

TRENCHERFIELD MILL N° 1, POTTERY ROAD, WIGAN,

Greater Manchester

Archaeological Evaluation



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SUMMARY

Nuttall Construction Limited has submitted a proposal to redevelop the Trencherfield Mill complex in Wigan, Lancashire (centred on SD 5787 0518). At its peak in the early 20th century, the complex incorporated three multi-storey, combined cottonspinning and weaving mills, and associated ancillary buildings. The earliest of these, Trencherfield Mill N° 1, was erected in 1823 on what then a green field site, some 0.5km to the south-west of Wigan town centre. The complex had been expanded by 1847 with the addition of a second multi-storey mill (Trencherfield Mill N° 2), and a third mill was built in 1907. The latter is presently the only extant mill on the site, designated a Grade II Listed Building in 1997, which was the focus of a recent archaeological building survey (UMAU 2005). This survey was coupled with an archaeological desk-based assessment of the entire proposed development site, which concluded that the buried remains of Trencherfield Mill N° 1 and a former blacking mill had some potential to retain *in situ* structures of archaeological significance.

In order to secure archaeological interest, the Assistant County Archaeologist for Greater Manchester recommended that the site be subject to a programme of evaluation prior to development to establish the presence or absence of buried remains. This programme of work included the excavation of 12 targeted trenches, of which eight were to be placed across the site of Trencherfield Mill N^o 1 and its immediate environs; in the event, only seven trenches were excavated due to logistical considerations. In February 2006, Oxford Archaeology North (OA North) was commissioned by Nuttall Construction Ltd to undertake this work, which commenced immediately.

The evaluation demonstrated that significant remains of Trencherfield Mill N° 1 survived *in situ* across the northern and south-eastern parts of the study area. In particular, the remains of the steam-power plant were represented by the substantial foundations for the original internal steam engine, and some evidence for a later engine within an extension to the mill. This was associated with the remains of a boiler room and the vestiges of a chimney. The evaluation also exposed considerable remains of the former blacking mill within the north-western part of the study area; the results obtained from that element of the evaluation programme will be presented in a future report.

The current design proposals for redevelopment are unlikely to have a negative impact upon the sub-surface archaeological resource, as it is envisaged that construction work will involve the raising of the present ground level. As such, it is not anticipated that any further archaeological work will be required. However, any revision of the current proposals that allows for earth-moving works within the footprint of Trencherfield Mill N° 1, or its immediate environs, may require an element of archaeological mitigation.

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Oxford Archaeology North (OA North) would like to express thanks to Alan Nuttall, Brian Elwall, Steve Rigg, and Peter Wallwork, of Nuttall Construction Ltd, for commissioning, funding and supporting the project. Thanks are also due to Norman Redhead, the Assistant County Archaeologist for Greater Manchester, for his advice and support.

The evaluation was directed by Sean McPhillips, assisted by Andy Lane, Caroline Raynor, Alastair Vannan, and Pascal Eloy. The report was written by Sean McPhillips and Ian Miller, and the illustrations were prepared by Mark Tidmarsh and Christina Clarke. The report was edited by Ian Miller, who was also responsible for project management.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 In February 2006, OA North was commissioned by Nuttall Construction Ltd to undertake a programme of archaeological evaluation of Trencherfield Mill, Wigan, in advance of a proposed redevelopment. The work followed on from an archaeological building survey and desk-based assessment of the site (UMAU 2005), which recommended that the buried remains of a 19th-century textile mill (Trencherfield Mill N^o 1), and a blacking mill of a broadly contemporary date, should be investigated in advance of development.
- 1.1.2 A project specification for an archaeological evaluation was devised by the Assistant County Archaeologist for Greater Manchester, which required a total of 12 targeted evaluation trenches to placed across the site. These were intended to establish the presence or absence of any buried archaeological remains, and assess their extent, character and significance. It was envisaged that the results of the evaluation could determine whether any further archaeological investigation would be required, and inform the final design proposals for the redevelopment of the site.
- 1.1.3 The present report is concerned with the results obtained from the evaluation of Trencherfield Mill N° 1. The site of the former blacking mill lies within a different part of the proposed development site, and the results obtained from that element of the project will be presented in a subsequent report.

1.2 SITE LOCATION AND GEOLOGY

- 1.2.1 The Trencherfield Mill complex lies some 0.5km to the south-west of Wigan town centre, at a height of approximately 29m above Ordnance Datum. The mill complex is centred on NGR SD 5785 0515, occupying an area bounded by Wallgate and Pottery Road to the north and north-west respectively and, to the west, the Leeds and Liverpool Canal (Fig 1). The river Douglas takes a route short distance to the south of the canal.
- 1.2.2 The Trencherfield Mills formed one of a group of large cotton factories within this part of Wigan, including Eckersley's Mills and Taylor's Victoria Mills. The surviving structures within the Trencherfield site include the 1907 N° 3 Mill, and its associated engine house, a designated Grade II Listed Building.
- 1.2.3 The geology of the area forms part of the Lancashire Coal Measures, which extend from the Mersey Valley in the south to the Amounderness Plain in the north-west (Countryside Commission 1998, 172). The solid geology comprises productive coal measures, with Bunter sandstone and marls to the south (Ordnance Survey 1951). The overlying drift geology is glacial and post-glacially derived tills, with fluvial deposits of gravel along the course of the river Douglas (Countryside Commission 1998, 128).

2. METHODOLOGY

2.1 INTRODUCTION

2.1.1 The project design (*Appendix 1*) allowed for the excavation of eight trenches across the site of Trencherfield Mill N° 1, although the presence of live service cables rendered this impracticable. Following consultation with the Assistant County Archaeologist, a decision to reduce the number of trenches to seven was reached, although the total area evaluated remained the same by expanding the size of the excavated trenches, which were targeted upon the former mill's power systems. The fieldwork was undertaken during February 2006, and was consistent with the relevant standards and procedures provided by the Institute of Field Archaeologists.

2.2 EVALUATION TRENCHING

- 2.2.1 The uppermost levels of each trench were excavated by a machine fitted with a toothless ditching bucket. The same machine was then used to define carefully the extent of any surviving walls, foundations and other remains, after which all excavation was undertaken manually. The floor and sides of each trench was cleaned and recorded in an appropriate manner.
- 2.2.2 All information was recorded stratigraphically with accompanying documentation (plans, sections and both colour slide and black-and-white print photographs, both of individual contexts and overall site shots from standard view points). Photography was undertaken with 35mm cameras on archivable black-and-white print film as well as colour transparency, all frames included a visible, graduated metric scale.
- 2.2.3 The precise location of the trenches, and the position of all archaeological structures encountered, was be 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.

2.3 FINDS

- 2.3.1 *Artefacts:* no artefacts were recovered from the evaluation trenches.
- 2.3.2 *Environmental Samples:* no palaeo-enovironmental samples were taken during the course of the evaluation as none of the deposits encountered were deemed appropriate.

2.4 ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with the current IFA and English Heritage guidelines (English Heritage 1991). The paper and digital archive will be deposited with Wigan Museum Services on completion of the project.

3. BACKGROUND

3.1 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 3.1.1 *Introduction:* a summary historical and archaeological background of Wigan is presented in order to place the results obtained from the archaeological evaluation into a wider context. Whilst considerable archaeological remains of Roman and medieval dates have been identified in Wigan (Tindall 1985; GMAU 2001; Miller 2006), these periods of the town's history are omitted as they are of little direct consequence to the present study area. The historical and archaeological background has been compiled largely from secondary sources, although the sequence of available historic maps has also been examined.
- **Post-medieval Wigan:** in broad terms, the 16th to 18th centuries was a period of 3.1.2 increased growth and prosperity for Wigan; the town probably expanded in size by about 30 percent during the 16th century to a total population of approximately 4,000 by 1600 (Hannavy 1990, 46). New buildings were constructed in the rear part of the medieval burgage plots within the historic core of the town, and by 1538 John Leland was able to describe Wigan as 'a paved town as big as Warrington, but better builded...' (Chandler 1998, 269). However, the outbreak of the Civil War in 1642 represented a severe check on the town's fortunes. Wigan entered the war as a Royalist stronghold, and was later subjected to a punitive taxation under the Commonwealth. It was not until the 18th century that the town once again achieved economic success and renewed expansion. The growth of Wigan during this period was largely the result of the coal, iron and textile industries, particularly woollen cloths, linen, calicos and checks. The town specialised in the manufacture of woollen bedding textiles, produced in cottage hand-loom shops (Powell 1998, 9).
- 3.1.3 It seems that cotton was beginning to be the dominant element of the textile industry by the later 18th century; in 1754, during a visit to Wigan, the Swedish industrial spy RR Angerstein noted that 'large numbers of women and children were occupied with the spinning of cotton' (Berg and Berg 2001, 295). This view was echoed some 40 years later, when Aiken (1795, 294) commented that 'the cotton manufactory, as in all other places, intrudes upon the old staple of the place'. However, the adoption of large, purpose-built cotton-spinning mills in Wigan was later than other parts of the region, reflecting the lack of fast-flowing streams in the town. The application of steam power to the textile industry during the late 18th century allowed Wigan to expand as a cotton-manufacturing centre, and by 1818 there were eight mills concentrated in the Wallgate area. Textile production, and particularly coarse counts of cotton, evolved as an important part of the local economy; at one point in the 19th century, the industry accounted for over 50 percent of the employment in the town (Hannavy 1990, 116).
- 3.1.4 Wigan rose to prominence as a significant cotton-spinning town in the mid-19th century. By 1870 there were 26 spinning and weaving mills in and around the town, employing more than 11,000 people. One of the interesting features of the Wigan textile companies was their willingness to adopt innovations in

business techniques and new technology. This is well illustrated by their early adoption of the ring-spinning process.

- 3.1.5 The spinning of cotton in the Lancashire textile industry throughout the 19th and early 20th centuries depended heavily on the spinning mule. However, as Murphy noted (1911, 74), 'the avowed intention of spinning frame inventors, for the most part, was to preserve spinning to the female portion of humanity', and yet the spinning mule was improved and enlarged during the 19th century to the extent that only men could cope with the labour involved in its operation (*ibid*). The ring-spinning frame offered a solution to this problem as it did not require hard manual labour to operate. This factor was of particular significance in Wigan, as the bulk of the male working population was employed in the mining industry, and women dominated the textile-manufacturing workforce (Hannavy 1990).
- 3.1.6 During the late 19th century, Wigan emerged as an important centre for the new process of ring-spinning. This was first introduced to the town in May Mill, Pemberton, during 1887. However, by 1888, Ffarrington Eckersley & Co Ltd had become the largest firm ring spinners in Britain, which was a position they retained for three decades (Williams and Farnie 1992, 35). The adoption of this latest technology was a key factor in the survival of Wigan as an important textile-producing centre; the town rose in status from the rank of the 14th largest spinning town in 1919 to that of fifth in 1963 (Farnie 1990).
- 3.1.7 Origins of the Trencherfield Mills: at its peak in the early 20th century, the Trencherfield Mills complex was occupied by three textile factories and associated ancillary buildings. For much of their life, the local firm of William Woods & Son operated the mills. The founder of this firm, William Woods, had been connected with the textile-manufacturing industry in Wigan since 1803, occupying premises Chapel Street (PP (HC) 1834 (167) XX, A1). This 'factory' was built in 1803, and therefore William Woods was one of the first occupants, and may have been one of its sponsors. In 1833, it was reported that this factory was powered 'by hand' (*ibid*), suggesting that it housed spinning jennies, and may have constituted little more than garret accommodation. In January 1822, these premises were released by Thomas Darwell to William Woods, who became the sole owner (WRO D/DX AP 147/2). By this date, Woods was also occupying premises on Queen Street in Wigan for textile manufacturing (*ibid*).
- 3.1.8 *Trencherfield Mill N° 1:* this mill was erected in 1823, at the behest of William Woods, in partnership with Henry Gaskell and other Manchester cotton merchants (PP (HC) 1834 (167) XX, A1). It was typical of its period, being of nonfireproof construction with timber joists, and was built to a height of five storeys with an attic (Mogg 1989, 9). The first cartographic depiction of the mill is upon Mather's



Extract from Mather's Plan, 1827

Map of the Town of Wigan, published in 1827. This shows the mill to have been situated on the edge of the town, surrounded by fields, and comprising a long building running approximately north-west/south-east with a large, irregular projection to its eastern elevation. The main building is shown on Mather's map to have measured some 62m by 16m (203ft by 52ft), representing a huge mill for its period, although the precise accuracy of Mather's survey should be viewed cautiously. The map also shows a narrow, three-sided reservoir alongside the south-west, south-east and north-east elevations of the mill, which presumably furnished a supply of water required by the mill's steam-power plant.

- 3.1.9 The mill was almost certainly steam-powered from its inception, although none of the available cartographic or documentary sources provide any indication of the position of the power plant. However, in his evidence given to a Parliamentary Commission on Child Employment in June 1833, William Woods stated that the mill was used for 'cotton-spinning and weaving by power', and was driven by a 70hp steam engine (PP (HC) 1834 (167) XX, A1). Given that this enquiry was only ten years after the mill had been established, this is likely to have been the original engine. This was a large engine for its day, not only reflecting the size of the mill, but also William Woods' investment in new technology. An engine of this size will have required at least two boilers for its efficient operation, and these are likely to have been of either the 'wagon'- or Cornish-type (Dickinson 2002, 10). Lighting within the mill was by gas (PP (HC) 1834 (167) XX, A1), although it is unknown whether this was obtained from the town supply, completed in c1830 (Watkin 1883, 20), or produced on site.
- 3.1.10 William Woods also reported to the Parliamentary Commission in 1833 that in addition to Trencherfield Mill, he also owned the Chapel Street factory (which was still powered by hand), and occupied premises for textile manufacturing at 'Scholes' Factory and Ranson's Factory' (PP (HC) 1834 (167) XX, A1). These were probably considerably smaller that Trencherfield Mill, as they were powered by engines of 20hp and 10hp respectively (*ibid*).
- 3.1.11 The next cartographic source for Trencherfield Mill is provided by *A Plan of the Town and Borough of Wigan*, dated 1837. Despite being produced at a small-scale, this map clearly shows the mill to have been extended to the south-west, encroaching upon an arm of the reservoir. This extension appears to have comprised a linear range, with a narrow projection at the south-western end. The rationale behind the erection of this extension is uncertain, although it is tempting to associate it with an expansion of textile-weaving; William Woods is accredited with introducing the first power-looms into the factory-based textile-industry in Wigan (Townend 1983), and was evidently 'weaving by power' as early as 1833 (PP (HC) 1834 (167) XX, A1).
- 3.1.12 The coal required by the steam-power plant was imported to the site from the Elms Colliery, part of the Holme House Estate, which had been purchased by William Woods in June 1836. This supply was augmented by the local Scot Lane and Dicconson Lane collieries, which also came to be owned by William Woods (Cook 1969, 2).

- 3.1.13 William Woods died in 1841, and the firm was managed thereafter by his son, Henry, but continued to trade as William Woods & Son. By this time, the firm owned Trencherfield Mills in their entirety, together with the factory on Queen Street in Wigan (WRO D/DX AP 147/2). This is confirmed in the Wigan Poor Rate of 1847, which shows that William Woods & Sons owned two factories, two steam engines, offices, three houses, stables, together with a spinning shop and land at Wallgate that contained a mill and three cottages (UMAU 2005, 4).
- 3.1.14 The Ordnance Survey 5': 1 mile map of the area, surveyed in 1847 (Fig 3), shows Trencherfield N° 1 Mill to have been expanded further. The main block
 - of the mill is shown to have been some 99m long (325ft), with large projections against the north-eastfacing elevation, and ancillary buildings have been added to the eastern part of the site. The northern arm of the three-sided reservoir had also been in-filled by this date, although the other elements evidently remained in use. The map also indicates that William Woods had expanded his textile-manufacturing site at Trencherfield with the addition of a second mill, placed immediately to the south-west of the existing factory (Fig 3).



Extract from the Ordnance Survey map of 1847

- 3.1.15 *Trencherfield Mill N^o 2:* this was also of five stories with an attic but, in contrast to the N^o 1 Mill, it was of fireproof construction (UMAU 2005, 36). The main block of the new mill was slightly shorter (97m) than N^o 1 Mill, but incorporated a narrow extension, some 56m long, to the south-east. The unusual reservoir system was respected during the construction of N^o 2 Mill, in that the eastern arm remained intact.
- 3.1.16 By the early 1880s, William Wood & Sons had taken on a warehouse on George Street in Manchester (Worrall 1881, 52), providing some indication of the large-scale of their business and the profits that were being accrued. Some ten years later, the firm's mills at Trencherfield were noted to contain 48,000 spindles and 420 looms, producing 16"/40" twist and weft yarn and manufacturing 'croydons, wigans and domestics' (Worrall 1891, 201). The layout of the site at this time is depicted on the Ordnance Survey 25": 1 mile map, published in 1894. This shows the south-eastern part of Trencherfield Mill N° 1 to have been remodelled slightly, and the reservoir along the south-western edge of the mill to have been in-filled.
- 3.1.17 Despite being of fireproof construction, N° 2 Mill was reported to have caught fire in 1901 (*Wigan Observer* 6th March 1901), and again in 1904 (*Wigan Observer* 12th November 1904). In 1903, an electrical power line was taken from Wigan Corporation to this mill, and the steam engine was replaced with electric motors (Cook 1969, 3). This was a very early example of the use of

electric drive motors in an English textile mill, providing further indication of William Woods & Son keeping apace with the most up to date technology. Conversely, the firm was comparatively late in being incorporated to become William Woods & Son Ltd, a decision that was not enacted until June 1906 (*Wigan Observer* 29th September 1913).

3.1.18 *Trencherfield Mill N^o 3:* the construction of the mill in 1907 retained several characteristics common to the last generation of Lancashire spinning mills. The first of these was the use of steel framing and concrete floors supported by

triple brick-arch a fireproof system. The second characteristic of this later mill was the of a use large compound horizontal steam engine housed in an engine house located at a right angle to the mill and powering a rope race. Trencherfield Mill is recorded as having 100,000 mule and ring spindles by 1910 (UMAU 2005).



South-west-facing elevation of Trencherfield Mill Nº 3

3.1.19 Shortly after Trencherfield Mill N° 3 had been completed, the N° 1 was demolished. The exact date of this event is uncertain, although based on the



Extract from the Ordnance Survey map of 1908, the final cartographic depiction of Mill N° 1

available cartographic evidence, it would appear to have been between 1908 and 1929. In June 1914, the company changed its name to the Trencherfield Spinning Company Ltd, which it continued to trade under until taken over by Courtaulds in the mid-20th century. Courtaulds announced the closure of the mill in 1968, with the loss of 350 jobs (Wigan Observer, 10th May 1968). Nº 2 Mill remained extant until after 1969, although the original engine had been removed and the former engine house was in use as an oil store (Cook 1969, 1).

4. EVALUATION RESULTS

4.1 INTRODUCTION

- 4.1.1 This section presents the results obtained from the programme of archaeological evaluation of Trencherfield Mill N^o 1. In total, seven evaluation trenches were excavated, although three of these were combined into a single trench. The locations of the evaluation trenches, superimposed upon extracts from historic mapping, are shown in Figures 2 and 3.
- 4.1.2 The level of the central part of site had been largely reduced prior to the archaeological evaluation, and as such many of the trenches yielded few features. However, at least two phases of the mill were identified, represented by external and internal walls, and structural remains associated with the mill's steam-power plant. The results obtained from the evaluation are presented below in chronological order within each trench.

4.2 THE TRENCHES

- 4.2.1 **Trench 1:** this north/south-aligned trench (Plate 1) was placed across the north-western end of the former mill, and was excavated for a length of 25m and to a maximum depth of 0.7m. A deposit of grey clay, clearly of natural origin, was exposed across the southern part of the trench, and within the footprint of the mill. This was overlain by a deposit of demolition rubble, with no internal floors or other archaeological features surviving. Indeed, no elements of the mill were exposed within the trench. The northern part of the trench, however, contained several brick walls (Plate 2), which can be related to features depicted to the north of the mill on historic mapping.
- 4.2.2 One of the walls (103) exposed within the northern part of the trench was aligned north-west/south-east, and measured 0.47m wide. It was constructed of hand-made brick (each measuring 230mm by 108mm by 0.63m), bonded with moderately-compacted, sandy-lime mortar, typical of the early 19th century. The position of this wall corresponded with a boundary feature to the north of the mill, as shown on historic mapping. Wall 103 was abutted along its southern edge by the vestiges of a drain of brick construction, which survived as a single course of hand-made bricks, spread across a level horizon.
- 4.2.3 Another wall (102) of a similar date was exposed at a distance of 2.40m to the south of wall 103, and comprised a double-skin construction of hand-made bricks. It survived to two courses in height, and was bonded with light brown-buff soft sandy-lime mortar. The wall is shown on the 1847 Ordnance Survey map as a parallel extension of the boundary wall (Fig 3).
- 4.2.4 Wall 103 was abutted along its northern edge by a north/south-aligned wall (104), which measured 0.23m wide. This comprised hand-made bricks bonded with black ash-rich mortar, indicative of a later 19th-century date. Another wall (101) of similar components to wall 104 was exposed to the south of wall 102. Wall 101 was aligned north-west/south-east, and had been built on a bedding layer of crushed concrete. It would seem that the concrete might have

represented a levelling episode associated with the restructuring of the mill during the latter half of the 19th century.

- 4.2.5 All of the exposed walls were sealed by a sequence of demolition layers, measuring up to 0.75m thick. Each layer contained large amounts of crushed sandstone and building debris that appeared to have been mechanically spread after the demolition of the mill sometime during the 20th century.
- 4.2.6 A small test pit measuring 3.2m by 2.3m was placed 8m to the east of Trench 1, across the projected line of the mill's exterior wall (Fig 2). This revealed natural clay at its base, overlain by a depth of demolition rubble; no evidence for the exterior wall of the mill was encountered, confirming that it had been removed completely during demolition.
- 4.2.7 *Trench 2:* the excavated trench measured 31m long and 10m wide, and was excavated to a maximum depth of 0.85m. The trench was aligned north-east/south-west with the intention of providing a full transect across of the mill.
- 4.2.8 Natural grey clay was exposed at a depth of 0.85m below the modern road surface, which bordered the south-western edge of the trench. This was overlain by a spread of stone ashlar blocks that collectively formed a substantial base for a large steam engine (Plate 3). Other structures observed included a culvert that ran beneath the stone foundation, a wide load-bearing wall that probably formed the external wall of the engine room, external walls of the mill, internal flagged floors, and the remains of an external cobbled yard. On the basis of these structures, the trench was enlarged to maximise the recovery of information pertaining to the former steam-power plant (Fig 4).
- 4.2.9 The stone foundation (114) was essentially rectangular in plan, aligned northeast/south-west, with an L-shaped projection along its north-western corner (Plate 4), giving overall dimensions of 10.5m by 9.1m. It comprised 24 closely-spaced rectangular- and square-shaped sandstone ashlar blocks, which survived to a height of three courses (0.85m). Many of the blocks contained evenly-spaced holes, some of which housed circular and threaded restraining rods that protruded above the block surface. The rods were largely concentrated along the western edge of foundation 114, although several isolated rods were observed throughout the surface. It would seem that the concentration of holed blocks along the western edge of the surface was intended to support the engine cylinder. Overall, the foundation is likely to have provided the foundation for a compound beam engine, which would have provided the higher power ratings needed for spinning and its allied preparatory processes (Dickinson 2002).
- 4.2.10 Located beneath the blocks was a north-east/south-west-aligned culvert (*109*), lined with stone, which extended below the central part of foundation *114* toward the northern part of the trench. At the time of the evaluation, the culvert was immersed under water, and it was not clear where the source of water derived. Although no pipe or structure was observed, the water appeared to run from the direction of the canal beneath N^o 3 Mill, to the immediate south of the trench. A sondage was excavated across the culvert entrance in

order to detect the water flow and exposed natural grey clay that retained surface water pooled at the same level below the foundation (Plate 5). This suggests the culvert may have functioned as a feed channel from a reservoir providing the constant water source required by the engine for condensing purposes. Evidence for this was identified by a wide valve (Plate 6) that passed through a block at the culvert entrance, into the water below, and the remains of an iron shutter across the entrance that possibly controlled the amount of water passing beneath the foundation. Further evidence of water carriage associated with the engine was represented by a drainage channel hollowed within the upper surface of the blocks along the western part of the foundation. The channel extended north for a distance of 2.5m then returned sharply east for 1.3m and terminated into an iron man-hole (110), which led into the culvert below.

- 4.2.11 The culvert was sealed along the northern edge of the foundation by a single-course Yorkstone-flagged surface (108) that possibly represented part of the original mill internal ground floor. The flagstones were observed for a distance of 4m by 3m, and each flagstone measured on average 2.4m by 1.85m. An area of flagstones (107) observed in the northern part of the trench (3.5m north of 108) was probably a continuation of the same floor, which had been severely truncated by three service cables and modern water pipes.
- 4.2.12 The flagstones abutted a wall (111) of brick and stone construction, observed along the western edge of the trench. The wall extended for a distance of 3.8m, and was 0.48m wide, and was originally built from two skin wide hand-made brick bonded with lime mortar that survived to a height of 0.22m. At some stage (probably during the latter half of the 19th century) the wall was reconstructed with thin stone flagstones married with compact light brown sand mortar. This stone element seemingly strengthened the walls fabric, perhaps to enable its function as a load-bearing external wall of the engine room.
- 4.2.13 Part of the mill's north-eastern external wall (105) was exposed within the northern part of the trench. The wall was aligned east/west, angling at a corner return to the south for a distance of 1.45m (Plate 7). It comprised hand-made bricks, married with sand and lime mortar, which survived to three courses in height (0.17m), and a width of 0.45m. The upper surface of the angled section was lined with roughly-cut stone, adhered to the underlying brick with compacted brown sand/cement mortar. A possible threshold (Plate 8) was observed within the centre of the wall, comprising two cut stone blocks set 1m apart, bridged by a single skin wide section of the wall. The northern edge of the threshold was bordered by tightly-packed and worn cobbles, seemingly representing a yard surface (106). This surface is likely to have been associated with the initial phase of the mill, as shown on Mather's map of 1827.
- 4.2.14 Foundation *114* was bordered along its eastern edge by a concrete-capped stone wall (*112*). A square-shaped brick structure (*115*), measuring 1.06m², was located along the eastern edge of wall *112*, and was probably of contemporary construction. The structure comprised machine-pressed bricks

- 4.2.15 Evidence of later activity was represented by two double-skin wide walls of machine-cut bricks bonded with grey mortar, exposed across the northern and southern parts of the trench. The walls were spaced approximately 14m apart, and represented the foundations of an early 20th century building. The original south external wall of the mill was not encountered within any of the trenches. However, the remains of two flagged surfaces (*116* and *117*), identical in size and level to surfaces *107* and *108* in the northern half of the trench, were observed below the southern wall of the later building. These probably represented elements of a surface internal to the former mill, suggesting that the south external wall was located further south, beneath the modern road.
- 4.2.16 *Trench 3:* the trench was excavated to a maximum depth of 0.80m along a north-west/south-east alignment, measuring 20m by 2m, cutting natural grey clay (Plate 9). The position of the trench was adjusted slightly to the south due to the presence of high-voltage electric cables. The trench was intended to assess the presence or absence of any surviving features internal to the mill, although it would seem any such remains had been removed during the demolition of the mill.
- 4.2.17 The deposits in the trench comprised mid- to dark brown silty-sand, which measured up to 0.80m in thickness, sealing natural clay. The sand contained 60% building debris, comprising crushed brick, plaster and concrete with occasional patches of clinker. No archaeological features were observed.
- 4.2.18 *Trench 4:* the trench was excavated with similar intention to that of Trench 3, and, additionally, to trace the mill's southern external wall. The trench was aligned north-east/south-west, measuring 13m long and 2m wide, and was excavated to a maximum depth of 0.66m onto natural grey clay (Plate 10). It would seem that the construction of a canteen facility in the last century had eradicated the foundations of the mill within this area of the site.
- 4.2.19 The deposits in the trench were similar to the type of demolition material observed within Trench 3, although several modern interventions were observed across all parts of the trench, including a reinforced-concrete platform. This appeared to have been associated with a system of modern drainage.
- 4.2.20 The natural clay was sealed by isolated spreads of clinker that were probably associated with deposits of dumped fuel waste deriving from the mill. The clinker was in turn overlaid by 0.60m thick demolition material comprising dark brown silty-sand, containing fragments of flagstones and disturbed stone blocks. The southern external mill wall was not encountered within the trench, which suggests its location lay beneath the modern road surface, or had been removed entirely.

- 4.2.21 Trenches 5 6 and 7: these trenches were combined to create a single trench due to close proximity of high- and low-voltage cables detected across the western edge of the proposed trenches, and the continued use of the road surrounding the eastern edge of the trenches. The excavated trench was aligned north-east/south-west with overall dimensions of 26m by 2m, although the northern part of the trench was widened to 8.5m, and was excavated to a maximum depth of 1.3m. The archaeological remains in the south-western part of the trench were characterised by a substantial, but fragmented wall of stone and brick construction (128), and an associated flagstone surface. The northeastern part of the trench contained two flues (118 and 119), three brick-lined pits (120, 121 and 122), and a stone plinth (123), collectively representing the remains of a boiler room, an economiser, and possibly the base of a chimney.
- 4.2.22 The central part of the trench was dominated by the installation of steel reinforced-concrete (130) laid above aggregate bedding associated with a toilet block of a 20th century date, positioned east/west across the trench for a distance of 7m. This had been cut into natural grey-yellow clay, and seemingly destroyed any structures that possibly linked the archaeology at either end of the trench, except for traces of a stone foundation associated with room (128) along the southern edge of the trench, and a north/south aligned 0.42m diameter cast iron pipe (Plate 11) observed immediately below the aggregate.
- 4.2.23 The pipe ran from the direction of the Leeds and Liverpool Canal beneath Trencherfield Mill N° 3 Mill, and continued north in the direction of the excavated boiler room. It seems possible that this pipe was intended to provide the supply of water for the steam-power plant. Interestingly, a pipe of identical dimensions and depth was noted to lie beneath the engine room floor within N° 3 Mill, running along the same alignment, and connected with the canal.
- 4.2.24 Structure 128: the pipe passed beneath a surface of sandstone flags, interspersed with brick insets, laid evenly across the southern end of the trench for a distance of 4m. The flagstones abutted a single course of bricks, aligned north-east/south-west along the trench (Plate 12). These abutted a substantial linear structure composed of large stone ashlar blocks, which survived to a height of 0.80m, and each block measuring on average 1.40m by 0.56m. The south-western edge of the ashlar blocks was abutted by a three-string wide wall, seemingly forming a single structure (128). The wall component incorporated hand-made brick married with lime mortar, which survived for an overall distance of 3m by 1.25m and to a height of 0.34m. The mid-section of the wall was hollowed and worn across the centre (Plate 12), hinting that it had been subjected to the continual friction of revolving machinery. These remains were cumulatively reminiscent of an engine room, possibly associated the extension to the mill after 1827. However, this could not be corroborated as the archaeological evaluation of the area immediately to the north was precluded by the presence of live services, and disturbance to the south-west had resulted in the complete destruction of any buried remains (4.2.22 above).
- 4.2.25 *Boiler room:* the remains of a boiler house were exposed within the northeastern part of the trench (Plate 13), and included the vestiges of two parallel flues (*118* and *119*) that were aligned east/west across the trench. Flue *118* measured 9m by 1.3m, and was located along the northern edge of the trench

bordering two refractory brick-lined rectangular-shaped pits (120 and 121; Plate 14) that were aligned north/south. The floor of the flue comprised irregularly-laid hand-made and refractory bricks, bonded with grey mortar, and bordered by walls of refractory brick that survived to two courses high. Flue 118 was sub-divided by a hand-made brick wall (129) that extended for a distance of 4.8m, and survived to a height of three courses. The central part of wall 129 widened to four brick courses thick that possibly marked the position of one of the boilers.

- 4.2.26 Pit 120 measured 3m by 1.58m and 0.72m deep, and was composed largely of refractory bricks, with the occasional use of hand-made bricks. It was bordered along its upper eastern edge by a 1.3m wide sloped flue floor (125) that comprised slightly sooted hand-made bricks of at least six courses in depth, the surface of which angled downwards above the pit. This was lined along its eastern edge by a single skin refractory brick wall that bordered a possible third pit along the eastern limit of the trench. The western edge of pit 120 was bordered by a four brick thick wall (126) bonded with grey mortar, the surface of which contained pieces of slate.
- 4.2.27 Pit 121 was located along the north-western corner of the trench and extended 3m from the northern edge of flue 118. It was placed along an identical alignment to that of pit 120, at a distance apart of 1.6m. The pit was very similar in fabric and dimensions to pit 120, although its southern end had a semi-circular rounded edge at the junction with flue 118, although the full length of the pit was not exposed (Plate 14). The pit was bordered along its eastern edge by an eight string wide wall (127) of hand-made bricks, which was bonded with creamy lime mortar.
- 4.2.28 *Economiser*: flue *119* extended into the entrance of a possible economiser pit (*122*, Plate 15). The western side of the flue floor was composed entirely of hand-made bricks, which was crossed by a cast-iron runner that separated the flue from the entrance into the putative economiser. The floor along the eastern edge of the iron runner was composed entirely of heavily-sooted refractory bricks that terminating into a rectangular-shaped refractory brick-lined pit of the economiser. This measured 3.3m by 2.1m, and was exposed to a depth of 0.7m. The northern edge of the structure was bordered by a heavily-sooted, three brick wide ledge that was sealed by wall *129*. This wall incorporated a small 0.13m thick plate, which housed a moulded spherical lump of iron. The iron plate possibly represented part of the economiser.
- 4.2.29 A short section of a wall (124) that was exposed along the southern edge of flue 119 possibly represented the south external wall of the boiler house. The wall measured four strings in thickness, aligned east/west for a distance of 2.6m, and returned sharply to the south for 1.3m, representing a corner of the building. The wall survived to a height of 0.52m, and comprised hand-made bricks bonded with white lime mortar.
- 4.2.30 *Chimney:* wall *124* was built directly above a sandstone base (*123*) that possibly represented the foundation of a chimney (Plate 16). The sandstone foundation extended 4m south from wall *124*, and comprised a contoured split-level construction that contained several semi-circular cuts and hollows

across the surface that ostensibly represented machinery scars. It was difficult to interpret the character and extent of the structure as much of the surrounding edge had been truncated by concrete intervention (130).

4.2.31 The structures along the northern part of the trench were sealed by 0.5m thick deposit of soft and friable soot-rich silty-clay, with little evidence of the type of demolition deposits encountered across the central and western areas of the site. This suggests that the boiler room was relatively undisturbed during the construction of the 20th century canteen, and may even have continued in use.

5. DISCUSSION

5.1 INTRODUCTION

- 5.1.1 The programme of evaluation trenching has revealed that buried remains of archaeological significance survive within the proposed development area. In particular, considerable remains of the steam-power plant associated with Trencherfield Mill N° 1 were encountered, providing physical evidence for the chronological development of the mill. The phases identified are outlined below, although it should be noted that this has been based on the physical evidence encountered during the evaluation, which has examined only a small percentage of the whole mill complex, coupled with limited documentary sources, and should therefore be considered as provisional.
- 5.1.2 The erection of Trencherfield Mill N^o 1 in 1823 may be seen to represent part of an important stage in the industrial expansion of Wigan, with the development of a former green-field area into what was essentially a suburb dominated by textile factories. During the same year, James and William Eckersley established their cotton-spinning business at Swan Meadow (Baines 1825), on the opposite side of the Leeds and Liverpool Canal to Trencherfield, although this mill was considerably smaller than that of William Woods (OA North 2005a). The choice of an edge-of-town location to build these mills was probably influenced by the comparatively low cost of the land, and the proximity to the canal. This will undoubtedly have provided a vital means of transporting bulk cargoes of goods to and from the site, including coal from local collieries and raw cotton from Liverpool, and also furnished a ready supply of water required by the mill's steam-power plant.
- 5.1.3 The prosperity of the firm during the nineteenth century was partly a result of the decision to carry out spinning and weaving on one integrated site, enabling massive production focussed on high volume and lower quality and making use of overseas markets. It also reflects the company's investment in new technology, and particularly ring spinning frames; whilst the majority of cotton spinning mills in the region closed from the late 1920s onwards, both William Woods and Son Ltd and Eckersleys Ltd remained in production until 1968.

5.2 PHASE 1: 1823 - 1833

- 5.2.1 Elements of the north-eastern external wall (105) of the mill were exposed within Trench 2. Interestingly, at only 0.45m wide, this wall was rather narrow for the load-bearing function it was probably intended for; recent archaeological evidence has indicated that the external walls for nineteenth-century multi-storey textile mills tended to be three-bricks wide, measuring 0.66m (*eg* OA North 2005b). This suggests that the projections against the north-eastern edge of the main block, as shown on Mather's map of 1827, were of a reduced height, and possibly only a single storey.
- 5.2.2 The results obtained from Trench 1 demonstrated that the north-western end of the mill had been completely destroyed, leaving no physical evidence of the

external walls or internal features within that end of the mill. Similarly, none of the trenches located the remains of the western external wall of the mill, although correlation with historic mapping indicated that Trenches 2 and 4 crossed its line. It may be assumed from the results of the evaluation, however, that the mill did not have a basement, as it is most unlikely that this would have been removed without any trace.

5.2.3 The most significant remains of this initial phase were represented by the large ashlar blocks exposed within Trench 2, within the north-western part of the mill. These undoubtedly represented the foundations for a large steam engine, whilst the size and configuration of the component ashlar blocks and iron restraining rods suggested that it had probably been a single-cylinder condensing beam engine. Documentary sources have indicated that Trencherfield Mill N° 1 was powered by an engine of 70hp (PP (HC) 1834 (167) XX, A1), which was a very powerful model for its date. This may be illustrated by comparison with engines that powered cotton mills in Preston

during the same period, as noted by Tulket. Writing in 1821. Tulket mentioned 12 factories in Preston, and listed the power ratings of their engines. These ranged from 7hp to 40hp, with an average power of just under 20hp (Whittle 1821), considerably less than installed that in Trencherfield Mill Nº



1 just two years later. A single-cylinder beam engine typical of the period (Bourne 1872)

- 5.2.4 Textile mills of the early 19th century frequently housed the steam engine and associated boilers internally (Williams with Farnie 1992, 69), and Trencherfield Mill N^o 1 evidently continued this tradition. The configuration of the ashlar foundation blocks (*114*) exposed in Trench 2 indicate that the engine was placed transversely across the mill, although rather than being situated at the far end of the mill, as was a common practice, it had clearly been placed a few bays in. It may be anticipated that the engine's flywheel will have been located close to the centre line of the mill, where the upright shaft that delivered the power to all floors is likely to have been situated. As such, the flywheel may have been at the north-eastern end of the exposed foundation blocks. However, the exact position of the pit for the flywheel could not be elucidated from the surviving remains, suggesting that the upper courses of the foundation bed had been removed during demolition in the 20th century.
- 5.2.5 Internal engine houses of the 1820s were normally segregated from the rest of the mill by a full-height internal cross-wall, which provided some protection

against fire (*ibid*). This also provided a solid mounting for the gearing of the shaft transmission system, and was thus sometimes referred to as the 'gearing wall' (*Textile Manufacturer* 1876, 283). However, no physical evidence for this structure was exposed during the course of the evaluation, providing further indication for the substantial truncation of remains during demolition.

- 5.2.6 The high level of disturbance to the remains of the mill may also account for the absence of any features that may be firmly identified as the remains of the steam-raising plant. The original boilers are likely to have been internal to the mill, and would probably have been situated adjacent to the engine. Similarly, it seems likely that the chimney at Trencherfield Mill N^o 1 was also internal, as it is not marked on the Ordnance Survey map of the site of 1847. The evaluation yielded no evidence for either of these components of the steam-power plant, although it is conceivable that they had been placed to the south-east of Trench 2, and were therefore undetected.
- 5.2.7 The triangular-shaped reservoir surrounding the mill, as shown on historic mapping of the site, was not exposed during the evaluation, as its position lies beyond the area that is to be disturbed by the proposed development. Nevertheless, its proximity along the south-western edge of Trench 2 was suggested by the level of water within the culvert below engine foundation *114*, suggesting that the reservoir furnished the water supply required by the steam engine. However, the precise mechanism of this supply, and the route of the associated water-management system is uncertain.

5.3 PHASE 2: 1833 - 1847

- 5.3.1 Analysis of available maps for the site has indicated that the south-eastern part of Trencherfield Mill N° 1 was expanded between 1827 and 1837, with further additions being completed prior to 1847. Surviving remains identified during the evaluation that may be ascribed to this period included elements of steampower plant additional to the original infrastructure. These included the well-preserved remains of a bank of boilers, a probable economiser, and the foundations for a possible second engine, which were all identified within Trench 5.
- 5.3.2 The substantial nature of structure *128*, exposed within the south-western end of Trench 5, is consistent with that used as a foundation for a steam engine, especially the ashlar component. However, only a small proportion of the structure was exposed and, as no iron restraining rods characteristic of a foundation for an engine were present, it precise function cannot be ascribed with confidence. The brick component may have represented the original south-eastern external wall of the mill, prior to the extension shown on the map of 1837. The position of structure *128* lay just within the footprint of the original mill, as shown on Mather's map of 1827, although this part of the building had been subject to considerable remodelling before 1847. However, notwithstanding the destruction of any physical link between structure *128* and the boilers exposed within the north-eastern part of the trench, it is tempting to suggest that all these remains were of a contemporary date.

- 5.3.3 The position of the boilers, economiser and possible chimney lay beyond the footprint of the original mill, and the extension shown on the map of 1837, but
 - were incorporated within the additions to the mill shown on the Ordnance Survey map of 1847. Despite a growing tendency for detached boiler houses from the mid-19th century, the continued use of internal boilers appears to have been common. The increased use of detached boiler houses was resultant upon the introduction and widespread adoption of the Lancashire boiler from 1844 (Williams with Farnie 1992, 86). However, the foundations exposed within Trench 5 may be identified as the remains of wagon-type boilers with some confidence. In particular, the dimensions of the exposed boilers were too small for the Lancashire-type, which typically measured 9.1m long (*ibid*).



A wagon boiler (Bourne 1872)

5.3.4 The identification of an economiser is of interest, particularly as it was seemingly of a contemporary date to the boilers. This device, also known as a feed water heater, was patented by William Green in 1845, and comprised a series of vertical tubes connected together in rows by manifolds situated at the top and bottom of the pipes. The various rows of pipes were coupled together

diagonally opposite sides, at which formed feed and delivery pipes. It was normal practice for the feed water to be introduced at the end nearest to the chimney, in order that the flow of water and gases were in opposite directions. The tubes were kept free from soot by a scraper mechanism, which consisted of a worm wheel driven chain drive. Watkins argued that the economiser 'undoubtedly saved more fuel for industry than any other single invention' (1999, 218), and whilst it was widely used at textile mill during the second half of the 19th century. its adoption at Trencherfield Mill was potentially of a comparatively early date.



Promotional advert for Green's economiser

5.4 **PHASE 3: 1847 - DEMOLITION**

5.4.1 The remains pertaining to the later phases in the development of the mill were scant, and of little archaeological interest.

6. IMPACT OF THE DEVELOPMENT

6.1 INTRODUCTION

6.1.1 The programme of archaeological evaluation has demonstrated that some significant archaeological structures associated with the former Trencherfield Mill N° 1 survive *in situ*, lying immediately beneath concrete capping and demolition debris (Fig 6). Although limited in their extent, the surviving structures are well-preserved, with some potential for additional buried remains to exist beyond the excavated area. In particular, the culvert identified beneath the foundation blocks in Trench 2 is almost certainly associated with the operation of the engine, and mapping its route may provide a better understanding of the relationship between the original engine and watermanagement features.

6.2 IMPACT OF DEVELOPMENT

- 6.2.1 It is understood that the current development proposals require the raising of the ground level across the site of Trencherfield Mill N^o 1, and that there will be no requirement for substantial earth-moving works within the footprint of the mill. Similarly, it is anticipated that any new drainage and electricity ducts will follow the route of pre-existing services, thereby avoiding an impact of buried archaeological remains. In these respects, the proposed development is therefore unlikely to have a significant negative impact on the sub-surface archaeological resource. However, an initial stage of the construction programme may include piling across the site. This should be designed to avoid damage to buried remains, and especially the engine foundation blocks exposed within Trench 2.
- 6.2.2 The programme of archaeological evaluation has been contained largely within the footprint of Trencherfield Mill N° 1, which has demonstrated that areas of significant and well-preserved archaeological remains do survive at shallow depths beneath the modern ground surface. It is therefore reasonable to assume that buried remains beyond the footprint of the mill may also survive, especially elements of the former reservoir and the associated water-management system. Any change to the current design proposals that involves earth-moving works are likely to have a negative impact on any such remains.

6.3 MITIGATION STRATEGY

6.3.1 The current design proposals for redevelopment are unlikely to have a negative impact upon buried remains of archaeological significance, allowing for their retention *in situ*. As such, it is not envisaged that any further archaeological work should be required. However, in the event of a change to current proposals that necessitates earth-moving works within the footprint of Trencherfield Mill N^o 1, or its attendant reservoir, a mitigation strategy would be advisable. Should the engine foundation blocks require removal in advance of a piling programme, for instance, an archaeological watching brief maintained during construction work may be an appropriate course of action.

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APPENDIX 1: PROJECT BRIEF

BRIEF FOR ARCHAEOLOGICAL EVALUATION OF TRENCHERFIELD NO. 1 MILL SITE, WIGAN PIER COMPLEX, POTTERY ROAD, WIGAN

Background

Nuttall Construction are redeveloping the Trencherfield Mill complex in Wigan, located at SD 5787 0518. A section of the 1907 spinning mill, which is a grade 2 listed building, has been used as an Industrial Museum forming part of the former Wigan Pier tourist attraction. An archaeological planning condition has been attached to planning permission. The first stage of the archaeological work has been completed; this comprised an archaeological building survey of the listed mill, Trencherfield No. 3 Mill together with an assessment of below ground archaeological potential across the proposal site. The University of Manchester Archaeological Unit undertook this piece of work, the results of which are presented in their report of September 2005 'Trencherfield Mill, Wigan – An Archaeological Survey of a 1907 Cotton Spinning Mill Complex'.

Trencherfield No. 3 Mill lies to the south-west of the sites of two earlier mills, also known as Trencherfield Mills. The first of these was built by William Woods in c1816-20 and is shown on Mather's Map of Wigan dated to 1827; it was non-fireproof and five storeys high. Woods was an important industrialist who introduced power loom weaving in Wigan. No 2 mill was also five storeys with an attic but this time of fire-proof construction being built in 1851-2. Benjamin Hick of Bolton carried out the millwork and gearing and also extended the weaving shed, in 1853. Nos 1 and 2 mills were driven by belt drives powered by 'McNaughted' steam beam engines giving 560 hp (in 1908). The 1907 mill was a fireproof spinning mill designed by Potts, Son & Hennings. The Trencherfield Mill complex is therefore of considerable industrial archaeological interest as it epitomises the development of the Lancashire textile mill both in architectural form and power provision.

When No. 1 mill was erected, it was surrounded by open fields with Wigan town lying about 200m to the north. Around the mill was an unusual shaped reservoir in the form of three narrow arms, and it is possible that there may have been water power in the northern projection of the mill as the alignment of one of the reservoir arms projects through this part of the mill and there is evidence of a leat beyond (on the 1827 map). By the 1960s most of the mill was demolished and the site occupied by a single storey long rectangular red brick building used as a canteen. In the south-east end elevation of this building was preserved a three and a half course wall of undressed ashlar which may have been a remnant of the original engine house.

The proposed trenching scheme will concentrate on the site of No. 1 Mill and the site of a Blacking Mill shown on maps in the first half of the 19th century, the remains of which are located under the current car park in the north-west corner of the development site on Pottery Road. The Blacking Mill was used to grind charcoal into a very fine powder which was then used for the dusting

of moulds in foundries. There will be no investigation of the site of No. 2 Mill as this lies close to Trencherfield No. 3 Mill on land which will not be disturbed by development.

The archaeological contractor is required to treat the No. 1 Mill and Blacking Mill evaluations as two separate pieces of work, as they are unlikely to be undertaken at the same time. Therefore, the project design and tender should provide separate costings for the two sites.

<u>Brief</u>

Ground investigation data, a topographic survey and historic mapping are available from the client. The few boreholes/window samples across the site of interest indicate made ground at up to c 2.50m, although in one place it is only 1.3m deep.

1) Methodology:

No. 1 Mill - Brief for Archaeological Works

Eight trenches 2m wide will be excavated as shown on the accompanying trench location plan. Trench 1 (25m long) and Trench 2 (30m long) are designed to investigate the northerly projection of the original mill and whether there are power features here including the possibility of water power, with Trench 2 also revealing the full width of the original mill. Trenches 3,4,5,6 and 7 (20m, 13m, 10m, 16m and 7m long respectively) will examine the interior of the original mill and the likely site of the engine house and associated power features at the south-eastern end of the building. It should be noted that the trenches are a minimum of 2m away from the line of a live power cable which connects to the electricity sub-station attached to the eastern side of Trencherfield No. 3 Mill engine house. Trenches 5, 6, and 7 partly overlie the site of a 20th century toilet block so there will be a certain amount of disturbance at this point. Trench 8 (30m long) is designed to examine the later south-western extension to the original mill.

The client can provide a detailed plan of the line of this cable which runs alongside the exterior of the south-eastern wall of No. 1 Mill.

Blacking Mill – Brief for Archaeological Works

Four trenches 2m wide will be excavated as shown on the accompanying trench location plan. Trench A (6m long) will examine the site of a pre-Blacking Mill rectangular building shown on the 1827 map fronting onto Pottery Lane, Trench B (30m will cross the north-east side of the mill including a projecting structure staddling a 'drain' (leat) as shown on the 1847 OS map, Trenches C and D (both 10m long) will investigate the south-eastern range of mill buildings.

Trenches will be dug by machine using a toothless ditching bucket, followed by hand cleaning and recording of the archaeological remains. It will be necessary to widen trenches by stepping or battering the sides where depths exceed 1.2m to facilitate safe access. Selective excavation of features and deposits shall be undertaken to determine their depth and character. There will be a site meeting towards the end of both site investigations to determine whether further more detailed archaeological excavation is required in relation to proposed development ground works for new development.

2) A programme of post excavation will be undertaken in accordance with IFA standards.

3) A report will be produced describing the results and it will include the following:

- a non-technical summary
- the site's historical and archaeological background
- an outline of the methodology of the investigation

- summary of results, to include: the location, extent, nature and date of any archaeological features or deposits (to include reduced plans, sections and photographs where appropriate)

- a description of the finds with dating evidence

- a discussion of the significance of the remains and finds

4) A site archive will be completed in accordance with the specifications given in MAP 2, Appendix 3. Arrangements should be made for depositing the archive with Wigan Heritage Service. A copy of the list of archive items should be sent to GMAU.

5) A summary of the excavation results will be published in the CBA North West magazine and relevant period journals. It should be noted that if the results are significant then a more detailed publication article will be required.

Other Considerations

Arrangements will be made by the contractor for the archaeological curator (GMAU) to make monitoring visits to the site during excavation. There will be a site meeting between all interested parties to review the archaeological work.

The curator will be consulted on the interim and final excavation report before it is sent out to the client.

The archaeological contractor will abide by the Institute of Field Archaeologists Bye-Laws of Approved Practice.

Contractors shall comply with the requirements of all relevant Health & Safety legislation and adopt procedures according to guidance set out in the Health & Safety Manual of the Standing Conference of Archaeological Unit Managers.

The practical requirements of the evaluation, including access arrangements, the safety and security requirements of the site, the presence of services, onsite facilities, and the re-instatement of the site, should be discussed in advance with the client.

The level of publicity/confidentiality and relevant contacts should be agreed between the archaeological contractor and developer prior to commencement of the excavation.

Copies of the evaluation report will be sent to: the client (x2), Wigan Planning

Prepared by:

Norman Redhead

Assistant County Archaeologist (GMAU)

21st December 2005

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APPENDIX 2: PROJECT DESIGN

Oxford Archaeology North

January 2006

TRENCHERFIELD MILL,

POTTERY ROAD,

WIGAN

ARCHAEOLOGICAL EVALUATION PROJECT DESIGN

Proposals

The following project design is offered in response to a request from Mr Steve Rigg, of Nuttall Construction Ltd, for the archaeological evaluation of Trencherfield Mill in advance of proposed development.

1. BACKGROUND

1.1 **CIRCUMSTANCES OF PROJECT**

- 1.1.1 Nuttall Construction Limited is redeveloping the Trencherfield Mill, a large cotton-spinning mill complex in Wigan. The mill was erected in 1907, and was situated to the south-west of two earlier cotton-spinning mills on the site, known as Trencherfield Mills N^{os} 1 and 2. These mills, together with their associated weaving sheds, formed one of the largest textile manufacturing sites in Wigan. In addition, a blacking mill was established on the site, which was used to grind charcoal to a fine power for use in the iron casting and gunpowder industries. This mill, together with Trencherfield Mills N^{os} 1 and 2, had been demolished by the 1960s, although the 1907 mill remains intact, and is designated as a Grade II listed building.
- 1.1.2 In order to secure archaeological interests, an archaeological condition has been attached to planning consent for redevelopment of the site, and a brief detailing the required archaeological works has been devised by the Greater Manchester Assistant County Archaeologist, in consultation with the Wigan Borough Council. In the first instance, an archaeological survey of the extant mill was undertaken, coupled with an assessment of below-ground archaeological potential across the development site. This concluded that the sites of the blacking mill and Trencherfield Mill N^o 1 offered some archaeological potential, and a scheme of evaluation trenching was recommended.
- 1.1.3 In January 2006, Oxford Archaeology North (OA North) was invited by Mr S Rigg, of Nuttall Construction Limited, to submit a costed project design for this programme of archaeological evaluation. The project design has been formulated to meet the requirements of the specification produced by the Assistant County Archaeologist for Greater Manchester, and allows for the excavation of 12 evaluation trenches. This programme is to be split into two phases: the first concentrates upon the remains of Trencherfield Mill N° 1, which will be investigated by eight trenches, and the second element focuses upon the former blacking mill.

1.2 HISTORICAL BACKGROUND

- 1.2.1 The origins of the Trencherfield Mill complex may be traced to the early 1820s, when William Woods erected the first textile mill on the site (Hannavy 1990, 112). The site at this time was noted for housing the first power looms to have been introduced into Wigan, representing a significant step in the mechanisation of the entire textile manufacturing process. A second mill was added to the site in 1851-2, at which time there was also an expansion of the weaving sheds of the site.
- 1.2.2 The present mill, the third to have been erected on the site, was constructed in 1907, and was equipped with 24,000 mule spindles and 60,000 ring spindles (Hannavy 1990, 114). It was the largest spinning mill in Wigan at the time, and also the last to have been built on a canal-side location. The mill was

powered by a twin tandem triple-expansion steam engine, built in 1907 by John & Edward Wood of Bolton and represented the highest development of the English tandem mill engine (Watkin 1999, 102). This drove a 26' 6" flywheel fitted with 54 ropes, by which means power was transmitted to all five floors within the mill. The engine was replaced in 1966-67, when electric motor-driven machinery was installed throughout the mill. Further to the mill closure in the late 1960s, the operation of the engine was taken over by Wigan Council in 1984, as part of the then new Wigan Pier development.

1.3 **OXFORD ARCHAEOLOGY**

- 1.3.1 Oxford Archaeology has over 30 years of experience in professional archaeology, and can provide a professional and cost effective service. We are the largest employer of archaeologists in the country (we currently have more than 200 members of staff) and can thus deploy considerable resources with extensive experience to deal with any archaeological obligations you or your clients may have. We have offices in Lancaster and Oxford, trading as Oxford Archaeology North (OA North), and Oxford Archaeology (OA) respectively, enabling us to provide a truly nationwide service. Watching briefs, evaluations and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA is an Institute of Field Archaeologists Registered Organisation (No 17), and is thus bound by the IFA's Code of Conduct and required to apply the IFA's quality standards.
- 1.3.2 OA North has considerable experience of the assessment, evaluation and excavation of sites of all periods, and has particular experience of industrial archaeology in the North West. Amongst the numerous projects that OA North have completed within Greater Manchester in recent years, those of particular relevance to the Trencherfield scheme include the archaeological evaluations of New Islington Mill, Waller's Mill, Salvin's Factory and Moore's Mill, all in the Ancoats area of Manchester, Peter Drinkwater's Bank Top Mill and Shepley Street Mill in Piccadilly, MacIntosh's Mill in Chorlton-on-Medlock, and Oldknow's Hillgate Mill in Stockport. Further afield, OA North have undertaken archaeological evaluations of the Calprina printworks near Stalybridge, the Torrs cotton mills at New Mills, and Eagley Mill near Bolton. These projects have given OA North unrivalled experience in the archaeological evaluation of textile mill sites, and allow us to provide an efficient and cost-effective service.

2. AIMS AND OBJECTIVES

2.1 ACADEMIC AIMS

2.1.1 The main research aim of the investigation, given the commercial nature of the development, will be to characterise the level of preservation and significance of the archaeological remains relating to these early mills, and to provide a good understanding of their potential.

2.2 **OBJECTIVES**

2.2.1 The objectives of the project may be summarised as follows:

Trencherfield Mill N^{o} 1

- to expose and determine the presence, character, and level of survival of the external walls of the mill and establish any evidence for phasing;
- to expose and determine the level of survival of floors within the mill;
- to establish the presence, character, and level of survival of the mill's power features;
- to inform a decision as to whether further excavation will be required in advance of development ground works.

Blacking Mill

- to expose and determine the presence, character, and level of survival of a rectangular building that pre-dated the blacking mill;
- to expose and determine the presence, character, and level of survival of a structure projecting from the north-east side of the mill shown on historic mapping.

3. METHOD STATEMENT

3.1 The following work programme is submitted in line with the aims and objectives summarised above, and in accordance with a project specification devised by the Greater Manchester Assistant County Archaeologist.

3.2 **FIELDWORK**

- 3.2.1 *Evaluation Trenching*: excavation of the uppermost levels of modern overburden/demolition material will be undertaken by a machine fitted with a toothless ditching bucket to the top of the first significant archaeological level. The work will be supervised by a suitably experienced archaeologist. Spoil from the excavation will stored adjacent to the trench, and will be backfilled upon completion of the archaeological works.
- 3.2.2 Machine excavation will then 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. It should be noted that no archaeological deposits will be entirely removed from the site. If the excavation is to proceed below a depth of 1.2m, then the trenches will be widened sufficiently to allow the sides to be stepped in or battered back to a safe angle of repose.
- 3.2.3 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 both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.
- 3.2.4 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the evaluation will be generated. Photography will be undertaken using 35mm cameras on archivable black and white print film as well as colour transparency, and all frames will include a visible, graduated metric scale. Extensive use of digital photography will also be undertaken throughout the course of the fieldwork for presentation purposes. Photographs records will be maintained on special photographic *pro-forma* sheets.
- 3.2.5 The precise location of the evaluation trenches, and the position of all archaeological structures encountered, will be surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process will generate scaled plans within an AutoCAD system, which will then be subject to manual survey enhancement. The drawings will be generated at an accuracy appropriate for 1:20 scale, but can be output at any scale required. Sections will be manually drafted as appropriate at a scale of 1:10. All information will be tied in to Ordnance Datum.
- 3.2.6 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*.

- 3.2.7 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.
- 3.2.8 *Finds policy:* finds recovery and sampling programmes will be in accordance with best practice (following current Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. OA has close contact with Ancient Monuments Laboratory staff at the University of Durham and, in addition, employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who are readily available for consultation.
- 3.2.9 Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham. Samples will also be collected for technological, pedological and chronological analysis as appropriate.

3.3 HEALTH AND SAFETY

- 3.3.1 OA North provides a Health and Safety Statement for all projects and maintains a Safety Policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (3rd Edition, 1997). OA North will liase with the Client/main contractor to ensure all current and relevant health and safety regulations are met. A risk assessment will be compiled in advance of any on-site works.
- 3.3.2 OA North has professional indemnity to a value of $\pounds 2,000,000$, employer's liability cover to a value of $\pounds 10,000,000$ and public liability to a value of $\pounds 15,000,000$. Written details of insurance cover can be provided if required.
- 3.3.3 Normal OA North working hours are between 9.00 am and 5.00 pm, Monday to Friday, though adjustments to hours may be made to maximise daylight working time in winter and to meet travel requirements. It is not normal practice for OA North staff to be asked to work weekends or bank holidays and should the Client require such time to be worked during the course of a project a contract variation to cover additional costs will be necessary.

3.4 **OTHER MATTERS**

- 3.4.1 Access to the site will be arranged via the Client/main contractor.
- 3.4.2 The Client/main contractor will be responsible for the provision of a secure enclosed area for the archaeological work to take place within. The costings presented at the rear of this document do not allow for the hire or installation

3.4.3 The Client/main contractor is asked to provide OA North with information relating to the position of live services on the site. OA North will use a cable-detecting tool in advance of any machine excavation.

3.5 **POST-EXCAVATION AND REPORT PRODUCTION**

- 3.5.1 *Archive:* the results of the fieldwork will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects, 2nd edition, 1991*) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct.
- 3.5.2 The paper and finds archive for the archaeological work undertaken at the site will be deposited with the Wigan Heritage Service, as this is the nearest museum which meets Museums' and Galleries' Commission criteria for the long term storage of archaeological material (MGC 1992). This archive can be provided in the English Heritage Centre for Archaeology format, both as a printed document and on computer disks as ASCii files (as appropriate). The archive will be deposited within six months of the completion of the fieldwork.
- 3.5.3 Except for items subject to the Treasure Act, all artefacts found during the course of the project will be donated to the receiving museum.
- 3.5.4 A synthesis (in the form of the index to the archive and a copy of the publication report) will be deposited with the Greater Manchester Sites and Monuments Record. A copy of the index to the archive will also be available for deposition in the National Archaeological Record in London.
- 3.5.5 **Report:** four copies of a bound and collated final report will be submitted to the Client within six weeks of the completion of the fieldwork. Further copies will be sent to the Wigan Planning Department, Wigan History Shop, and the Greater Manchester Assistant County Archaeologist. The final report will include a copy of this project design, and indications of any agreed departure from that design. It will include an historical background to the study area, an outline methodology of the investigation, and present, summarise, assess, and interpret the results of the programme of archaeological works detailed above. It will also include an assessment of any finds recovered from the evaluation trenching. In addition, recommendations for any further mitigation works and details of the final deposition of the project archive will also be made.
- 3.5.6 A summary of the results produced from the archaeological investigation will be published in the CBA North West magazine.

3.5.7 *Confidentiality:* the final report is designed as a document for the specific use of the Client, 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.

4. WORK TIMETABLE

- 4.1 It is envisaged that the programme of archaeological evaluation will be undertaken in two stages. A two-week period should be allowed to excavate, record and backfill the evaluation trenches targeted upon Trencherfield Mill N° 1, within the eastern part of the development site. A further one-week period will be required to investigate the former blacking mill, which lies across the northern edge of the site.
- 4.2 A report will be submitted within six weeks of the completion of the fieldwork, although interim reports upon the completion of each element can be produced within three weeks, if required.
- 4.3 OA North can execute projects at very short notice once an agreement has been signed with the Client.

5. STAFFING PROPOSALS

- 5.1 The project will be under the overall charge of **Ian Miller BA** (OA North Senior Project Manager), to whom all correspondence should be addressed. Ian has considerable experience and particular research interests in Industrial Archaeology and, amongst numerous other projects, was involved in the excavation recording, analysis and publication of the Netherhall blast furnace site in Maryport, Cumbria, the excavation, recording and publication of work at Carlton Bank alum works in North Yorkshire, the excavation of Macintosh Mill in Manchester, and several evaluations of former textile mills in the Ancoats area of Manchester. Ian is currently managing the programme of detailed survey and excavation at the Murray's Mills complex of cotton spinning mills in Manchester.
- 5.2 The evaluation will be undertaken by **Sean McPhillips BA** (OA North Project Officer). Sean is an highly experienced field archaeologist, who has a particular interest in Industrial Archaeology, and especially that of Greater Manchester. Sean recently directed the archaeological investigation of a complex of textile mills at the Torrs in New Mills, and played a key role in the excavations at the Calprina textile works, Stalybridge, and Macintosh Mill, Manchester. Sean also directed the evaluations of New Islington Mill, Salvin's Factory, and Moore's Mill in Manchester. Sean will be assisted by at least two technicians.
- 5.3 Assessment of any finds from the excavation will be undertaken by OA North's in-house finds specialist **Christine Howard-Davis BA** (OA North Finds Manager). Christine has extensive knowledge of all finds of all periods

6. MONITORING

6.1 Monitoring meetings will be established with the Client and the archaeological curator at the outset of the project. Monitoring of the project will be undertaken by the Greater Manchester Assistant County Archaeologist, who will be afforded access to the site at all times.

APPENDIX 3: SUMMARY CONTEXT LIST

TRENCHERFIELD MILL Nº 1

Context	Trench	Description
100	1	Natural light grey clay
101	1	North-west/south-east-aligned brick wall
102	1	East/west-aligned brick wall
103	1	East/west-aligned brick wall
104	1	North/south-aligned brick wall
105	2	North-west/south-east-aligned mill wall
106	2	Cobbled surface north-east of wall 105
107	2	Flagstone surface
108	2	Flagstone surface
109	2	Culvert beneath foundation 114
110	2	Man-hole for into culvert 109
111	2	Stone and brick wall, possible external wall of engine room
112	2	Concrete-capped stone wall along the eastern edge of foundation 114
113	2	Northern wall of 20 th century canteen
114	2	Large ashlar block foundation
115	2	Square-shaped brick-lined pit
116	2	Flagstone paving slabs along the southern end of the trench
117	2	Flagstone paving slabs along the southern end of the trench (possibly earlier than <i>116</i>)
118	5	East/west-aligned flue
119	5	East/west-aligned flue (south of <i>118</i>)
120	5	Rectangular brick-lined (boiler?) pit
121	5	Sub-rectangular brick-lined (boiler?) pit
122	5	Economiser pit
123	5	Stone plinth base of possible chimney

124	5	External wall of the boiler room
125	5	Sloping flue floor that bordered the eastern edge of pit 120
126	5	Wall along the western edge of pit 120
127	5	Degraded eight-string wide wall
128	5	Possible engine room along the southern end of the trench
129	5	Partition wall dividing flues 118 and 119
130	5	Reinforced-concrete foundation of toilet block
131	5	Southern wall of 20 th century canteen

ILLUSTRATIONS

Figures Site location Figure 1: Figure 2: Trench location plan, superimposed upon Mather's map of 1827 Figure 3: Trench location plan, superimposed upon the Ordnance Survey map of 1847 Figure 4: Detailed plan of Trench 2 Figure 5: Detailed plan of Trench 5 Figure 6: Areas of archaeological sensitivity **Plates** Plate 1: General view of Trench 1, looking south-west Plate 2: View of the walls exposed along the northern edge of Trench 1 Plate 3: View of engine foundation blocks 114 in Trench 2, looking north Plate 4: View of engine foundation blocks 114 in Trench 2, looking east Plate 5: Surface water pooled at the southern edge of foundation 114 in Trench 2 Plate 6: The culvert beneath foundation blocks 114, showing the metal rods used to restrain the engine Plate 7: North external mill wall 105, looking east Plate 8: Threshold through wall 105 in Trench 2, looking south, showing part of the cobbled surface forming the mill yard Plate 9: View of Trench 3, looking east Plate 10: View of Trench 4, looking south Plate 11: Pipe immersed under water running below engine room 128 Plate 12: Engine room 128, looking north Plate 13: View of boiler room, looking west Plate 14: Pits 120 and 121, looking south-west Plate 15: Economiser pit 122, looking west

Plate 16: Remains of the south external wall (124) of the boiler room and stone foundation of a possible chimney (123), looking north



Figure 1: Site Location







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Figure 4: Detailed plan of Trench 2

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Figure 5: Detailed plan of Trench 5





Plate 1: General view of Trench 1, looking south-west



Plate 2: View of walls along the northern edge of Trench 1



Plate 3: View of machine foundation 114 in Trench 2, looking north



Plate 4: View of machine foundation 114 in Trench 2, looking east



Plate 5: Surface water pooled at the southern edge of foundation 114 in Trench 2



Plate 6: The culvert beneath foundation blocks 114, showing the metal rods used to restrain the engine



Plate 7: North external mill wall 105, looking east



Plate 8: Threshold through wall 105 in Trench 2, looking south



Plate 9: View of Trench 3, looking east



Plate 10: View of Trench 4, looking south



Plate 11: Pipe immersed under water running below engine room 128



Plate 12: Engine room 128, looking north



Plate 9: View of Trench 3, looking east



Plate 10: View of Trench 4, looking south



Plate 11: Pipe immersed under water running below engine room 128



Plate 12: Engine room 128, looking north



Plate 13: View of boiler room, looking west



Plate 14: Pits 120 and 121, looking south-west



Plate 15: Economiser pit 122, looking west



Plate 16: Remains of the south external wall (*124*) of the boiler room and stone foundation of a possible chimney (*123*), looking north