile operation by the early 1930s, and was used subsequently non-textile related purposes.

In the light of the historic textile-manufacturing use of the site, the Planning Officer (Archaeology) for Lancashire County Council recommended that a programme of archaeological investigation of the site was be merited in advance of development, in line with the National Planning Policy Framework, Paragraph 128. In accordance with this recommendation, Mulbury Homes Ltd commissioned Oxford Archaeology North to undertake an appropriate scheme of archaeological investigation which, in the first instance, comprised the excavation of a single trench that was targeted on the footprint of the mill's steam-power plant.

The excavation revealed that extensive structural remains of the former engine and boiler houses survived *in-situ*. However, a significant quantity of asbestos-containing material, including suspected chrysotile and amosite lagging insulation products in a loose fibrous form, was exposed within the demolition material overlying the archaeological remains. Following consultation with appropriate specialists, and in due consideration of the requirements to ensure that no airborne fibre were released, it was recommended that the site remained undisturbed until such a time as a full and detailed remediation strategy has been developed, although it was considered most unlikely that there would be an opportunity to undertake any further archaeological investigation safely. Thus, whilst the buried remains of the mill's former steam-power plant would merit further archaeological investigation to mitigate their damage or complete loss during ground works necessitated by redevelopment, this will not be possible due to Health & Safety considerations.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) is grateful to Mulbury Homes Ltd for commissioning the project. Thanks are also due to Doug Moir, the Planning Officer (Archaeology) for Lancashire County Council, for his advice and guidance. OA North is also grateful to Martin Dyer of the Environmental Engineering Partnership Ltd for providing specialist advice on the asbestos-containing material encountered during the excavation.

The excavation was directed by Graham Mottershead, who was assisted by Sarah Mottershead and Lewis Stitt. The report was written by Ian Miller and Lewis Stitt, and the drawings were prepared by Graham Mottershead and Mark Tidmarsh. The report was edited by Ian Miller, who was also responsible for project management.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 Mulbury Homes Ltd recently submitted a planning application to Preston City Council (Planning Application 06/2014/0117) for the redevelopment of a former industrial site off New Hall Lane in Preston (centred on NGR 355195 429815). The proposals allow for the erection of 51 two-storey affordable homes together with associated infrastructure and landscaping works, which will inevitably necessitate considerable earth-moving works with the potential to damage or destroy any buried remains of archaeological interest.
- 1.1.2 The development site was undeveloped land on the fringe of Preston until 1864, when William Calvert established an integrated cotton spinning and weaving mill. Known as India Mill, this formed one of a concentration of textile mills in this part of Preston, and was one of several cotton mills in the town that were owned by William Calvert & Sons, who emerged as one of Preston's leading textile manufacturers in the mid-nineteenth century. Established at the height of the Lancashire 'Cotton Famine', India Mill was reputedly the last textile mill to be built in Preston for a period of some 30 years. The mill had ceased textile operation by the early 1930s, and was used subsequently for various non-textile related purposes, including the production of motor vehicles, a storage centre for the Ministry of Food, and as a cinema.
- 1.1.3 In the light of the historic industrial use of the site, the Planning Officer (Archaeology) for Lancashire County Council recommended that a programme of archaeological investigation of the site was be merited in advance of development, in accordance with the National Planning Policy Framework, Paragraph 128. In accordance with this recommendation, Mulbury Homes Ltd commissioned Oxford Archaeology North (OA North) to produce a Written Scheme of Investigation for an appropriate scheme of archaeological investigation. This allowed in the first instance for the excavation of a single trench that was targeted on the footprint of the mill's steam-power plant in the south-eastern part of the development site (*Appendix 1*). This was intended primarily to establish the extent and significance of any surviving buried remains of the mill's engine and boiler houses to enable an appropriate strategy to be devised to mitigate the damage or destruction of any archaeological remains during the course of the proposed development.
- 1.1.4 Following the formal approval of the Written Scheme of Investigation by the Planning Officer (Archaeology) for Lancashire County Council, in his capacity as archaeological advisor to Preston City Council, the programme of evaluation trenching was implemented in May 2014. However, during the initial mechanical excavation of the site, a significant quantity of asbestos-containing material, including suspected chrysotile and amosite lagging insulation products, was exposed within the demolition material overlying the archaeological remains. Following the discovery of this material, and consultation with appropriate specialists, the archaeological work was halted.

1.2 SITE LOCATION

1.2.1 The study area lies to the west of Mosley Street, off New Hall Lane in Preston (centred on NGR 355195 429815). It is bounded to the north by the weaving sheds associated with Manchester Mill, to the west by Goodier Street and the Alliance Works, and to the south by properties fronting onto New Hall Lane (Fig 1). At the time of the archaeological works, most of the site comprised hard-standing, with localised areas of scrub vegetation (Plate 1).



Plate 1: Recent aerial view of the Site Area and its environs

1.3 HISTORICAL BACKGROUND

- 1.3.1 Preston has a rich history of textile manufacture, and emerged an important centre for the early development of the factory-based cotton industry in Lancashire. Preston began to develop an industrial base during the sixteenth and seventeenth centuries, and the importance of the textiles increased as many of the town's burgesses became involved in the wool, flax and linen trades (Scott 1952). Cloth merchants began to build purpose-built cottages for weavers from the end of the eighteenth century, including a colony of handloom weavers houses built on New Hall Lane (Hunt 1992, 152).
- 1.3.2 The first cotton factories in Preston were established during the late eighteenth century, with the earliest being built on Moor Lane by William Collinson in 1777. The mill was powered initially by a windmill, although this was replaced by horse power, and eventually by a steam engine (Dickinson 2002, 6). A second cotton mill, known as the Yellow Factory, was built in 1791 (Clemesha 1912, 215). Initially, this was horse-powered, but a steam engine had been installed by mid-June 1795 (Dickinson 2002, 4).

- 1.3.3 The rapid expansion of the cotton industry led to the modernisation of the town after the early nineteenth century. This included a redevelopment and intensification of settlement within the medieval street system, as the growing population of textile workers, including handloom weavers, had to be accommodated. Many of the new cotton factories were erected on the fringes of Preston's historic core, with expansion eventually becoming focused to the north and north-east of the town centre. By 1802, there were eight cotton-spinning mills operating in the town, and this figure had doubled by 1821 (Dickinson 2002, 8-9). Nearly all of these were steam-powered mills, utilising supplies of coal imported by boat from the Wigan Coalfield.
- 1.3.4 Preston's cotton industry experienced a boost during the 1820s, stimulated in part by the end of the French Wars. The factory-based use of power looms was introduced in 1824 (Dickinson 2002, 12), and whilst spinning remained the dominant branch of the town's cotton industry, weaving became increasingly important. By 1856, there was a total of 75 cotton mills in the town, of which some 37 were integrated spinning and weaving factories, 15 were solely for spinning yarn, and 23 purpose-built weaving factories (Hardwick 1858, 424). Up to the middle of the century, there were also several flax and worsted mills, although by 1856 only two flax mill remained in use (*ibid*).
- 1.3.5 Preston's textile industry experienced a further growth period during the late 1870s and 1880s, and many of the older mills were modernised or rebuilt. During this period, the firm of William Calvert & Sons was one of the leading textile manufacturers in Preston. The firm operated several large mills in the Preston area, including Aqueduct Mill on Aqueduct Street, Flatts Mill at Walton-le-Dale, and India Mill on New Hall Lane. By the late 1880s, the firm was operating a combined total of 150,566 spindles to produce both twist and weft yarns, and 2,546 looms with a focus on manufacturing shirtings and sheetings (Worrall 1887, 149; Worrall 1891, 163).
- 1.3.6 The final period of expansion occurred during the early Edwardian era, with the construction of some large cotton factories, including both ring spinning as well as weaving. William Calvert & Sons endeavoured to keep abreast of technological innovation in the textile industry during this period, and expanding their capacity. By 1923, the firm was operating a combined total of 108,620 mule spindles, 42,844 Ring Spindles, and 3211 looms in their three mills (Skinner 1923).
- 1.3.7 The Lancashire textile industry declined rapidly after the mid-twentieth century, and many of the cotton mills in Preston were converted for new use or demolished as textile-manufacturing firms ceased trading; William Calvert & Sons went into liquidation in 1931. A recent survey of Lancashire's historic textile-manufacturing buildings identified a total of 44 cotton mills in the borough of Preston, although very few survive largely intact (OA North 2012).

1.4 DEVELOPMENT OF THE STUDY AREA

1.4.1 The study area was undeveloped land on the fringe of Preston until 1864, when William Calvert & Sons established an integrated cotton spinning and weaving mill. Known as India Mill, this formed one of an important concentration of textile mills in this part of Preston. Established during the Lancashire 'Cotton Famine', India Mill was reputedly the last textile mill to be built in Preston for a period of some 30 years (Hewitson 1883). It was an extensive mill complex for the period, covering an area of 2.03 acres (Plate 2).



Plate 2: Aerial view across the New Hall Lane in the early 1950s, showing India Mill

A newspaper article printed in the *Preston Chronicle* in 1884 reported that the 1.4.2 'well appointed, lofty and substantial fire-proof mill' housed 30,228 spindles and 570 looms, and provided employment for 476 operatives. The machinery was reported to have been driven by a large horizontal engine that was supplied by Joseph Clayton of Preston. It has been suggested that the engine was installed during the early 1880s, and that the steam was raised in a bank of four Stevenson boilers, which had been built in 1877 (Dickinson 2002, 61-2). This engine presumably replaced, or supplemented, the steam engine that had powered the mill from 1864, although no information on the original engine is provided. Further details of the mill complex were provided by a survey that was carried out for insurance purposes in September 1896, which listed all the component buildings. The buildings included offices, two warehouses, an engine house (measuring 41ft by 25ft), boiler houses (60ft by 42ft), shed (138ft by 22ft), weaving shed (162ft by 157ft), a four-storey spinning block (132ft by 95ft), weighing shed (14ft by 9ft) and a chimney, which was 52 yards high; no reference is made to a second engine house, suggesting that the original engine was disused.

1.4.3 An oblique view of the mill's steam-power plant is visible is provided by an aerial photograph taken in the mid-twentieth century (Plate 3). This shows a range of four buildings abutting the western elevation of the spinning block, and fronting onto a linear yard. This range seemingly included a three bay, two-storey warehouse/preparation block at the southern end, with a four-bay boiler house incorporating a double-pitched roof immediately to the north. The adjacent building incorporated a tall arched window, and almost certainly housed the horizontal engine that was installed during the early 1880s. At the northern end of the range was a small single-storey building, with a taller component to its rear. This clearly had a pitched roof and tall arched windows fitted to the front and side elevations, suggesting that this may have housed a beam engine that had powered the mill from 1864.



Plate 3: Aerial view showing the buildings housing the steam-power plant at India Mill

1.4.4 The mill ceased textile operations in 1931, when William Calvert & Sons went into liquidation. By 1932 the buildings were occupied by TL Robinson's wine company and by a leather manufacturer. The mill was also occupied during the 1930s by the Moveo Car & Engineering Company, although this firm only remained in production for a few years. However, India Mill was again used for the production of motor vehicles when Bond Cars Ltd occupied some of the buildings in the early 1960s to assemble a range of their cars and, for a short period, jet skis (Plate 5). During this period, the warehouse and office on the New Hall Lane frontage was used as the Plaza Cinema, and the spinning block as a food store for the Ministry of Food. The engine and boiler houses were occupied by the General Post Office.



Plate 4: An advertisement for Moveo cars dating to the early 1930s



Plate 5: Bond jet skis being assembled in India Mill during the mid-1960s

2. METHODOLOGY

2.1 ARCHAEOLOGICAL INVESTIGATION

- 2.1.1 The scope of the required archaeological work was specified in a Written Scheme of Investigation (WSI), which was devised by OA North, in consultation with the Planning Officer (Archaeology) for Lancashire County Council. The WSI allowed the intrusive investigation of the site of India Mill via the initial stripping of a single large area within the footprint of the former steam power plant (*Appendix 1*). The modern surface was removed using a mechanical excavator fitted with a toothless ditching bucket operating under archaeological supervision. The same machine was then used to carefully define the extent of any surviving walls, foundations and other remains, after which all excavation was undertaken manually. All work carried out was consistent with the relevant standards and procedures provided by the Institute for Archaeologists (IfA), and their code of conduct.
- 2.1.2 The results obtained from this initial work indicated that further investigation was merited in the area which was occupied by the steam-power plant for the mill. However due to the amount of asbestos that was found within the trench, the health and safety concerns during any further excavation need to be considered.
- 2.1.3 *Photographic Survey:* a photographic archive of the structure was compiled, consisting of both general and detailed photographs, which were captured using a high-resolution digital format.
- 2.1.4 The precise location of the trenches, and the position of all archaeological structures encountered, was surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process generated scaled plans and sections within AutoCAD, which were then subject to manual survey enhancement. The drawings were generated at an accuracy appropriate for 1:20 scale, and all information was tied in to Ordnance Datum.

2.2 ARCHIVE

2.2.1 A full archive of the work has been prepared to a professional standard in accordance with current English Heritage guidelines (1991) and the *Guidelines* for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990). The archive will be deposited with the Lancashire Record Office on completion of the project. In addition, a digital copy of the report will be forwarded to the Lancashire Historic Environment Record (HER).

3. RESULTS

3.1 INTRODUCTION

3.1.1 The archaeological investigation comprised the excavation of a single trench that was targeted on the footprint of a linear range of buildings that had housed the mill's steam-power plant as shown on historical mapping. The trench measured c 40 x 20m, and was aligned broadly north-west/south-east (Fig 3). Upon removal of the modern tarmac surfacing (001) and the underlying rubble levelling deposit (002), the foundations of four buildings that had cumulatively housed the steam-power plant were discovered. A summary of the results obtained from this excavation area is presented below.

3.2 THE ORIGINAL ENGINE HOUSE

3.2.1 The foundations of the building at the northern end of the steam-power plant range were revealed at the north-western end of the excavated trench, and comprised several features of brick and stone construction (Plate 6). This building probably represented the engine house that had powered the mill originally, together with the single-storey structure visible on historical aerial photographs (Plate 3). However, no internal features, fixtures or fittings that could be firmly associated with the building's use as an engine house were exposed within the excavated area, although the possibility that structural remains survived *in-situ* below the excavated level cannot be discounted.



Plate 6: The excavated remains of the engine house, facing north-west

- 3.2.2 Two walls (004 and 005) were exposed in the north-western corner of the trench (Fig 3). The fabric of walls 004 and 005 comprised wire-cut bricks, with average dimensions of 0.22 x 0.1 x 0.075m (8³/₄" x 4¹/₄" x 3"), which were bonded with lime-based mortar, consistent with a mid-nineteenth-century construction date. The walls were both three courses wide, and survived to a maximum height of five courses. The excavated element of wall 004 was 4m long, and wall 005 was 6m long. It is likely that wall 004 represented the western wall of the original engine house, forming a partition between the single-storey structure shown on historical photographs. The position of wall 005 corresponded with the southern wall of the engine house shown on historical mapping (Fig 4).
- 3.2.3 A brick-built plinth (003) was discovered in the eastern part of the beam engine house. It measured 3 x 3m, and was constructed from machine-made bricks. The individual bricks had dimensions of 0.23 x 0.11 x 0.075m (9"x 4¹/4"x 3"), and were bonded with a light grey cement-based mortar, suggesting twentieth-century construction date. This structure had almost certainly been built following the disuse of the buildings as an engine house, and whilst its intended function remains uncertain, it is unlikely to have been associated with the original engine.

3.3 THE HORIZONTAL ENGINE HOUSE

- 3.3.1 Wall *005* formed the partition between the original engine house and the adjacent building to the immediate south, which is likely to have housed the horizontal steam engine that was installed during the early 1880s (*Section 1.4.2 above*). Several structural remains were revealed within the footprint of this building.
- 3.3.2 Wall *007* was revealed in the central part of the engine house. This wall was aligned north-west/south-east, abutted wall *005*, and was constructed of similar wire-cut bricks to those used in walls *004* and *005*. Wall *007* was 2.2m long, three courses wide, and survived to a maximum height of seven courses. The south-western elevation of the wall was faced with refractory bricks, which each measured $0.23 \times 0.11 \times 70m$ (9"x 4¹/4"x 2³/4"). A similar wall (*009*) with refractory bricks lining its north-west-facing elevation lay a short distance to the south-west (Fig 3). Wall *009* was 4m long, aligned north-east/south-west, and incorporated bull-nosed bricks at its north-eastern end.
- 3.3.3 Keyed into the south-eastern end of wall 007 and the north-eastern end of wall 009 were the remains of a curved wall (008). The component bricks forming the western face of the wall were blackened with soot, and whilst this suggested that it may have formed part of the flue system between the boilers and the mill chimney, further investigation was precluded by the presence of asbestos.
- 3.3.4 Wall *007* was abutted by a substantial stone block (*006*), which almost certainly represented part of the foundation bed for the horizontal steam engine (Plate 7). The block measured 4.5 x 2.5m, and retained several holding-down bolts, each 0.03m in diameter.



Plate 7: Engine bed 006, facing north-east

- 3.3.5 Situated on the north-eastern side of wall 007 was a small structure constructed from refractory bricks (Fig 3). The component walls (029 and 030) were keyed into each other, although wall 029 abutted wall 007, and wall 030 abutted 005, suggesting that they represented a later addition to the original build. The rest of this structure could not be investigated due to the presence of degraded asbestos lagging. Similarly, most of the eastern part of the engine house could not be excavated due to a high concentration of toxic asbestos fibres being present in the rubble backfill (002) that overlay the structural remains. However, the remains of a north-east/south-west-aligned wall (010) that was composed of refractory bricks was identified in the southern part of the building (Fig 3). The use of refractory bricks in the wall suggested that 010 had also formed part of the flue system, although this could not be investigated further.
- 3.3.6 The southern side of the engine house was formed by wall *011*, which also formed the northern end of the boiler house. Wall *011* was aligned north-east/south-west, was three courses wide, survived to a maximum height of seven courses, and was exposed for a distance of 13m.
- 3.3.7 Internally, the engine house for the horizontal steam engine measured 6.82m wide. This size corresponds to the details provided by the survey that was carried out for insurance purposes in September 1896, and is broadly consistent with the requirements for the horizontal engine that is thought to have been installed during the early 1880s (*Section 1.4.2 above*).

3.4 BOILER HOUSE

3.4.1 The remains of the mill's boiler house were located in the centre of the excavated trench, immediately adjacent to the engine house. The fabric of the component walls of the building comprised wire-cut bricks with average dimensions of 0.22 x 0.1 x 0.075m (8³/₄" x 4¹/₄" x 3"), which were bonded using lime-based mortar. The surviving fabric of the boiler house was consistent with a mid-nineteenth-century construction date, and whilst the boilers are documented to have been replaced after 1877 (*Section 1.4.2 above*), there is no evidence to suggest that the boiler house did not date from the original construction in 1864. A flagstone surface was exposed at the western end of the boiler house represented the charging platform, from where the boilers were stoked with fuel (Plate 8).



Plate 8: The remains of the boiler house during excavation, looking south-east

- 3.4.2 The partition between the engine and boiler houses was formed by wall *011*, which was aligned north-east/south-west (Fig 3). Wall *011* was three courses wide, survived to a maximum height of seven courses, and was exposed for a distance of 13m. At its north-eastern end, it was keyed into wall *012*. This wall was aligned north-west/south-east, and was also three courses wide, but only three courses high.
- 3.4.3 Keyed into the south-eastern end of wall *012* was another brick wall (*031*). This wall lay parallel and to the south of wall *011*, was similarly aligned north-east/south-west (Fig 3). It was three courses wide, seven courses high, and was exposed for a distance of 9m. Wall *011* formed a partition across the boiler house, isolating the northern bay. The wall had evidently been slightly remodelled at its south-western end, where a 3.5m long section (*032*) comprised wire-cut bricks that were bonded using a hard, black, ash mortar, indicative of a late nineteenth-century construction date (Plate 9). This may have been constructed during the replacement of the boilers after 1877.

- 3.4.4 Two small rectangular structures (**014** and **015**), aligned north-east/south-west, were exposed in the centre of the northern bay of the boiler house (Fig 3). These seemingly represented the remains of a foundation bed, although were smaller and of a slightly different construction to the foundations (**018**, **019** and **020**) revealed in the bays to the south of wall **011**.
- 3.4.5 Part of a floor (016) comprising flagstones of various sizes was revealed at the south-western end of the excavated trench, abutting walls 011 and 032. At the western corner of the floor in the northern bay was a brick plinth (017), composed of wire-cut bricks and bonded with lime-based mortar (Plate 9). It survived to a height of five courses, with a flagstone surmounted on the top course. The intended function of this structure is uncertain, although it may have been a foundation pad for a column supporting the roof of the building.



Plate 9: Wall 032 in the boiler house, with plinth 017 visible to the rear

- 3.4.6 The northern bay of the boiler house was only 2.73m wide, and too narrow to have contained a Lancashire boiler. Conversely, this part of the building may have housed an economiser, or feed water heater, connected to the boilers. A large quantity of steel pipes where discovered during the removal of the demolition backfill (002) in this part of the building. These were consistent with the type of pipe work used for the construction of an economiser. This device utilised the waste heat in the gases passing from the boiler, and could increase the temperature of boiler feed water from about 65°C to 120°C.
- 3.4.7 Three brick structures (018, 019 and 020) were revealed in the centre of the boiler house to the south of wall 011; this part of the boiler house measured 8.84m wide internally (Plate 10). The fabric of these structures was similar to structures 014 and 015 in the northern bay, comprising a core of hand-made bricks with the outer courses built from refractory bricks. Each of the structures was 2m wide and up to 7m long, although full excavation was precluded by the presence of asbestos in the backfilled material 002.



Plate 10: The upper surface of boiler seating walls 018 and 019 in the boiler house

- 3.4.8 Structures **018**, **019** and **020** clearly formed the seating walls for two Lancashire boilers. Structure **018** abutted partition wall **011**, and structure **020** abutted the southern wall of the building (**021**). The unexcavated areas between the structures will have been the flame beds beneath the centre of the boilers, although these areas could not be excavated due to significant amounts of asbestos that was present in the demolition overburden (**002**).
- 3.4.9 As was noted in the northern bay, a wall-preserved flagstone floor (016) survived *in-situ* at the northern end of the boiler house, representing the charging platform. This surface was exposed at a depth of 1.39m below the modern ground surface, which was at broadly the same level as it had been during the site's use as a textile mill. The component flagstones were of various sizes, although the surface was uniformly 3m wide. The common flue leading from the boilers to the chimney will have been along the eastern wall of the boiler house, although asbestos-containing material in this area precluded excavation.
- 3.4.10 Wall **021** formed the southern end of the boiler house, with its position corresponding closely to the wall depicted on historical mapping (Fig 4). This north-east/south-west-aligned wall was constructed from wire-cut bricks, and was bonded with a lime-based mortar, suggesting that it had formed part of the original 1864 construction. It was three courses wide, survived to a height of seven courses high, and was excavated for a distance of 13m (Fig 3).

3.5 SOUTHERN BUILDING

- 3.5.1 The building forming the south-eastern end of the steam-power plant range, although only part of its floor plan was exposed in the excavated trench as the southern part was occupied by a large buried tank (Fig 3). Wall *021* formed the northern side of the building, with a parallel wall (*022*) lying 1.5m to the south (Fig 3).
- 3.5.2 The fabric of wall 022 comprised machine-made bricks, each measuring 0.23 x 0.11 x 0.075m, and were bonded with a cement-based mortar. The wall was two courses wide, and was laid on top of an I-section steel beam that was supported on brick-built piers (Plate 11). The brick pillars were 14 courses high, and built from the same brick and mortar type used in wall 022, indicative of a twentieth-century construction date. The north-eastern end of the wall (023) was clearly of a different construction phase, although the similarly of the building materials suggested that the two sections of wall were of a broadly contemporary date. Wall 023 abutted the eastern wall of the building (026). The wall was four courses wide, and comprised hand-made bricks, suggesting that it had formed part of the original 1864 construction.
- 3.5.3 Aligned parallel to the south-east of walls *022* and *023* was wall *027*. This was similarly constructed from machine-made bricks, was three courses wide, and survived to a height of 15 courses. It incorporated a brick-blocked doorway (*028*), which was situated 3m from the south-western end of the excavated trench (Fig 3). The door way had a steel I-section lintel, and had been blocked using machine-pressed frogged bricks that were bonded with cement-based mortar.



Plate 11: The excavated remains of the southern building, looking north-east

3.5.4 The floor of the southern building comprised flagstones (025) of various sizes, which probably represented the original interior surface. The uniform nature of the floor surface, coupled with the lack of any fixtures and fittings, indicates that this building had not formed part of the steam-power plant, and is more likely to have been intended to house warehousing/preparation process.

3.6 THE FINDS

3.6.1 No artefacts were recovered from the archaeological investigation.

4. DISCUSSION

4.1 INTRODUCTION

4.1.1 The archaeological investigation has provided a valuable opportunity to investigate the physical remains of the steam-power plant associated with a mid-nineteenth-century textile mill. Despite the immense importance of the textile industry to the industrial development and expansion of Preston during the nineteenth century, very few mills in the city have been examined archaeologically. The mid-nineteenth century, moreover, was a key period in the technological development of power generation in textile mills, although some aspects are not well understood. The only comprehensive account of the steam-power systems utilised in Preston's cotton mills is that produced by Dickinson in 2002, which has provided a useful source for the present study.

4.2 THE ORIGINAL ENGINE HOUSE

- 4.2.1 There is virtually no information available on the steam engine that powered the mill prior to the installation of the horizontal engine in the early 1880s, and the archaeological excavation did not expose any physical remains of the original engine. Nevertheless, it is probable that this engine was housed in the building that formed the northern end of the range that was examined during the archaeological excavation. The size and plan form of this building, based on the information provided by historical mapping and aerial photographs, is consistent with that required for a beam engine. Whilst horizontal engines were being installed in some textile mills during the 1860s, beam engines were still employed widely. The power transmission from this engine to the machinery in the mill will almost certainly have been via shafting, rather than the rope drive systems that were installed in numerous mills during the second half of the nineteenth century.
- 4.2.2 The original engine was seemingly taken out of service when the horizontal engine was installed during the early 1880s. A sketch plan of the mill complex that was produced for insurance purposes in 1896 marks the building a 'stores', whilst the associated valuation only mentions a single engine.

4.3 THE HORIZONTAL ENGINE

4.3.1 The large stone block revealed in the building adjacent to the original engine house almost certainly represented the foundation bed for a horizontal steam engine. This building is identified on the 1896 sketch plan as an engine house, and this is supported by the evidence from the archaeological excavation. The limited depth of the excavation precluded a detailed plan of the engine house to be compiled, although the presence of just a single stone foundation block suggests that the engine may have been a single cylinder model. The documentary evidence suggests that this engine had been supplied by Joseph Clayton of Preston (*Preston Chronicle*, 26 July 1884).

4.4 **THE BOILER HOUSE**

- 4.4.1 The excavation revealed that well-preserved structural remains of the boiler house survived *in-situ*. The exposed width of the boiler house, measuring some 12.8m wide, was consistent with the dimensions provided by the insurance assessment of 1896. The results obtained from the excavation suggested that the northern bay of the boiler house had been partition from the main body of the building, and had housed an economiser. This may have been installed during the later nineteenth century, as the partition wall clearly represented a later addition.
- 4.4.2 In his study of Preston's cotton mills, Dickinson concluded that the steam requirements of India Mill had been provided by a bank of four Lancashire boilers, which had been installed shortly after 1877 (Dickinson 2002, 62). The physical remains exposed during the excavation, however, indicated that the building had housed just two boilers, with insufficient room available for a bank of four. The exposed remains of the boiler foundation beds were consistent with those required by a Lancashire-type boiler, although the limited depth of the excavation precluded firm confirmation.
- 4.4.3 The precise route of the flue from the boilers to the chimney was not established, which again reflected the restricted depth of the excavation. However, it is probable that the flue will have been placed along the eastern wall of the building, to the rear of the boilers, passing beneath the external yard area via the economiser to the chimney situated to the west.
- 4.4.4 The sketch plan of 1896 implies that the building forming the southern end of the steam-power plant range had formed a second boiler house. However, notwithstanding considerable remodelling during the twentieth century, the evidence obtained from the excavation concluded that this building had not been used to house elements of the steam-power plant, and no contained no physical indication for having contained boilers. It seems more likely that this building had been used for warehousing or preparatory purposes.

5. CONCLUSIONS

5.1 SIGNIFICANCE

5.1.1 The archaeological investigation has provided a valuable opportunity to investigate the physical remains of the steam-power plant that served a midnineteenth-century textile mill. The work demonstrated that considerable structural remains of the former steam-power plant survived *in-situ*, and may be considered to be of high local, if not regional, significance. It is probable, moreover, that further remains of archaeological interest survive *in-situ* below the excavated level, increasing the archaeological significance of the site.

5.2 **Recommendations**

5.2.1 Under normal circumstances, the archaeological remains would merit further, more detailed investigation prior to any damage or destruction that necessitated by the proposed development. However, a significant quantity of asbestos-containing material, including suspected chrysotile and amosite lagging insulation products in a loose fibrous form, was exposed within the demolition material overlying the archaeological remains. Following consultation with appropriate specialists, and in due consideration of the requirements to ensure that no airborne fibre were released, it was concluded that the contaminated material would need to be removed via whole scale excavation, with no opportunity to undertake any further archaeological investigation safely.

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APPENDIX 1: WRITTEN SCHEME OF INVESTIGATION

May 2014

Oxford Archaeology North

LAND WEST OF MOSLEY STREET, NEW HALL LANE, PRESTON

ARCHAEOLOGICAL WRITTEN SCHEME OF INVESTIGATION

Planning Application 06/2014/0117

Proposals

The following Written Scheme of Investigation is offered in response to a request from Paul Walton, acting on behalf of Mulbury Homes Ltd, for archaeological investigation in advance of a proposed redevelopment of a former industrial site off New Hall Lane in Preston.

1. BACKGROUND

1.1 **PROJECT BACKGROUND**

1.1.1 Mulbury Homes Ltd has submitted a planning application to Preston City Council (Planning Application 06/2014/0117) for the redevelopment of a former industrial site off New Hall Lane in Preston. The Application Site lies to the west of Mosley Street (centred on NGR 355195 429815), and is bounded to the north by weaving sheds associated with Manchester Mill, to the west by Goodier Street and the Alliance Works, and to the south by properties fronting onto New Hall Lane (Figure 1). The development proposals allow for the erection of 51 two-storey dwellings, with associated roads and landscaping, which will inevitably necessitate earth-moving works.



Figure 1: Recent aerial view of the Application Site

1.1.2 The Application Site was undeveloped land on the fringe of Preston until 1864, when William Calvert established an integrated cotton spinning and weaving mill. Known as India Mill, this formed one of a concentration of textile mills in this part of Preston, which included Manchester Mill on Geoffrey Street and the Alliance Works on Brindle Street. Established at the height of the Lancashire 'Cotton Famine', India Mill was reputedly the last textile mill to be built in Preston for a period of some 30 years.

A newspaper article printed in the Preston Guardian in 1881 reported that the 1.1.3 mill housed 30,228 spindles and 570 looms, operated by William Calvert & Sons, one of Preston's leading nineteenth-century textile manufacturers. The machinery in the mill was reported to have been driven by a large horizontal McNaughted cross-compound engine with four Stevenson boilers, which had been installed in 1877. Further details of the mill complex were provided by a survey that was carried out for insurance purposes in September 1896, which listed all the component buildings and identified their position on a sketch plan. The buildings included offices (17ft by 45ft), a warehouse (115ft by 58ft), a second warehouse (163ft by 43ft), an engine house (41ft by 25ft), boiler houses (60ft by 42ft), shed (138ft by 22ft), weaving shed (162ft by 157ft), a four-storey spinning block (132ft by 95ft), weighing shed (14ft by 9ft) and a chimney, which was 52 yards high. The detail provided by this document, coupled with the accurate plan of the area compiled by the Ordnance Survey in 1891-2, enables the location of the component buildings to be plotted precisely (Figure 2).



Figure 2: Extract from the Ordnance Survey plan published in 1893

1.1.4 The mill had ceased textile operation by 1952, although its layout was captured on an aerial photograph taken shortly prior to closure (Figure 3). The buildings then became a storage centre for the Ministry of Food, and were used subsequently as a cinema. It has since been demolished, although there is potential for buried remains of archaeological interest to survive *in-situ*.



Figure 3: Aerial view showing India Mill in c 1950

1.1.5 In order to secure archaeological interests, the Lancashire County Archaeology Service (LCAS), in their capacity as archaeological advisor to Preston City Council, has provided a consultation response to the planning application that recommends a condition is attached to consent. This allows for an appropriate scheme of archaeological investigation to be carried out in conjunction with the development works, in accordance with the National Planning Policy Framework, paragraph 141:

'No development shall take place until the applicant, or their agent or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved by the Planning Authority.'

1.1.6 This document presents the required written scheme of investigation for the approval of the Local Planning Authority. It has been produced by OA North at the request of Mulbury Homes Ltd, and has been formulated in consultation with LCAS. In the first instance, the scheme of archaeological works allows for the investigation of targeted elements of the former mill complex to establish whether any buried remains of interest survive *in-situ*. Pending the results obtained from this initial investigation, further archaeological excavation may be required to ensure that a complete record of any significant buried remains is compiled. It is anticipated that this work will be carried out in conjunction with the construction works required for the proposed development, although the area of archaeological interest will be marked out and fenced off from the rest of the site until the archaeological investigation has been completed.

1.2 PROJECT BACKGROUND

- 1.2.1 OA North is the largest archaeological contractor in north-west England, with unsurpassed experience of working in the region. OA North has the professional expertise and resource to undertake the project to a high level of quality and efficiency. OA North is an Institute for Archaeologists (IfA) registered organisation, registration number 17, and all its members of staff operate subject to the IfA Code of Conduct.
- 1.2.2 OA North has established itself as one of the country's leading practitioners in the field of industrial archaeology, and has generated an impressive portfolio of projects that include those completed at the Derwentcote Steel Furnace in County Durham (Cranstone et al 1997), the Carlton Alum Works in North Yorkshire (Miller 2002), the Pilkington's Sheet Glass Works in St Helens (Krupa and Heawood 2002), Thomas Telford's Holyhead Road in North Wales (Quartermaine et al 2003), and the Percival, Vickers Flint Glass Works in Manchester (Miller 2007). A large proportion of the industrial archaeology projects carried out by OA North, however, have been focused on the development of textile-manufacturing sites. In 2007, for instance, OA North completed a four-year project of conservation-based research, building survey and excavation at the Grade II Listed Murrays' Mills spinning complex in the Ancoats area of Manchester. This project culminated in the publication of a monograph on the history, development, and fabric of Manchester's oldest surviving steam-powered cotton mill (Miller and Wild 2007). Most recently, OA North has just completed a comprehensive archaeological study of Quarry Bank Mill in Cheshire on behalf of the National Trust.
- 1.2.3 All work on the project will be undertaken in accordance with relevant professional standards, including:
 - If A's Code of Conduct, (2012); Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, (2010); Standard and Guidance for Archaeological Evaluations, (2010); Standard and Guidance for Archaeological Watching Briefs, (2012);
 - English Heritage's Management of Research Projects in the Historic Environment (MoRPHE), 2006;
 - The European Association of Archaeologists Principles of Conduct for Archaeologists Involved in Contract Archaeological Work (1998).

3. METHOD STATEMENT

3.1 STRIP, MAP AND RECORD

- 3.1.1 The footprint of the former mill's steam-power plant (engine house, boiler house, economiser, chimney and associated flues) will be subject to intrusive archaeological investigation (Figure 4). This will comprise the stripping of modern surfacing, followed by the rapid manual cleaning of any exposed remains and archaeological recording. This will be intended to establish the presence or absence of any buried remains of interest, and, if established, will then test their date, nature, depth and quality of preservation, enabling a mitigation strategy to be formulated in consultation with LCAS. It is not anticipated that other parts of the development site will retain buried remains of archaeological significance, and thus do not merit intrusive investigation.
- 3.1.2 In the first instance, the footprint of the former engine and boiler house and chimney will be marked out precisely on the ground, according to Ordnance Survey (OS) co-ordinates. The area will then be isolated from the remainder of the site via the installation of barrier fencing. No ground-breaking work required by the development programme within that part of the site will be carried out until the programme of archaeological investigation has been completed. It is anticipated, however, that the construction programme will commence on other parts of the site prior to the archaeological investigation.



Figure 4: Area proposed for the archaeological works, including sufficient room for a temporary stockpile of excavated material

- 3.1.3 The precise area to be subject to the strip, map and record exercise will be determined with due consideration to on-site logistical factors, and in consultation with LCAS. In broad terms, however, an area measuring a maximum of 40 x 25m will be subject to mechanical stripping. The modern surfacing will then be excavated by a mechanical excavator of appropriate power using a toothless ditching bucket, and operating under constant and close archaeological supervision.
- 3.1.4 Mechanical stripping, with selective excavation to determine depth and character of features and deposits, will be followed by the rapid manual cleaning to allow a basic record to be compiled of any exposed remains of archaeological interest.
- 3.1.5 Where significant buried remains are found to survive, and will be destroyed during the construction works, further archaeological investigation will be required. This is likely to involve detailed excavation of targeted features, or a watching brief to monitor earth-moving works in those parts of the site beyond the stripped area.
- 3.1.6 *Recording:* machine excavation will be used to define carefully the extent of any surviving walls, foundations, and other remains. Thereafter, structural remains will be cleaned manually to define their extent, nature, form and, where possible, date. If the excavation is to proceed below a depth of 1.2m, then the trench will be widened sufficiently to allow the sides to be stepped in or battered back to a safe angle of repose.
- 3.1.7 All information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage. Results of the evaluation will be recorded on *pro-forma* context sheets, and will be accompanied with sufficient pictorial record (plans, sections and photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.
- 3.1.8 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the evaluation will be generated. Photographs records will be maintained on special photographic *pro-forma* sheets. Accurate large-scale plans and sections will also be produced at an appropriate scale (1:50, 1:20 and 1:10).
- 3.1.9 *Human remains:* human remains are not expected to be present, but if they are found they will, if possible, be left *in-situ* covered and protected. If removal is necessary, then the relevant Home Office permission will be sought, and the removal of such remains will be carried out with due care and sensitivity as required by the *Burials Act 1857*.
- 3.1.10 Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996.

3.2 POST-EXCAVATION

- 3.2.1 *Report:* the content of the fully illustrated and integrated report on the building investigation and the strip, map and record will comprise the following:
 - (i) a title page detailing site address, NGR, author/originating body, client's name and address a site location plan related to the national grid;
 - (ii) full content's listing;
 - (iii) a summary account of the results;

(iv) an explanation to any agreed variations to this written scheme of investigation, including any justification for any analyses not undertaken;

- (v) a description of the methodology employed, work undertaken and results obtained;
- (vi) a description of the archaeological background, and an account of the historical development of the site;
- (vii) copies of plans, photographs, and other illustrations as appropriate;
- (viii) plans of each of the stripped trench showing the archaeological features exposed;
- (ix) an overall phased plan with sections of the excavated archaeological features;
- (x) a consideration of the importance of the archaeological remains present on the site in local, regional and national terms;
- (xi) recommendations for further archaeological investigation where appropriate;
- (xii) a complete bibliography of sources from which data has been derived.
- 3.2.2 The report will be in the same basic format as this written scheme of investigation; a copy of the report can be provided on CD, if required. Copies of the report will be supplied to the client as requested, and further digital copies will go to the appropriate repository.
- 3.2.3 *Archive:* the results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines. The project archive represents the collation and indexing of all the data and material gathered during the course of the project.
- 3.2.4 The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IfA in that organisation's code of conduct. OA North conforms to best practice in the preparation of project archives for long-term storage. OA North practice is to deposit the original record archive of projects with the appropriate County Record Office.

- 3.2.5 The Arts and Humanities Data Service (AHDS) online database project *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.
- 3.2.6 **Confidentiality:** all internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

4. OTHER MATTERS

- 4.1 *Health and Safety:* archaeological staff and visitors will respect Health and Safety provisions and site-specific safety regulations. It is the policy of OA North ('the Employer') to conform fully with the requirements of the Health and Safety at Work Act (1974), and all site procedures will be in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). Attention will also be paid to the requirements of more recent legislation, including the provision and use of Work Equipment Regulations (1992), the Management of Health and Safety at Work Regulations (1992), and the Construction (Design and Management) Regulations (1994).
- 4.2 In furtherance of the duty of care imposed by the Health and Safety at Work Act (1974), the Employer shall make available to his employees whatever reasonable facilities are required by particular circumstances, *eg* appropriate protective clothing, safety equipment, rest breaks for specialised tasks, etc. A written risk assessment will be undertaken in advance of project commencement, and copies will be made available on request.
- 4.3 *Insurance:* evidence of Public Liability Insurance to the minimum value of £5m, and Professional Indemnity Insurance to the minimum of £2m, will be provided prior to the commencement of the archaeological works.
- 4.4 **Project Monitoring:** the aims of monitoring are to ensure that the archaeological works are undertaken within the limits set by the Written Scheme of Investigation, and to the satisfaction of the curatorial archaeologist at the Lancashire County Archaeology Service (LCAS). The curatorial archaeologist will be given at least five days' notice of when work is due to commence, and will be free to visit the site by prior arrangement with the project director. It is anticipated that there will be at least one formal monitoring meeting during the course of the archaeological works, which should also be attended by the Client or his representative.
- 4.5 *Contingencies:* if there are more complex or generally deeper deposits than can be anticipated from the evidence available, there may need to be a corresponding increase in costs, which will be subject to agreement with the Client and the archaeological curator. These contingency costs are in accordance with the Institute for Archaeologists' guidance.

4.6 **Confidentiality:** the report is designed as a document for the specific use of the Client, for the particular purpose as defined in the project design, and should be treated as such; it is not suitable for publication as an academic report, or otherwise, without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project design, or for any other explicit purpose can be fulfilled, but will require separate discussion and funding.

5. WORK TIMETABLE

- 5.1.1 *Strip, Map and Record:* a five-day period should be allowed to carry out the initial strip and record exercise. The time required for any additional excavation cannot be determined until the results of the strip and record are known.
- 5.1.2 *Report/Archive:* the report and archive will be produced within six weeks of completion of the fieldwork. OA North can execute projects at very short notice once a formal written agreement has been received from the client.

6. STAFFING

- 6.1 The project will be under the overall charge of **Ian Miller BA FSA** (OA North Senior Project Manager) to whom all correspondence should be addressed. Ian has considerable experience and particular research interests in Lancashire's textile industries. Ian managed the archaeological fieldwork, analysis and ultimate publication at Murrays' Mills (Miller and Wild 2007), and has managed numerous excavations of former textile mills throughout Greater Manchester. He is presently managing the Lancashire Textile Mills Survey, a strategic research project funded by English Heritage.
- 6.2 The archaeological investigation is likely to be directed by **Chris Wild BSc** (OA North Project Officer). Chris is an highly experienced field archaeologist, who has a particular interest in Industrial Archaeology, and has carried out numerous excavations of former textile-manufacturing sites.

ILLUSTRATIONS

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- Figure 2: Trench area superimposed on the Ordnance Survey 25": 1 mile map of 1893
- Figure 3: Plan of the evaluation trench
- Figure 4: Evaluation trench superimposed on the Ordnance Survey 1:500 map of 1892



Figure 1: Site location



Figure 2: Trench area superimposed on the Ordnance Survey 25":1 mile map of 1893



Figure 3: Plan of the evaluation trench



Figure 4: Evaluation trench superimposed on the Ordnance Survey 1:500 map of 1892