



University of
Salford
MANCHESTER

**Community
Archaeological
Excavation**

Mellor Mill

Client: Revealing
Oldknows Legacy
Project

Technical Report:
Sarah Cattell

Report No: SA/2017/45



Site location: Land adjacent to Roman Lakes Leisure Park, Lakes Road, Marple, Stockport, SK6 7DR.

NGR: (Centred at SJ 966884)

Internal ref: SA/2017/45

Proposal: Community Archaeological Excavation

Planning ref: N/A

Prepared for: Revealing Oldknow's Legacy Project

Document title: Archaeological Excavation: Mellor Mill

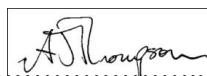
Document type: Archaeological Excavation Report.

Version: Version 1.2

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Date: November 2017

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Summary

Salford Archaeology (SA) and Taylor and Miller Archaeological Services (TAMAS) were commissioned by the Revealing Oldknow's Legacy project to undertake a series of community archaeological excavations on the site of Mellor Mill, Lakes Road, Mellor, Stockport (centred at SJ 96718 88491). This work was carried out as part of a Heritage Lottery Funded programme of activities around Mellor and Marple to investigate the impact of the industrialist, Samuel Oldknow, on the area. Oldknow was responsible for the construction of Mellor Mill, Marple Lime Kilns and Marple Aqueduct, all of which caused rapid expansion and population growth in Mellor and Marple and laid the foundations of the towns as they are today.

The purpose of the excavations was to uncover, record, interpret, conserve and expose the remains of Mellor Mill for public view. The structures will be displayed as consolidated foundations. Following the work done to partially expose the remains of the mill by volunteers from Mellor Archaeological Trust (MAT) the excavation areas were able to directly target the buried remains of the northern end of the mill building including the engine and boiler house. Whilst volunteers from MAT working with TAMAS continued to excavate the engine and boiler house the Salford Archaeology community excavations were located over the northern three storey wing of the mill and the northern end of the central six storey range.

The excavations were able to reveal the entire footprint of the northern part of the mill building at both the ground floor and basement levels. The remains were found to be in a reasonably good state of preservation and retained a significant number of internal features associated with the operation of the mill, in particular both the water and steam driven power systems. In addition, despite the mid-20th century deposition of waste material on the site, significant finds relating to the occupation of the mill were made.

This work has enabled a comparison of the relatively detailed documentary evidence on the mill with the physical remains preserved on site. It has both highlighted subtle differences between the two and answered questions on various aspects of the mill's construction and use at differing points in its occupation.

1. Introduction

Background

Salford Archaeology (SA) was commissioned by the Revealing Oldknows Legacy project to undertake a series of community archaeological excavations on land adjacent to the Roman Lakes Leisure Park, Marple.

The purpose of the excavations was to uncover, record, interpret, conserve and expose the remains of Mellor Mill for public view. The structures will be displayed as consolidated foundations. This work is part of an ongoing programme of clearance by machine and hand, followed by archaeological cleaning and recording undertaken by a mix of experienced and inexperienced volunteers and supervised by professional archaeological staff from Salford Archaeology with support from the Mellor Mill site director and other specialists.

This work includes mapping and understanding the extent, function, phasing and relative significance of the buried remains and exposed fabric.

The project's 3 year programme of excavation, consolidation and presentation focuses on the mill remains in Year 1, on the ancillary buildings and the Waterloo Wheel pit in Year 2, and on Oldknow's residence (Mellor Lodge) in Year 3. The current report represents the results of the Year 1 excavations on the site of the mill.

Location, topography & current land use

The site lies on land adjacent to the Roman Lakes Leisure Park, Lakes Road, Marple, Stockport, SK6 7DR (SJ 966884) at a height of roughly 95m AOD. It is located approximately 400m east of the b6101 (Strines road), 1km south-east of Marple town centre and 615m north of the Roman Lakes Leisure Park. The site is bounded on the west by bottoms mill road, on the south by Lakes Road and by farmland to the north and west (**Fig. 1**).

The geological bedrock for the Mellor Mill site is described by the British geological survey on-line search facility as; rough rock – Sandstone known locally as Woodhead Hill rock, overlain by superficial deposits of Devensian till – Diamicton (<https://www.bgs.ac.uk>).

Personnel

The project was conducted by professional archaeologists from SA. On-site excavations were conducted by Sarah Cattell, Kirsty Whittall, Simon Hinchliffe and

Mandy Burns. The report was compiled, written and illustrated by Sarah Cattell, Racheal Reader and Mandy Burns. The project was managed by Adam Thompson.

Monitoring

Norman Redhead, the Heritage Management Director (Archaeology) for Greater Manchester Archaeology Advisory Service, (GMAAS) monitored the archaeological works throughout.

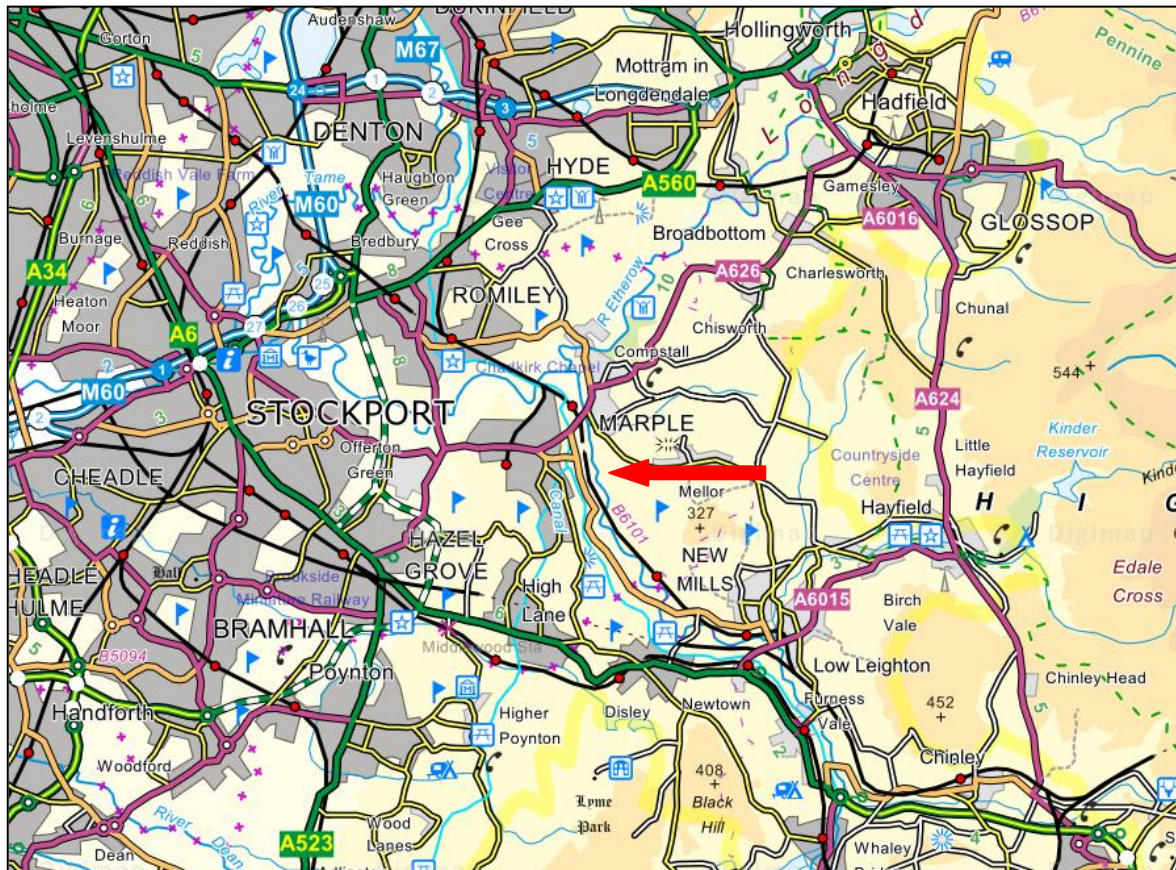


Figure 1. Location of the Mellor Mill site shown on current OS mapping (Reproduced by permission, OS Licence Number 100050261).

2. Historical Background

Historical Background

Prehistoric & Romano-British

No finds of the prehistoric and Roman periods are known from within the study area. The nearest such sites are the Bronze Age burial mound at Shaw Cairn and the Iron Age/Romano British hillfort surrounding St Thomas' Church, both Mellor.

Medieval and Post Medieval

During the medieval period the township of Marple was a largely rural community and remained so until the 18th century. No medieval finds have been made within the study area but a large aisled hall is known to have existed in Mellor on the site of the Iron Age hillfort. During the post medieval period the agricultural economy of Marple and Mellor was supplemented by the cottage industry of handloom weaving which lay the foundation for the town's expansion during the Industrial Revolution.



Figure 2. Mellor Mill as painted by Joseph Parry in 1805.

Industrial

Mellor Mill was the centre of a manufacturing complex built in 1792 by Samuel Oldknow which included the mill itself, workshops and offices, a corn mill, two mansions and an apprentice house. Oldknow originally came from Anderton in Lancashire where he had established himself as a cotton manufacturer but, in the 1780s he bought land in Stockport where he built a house and warehouse for the manufacture of cotton cloth, predominantly muslins. During this period he began to look for areas and opportunities into which he could expand his business and in 1787 acquired the Bottoms Hall estate in Marple (Unwin, 1924). Over the next few years he continued to buy up land in Marple and Mellor and extended his estate to encompass most of the area between Longhouse Lane to the north and Strines to the south.

With a loan from his friend Richard Arkwright, Oldknow began the construction of Mellor Mill in 1790 along with an ambitious programme of works to redirect the nearby river to supply the millponds. The building was constructed from bricks with a stone foundation course and was made up of a central six storey block flanked by two L shaped three storey wings at either end. At the junctions between the central block and wings were two projecting stair towers with a third, larger, central tower forming the main entrance.

An inventory from the sale of the mill in 1867 indicates that at this time the southern wing contained warehousing and the northern wing had cotton rooms on the ground floor and upper rooms for carding, warping and a lumber attic. The central tower contained offices on the first floor with store rooms on the upper floors. The main body of the mill was divided into three areas with the central area being the largest. At the northern end were blowers on the ground and second floors with throstle spinning machines on the third. The larger central area contained throstles on the first three floors with carding rooms above. The southern area contained throstles on the first three floors with warehousing above in the attic.

The mill was powered by a large internal waterwheel which was fed by three large millponds to the east. The wheel was located at basement level in the centre of the six story block with the generated power transferred to either side by two drive shafts. A second water wheel, the Waterloo Wheel was added, presumably around 1815, to increase the power supply to the mill. This was located to the west of the mill on the slope down to the river with the power transmitted by a drive shaft which was carried in a tunnel beneath the road. The area suffered a drought in 1858/9 which meant that there was not sufficient water to power the mills wheels leading to a significant drop in production. As a result a steam engine and boiler house were installed in 1860 and continued to power the mill until the fire in 1892.

Following Oldknow's death in 1828 his estate passed to his creditor Richard Arkwright who retained Oldknows half-brother John Clayton as the mill manager.

The mill continued to produce cotton throughout the later 19th century under the name of John Clayton & Co. Despite the destruction of the mill by fire in 1892 the other buildings within the complex were unaffected and continued in use for various purposes until the early-mid 20th century.

Archaeological Background

An archaeological evaluation was undertaken by the University of Manchester Archaeological Unit and Mellor Archaeological Trust in April/May 2009. The evaluation was carried out as part of the Mellor Heritage Project (MHP); a three-year Heritage Lottery funded community archaeology project. A photographic survey and visual inspection of Mellor Mill's wheel pits, drive and access tunnels was also carried out during the works.

The evaluation proved successful in establishing a substantial level of surviving structural remains associated with the 18th century cotton mill in two trenches, as well as an early 19th century corn-drying kiln within Trench 1. Trench 1 also revealed the ground-floor remains of a late 19th century brick structure to the southeast between the southern elevation of the cotton mill and the mill pond which possibly served as a warehouse. A large assemblage of artefacts predominantly associated with a gassing frame were also recovered.

The western wall footings to the mill were uncovered together with a north-easterly return, which helped to establish the extent and orientation of the mill. An unexpected engine-room was also discovered within a basement of the mill with two engine beds still in-situ. The excavation revealed that the remains encompassed at least four distinct building phases of the cotton mill complex which included the separate constructions of a warehouse to the southeast and a drying kiln connected to a corn mill.

The Mellor Archaeological Trust have continued to work on the site with volunteer excavators uncovering sections of the northern part of the mill including the engine and boiler houses. In 2011, a grant from the Association for Industrial Archaeology enabled 120 tons of debris to be cleared from the Wellington wheelpit under the centre of the mill and open it for public view. Volunteers have continued to clear the cobbled area in front of the mill, a stable for visitor's horses under the central projection and the 100-metre tunnel for the drive shaft from the Waterloo wheel. In September 2012 an HLF grant was secured to fund the present project "Revealing Oldknow's Legacy: Mellor Mill and the Peak Forest Canal in Marple".

3. Methodology

Excavation Strategy

The aim of the archaeological excavation was to expose, record, interpret and conserve the remains of Mellor Mill. This work was required in advance of the creation of the Mellor Mill heritage park which will open the remains for public viewing.

The project's 3 year programme of excavation, consolidation and presentation will focus on three main areas of interest; the mill remains, the ancillary buildings and the waterloo wheel pit, and on Oldknows residence, Mellor Lodge.

The site is heavily wooded therefore an ongoing programme of clearance is underway which includes the removal of both trees and low level vegetation across the footprint of the mill structures. Following the clearance of an area, excavations proceeded using a mechanical excavator to remove topsoil and overburden with all archaeological features below excavated by hand.

During the current season of works the excavation of the mill structure focused on the northern half of the mill including the three storey north wing and the engine and boiler house added in the 1860s. The excavation was undertaken jointly by Salford Archaeology and TAMAS, working on behalf of Mellor Archaeological Trust, with SA carrying out the excavation of the main mill building and TAMAS excavating the engine and boiler houses.

Excavation methodology

All archaeological features (stratigraphical layers, cuts, fills, structures) were evaluated by hand tools and recorded in plan at 1:20 or in section at 1:10 using standard single context recording methods with photographs taken as appropriate.

Removal of modern overburden (topsoil and subsoil) was conducted using a mechanical excavator with a toothless ditching bucket under the supervision of a professional archaeologist acting as a banksman. Removed overburden was stored on a mounded spoil heaps located at an appropriate distance away from the main open areas of excavation within the fenced edges of the site.

Machine excavation continued in the areas of the mill which were thought to have cellars or other buried features to ascertain the survival of these lower levels. Areas outside the mill structure were machine excavated in 100mm spits until either natural geological deposits or significant archaeological deposits were identified. Machine

excavation remained cautious, with preference for surviving information and hand excavation where possible once interfaces were encountered.

During the machine excavation and until the programme of archaeological works were complete, the open area excavation and spoil heaps were surrounded by orange barrier fencing, located not less than two metres away from the edges of either. The site as a whole was contained within a circuit of wooden fencing accessed by locked gates.

Following machine excavation all areas were cleaned using appropriate hand tools and archaeological features recorded by photography and scaled plan. During the machine excavation and planning phase Mr Norman Redhead of the Greater Manchester Archaeological Advisory Service (GMAAS) was consulted at regular intervals.

Recording methodology

A unique text-number site code was created prior to the commencement of the programme of works.

Separate contexts were recorded individually on pro-forma context sheets. Plans and sections were recorded on drawing sheets at an appropriate scale of 1:10, 1:20, or 1:50, depending on the complexity of the data and features encountered. All drawings were individually identified and cross referenced, contexts enumerated and principal layers and features annotated with OD level information.

A ‘site location plan’ indicating the site north and based on the current ordnance survey 1:1250 map (reproduced with the permission of the controller of HMSO) was prepared. This was supplemented by a trench plan at 1:200 (or 1:100), which shows the location of the areas investigated in relation to the investigation area and National Grid Reference (**Fig. 48**).

Photography of all relevant phases and features was undertaken with digital formats. General working photographs were taken during the duration of the archaeological works, to provide illustrative material covering the wider aspects of the archaeological work undertaken and to contribute to the creation of the heritage park. A copy of the digital photographs will be made available to the curatorial body, GMAAS with the production of the technical archaeological report.

All finds were recorded by context. Significant “small finds” located within three dimensions to the nearest 10mm and bagged and labelled separately, numbered and a simple description made so that they can be identified within the assemblage.

4. Archaeological Descriptions

The excavation of the mill site was undertaken jointly by Salford Archaeology and TAMAS on behalf of Mellor Archaeological Trust, with SA working on the main mill structure and TAMAS working on the engine and boiler houses. As a result these areas have been described separately, using separate context numbers.

TAMAS Area



Figure 3. General view of Sub Divisions 1 and 2. Looking East.

For the purpose of this report the descriptions of the excavated areas have been separated into sub divisions. These sub divisions are identified on the site plan as Sub Division 1 and Sub Division 2.

The archaeological remains were revealed after the removal of the topsoil (001), and an underlying deposit (*02) which covered the entire excavated area and contained large amounts of demolition rubble such as brick, stone, slate and solidified mortar, mixed with 19th and 20th century debris which contained frequent inclusions of glass, ceramics and metal. The depth of deposit (*02) varied greatly from a range of 0.20m to 4.40m and depended upon the extent and depth of the survival of the underlying archaeological remains. All archaeological features are thought to have been directly constructed onto the natural clay geological deposit (*03).

Sub Division 1

Sub Division 1 occupied the north western corner of the site, bounded on the north, south and west sides by substantial gritstone walls (*04) – (*07) & (*76), and a central rough built gritstone wall (*09). The southern boundary wall (*04) was aligned east – west and measured 4.50m long. The height of the wall varied significantly from 0.60m at the eastern end where it was heavily truncated, rising to 2.33m at the western end, and was constructed of ashlar blocks varying in length and width up to 0.60m x 0.20m, with a rubble core and bonded with solid white mortar. To the south this wall abutted wall (*76) which was of identical construction and extended 5.50m southwards to align with (*79) in Sub Division 2 (**Fig. 4**).



Figure 4. Walls *76 to the north and *77 to the south at the boundary of Sub Divisions 1 & 2. Looking southwest.

The western boundary wall (*05) was aligned north – south, and stood to a height of 2.33m. It abutted (*04) at its southern end, (*06) at its northern end and was constructed of ashlar blocks measuring up to 0.52 x 0.24m with a rubble core. This wall measured 3.55m long x 0.45m wide, bonded with solid white mortar, and was extended to the north for a further 4.40m by a similar gritstone wall (*06). Wall (*06) measured 0.90m wide and stood to a height of 1.60m, constructed from ashlar blocks measuring up to 0.52m x 0.25m. It was not clear if (*05) and (*06) were one complete wall or two separate walls. The internal face of (*05) and (*06) was obscured in the centre by wall (*09) (**Fig. 5**).



Figure 5. Differing depths of (*05) and (*06). Wall (*09) in the foreground. Looking north.

Of near identical construction to (*04), (*05) and (*06), wall (*07) formed the northern boundary wall of the structure, was aligned east – west, and abutted (*06) at its western end. It measured *c.*0.70m wide x 5.70m long to the easternmost end of Sub Division 1. Ashlar blocks bonded with white mortar were laid in regular courses from its foundation stones to a height of 1.30m, with an upper layer of an exposed rubble core which continued to a height of *c.*2.15m. Wall (*07) extended along the entire length of Sub Division 2.

Wall (*09) was aligned east-west and formed a central dividing wall located approximately 3.00m to the north of (*04) and 3.20m to the south of (*07), abutting (*39) at its eastern end and (*05) & (*06) at its western end. The wall stood to a height of 1.93m on its southern side which consisted of a lower course of ashlar blocks to a depth of 0.95m from its foundation stones, with a further course of rough blocks above measuring 0.98m (**Fig. 6**). This wall also stood to a height of 0.98m on its northern side (**Fig. 7**) and measured 5.75m long x 0.68m wide. The rough built wall was constructed of gritstone blocks which varied in size from 0.40m x 0.15m and



Figure 6. Depth of wall (*09). Looking north.

0.26m x 0.12m, with occasional degraded red brick, laid in irregular courses with no evidence of mortar.



Figure 7. Depth of wall (*09). Looking south.

Two truncated field drain pipes aligned northwest – southeast lay side by side directly upon the natural clay (*03) in between (*09) and (*07), and extended under the foundations of wall (*06). The northernmost pipe measured 1.00m long x 0.07m diameter, the southernmost pipe measured 0.32m long x 0.07m diameter.



Figure 8. Detail of features (*11) – (*13). Looking northwest.

A red brick and slate feature (**Fig. 8**) was identified lying directly on the natural clay (*03), aligned north – south, and which abutted (*07) at its northern end. It comprised nine rough edged, dark grey slate pieces (*12), each approximately 0.20m length and width, laid end to end from (*07) for a total length of 1.80m. Two parallel lines of single red brick (*11) with a gap in between of 0.12m, and laid in stretcher bond, sat on top of (*12). A third field drain pipe was identified lying on natural (*03), was aligned east-west against (007), and abutted (*11) – (*12) at its eastern end. This pipe measured 0.52m long x 0.07 diameter (**Fig. 8**).



Figure 9. Detail of (*40). Looking east.

Sub Division 2



Figure 10. General View of Brick Structures 1 and 2. Looking east.

Sub Division 2 occupied the north eastern corner of the site and lay to the east and south of Sub Division 1 (**Fig. 10**). The whole of the eastern end of Sub Division 2 was truncated by the growth of a large sycamore tree and its associated root system. It was likely that all associated features continued beyond the limits of the accessible excavation area. The area was bounded to the north by wall (*07), to the south by (*79), to the west by (*77) and to the east by the limit of excavation.

Wall (*07) continued to the east and formed the northernmost boundary wall of Sub Division 2. Its excavated length measured c.14.8m long and it was constructed of ashlar blocks with an exposed upper rubble core. The width of (*07) could not be investigated fully due to safety concerns regarding the fragile nature of the wall. The southern face of the wall was obscured at its eastern end by features relating to two large brick structures occupying the northern part of Sub Division 2.

A stone flagged surface (*39) was identified covering an area c.4.20m x 2.80m, which abutted and lay just in between walls (*04) and (*09) by 0.26m to the west, but was heavily truncated to the south, and to the east where the underlying ground dropped

away steeply. This surface comprised York stone flags of varying sizes 0.25m x 0.22m – 0.08m x 0.91m, of which approximately 80% were cracked or broken (**Fig. 11**). Towards the south eastern end of this surface, a drain (*40) was revealed, with an iron grid placed on top. This drain appeared to be constructed from small stones deliberately laid to create a vertical square drain shaft with a depth of c.0.40m. The drain measured 0.18m long x 0.14m x c.0.40m (**Fig. 9**).

Two large, dressed, stone steps (*48) were identified which abutted the northern end of flags (*39) (**Fig.11**). Aligned east-west, the lower step measured 1.25m long x 0.16m high x 0.25m wide. The upper step partially obscured the lower step and measured 1.26m long x 0.20m high x 0.30m wide. Directly north of, and in line with (*48), a concentration of broken red brick (*37) was revealed which lay on slate pieces surrounded by small stones, measuring an area of c.1.00m x 0.55m (**Fig.10**). The eastern end of (*39), (*48) and (*37) abutted the longest internal large stone wall (*43) which was aligned east – west, with a short return wall 0.65m to the north at its western end. Wall (*43) was constructed of ashlar blocks bonded with solid white mortar, and had a rubble core that comprised rough cut gritstone blocks and a substantial amount of broken red brick probably used to fill in gaps. This wall measured c.13.2m long (excavated length) x 1.00m wide, and stood to height of c.1.68.

Running alongside the northern face of (*43), wall (*35) was identified which was constructed of whole red brick interspersed with occasional firebrick, and laid in stretcher bond. This wall measured c.12.6m long x 0.11m wide. This wall survived to a depth of eight courses at its western end with a metal pipe (*18) protruding 0.02m, approximately 3.15m from the west end of, and 0.05m from the base of (*35). The pipe measured 0.07m in diameter and ran north – south directly through (*35) and (*43) for a length of 1.04m.

A narrow flagged floor surface (*15) was identified lying against the northern face of wall (*35), and which abutted the return wall of (*43). The surface measured 2.10m x 0.92m and comprised stone flags measuring c.0.60m x 0.65m, 75% of which were broken or cracked.

The eastern end of (*15) abutted wall (*17) which was aligned north – south and adjoined (*35) at its south end and (*07) at its north end. This wall was constructed of whole and fragmented red brick bonded with white mortar, and survived to a height of six courses laid in stretcher bond at its southernmost end. This wall measured 2.80m long x 0.47m wide x 0.53m deep and was heavily truncated down to its bottom course approximately 1.00m from its northernmost end.

The largest features identified in Sub Division 2 were two brick built structures which occupied the north eastern area. Separated by wall (*43), all associated walls and features of these structures were aligned east – west. The most northerly was Brick



Figure11. General view of features (*39), (*40) and (*48). Looking North.

Structure 2 measured 10.40m (excavated length) x 2.78m wide and was revealed to survive to an overall height of c.0.80m-1.40m. The walls which formed either side of Brick Structure 2 were comprised of three distinct sections of walling, and both walls were of near identical construction, all minimally bonded with white mortar (**Fig. 12**). Wall (*26) lay along the southern face of (*07) for an excavated length of c.9.10m, constructed of single width firebrick (0.11m) laid in stretcher bond, at a level 0.08m higher than adjoining wall (*27), and survived to a height of eight courses at its extreme eastern end. The central section (*27) lay along the southern face of (*26) and measured c.8.20m long x c.0.31m wide, and was constructed of handmade red brick laid generally in stretcher bond interspersed with areas of degraded red brick, bonded with solid white mortar (**Fig. 12**). Approximately 0.42m from its western end lay a section of firebricks 0.38m wide, shaped to form a short downwards slope to abut wall (*23). A third section of wall was constructed from firebrick (*28) and lay along the southern face of (*27) for its entire length. This wall measured 8.10m long x 0.23m wide x 0.78m high, laid in seven courses. The wall was laid in English Garden Wall bond with an upper course of headers laid on end changing to stretcher bond 1.40m from the western extent with no evidence of mortar. Abutting (*23) to the west, the last two firebricks formed a rounded corner. A section of the top course was truncated approximately 0.44m from the western extent for a length of 1.42m which exposed the red brick core of (*27).

Wall (*28) abutted wall (*30) at its eastern extent (**Fig. 12**). Wall (*30) was aligned north – south with curved sides which adjoined (*28) and (*32) respectively. Its northern return measured 0.53m long x 0.11m wide, and its southern return measured

0.58m long x 0.11m wide. Wall (*30) comprised two separate layers of red brick and firebrick and measuring c.1.25m at its widest point and stood to a height of c.1.40m.



Figure 12. General view of differing wall sections (026) – (028). Looking northeast.

The lower layer comprised thirteen courses of firebrick laid in English bond and bonded with white mortar, while the upper layer comprised five heavily truncated courses of red brick laid in header bond and bonded with minimal white mortar. The area beyond the face of this wall and adjacent walls could not be investigated further due to tree growth and safety concerns.

A linear feature (*31) was identified abutting the internal face of (*30) at a right angle, orientated east – west. This feature measured 1.40m long x 0.11m wide and was constructed of whole and degraded firebrick laid in regular coursing. Although severely truncated it survived to a height of 0.61m at its eastern end to 0.07m at its western end.

Walls (*32), (*33) and (*35) were aligned east – west and formed the southern wall of Brick Structure 2 which was found to be of an identical construction method, length and height to (*26) – (*28). Wall (*33) had a width of 0.60m while the outermost wall (*35) – aligned between and against (*33) and stone wall (*43) – was constructed equally of red brick and firebrick laid in stretcher bond, and was revealed

to extend west for a further 3.50m, abutting (*43) at its western end and (*15) along its northern face. Walls (*32), (*33) and (*35) were found to be severely truncated in a concentrated area approximately 2.90m from its eastern end, which reduced the height to 0.24m (**Fig. 13**).



Figure 13. Detail of truncated walls (032), (033) and (035). Looking southwest.

Structures (*23) and (*24) were found to abut the western ends of the Brick Structure walls. Both were constructed of whole and fragmented red brick laid in regular coursing, which sloped upwards at an approximate 45 degree angle and abutted walls (*26) and (*35) to the north and south respectively. Each measured c.0.60m along the slope and stood to a height of c.0.58m. In turn, two short walls (*21) and (*25) were located abutting the western edges of (*23) and (*24) and were constructed from regular coursed firebrick. Wall (*21) measured 0.70m long x 0.38m wide x 0.46m high, with a rounded corner, and abutted stone wall (*07) at its northern end. Wall (*25) was constructed in a similar manner to (*21) but stood 0.31m high x 0.36m wide x 0.60m long and abutted (035) at its southern end.

A semi-circular feature (*20) was identified lying at the western end of Brick Structure 2, central between the walls and c. 0.72m east of (*17). Constructed of firebrick and measuring 0.75m long x 0.73m wide and surviving to a single brick depth, the feature comprised a line of five bricks laid as headers with three bricks laid as stretchers along its east side, and a semicircle of half bricks then laid again to the east. Within the semi-circle were randomly placed broken firebricks and a brownish sandy silt deposit (**Fig. 14**).

Directly below Brick Structure 2, visible through voids in the overlying features, lay a handmade brick surface (*19) measuring 10.40m long. The surface was laid as a single layer comprising whole and broken red brick, predominantly in the same pattern as English bond. Its visible width was 1.22m from the eastern end until c.0.80m from its western end where it widened to 2.68m where it was heavily truncated. The inner lower face of (*30) and adjacent walls (*28), (*32) and floor (*19) were heavily blackened suggesting high volumes of coal dust in this area.



Figure 14. View of features (*20, (*23) and (*24) sat on floor (*19) at western end of Boiler Bed 2. Looking east and down.

Orientated east – west, Brick Structure 1 incorporated an area 9.90m x 3.2m. It was heavily truncated at its eastern extent and was found to adjoin the lower south face of stone wall (*43). Although constructed in a similar manner to Brick Structure 2 with both side walls comprising three distinct sections of walling, the red brick floor (*61) of this structure was laid at a level approximately 0.80m lower than floor (*19), and measured c.9.40m long x 1.02m wide from its east end to the western end of the structures walls, where it measured 2.40m x 1.60m.

A red brick sloping wall (*55) was found which abutted (*61) along its southern edge and sloped upwards at an angle of approximately 45 degrees and abutted (*44) along its northern edge, and abutted the return wall of (*56) to the east (**Fig. 15**). Similar in construction to (*23) and (*24) it measured c.1.10m long x 0.68m wide and stood at a height of c.0.64m.

Wall (*44) was identified lying parallel along the south face of (*43) and adjacent to the north face of wall (*54) for a length of c.9.50m and comprised a single line of firebrick laid in stretcher bond with some truncation at its eastern end. Wall (*54)

formed the central section and was aligned between (*44) along its northern edge and (*56) along its south edge (**Fig. 16**).

This wall was constructed of approximately 70% whole and degraded firebrick and 30% whole and degraded red brick and was laid in no particular bonding style. Concentrations of red brick with occasional firebrick were identified c.1.60m from its western end, a central section c.4.30m long comprised firebrick with occasional red



Figure 15. View of sloping wall (*55) abutting stone wall (043), with floor (*61) in the foreground. Looking north.

Brick, and from the eastern end c.1.80m both red brick and firebrick were completely mixed. This wall measured c.8.00m long x c.0.50m wide.

A third firebrick section (*56) lay along the south face of (*54) with a short return that abutted (*44) at its northern edge and (*55) at its eastern edge. Although this wall was constructed in a similar manner to (*32), the top course comprised degraded half bricks along its entire length, with a central section severely truncated approximately 2.60m from the western end which exposed the red brick core of (*54) (**Fig. 17**).

Wall (*56) measured 8.20m long x 0.22m wide and stood to a maximum height of 0.64m. The eastern end of (*56) adjoined curved wall (*57) which formed the rear wall of Brick Structure 1. This wall was constructed of firebrick of which ten courses laid in English bond survived to a height of 0.83m x 1.02m wide (**Fig. 16**). The curved return walls at the north and south of (*57) ran westward for 0.50m on each side. The eastern end of boiler bed 1 could not be fully investigated due to the growth of a large sycamore tree and its substantial root system.

The southern edge of (*57) adjoined wall (*58) which was aligned east – west, and measured c.8.00 with a short return 0.56m long to the south and which abutted (*60) at its southern end. Again, similar in construction to Brick Structure 2, the three walls which comprised the southern edge of Brick Structure 1 were all severely truncated to the east by tree roots which had caused considerable damage, in particular to the

upper three courses of wall (*58) which was constructed of whole and degraded firebrick and survived to a height of 0.62m.



Figure 16.
General view
of the lower
boiler, Brick
Structure 1.
Looking east.



Figure 17. Detail
of exposed red
brick core of (*54).
Looking north.

The central section (*59) which adjoined (*58) along its southern face measured c.8.00m long x 0.58m wide and was constructed of whole and degraded red brick interspersed with occasional firebrick laid in no particular bonding style. This wall was heavily truncated at its western extent revealing only the lowest two courses. The most southerly section (*60) lay in between and against (*59) along its northern face, and (*62) along its southern face. Again severely truncated at its eastern end this wall consisted of whole and degraded firebrick laid in mostly stretcher bond and measured c.8.70m x 0.11m wide, at a level 0.08m higher than (*59).

A substantial red brick wall (*62) was identified orientated east – west which adjoined (*60) along its northern edge and abutted a large stone lintel (*63) at its western end. This wall measured c.9.00m long x 0.36m wide and was constructed of red brick laid in English bond, it survived to a depth of seven courses (0.48m) at its west end where it was heavily truncated, fourteen courses along the central section (1.10m high) (Fig. 18) and to a maximum of twenty two courses (c.1.50m) at its easternmost end (excavated depths).

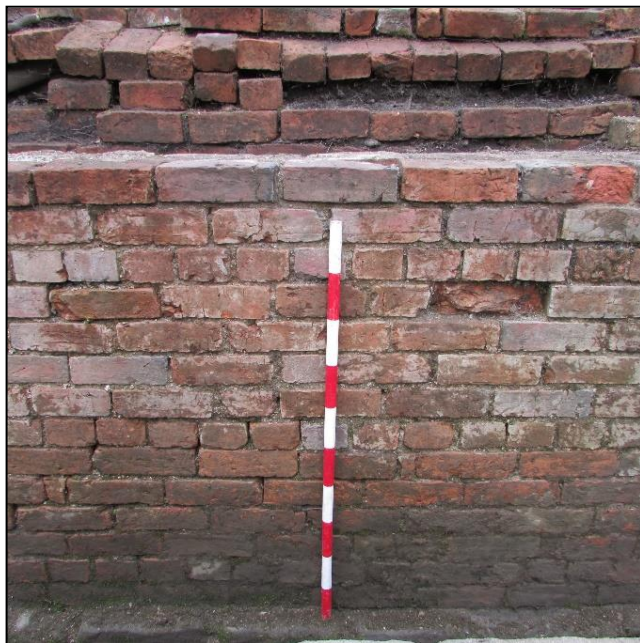


Figure 18. Detail of central section of wall (*62). Looking north.

Figure 19. View of stone lintel (*63) showing depth. Looking north.



The top course was laid in stretcher and header bond, and was found to lie level with the floor (*61) of boiler bed 1 (**Fig. 16**). This wall was constructed on foundation stones as evidenced by several stones identified at the southern base of (*62) (**Fig. 18**). These foundation stones protruded c.0.08m and measured c.0.32m long, but were not fully excavated due to flooding. Wall (*62) abutted a large stone lintel (*63) at its west end which was aligned east – west and measured 1.02m long x 0.32m wide x 0.18m high. The east end of the lintel was keyed into (*62) for 0.20m while the west end was keyed into a red brick feature (*64) (unexcavated) for 0.30m which created a void under the lintel c.0.40m depth (**Fig. 19**).

The deepest feature identified within the excavation area occupied the far south eastern corner of Sub Division 2 and was revealed c.0.70m south of wall (*62). It aligned with the curved rear walls of the large brick structures and was dominated by a single large dressed stone surface (*68) supported on a red brick plinth (*72). The surface was orientated east – west and measured approximately 5.50m along its northern edge, 6.10m along its southern edge and 3.60m wide, it consisted of eight large symmetrical dressed blocks deliberately placed to create a central sunken area (*71) (**Fig. 20**).



Figure 20. General view of steam engine bed (*69) with protruding iron bars, and red brick supporting plinths (*72) – (*74). Looking east.

The easternmost blocks measured 0.72m in depth while all remaining blocks measured 0.46m in depth. Two iron bars were identified on each block protruding from the surface to a height of c.0.80m with the exception of the easternmost blocks which each had a single iron bar. All eight blocks contained an approximately central rectangular hole which measured 0.06m x 0.10m.

Surface (*68) was found to be supported by three red brick plinths (*72), (*73) and (*74) orientated east – west, and laid 0.60m apart. Each plinth was constructed of seven courses of handmade red brick laid in a combination of stretcher and header bond with areas of smaller degraded red brick, and bonded with solid white mortar of which large patches were visible on the surface. While each plinth measured 3.30m in length, the central plinth (*73) measured 1.56m at its widest point, with two recesses built into either side. Each recess measured 0.48m long. The easternmost recesses of the central plinth measured a width of 0.30m and the westernmost recesses measured a width of 0.36m (**Fig. 20**).

The two outer plinths (*72) and (*74) unlike the central plinth, had straight outer sides which aligned with the north and south sides of (*68) (**Fig. 20**). Each plinth measured 0.56m at its widest point and had two recesses built into the inner side which measured c.0.34m x 0.30m. It is likely the red brick plinths continued to underlie (*68) as evidenced by the presence of a line of red brick laid east – west in header bond protruding out from under the northern side by 0.12m. The plinths (*72) – (*74) were constructed directly onto a flagged floor surface (*75) which measured approximately 3.30m x 3.40m although the size of individual flag stones could not be ascertained. The area below (*68) and around the base of the plinths have not been fully excavated due to repeat flooding of the lowest levels.



Figure 21. Wall (*79). Looking east.



Figure 22. Wall (*79). Looking south.

To the south of the brick structures lay wall (*79), measuring 0.90m x 15.00m, the southern boundary wall of Sub Division 2 (**Figs. 21 & 22**). This wall was identical in nature and construction to (*07) and ran in an east-west alignment rising to the west to follow the contours of the ground surface. At its deepest section the wall stood to a height of 0.90m which rose to 1.50m where it was abutted by walls (*78) and (*77) (**Fig. 25**). A narrow indentation was identified in the northern face of the wall opposite (*68) which measured 0.32m wide and 0.06m deep. Approximately 0.60m east of the indentation at the far eastern end of the wall, a large stone built recess measuring 2.70m x 2.50m had been formed by wall (*80). This wall was again identical in construction to (*79), standing to a maximum height of 1.30m and enclosed a sub-rectangular area of flagged flooring (*82) (**Fig. 23**). A single large slab



Figure 24. Wall (*80) & surface (*82). Looking south.

Figure 23. Detail of stone slab lying on (*82).



Lay on the southern side of (*82) measuring 1.25m x 0.70m which had the remains of four iron bolts associated with a square imprint on the face of the stone measuring 0.60m x 0.60m (**Fig. 24**). On the north-western side of the surface lay a small machine made frogged brick projection comprising two courses of brick wide and two courses high. The eastern extent of wall (*80) returned northwards and abutted the end of (*79).



Figure 25. Walls *77 and *78, showing floor *81 in the background and *101 in the foreground. Looking southwest.

At the western end of wall (*79) and abutting it, two stone walls were identified; (*78) to the east and (*77) to the west (**Fig.25**). Both were constructed from dressed stone blocks with a rubble and lime mortar core measuring 0.35m wide and extending 2.50m north from (*79). To the north wall (*78) abutted a handmade brick structure (*101) which appeared to form the corner of a small narrow room to the west. The structure comprised an L shaped wall extending northwest 0.75m before returning southwest 0.90m measuring 0.34m wide and standing 6 courses high. Wall (*77) abutted surface (*39) to the north and had a central opening measuring 2.50m wide flanked by dressed stone blocks with ironwork protruding from their eastern faces. A single stone flag (*81) was revealed to lie between walls (*79) and (*77) but scars could be seen at the same level on all three walls including (*78) indicating that this surface formerly covered the space enclosed by these walls. To the west of wall (*77)

lay a narrow 1.25m wide corridor bounded by (*76) in Sub Division 1 which had no evidence of flooring but retained two stone steps, one to the south and one to the north linking the lower level of the corridor with the areas to the north and south (**Fig. 4**).



Figure 26. Walls *83 and *84 enclosing floor *86. Looking southeast.

To the southwest lay several stone and brick features which were in line with the northern end of the main mill structure. Two stone walls (*83) and (*84) were found to form the northern corner of a flagged stone surface (*86) abutted by handmade brick structures to the south (**Fig. 26**). Walls (*83) and (*84) were both constructed from dressed gritstone with a rubble and mortar core and measured 0.90m wide and 4.50m in length. Wall (*83) possessed an opening at its southern extent to accommodate an abutting U shaped brick structure (*89) measuring 0.90m x 0.90m. This was constructed from two course brick walls standing to a height of 0.80m with two small square openings supported by stone lintels on the southern and western sides. The southernmost of these openings appeared to correspond with the fragmentary remains of a stone culvert which abutted to southern face of (*89) (**Fig. 29**).

Surface (*86) comprised varying sized flag stones between 0.30m-0.80m and abutted walls (*83), (*84) and (*85) but lay approximately 0.25m higher than (*87) which appeared to continue below the surface to the north. Wall (*85) was constructed from two courses of degraded brick laid on a single course of gritstone blocks with a central square stone block possessing a circular hole (**Fig. 27**). The wall formed the south-eastern boundary of the surface and continued southwards to abut wall (*88). Wall (*87), measuring 2.60m long, lay along the southern edge of (*86) and was constructed from handmade bricks laid two courses wide (0.24m) in stretcher bond with fragmented evidence of a projecting foundation course. The wall was abutted in the centre of its southern face by a small handmade segmental brick arch (*91) which measured 0.23m x 0.75m running northeast-southwest. The arch was in turn, abutted by another, shorter handmade brick wall (*92) measuring 0.23m x 1.30m laid in header bond (**Fig. 28**). Approximately 0.50m south of this lay wall (*88) which was

another handmade brick wall two courses wide and 2.50m long which extended north west from (*85) to abut the fragmented southern remains of (*83).



Figure 27. Wall *85 showing the central stone with hole. Looking north



Figure 28. Brick features to the south of *86, showing walls *87 - *89 and *91 and *92. Looking northwest.



Figure 29. Detail of wall *89 showing the lower openings. Looking northwest.

Approximately 1m west of (*89) lay a small rectangular handmade brick feature (*93) measuring 2.50m x 2.80m, comprising 0.48m wide outer walls surrounding an inner brick surface (*94) (**Fig. 30**). The walls forming (*93) were laid with black mortar in what appeared to be English Garden Wall bond, four courses wide. Surface (*94) lay at a depth of 0.48m (four courses) and measured 1.50m x 1.80m. The whole structure was constructed directly onto the natural sand and gravel and showed no evidence of fixtures or fittings.



Figure 30. Handmade brick feature *93. Looking southeast.

Although not part of the recent excavations of the mill and engine house, one of the earliest areas of the mill to be excavated by TAMAS was the cobbled area immediately west of the Wellington Wheel pit (**Fig. 31**). The excavation revealed an area of sub-rounded cobbles of varying sizes between 0.05m-0.25m (*97) which was enclosed by a large canted gritstone wall (*95). The wall was constructed from dressed stone blocks on the exterior faces with a rubble and mortar core and measured 1.00m x 17.50m in total, abutting wall (*96) to the east. Wall (*96) was of a similar construction to (*95) but measured only 0.50m in width and formed the eastern boundary of (*97). Surface (*97) was found to slope inwards to a channel on the eastern side of the space which continued northeast-southwest across the full length of the surface and which had two central carved stone drainage holes measuring 0.18m diameter *c.* 1.50m apart. In addition, four larger cobbles (*99) were identified at 1.85m intervals across the centre of the surface which had square holes measuring 0.12m x 0.13m cut into them. An area of flag stones (*98) was revealed abutting the western face of (*96) which measured 0.70m in width and continued to abut (*95) to the north and south. The northern and southern halves of the surface had been separated by a 2.40m wide continuation of (*97).



Figure 31. Cobbled area to the west of the Wellington wheel pit. Looking southeast.



Figure 32. Detail of drainage hole in *97.



Figure 33. Detail of *99.

SA Area

This area incorporated the remains of the northern end of the main mill building comprising the three storey wing and projecting six storey tower. The excavation area measured 22.00 x 14.00m and was aligned northeast-southwest.



Figure 34. General view of SA Area. Looking north.

Following the removal of the topsoil (001) an extensive deposit of 20th century demolition and rubble material (002) was revealed which lay over all archaeological features on the site. This deposit varied in depth across the site depending on the depth of the underlying features with an approximate range of between 0.20m to 1.50m. The deposit contained frequent inclusions of brick, stone, slate and mortar as well as a large percentage of the finds made on site including 19th and 20th century ceramics, glass, animal bone and metal objects including engine and machine parts. Below this layer at the far northern extent of SA area 1 a large gritstone wall (004) was identified which measured 1.15m wide x 6.90m long and was excavated to a depth of 0.90m (**Fig. 34**). The wall was constructed from dressed gritstone blocks varying in width and length up to 0.70m but all with a depth of 0.14m with a rubble core and bonded with a solid white mortar. At its south-eastern end the wall was abutted by (005), an almost identical gritstone wall constructed from dressed blocks with a rubble core and white mortar (**Fig. 35**). This wall measured 1.10m wide x 22.75m long and stood to a height of 0.54m. It is thought that both walls were constructed directly onto the natural yellowish-brown sandy geological deposits (003),

although no foundation cut was observed, however the lower core of the wall appeared to be made up of this natural deposit. A stone flagged surface (006) was revealed to lie between and abutting (004) and (005) but was heavily truncated to the west where the underlying natural ground dropped away steeply (**Fig. 36**). This surface was comprised of stone flags of varying sizes around 1.04m x 0.70m 75% of which were broken or cracked.

The south-western end of (006) abutted a third stone wall (034) which was almost identical to (004) and (005), constructed of dressed, coursed gritstone blocks with a rubble and natural core. Wall (034) measured 1.00m wide, 2.00m long and stood to a height of *c.*2.00m and was bonded with white mortar. The south-western face of the wall was clearly visible as it formed the boundary of a small basement room to the south of the flagged area, into which was set a truncated curving flight of 3 stone steps leading to the ground floor. This room measured 1.08m x 3.69m and was bounded to the south by (038) a stone wall comprising dressed blocks *c.*0.25m x 0.40m laid with white lime mortar, to the northwest by a single course of handmade brick (046) which blocked an earlier opening in wall (007) and to the southeast by a single course brick wall (041) made from frogged machine made bricks stamped with the name 'Tymm' which blocked an doorway in the main mill wall (005) (**Fig. 37**).



Figure 35. Junction between walls (004) and (005) showing broken floor (006). Looking northeast.

This doorway had a single step up to it and retained both the hinges and latch fastened into the stonework (**Fig. 40**). To the southeast of this wall lay an external flight of 8

stone steps (040) enclosed by a dressed stone wall (039) and leading up to the rear of the mill (**Fig. 41**). This wall measured 0.50m x 3.83m comprised of two sections of

Figure 36. General view of higher eastern level of the mill showing wall (005) and floor (006). Looking northeast.



Walling, the northernmost lying c.0.75m further east than the southernmost with a 0.77m overlap. A sill, (042), approximately 1m below ground level and the stepped plan of this wall both indicated that the wall contained the remains of a cellar light.

Both walls (004) and (034) and floor (006) appeared to have been truncated by the construction of a group of more deeply buried structural linear features. Abutting the western ends of walls (004) and (034) lay a single course gritstone and sandstone wall (007) constructed from roughly dressed, regularly coursed blocks and bonded with solid white mortar (**Fig. 42**). The wall measured 0.36m wide x 0.65m high, was aligned northeast-southwest and was constructed directly against the natural deposit (003). A number of repairs could be seen along the wall made visible by the use of brick rather than stone (**Fig. 43**). Running alongside the western face of (007) a stone flagged surface (010) was revealed which had a number of sunken sections interspersed with pierced sandstone blocks (009) (**Fig. 43**).



Figure 37. Staircase area to the south of (034), showing (034) with integrated stair case, blocked doorway in wall (005) and wall (038).



Figure 38. Staircase set within (034). Looking north.

Figure 39. Below. Brick blocking (046) in wall (007). Looking northwest.





Figure 40. Blocked doorway in wall (005).
Looking east.

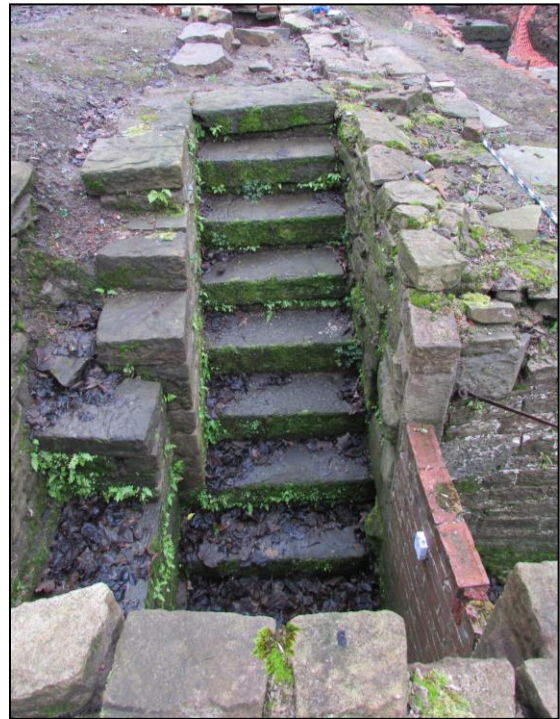


Figure 41. External staircase area (040)
To the east of (005). Looking south.



Figure 42. General view of
surface (010) showing sunken
sections, supporting wall (011),
flagged surface (012), stone
blocks (009) and wall (007).
Looking northeast.



Figure 43. Detail of pierced stone block (009) and sunken section in (010). Looking southwest.

Surface (010) measured 1.10m x 18.80m with the sunken sections occurring at approximately 2.00m intervals at a depth of c.0.30m with stone blocks (011) supporting the raised level. The sandstone blocks forming context (009) were identical in size each measuring 1.36m x 0.46m and set approximately 2.85m apart with the first located immediately north of (004). Each of the blocks had two square cuts c.0.10m x 0.10m towards the centre and two rectangular cuts c.0.12m x 0.05m towards the outer edges (**Fig. 43**). The south-western end of features (009) and (010) lay flush with the southern face of wall (034) where they abutted the first of an alignment of larger blocks (047) which continued southwest as far as the central wheel pit this area will be described fully below.

Figure 44. Detail of larger stone block at south-western end of (010) showing truncated remains of wall (034). Looking southeast.



Blocks (009) abutted (007) to the east and were cut into the retaining wall (008) to the west of surface (010) (**Fig. 43**). Wall (008) was constructed from roughly dressed Sandstone blocks bonded with white mortar and aligned northeast-southwest with a projecting foundation course. The wall ran parallel to (007) with a curving section at its northern end where it abutted a large Sandstone block set within (004). Wall (008) measured 0.50m wide x 0.82m high x 18.80m long The blocks used to construct (008)

measured $c.0.70\text{m} \times 0.30\text{m} \times 0.16\text{m}$ but were replaced by single courses of both hand and machine made bricks where the sandstone blocks (009) had cut into the wall.

A narrow flagged floor surface (012) was identified lying between (008) to the southeast and (013) and (014) to the northwest at a level approximately 0.85m lower than the level of (010) (**Fig. 45**). The surface measured $1.00\text{m} \times 45.00\text{m}$ and comprised stone flags measuring $c.0.90\text{m} \times 0.65\text{m}$ with occasional smaller flags used as packing/repairs. The surface continued to the northwest between the western returns of walls (013) and (014). Walls (013) and (014) were almost identical in nature to (007) as they were both constructed from a single course of dressed gritstone and sandstone blocks measuring $c.0.28\text{m} \times 0.13\text{m}$ and stood to a height of 0.74m (5 courses) (**Fig. 44**). Approximately 3.00m south of the northern limit of excavation both walls possessed a north-western return with a curved corner which extended $c.3.75\text{m}$



Figure 45. General view of walls (008) and (013) lying either side of surface (012), before excavation continued further southwards. Looking southwest.

With a continuation of (012) lying between. Both walls were found to abut a short northwest-southeast stone wall (028) which was also constructed from a single course

of dressed stone blocks. All three walls (013), (014) and (028) were constructed directly against the natural sand and gravel deposit (003).

Although the linear arrangement of blocks and walls continued at this level as far as the central wheel pit of the mill, their character within the six storey section of the building was entirely different and is thus described as a separate section. All of the blocks identified as (047), to the south of the terminus of (009) and (010), were of a similar size to it and unlike the smaller ones to the north, lay on individual brick plinths with large gaps of between 1.20m and 2.35m between each block. Two types of block were revealed in this area, four larger examples measuring c.1.50m x 1.70m with four fixing holes and two central T shaped grooves and four smaller, measuring c.0.80m x 1.70m with two holes and a rectangular recess, similar to the blocks of (009). The northernmost block, however, measured 1.36m x 1.45m with the same square and rectangular holes in each corner but had a large recess extending 1.00m from its western edge and measuring 0.25m wide, lying just to the northeast of centre (**Fig. 44**).



Figure 46. Southern section of channel showing blocks (047), flags (012) and walls (007) and (013). Looking south.

Not only were the stone blocks different, the channels retaining walls (007) and (014), also altered in character and from the same point were constructed in handmade brick which was badly degraded with heavily truncated upper courses but which retained the same position and alignment as the northern stone sections (**Fig. 46**). In addition, the eastern wall (007) was abutted to the east by three, two course handmade brick walls which appeared to continue eastwards below (006) at ground floor level. The

flagged flooring (012) continued to run along the north-eastern side of the channel but was not found to lie between the larger blocks to the southwest, instead, this area had a rough, compact sandy silt deposit (048), lying against (012) and below (047). This compacted layer was cut in several places, firstly by a small stone capped culvert (049) which ran from (012) and below (046), and by three square stone features, (050), which measured 0.65m across with a 0.30m central hole, two of which were partially covered by the brick plinths for two of the stone blocks.

A second external structure was identified abutting the main eastern wall of the mill which lay 4.37m south of (040). This was a square structure measuring 3.15m x 3.15m, comprising a stone flagged floor (045) enclosed by a machine made brick wall (044) which had a smaller truncated brick structure abutting its northern side (043). Wall (044) was a U shaped feature measuring 0.23m x 9.45m constructed from frogged bricks, again bearing the name of Tymms brick works, with black staining on the internal face. Floor (045) was constructed from stone flags measuring c.0.50m x 0.70m which were found to be well preserved and undamaged. The north-eastern corner of (044) was abutted by (043) which was of the same construction and measured 0.74m x 0.86m, enclosing a brick surface (051) at a level c.0.35m below (045). Both these features were truncated to the west. No evidence of a doorway or entrance was found to access this room.



Figure. 47. General view of (015). Looking Southwest.



Figure. 48. Detail of vaulted top of (015). Looking southwest.

A concentration of brick and stone features were found at the north-eastern end of the main mill building, approximately 1.50m west of (013) at a level *c.*1.35m higher than surface (012). The first of these to be encountered was a linear feature (015) constructed from a handmade brick base with stone uprights and a vaulted brick top, although this was missing in places, all bonded with a very solid white mortar (**Fig. 47**). Feature (015) was aligned northeast-southwest and measured 0.70m wide x 12.00m (excavated length) x 0.60m high from the brick base to the top of the vaulted arch (**Fig. 48**). The feature was filled by (019) a very dark black brown loam with frequent finds of corroded iron objects, 19th century ceramics frequent fragments of animal bone and a piece of corroded copper. The north-eastern end of this feature was truncated by the growth of a tree meaning the relationship between this and the north-western return of (013) could not be ascertained. At its south-western end this feature was overlain by a brick and a stone flag surface (026) and (020) respectively, before continuing southwest beyond the limit of excavation. At its north-western end the western side of (015) was found to lie against a row of a badly damaged stone blocks (016) (**Fig. 49**). This feature measured 0.63m x 4.00m and was composed of 6 stone blocks with dressed eastern faces and roughhewn western faces. It was abutted to the



Figure 49. Detail of stone blocks (016)
Looking southwest.



Figure 50. Structure (017) showing (015) in
The foreground. Looking west.

Southwest by a stone and brick covered channel (017) which continued west beyond the edge of excavation measuring 0.73m wide x 1.50m excavated length x 0.32m deep (**Fig. 50**). The feature had a similar handmade brick base to (015) with 2 courses of bricks to either side forming the walls which were capped by gritstone slabs measuring *c.*0.75m x 0.55m x 0.05m thick. Channel (017) had been truncated at its

eastern end and a 0.05m wide space was identified between this and (015) which appeared to indicate that the latter had cut through the former.

A gritstone wall (018) was identified lying approximately 0.50m southwest of (017) which measured 0.88m wide x 7.60m long and stood to a height of 0.42m (**Fig. 51**). The wall was constructed from dressed gritstone blocks with a narrow rubble core bonded with white mortar and had a slightly projecting foundation course. At the north-eastern end of the wall a single well dressed large block spanned the width of



Figure 51. Features on the raised north-western part of Area 1 showing deposit (035) and (015) in the background, surfaces (020) and (026) and walls (018) and (027) in the foreground centre and left respectively. Looking southwest

(017) which had a stepped cut reminiscent of a doorway or opening, although no other evidence was found to support this. A single broken flag stone (033) was revealed to lie against the south-eastern face of (018) which overlay the remains of (015) (**Fig. 52**). This appeared to be the only remaining piece of a larger surface which may have been associated with (006) or (020). The south-western end of wall (018) abutted (026) a curved brick surface. Approximately 2.40m from the north-eastern extent of (018) a second stone wall (027) was identified which was similar in nature to (018) but which had an internal single course of handmade bricks with an underlying stone foundation course (**Fig. 53**). The stone courses of wall (027) were abutted to (018), however the

Figure 52. The fragmentary remains of possible surface (033) showing (015) in the foreground and (018) in the background. Looking northwest.



Figure 53. South-eastern face of wall (027) showing internal brick course, stone footings and rubble core with (018) in the foreground. Looking northwest.

Brick lining course was keyed into the lower courses of (018) indicating that the two were constructed at the same time. Wall (027) measured 0.90m x 9.00m x 0.75m and was aligned northeast-southwest with a south-eastern return abutting (018). To the southwest wall (027) was revealed to abut a semi-circular stone wall (037) measuring 1.00m x 7.30m (**Fig. 55**). It was constructed from dressed, coursed stone blocks measuring c.0.0.30m x 0.40m x 0.15m with a rubble core and bonded with white mortar. Wall (037) abutted an almost identical stone wall (036) which continued southwest beyond the limit of excavation. The wall was composed of dressed gritstone blocks with a rubble core and measured c.1.00m wide. This wall was not fully excavated therefore no further measurements were taken.

A number of *in situ* structures and surfaces were found to lie within the area enclosed by wall (037) but all had been damaged or truncated by a large tree bole in the centre of this area. At the south-western end of wall (018) the truncated remains of surfaces (020), (026) and (031) were identified to be lying at the same level and overlay (015) (**Fig. 54**). Surface (020) measured 1.60m x 2.70m and was composed of stone flags measuring c.0.50m x 0.70m x 0.08m. Surface (026) was set within and lay flush with (020) and comprised 2 courses of handmade brick which curved round from northwest to southeast. This feature measured 0.36m x 2.90m and had been truncated to the south. Surface (031) which was also composed of handmade brick, was considerably shorter than (026) and far more badly damaged however the cut edge in



Figure 54. General view of surfaces (020), (026) and (031). Looking southeast.

(020) suggests that the two had parallel curves set 1.00m apart. A broken continuation of (020) was identified to the southwest of (031) but this was very badly truncated and damaged and was incorporated into deposit (035) a dark brown humic soil resulting from the tree bole in this area.

Extending southeast from below the north-western inner face of (037) a second, larger brick vaulted structure (021) was identified (**Fig. 56**). This feature was composed of a handmade brick barrel vault with white mortar which measured 1.00m wide and extended 2.20m from (037) before being truncated by (035). Following partial excavation this feature was found to be filled with brick rubble which overlay a level brick base at a depth of 1.60m. The internal walls of this feature were constructed

from handmade brick with a projecting course identified 0.77m from the base and ended with a square terminus where it abutted (036).



Figure 55. General view of features enclosed by wall (037). Looking southeast.



Figure 56. Detail of (021). Looking northwest.



Figure 57. Detail of (023). Looking southwest.



Figure 58. Detail of deposit (029) Underlying (022) and bounded by (024) to the northeast and (037) to the southwest. Looking northwest.

The south-western side of the area enclosed by (037) was dominated by a fragmentary stone flag surface (022) comprising broken flags measuring c.0.65m x 0.45m x 0.08m. This surface lay on top of a layer of degraded brick (029) with frequent inclusions of brick and stone fragments which covered an area measuring 2.00m x 1.30m. Lying between (021) and (022) in the centre of the enclosed area lay a hollow, circular handmade brick structure (023) around which the flags from (022) had been cut to fit (**Fig. 57**). This structure comprised 2 courses of handmade brick with black staining on the interior faces laid with white mortar which measured 0.92m diameter and was excavated to a depth of 0.60m, although again, the full depth was not fully excavated. Structure (023) was filled by a dark black-brown humic material (025) which had been significantly disturbed by tree root action and contained frequent inclusions of brick fragments. A 2 course handmade brick wall (024) was identified to abut the south-eastern side of (023) measuring 0.25m x 1.40m and stood to a height of c.0.40m.

At the far south-eastern end of the area enclosed by (037) two small brick features were identified on either side of (015). The westernmost of these was a 2 course northeast-southwest alignment of handmade bricks (032) measuring 0.25m x 0.56m with no clear relationship to any other feature. Approximately 0.15m southeast of (015) lay a U shaped handmade brick structure (030) measuring 1.30m x 0.60m comprising 2 courses of brick laid with white mortar. This feature was set within (003) and aligned with the north-western end of (034).

Figure 59. Detail of brick features showing (032) in the foreground, (015) in the middle and (030) in the background. Looking southeast.



To the east of walls (027) and (037) lay a large area of sub-rounded cobbles (052) measuring c.10.00m x 13.50m. The stones appeared to be laid as a level surface comprising stones measuring <0.20m and lay approximately 0.30m above the upper excavated level of the adjacent walls.

5. Archaeological Results

The recent excavations were designed to expose the full extent of the below ground remains of structures at the northern end of Mellor Mill.

TAMAS Area

This area, at the northernmost end of the site was excavated to expose features within the coal cellars and boiler/steam engine rooms at the northern extent of the Mill.

Sub Division 1

The excavation was able to reveal the north, south and western boundary walls of the mills coal cellars represented by contexts (*04)-(*07). It is likely that there was originally one cellar room built when the first boiler was installed in 1860, with a later extension constructed to the north to coincide with the installation of a second boiler. The presence of a corridor between walls (*76) and (*77) with no apparent southern wall may indicate that this was the original way of entering the Engine and boiler house.

This was evidenced by the marked differences in depth, width and construction of the western walls, and by the addition of a central wall. The dressed southern section of wall (*09) was much deeper than its northern side, and appeared to have been built into the north end of wall (*05). The almost crudely built upper level of the central wall lay against the join between the western walls, and its base on the northern side was at the same level of the foundation stones of wall (*06).

The location of three field drain pipes as well as a slate and brick built culvert all concentrated in the northern room of the coal cellars suggested the possible need for drainage of rain water from the adjacent higher ground to the north of the coal cellar building.

Sub Division 2

In this area the excavation was able to reveal most of the footprint of the two boiler beds, Brick Structures 1 & 2 and steam engine bed (*68). Unfortunately the entire eastern end of Sub Division 2 was truncated by a large sycamore tree which had grown on top of the archaeological remains. Its tree root system had spread to the north and south, and also west along the orientation of the boiler beds, and had caused substantial damage to the configuration of the affected walls.

The main rear wall to the north of Sub Division 2 was well preserved at a lower, generally consistent layer of ashlar blocks, and although it was the highest wall excavated, its upper layer existed only as a rubble course. The level of natural ground on its north side provided some support for this wall meaning it could not be safely excavated.

It would appear from archived newspaper reports that in 1860 a steam engine and single Lancashire boiler were installed at Mellor Mill which led to the construction of the lower boiler bed and related coal cellar. Again from archived news reports it would seem that in 1877 the steam engine was put up for sale, probably to enable the installation of a larger steam engine which was likely to have required the second Lancashire boiler to be installed.

Both the boiler room and coal cellar appear to have been extended north, with both constructed at a higher level than the original boiler bed/cellar which was probably linked to the height of surrounding land. The lower boiler bed had been severely truncated along the majority of its walls and surfaces, with only the red brick floor surviving relatively intact. The western end of this lower boiler had a substantial amount of brick work missing or damaged, and it is likely there was originally a matching sloping red brick wall (*55) at its southern side similar to the matching sloping walls (*23) and (*24) as revealed in boiler bed 2.

The flagged floor that lay in between the coal cellars and boilers was badly damaged and truncated at the eastern end where a drain was located. It is likely the flags would have continued to the east and possibly continued as a floor surface in the southern coal cellar. These flag stones ended deliberately at the west end of the dividing wall where two dressed stone steps were revealed to lie, the upper of which was cracked into two pieces.

The height of the steps lay at a similar level to the foundation stones of the northern coal cellar room. The northern coal cellar appeared to have been built in line with the northernmost boiler bed. The top stone step and upper boiler bed appeared to have been connected by a narrow line of cracked flag stones, which were truncated to the north but suggest a flagged floor was present similar to the flagged floor between the lower cellar and boiler bed. The upper, and likely later boiler bed was preserved in much better condition than the lower boiler bed. Although the firebrick edges were slightly degraded, the walls themselves survived in the manner they were originally built.

Two features were found on the floor of boiler bed 2 of which there was no evidence of similar features in boiler bed 1 and may reflect innovative techniques that had developed in the intervening years between the installation of the two boilers. The semi-circular feature at the western end, and the protruding firebrick feature at the eastern end both appear to be related to the directing the movement of gases from the boilers themselves.

Some features remained the same between the two boilers; the sloping red brick walls of which one was missing in the lower boiler, as well as the methods used to construct the walls of the boiler beds. All four walls were comprised of three separate sections. Where the central red brick wall has been exposed to its core in some sections, the visual evidence suggests the walls were initially constructed of red brick, with a single width firebrick wall built along both edges, with a top layer of firebrick laid on the red brick edge closest to the actual boiler. These walls all appear to continue beyond the rear curved walls of both boiler beds and may have also aided the movement of gases

towards a potential chimney system. As it was not possible to excavate beyond the rear walls of the boilers, there was no physical evidence obtained.

The large stone steam engine bed (*68) lay in the deepest area of Sub Division 2. The presence of two smaller blocks on top of the larger base blocks, one of which had an iron bar protruding from it, indicates the height the stone bed would have originally been. The iron bars found embedded in (*68) were fed through small round holes cut into the stone and extended below the base of the blocks into flooded, oily recesses so an exact length could not be determined. While relatively solid, the bars all show some signs of rust damage. It is likely that these were used to secure the engine to its stone base.

The stone engine blocks appear to be supported on red brick plinths, the manner of which could not be ascertained during this excavation. This is evidenced by the red brick plinths that extend west from the engine bed and can be clearly be seen to continue east under the blocks. While truncated along the western edges of the plinths, the stepped construction methods are relatively intact and give a good indication of how the steam engine itself would have fitted into and on the plinths. There was no evidence found of any alterations to the steam engine room.

The recessed area (*80) to the south of the engine bed (*68) is likely to be the site of the machinery which transferred the power from the engine house to the mill structure to the south. The stone block on the floor of this area retained the remains of mounting bolts and a square imprint which indicate the position and size of a probable axel block which held a bevel gear linking the engine itself and the main mill drive shaft. It is likely that the gap in the south-eastern side of wall (*80) was also associated with the axel block and drive shaft transmission.

To the south of the engine house, the structure represented by contexts (*83)-(*92) is more than likely the far western end of the northern three storey wing of the mill. This is indicated by both the size and nature of the stone walls and the good alignment of these walls with the northern wall of the main mill building. The flagged floor surface represents the internal ground floor in this part of the wing, with the brick walls (*85), (*87) and (*88) forming the supports for this floor. The arched wall (*91) is another feature which appears to correspond with features found in the main mill building, in this case (015). The position of (*91) is in line with the point of truncation of (015), suggesting it may form a possible return of this feature, and both are located just below stone floor surfaces. Structure (*89) projects from the western extent of the three storey wing and has evidence for drainage purposes, in the form of the openings at the base of the structure and the associated culvert to the south. In addition, images of the mill do indicate that a stepped entrance existed on this wall and it is possible that the brick structure may relate to those steps.

The small square brick feature to the west of the three storey wing corresponds with a structure seen on the late 19th century mapping which was labelled as a weighing machine. As this feature does not appear on the 1867 inventory and is not mentioned

in the documentary research it is difficult to ascertain exactly what form the machine took. It is possible that wall (*93) contained the balance mechanism which lay within this space and the weighing platform was suspended over the floor surface (*94).

The enclosed cobbled surface to the southern end of the excavation area can also be identified on older images of the mill due to its distinctive shape and central position within the mill. This structure formed the ground floor level of the mills main central angled tower and it is likely that the cobbled surface represents the internal floor of a chamber below the mills main entrance steps. The nature of the surface and the inclusion of both a drain and post holes would suggest that this space may have been used as a day stable for distinguished visitors to the mill.

SA Area

According to documentary evidence the northern three storey wing was part of the original mill structure but was later altered when the engine and boiler house were added in the 1860s (Noble & Grimsditch 2009). Following the demolition of the remains of the mill in the 1930s the site was left vacant although the former owners allowed commercial waste to be used to level up the ground surface and fill in the areas of cellars and tunnels (Robert Humphrey-Taylor *pers. Comm*). As a result this deposit was found across the site and accounts for the large volume of 20th century finds uncovered during the excavation.

The excavation was able to reveal a significant portion of the north-eastern end of the mill including the main walls of the three story wing represented by contexts (004), (005), (034) and (018). The rear main wall (005) was relatively well preserved and continued unbroken along the length of the excavation area. The front main wall (018) was more fragmentary and had been truncated to the northeast, possibly due to the presence of (017) which appeared to be some sort of culvert or drain. It is likely, however that the blocks identified as (016) are the north-eastern continuation of the front wall, albeit very badly damaged. Historic mapping indicates that the three storey wing was L shaped with a north-western return, the fragmentary remains of the corner of which were identified during the early TAMAS excavations and described above.

The two main northwest-southeast walls (004), (030) and (034) were also relatively well preserved but had both been truncated in order to accommodate the deeper linear features (007)-(014) and (047)-(050). These features are likely to have been associated with the mills power systems and the linear nature of the features along with the fixing holes observed in (009) and (047) would suggest this area was used to accommodate the drive shaft responsible for transferring power from, at first the Wellington water wheel and later, the engine adjacent to the mill. The distinctive square holes in the large stone blocks (009) and (047) are likely to have been fixing holes for cast iron baring blocks designed to hold the drive shaft in place. The larger

block within (047) lying against wall (034) also displayed these fixing holes as well as a wide channel potentially used to accommodate a set of bevel gears to transfer the power up to the upper floors of the six storey part of the building.

The features which together make up the below ground drive shaft indicate the scale of alterations that were needed when changes were made to the power systems, relating to both the water wheel and the steam engine. The clear differences in character and construction between the sections of the drive shaft to the north and south of wall (034) illustrate the differences in the requirements made by both forms of power generation. The remains uncovered appear to be associated with the major changes made between the opening of the mill and the late 19th century; the installation of the first water wheel in the early 1790s, the replacement of the wheel sometime in the early 1800s and the installation of the steam engine in the early 1860s. Although the baring blocks from the earliest phase are missing, it is likely that the section of flagged flooring (012) to the south of (034), along with the brick sections of (007) and (008) and the square features set within (050), all relate to this phase and were part of the original mill construction. The blocking of the external entrance by (046) may be an indication that this early drive shaft lay along the western side of the channel with the inspection area to the east accessible from the doorway. It is likely that after blocking, access to this area was moved elsewhere, although no evidence of this location has been found. The external steps (040) leading to this area however, were not blocked until later as the use of frogged machine made bricks suggests, indicating some degree of access was maintained, if only to the internal steps up to the ground floor. The next phase following the replacement of the wheel is represented by the larger baring blocks (047), which may have needed to be more substantial to accommodate potentially greater speeds generated by the replaced water wheel thought to have been fitted in the 1800s, or possibly at the same time as the Waterloo Wheel was fitted (Arrowsmith, 2017).

The final phase of activity in this area is represented by the northern, raised section of the drive shaft, (009) and (010) which leads out the through the end wall of the mill to the location of the engine house built in 1858-60. It is believed that from this point on, the engine and wheels supplemented each other to provide the mills power and it is likely that both drive shafts remained operational, possibly even sharing the transmission block at the northern end of the main six storey section of the mill.

The change to steam power caused alterations to be made to wall (004), as the drive shaft needed to extend through this wall to the engine house to the northeast. The identification of a baring block to the immediate north of the wall suggests that a small section of walling was removed to allow the shaft to run through it with a support on either side. The attached corridor represented by floor surface (012) is likely to have been used for the inspection and maintenance of the drive shaft. Again, it is unclear where the access to this part of the mill came from however it is reasonable to suggest that this may have been reached through a possible access point

at the northern end of the corridor represented by a gap in the main northern wall immediately next to the location of the drive shaft.

Fragmentary remains of floor surfaces at the ground floor level of the three storey wing were also identified and it is possible, given the similarity in height, that (006) and (033) may originally have been part of the same surface. Documentary evidence from an 1867 auction plan (**Fig. 46**) indicates that this room contained 'Blowers' which appeared to occupy the full width of the building with an unbroken floor. It is probable that the alteration of the drive shaft below meant that this floor surface was cut and then re-laid, possibly with wooden boards or large flag stones over the central void. Another feature to be found below this floor surface on the north-western side of the mill was a linear brick vaulted channel which ran the full length of the present excavation area and can also be seen in other exposed areas of the mill site. It is possible that this channel was associated with the heating/ humidifying system within the mill used to make the raw cotton less brittle for the spinning process.

The south-western corner of the excavation area was dominated by the remains of the full height projecting stair tower enclosed by wall (027). This feature is the northernmost of two visible on both the historic mapping and contemporary images of the mill. Within the area enclosed by the curved wall the remains of the central hollow circular stair column and lower flagged floor surface were both identified represented by contexts (023) and (022) respectively. This floor was missing on the north-eastern side of the tower and revealed a second, larger vaulted structure lying below floor level. This may have been associated with the heating/humidifying system or alternatively may have been related to the movement of gas used for lighting the mill from the nearby gasometer as suggested by its continuation northwest beyond wall (037).

The unusual alignment of the brick and stone floor surfaces lying between the staircase area and the south-western end of wall (018) present a challenge for interpretation. It is likely that the stone floor continued north-eastwards between walls (018) and (027) however this area is not shown as separate on the auction plan, it is also unclear how high, if at all, the curved brick features (026) and (031) originally stood. If these features were originally walls their spacing would suggest that they formed a small corridor, possibly between the blowing room and staircase tower. If these features were not standing structures they may indicate the position of some sort of machinery, possibly added later to this part of the building.

The latest addition to the mill was identified to abut the main rear wall to the southeast of the steps (040) and was a rectangular structure constructed from J & W Tymms machine made frogged bricks, indicating a date no earlier than the 1880s when their Rose hill factory was established. The structure or its associated feature (043), contained nothing to suggest either its function or the location of an entrance making its interpretation difficult. It's reasonably late construction date and position on the

eastern side of the mill may mean it was contemporary with the single storey extension on this side of the mill built in the late 19th century.

6. Discussion

The current work at the site of Mellor Mill is enabling the rediscovery of not only the form of the mill itself but also the growth and development of the industrial community set up by Samuel Oldknow. When Oldknow bought the land that the mill was to stand on in 1787 the surrounding landscape was largely dominated by farming, with farmhouses and other agricultural buildings the most common structures in the area. By the time the mill was destroyed by fire in 1892 Marple had become a fully industrialised town producing cotton, coal and lime which was carried on new roads and canals linking it with markets across the country and beyond.

Samuel Oldknow's career began when he was apprenticed to his uncle Thomas at the family drapery business in Nottingham where he learned the basics of the cotton trade and soon went into partnership with his uncle. In 1781, at the age of 25 he returned to his home town of Anderton where he set himself up as a manufacturer of calico fabrics. At this time the weaving of cotton was carried out as part of a 'putting out' system where yarn was sold to individuals to weave in their own homes and the fabric then checked and sold back to the manufacturer. At Anderton, however Samuel chose to retain ownership of the materials and directly employ the weavers to produce the fabric which was then returned to his warehouse. This is almost certainly the first example of Oldknow's openness to new ideas to maximise productivity and returns as well as his first experience as an employer, a role he would take very seriously in his later businesses.

Following the success of his business at Anderton, Oldknow turned his attention to Stockport where in 1784 he purchased a house, warehouse and land. From here he continued the practice of hiring external weavers who, by using yarn spun by Richard Arkwright on his new water frames, were able to produce much finer muslin cloth for which Oldknow became renowned across the country. Stockport had become a centre for silk production during the mid-18th century with at least six water powered mills in the town centre, several of which changed to cotton production around the time that Oldknow set up his works on Hillgate (Unwin, 1924). It is reasonable to assume that Oldknow saw the potential of the town both in terms of its access to a skilled workforce and its growing industrialisation.

The 1780s were a period of great success for Oldknow and he was able to expand his business with a spinning works in Stockport, bleaching, dying and weaving in Heaton Mersey and a saleroom in Manchester. Inspired to control all the stages of cotton production and funded by his successes in Stockport and Anderton, Oldknow began buying up land in Mellor and Marple with a view to building a large spinning factory to supply his weavers. This venture also gave him the opportunity to contribute to the building of a community in Marple similar to those at Cromford and Styal where the

factory owner's influence permeated all parts of society (Atkinson, 2015). Whilst the mill at Mellor continued to be the focus of Oldknow's ambition the slump in sales during 1787-8 following the outbreak of conflict with France coupled with his debts to creditors who he used in the building of his factories meant that both the Stockport and Heaton Mersey sites had to be sold off. Despite this he still obtained further credit from the Arkwrights in order to complete the mill at Mellor which opened in 1793.

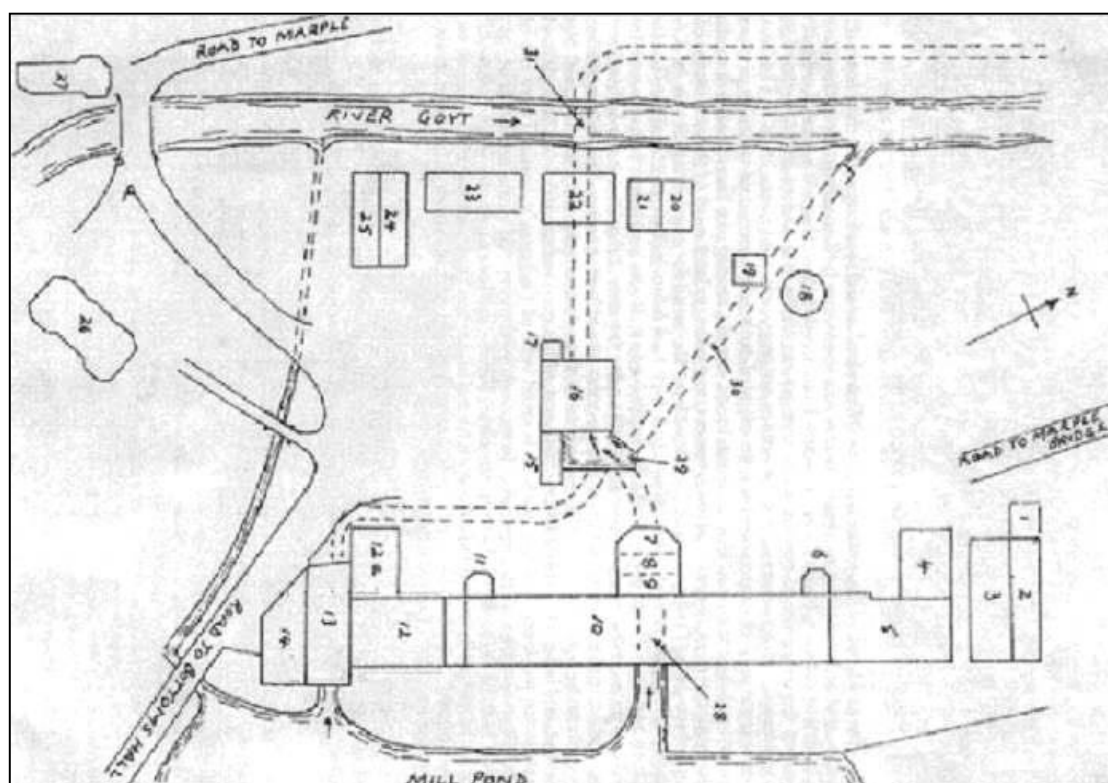
Building Mellor Mill was a vast undertaking and involved not only the construction of the mill itself but also the building of workshops, offices, a gasometer and retort house and even the redirection of the nearby River Goyt into three millponds to supply the mills water wheels. Although steam powered mills were not uncommon within towns at this time, more rural sites relied on water power for their operation well into the 19th century. At Mellor, Oldknow was able, as a result of his ambitious development of the area, to run the mill on water power alone, which continued to contribute to the mill's power right up until its destruction in 1892. The first water wheel, the Wellington wheel, was constructed within the centre of the mill and was fed by a headrace supplied by the largest of the three millponds, the flow between this and the river was controlled by a complex system of sluices and weirs. The wheel itself is thought to have initially been a pit wheel, however, evidence uncovered during a survey of the wheelpit in 2011 suggests that the wheel may have been replaced in the early 19th century with a suspension wheel (Grimsditch, Bishop & Nevell, 2011). This type of wheel was developed in the early part of the century to produce greater speeds and efficiency of power by having geared teeth fitted to the wheel rim itself removing the need for a separate geared wheel. More recent work at the mill has since found no evidence that the replacement was indeed a suspension wheel and further work is needed to ascertain exactly what type of wheel was in use at the mill. Originally the tailrace for this wheel was housed within a tunnel which transported the water downhill and back into the river. By c.1815 the demand for power in the mill had increased, necessitating the construction of a second water wheel to the west of the mill, the Waterloo wheel, which was supplied by the tailrace from the Wellington wheel. Such engineering works indicate the extent to which Oldknow was prepared to go to secure the mill's productivity and maintain his standing as an important member of the manufacturing community.

The mill's construction was clearly well thought out, combining a highly decorative architectural style with an efficient layout using the central water wheel to drive shorter drive shafts to either side, an arrangement found in several water powered mills such as Crimble Mill, Heywood (Williams & Farnie, 1992). The mill was divided into three sections, a six storey central block with three storey wings with crosswings to the northeast and southwest and three projecting towers containing stairs and offices to the front. Like many mills built at this time Mellor Mill followed the general pattern of a long narrow building with rows of large windows to allow the maximum amount of natural light on to the working floors. The presence of a gasometer and retort house on the site also indicate that this natural light was

supplemented and replaced in the winter by gas lighting, another common innovation of the time.

Documents from Oldknow's estate indicates that in the early 19th century the main mill building was used to house the spinning frames on the lower floors and carding machines on the upper floors whilst in the north wing particularly, lower floors were used for opening and preparatory processes such as picking and winding (Arrowsmith, 2017). A later inventory from the 1867 auction of the mill indicates that the arrangement of processes in the mill remained largely unchanged but with added space for warehousing and additional throstles at the southern end of the building. Throstles were developed from Arkwrights water frame and were by far the most popular weaving machinery in use during the 19th century (Williams and Farnie, 1992). Records indicate that during Oldknows lifetime, however, the spinning machinery used at the mill was largely comprised of water frames, with up to 10,000 spindles recorded in 1805, but with a number of unworking mules also mentioned indicating that the spinning of both finer and coarser yarns was undertaken at the mill at some points in this early period (Arrowsmith, 2017). The lack of documentary evidence for the mid-19th century means it is difficult to ascertain at what point the change in machinery took place but it is likely to have been some time during the 1820s and 30s when the widespread use of water frames was dwindling (Calladine and Fricker, 1993).

Differing machinery in use at the mill will have had an impact on the arrangement of the drive shafts used to convey the power from both the water wheel and later the steam engine. Although in many cases horizontal drive shafts were located in the upper storey of mill buildings, several have been found, like Mellor, to have horizontal shafts at basement level which transferred power upwards via vertical shafts. By the later 19th century it was common to connect these vertical shafts to line shafts on each floor which held the belt drums to drive individual machines, however the powering of water frames and mules in the late 18th and early 19th centuries tended to use multiple upright shafts which drove one or two frames on each floor. Calculations made by John Glithero at Mellor based on the size of the bays and the location of floor joists (on which to support the heavy frames), along with entries from a 1799 stock book from the mill, have lead him to suggest that prior to the introduction of throstles the mill had 22 upright drive shafts each powering a pair of water frames on each spinning floor (Glithero *pers comm.*). It is likely that following the introduction of throstles and the addition of the steam power, the drive shaft arrangement was altered to the more common one or two upright shafts powering a line shaft on each floor from which drums drove individual machines. The archaeological evidence uncovered in the drive shaft within the six storey building, does not show any evidence of such a high number of upright shafts, although the subsequent alterations made to the power systems and drive shaft will have almost certainly included the replacement of the baring blocks used for this purpose.



No.	1st STOREY	2nd STOREY	3rd STOREY	4th STOREY	5th STOREY	6th STOREY	7th STOREY
1	Coal Place						
2	Boiler House						
3	Engine House						
4	Cotton Rooms						
5	Blowers						
6	Stairs	Carding	Warping	Lumber	Attic	Stairs	
7	Offices	Ditto	Throstles	Empty	Stairs		
8	Passage	Stairs	Stairs	Stairs			
9	Store & Making up Rooms	Store Rooms	Store Rooms	Store Rooms	Store Rooms	Store Rooms	Attic
10	Throstles	Throstles	Throstles	Carding	Carding	Reeling & Warping	Lumber
11	Stairs	Stairs	Stairs	Stairs	Stairs	Stairs	Attic
12	Throstles	Throstles	Throstles	Warehouse			
12a	Warehouse	Warehouse	Ditto				
13	Wheelrace & Drying Kiln						
14	Corn Mill	Store Room					
15	Shaft Shed						
16	Wheelrace						
17	Ditto						
18	Gasometer						
19	Retort House						
20	Warehouse	Warehouse	Warehouse				
21	Cottage	Cottage	Ditto				
22	Mechanics' Shop	Mechanics Shop					
23	Workshop	Workshop					
24	Warehouse	Warehouse					
25	Stables & Coach House	Hay Loft					
ADDITIONAL DETAILS							
26	Mellor Lodge, Oldknow's House.						
27	Marple Lodge.						
28	Position of Waterwheel in Mill Basement.						
29	Water Junction.						
30	Tunnel to take water to river from upper wheelpits.						
31	Tunnel under river discharging into the river at a lower level some distance downstream						

Figure 44. 1867 inventory plan of Mellor Mill (Noble and Grimsditch 2009).

According to the 1867 inventory, the ground floor of the three storey wing contained the ‘blowers’ which were used in the early stages of the spinning process to prepare the raw cotton for carding. This would have included opening the bales, removing dirt and impurities from the cotton and aligning the fibres into a lap ready for carding. After 1800 blowing rooms usually contained scutchers, heavy machines which used a spiked roller to carry out these initial processes and it is likely that such machines would have been found in the ground floor room exposed during the excavation. As the opening and processing of the raw cotton caused large amounts of cotton dust to be produced, blowing rooms were often the only fireproof areas in spinning mills before fireproof designs for all new mills were taken up in the mid-19th century (Williams and Farnie, 1992). It is likely therefore that the section of flooring covering the drive shaft channel in the centre of the excavation area was re-laid in stone rather than wood to maintain the room’s fireproof qualities.

Following Oldknows death in 1828 his industrial estate was passed to his creditor, Richard Arkwright in lieu of his debts. Despite this Samuels half-brother, John Clayton was allowed to remain as the mill manager and indeed John Clayton and Co. were still named as the mill owners at the time of the fire in 1892 (Noble and Grimsditch, 2009). The mill continued to produce large quantities of yarn throughout the 19th century although levels of production were dependant on sufficient quantities of water available to power the Wellington and Waterloo wheels. This reliance on natural resources came to a critical point in the latter half of the 1850s when successive droughts resulted in several stoppages of production and led to the introduction of steam power at the mill in 1860.

An article in the Stockport Advertiser from September 1860 describes a ‘liberal repast’ prepared for the mill managers and a selected group of employees to celebrate the testing of the new engine and boilers fitted at the mill by Benjamin Goodfellow of Hyde. The engine was described in a later sale advertisement of 1877 as a horizontal cross compound engine, where the high and low pressure cylinders lay on either side of the flywheel, with the condenser in line with the low pressure cylinder (**Fig.23**). Goodfellow patented this arrangement in 1858 and the description from 1877 suggests that the engine at Mellor Mill followed the same design, although slight differences in the arrangement of the foundation bolts were found on the remains of the engine bed uncovered on site (Glithero, 2016 *pers comm.*). The 1867 auction documents indicate that the two cylinders were of 20 nominal horsepower each which is a relatively low power output for a mill of this size and date, indicating the main power source was still intended to be the two water wheels, with the engine providing only supplementary power when necessary.

In addition to the new engine house, a boiler house was naturally needed which was constructed at the northern end of the site and was found to have an abutting coal store. The need for more power in the 1870s caused not only the engine to be replaced or uprated but also the need for a second boiler to support the increased demands of

this engine. The size of both boiler settings uncovered indicate they accommodated 30 x 7 foot Lancashire boilers which, if both were in operation, would enable the new engine to be the sole provider of the mills power from the 1870s onwards (Glithero, 2016 *pers comm.*). Despite this, there is no evidence that this became the case and the continued maintenance of the wheel pits suggest both remained in use until 1892. It is likely that water power was utilised as much as possible to avoid the high coal costs associated with keeping two Lancashire boilers of this size running constantly.

Considerable alteration works on the main mill building would have been necessary to accommodate the new engine and its associated machinery, particularly as the water fed power systems were still in place. In order to transmit the power into the mill building, the excavation has revealed that a channel was cut under the northern three storey wing into the natural ground surface to accommodate a drive shaft and inspection corridor. This channel formed an extension to the one already in use in the main six storey range by the water fed power system but was continued northwards to connect with the new engine house. The use of stone to construct the later section of the channel is unusual, especially in view of the use of brick further south. However, the stonework identified is almost identical to that used in the engine house and may have been specifically chosen for its position below the blowing room.

The construction of the channel would have been a significant undertaking involving the cutting of the main northern mill wall at foundation level as well as the possible taking up and re-laying of floors immediately above to gain access to the drive shaft inspection corridor. Yet more alterations are likely to have been made to these structures in the late 1870s as a result of the replacement or upgrading of the Goodfellow engine, possibly requiring the installation of a more substantial drive shaft. This work also required the installation of the second boiler, indicating an increase in the number of machines at work in the mill at this time. The alteration work may also explain the odd configuration at the far northern end of the drive shaft as it enters the three storey wing where part of wall (004) appears to be lying on top of one of the baring block stones (009).

Such extensive alterations to the building would have had an impact on the daily operation of the mill, although it is unclear which, if any, processes were suspended during the works. Even if this were not the case, it is likely that the output of the mill was reduced as rooms were closed off, in either a single block or piecemeal, to complete the structural works. Despite the potential for a drop in revenue during construction, the problems with the water driven power system were clearly sufficiently serious to warrant the scale of investment needed to upgrade the mill and offset any temporary losses. The continued reliance on water power even after the engines installation and greater mechanisation of the process of cotton production at this time ensured that the running of the mill remained as efficient as possible. Indeed expansion and progress seems to have continued right up until the fire in 1892, with new machinery purchased in the years immediately before (Arrowsmith, 2017). This

would suggest that although industrial expansion was booming in the towns around Manchester in the later half of the 19th century, Mellor Mill did not appear to suffer from its location outside these main centres.

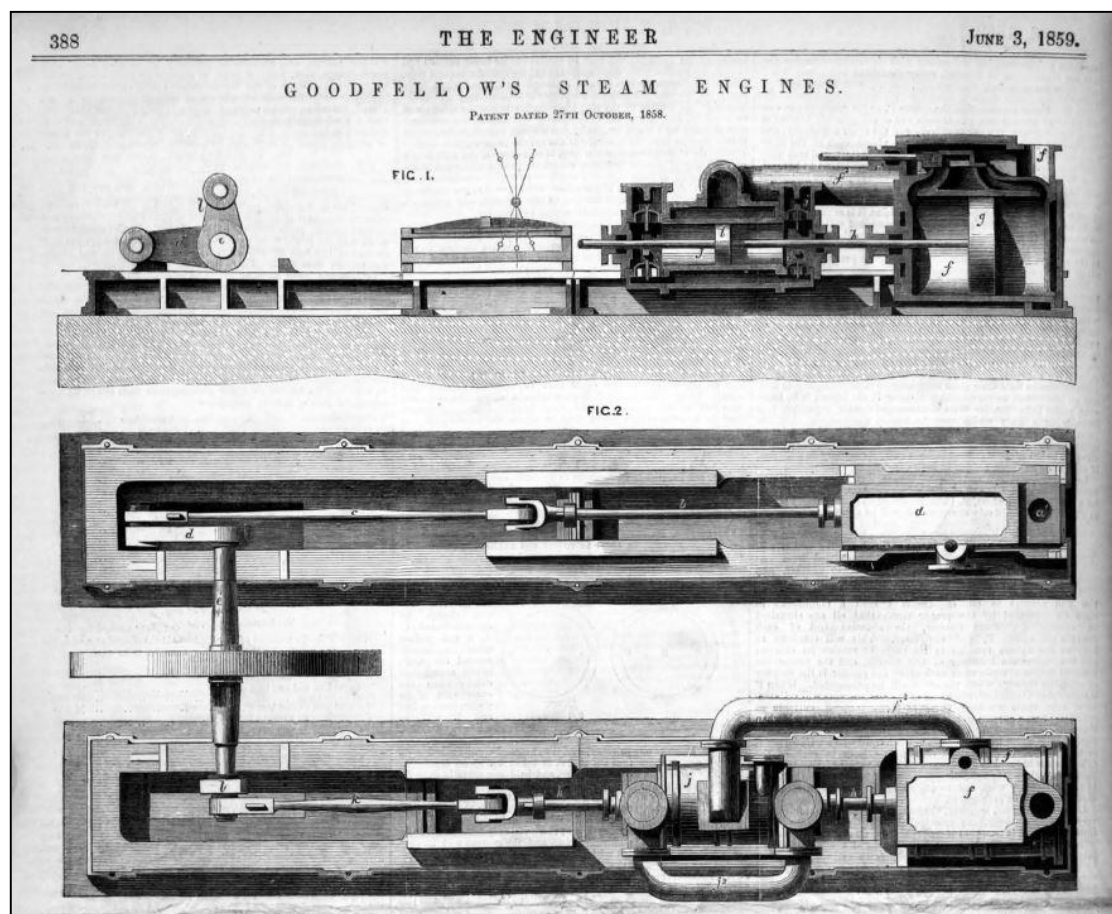


Figure 45. Technical drawing of a Goodfellow engine of a similar type to that fitted at Mellor (courtesy of John Glithero).

The results of the excavations have revealed that the main structure of the mill building was constructed as part of a single event but that the power systems required additional works and ongoing maintenance and alterations throughout the history of the building. The excavations have revealed evidence for six phases of activity within the northern half of the mill, some of which correspond to documented events.

Phase 1 1793-1800

This phase saw the construction of the mill including the three storey wings and Wellington wheel pit with its associated basement level drive shaft and inspection corridor. It is likely however, that only the brick built section of this channel was constructed at this time as the section within the north wing was not necessary until later changes were made to the mills machinery. This phase also included the external staircase accessing the inspection corridor, which may indicate that the original shaft lay on the western side of the corridor.

Phase 2 1800-c.1860

Despite the broad timescale for this phase, much of the activity contained within it related to changes made in other parts of the mill no longer surviving or which were superseded by later development of the building. As a result, no evidence of this period could be securely identified in the archaeological record. Documentary evidence indicates that during the early part of this phase the Wellington Wheel is likely to have been replaced which may have led to the rearrangement of the baring blocks within the drive shaft in the six story section of the mill. In addition, the Waterloo wheel was constructed at around the same time potentially to coincide with the introduction of new spinning machinery which may have caused further alterations to the drive shaft. It is likely, however, that at this time the baring blocks were still located on the western side of the corridor. Glithero suggests that the line shafting itself was also probably replaced in this period (*pers comm.*).

Phase 3 1860-1877

This phase saw the greatest alterations made to both the power systems and the mill building itself as a result of the installation of the first steam engine in 1860. This work involved the construction of engine and boiler houses and a coal store as well as the cutting of the mill's northern wall and construction of the inspection corridor in the three storey wing to accommodate the new section of drive shaft from the engine. It is likely that the drive shaft and inspection corridor in the six story wing was also reconfigured at this time, moving the shaft to the eastern side of the corridor to better align with the new engine and replacing or modifying the baring blocks as necessary. This would have caused the external eastern access stairs to become redundant and the doorway to the corridor to be blocked.

Phase 4 1870s

A sales notice from 1877 refers to the engine being sold at this time but it is unclear if it was replaced with a new, more powerful engine or merely upgraded to accommodate the increasing demands on the mill's power systems. Either way the increased output caused the addition of a second boiler, housed immediately next to the first at the northern end of the mill, along with a new coal store to the west. Indications of changes to the steam driven power system can be seen on both the engine mounting block, in the form of changes to the configuration of the iron mounting bolts and on the drive shaft, particularly at the point at which it enters the mill through the north wall, where an earlier block appears to have been obscured by later construction of an abutting brick wall and by the replacement of baring blocks for smaller ones and the filling of the resulting gaps in the adjacent wall with brick.

Phase 5 1880s and 90s

This is the final occupation phase at the mill and is represented on site by minor alterations and repairs such as the secondary blocking of the eastern external access stairs and the construction of the frogged brick structures further south. Documentary evidence suggests that the mill was in full operation at this time with new machinery

even being added, meaning ongoing repairs are likely to have continued to the older parts of the building and may account for the areas of frogged brick within the boiler houses and along the southern section of drive shaft. This phase concludes with the destruction of the mill by fire in 1892.

Phase 6 Twentieth Century

The demolition of the standing remains of the mill in the early 20th century and the subsequent backfilling of the site with builders waste during the 1950s resulted in an extensive layer of overburden across the site, from which the majority of the initial finds came. Although not related to the operation of the mill complex the nature and topography of this material show the site's later decline and use as part of the wider recreational landscape emerging around the 'Roman Lakes'.

The excavation of Mellor Mill has allowed the already considerable array of documentation relating to the operation of the mill and Samuel Oldknow himself, to be expanded on, giving detail especially to the technological advances made throughout its history. In addition however, glimpses of the lives of those working there during the later occupation of the mill have been seen in the artefacts found across the site, in particular various glass and ceramic food and drinks containers such as mineral bottles, preserve jars and table wares. Together these objects suggest that the workers at the mill were paid sufficiently well to enable them to lead relatively comfortable lives and echoes accounts of their predecessors that even during Oldknows time his workers were paid and treated fairly (Atkinson, 2015). The workforce at the mill was predominantly made up of women and children and peaked at around 500 in the early 19th century. Despite levelling off to around 350 in the middle of the century the output of the mill still increased as a result of the installation of the new engine. It is possible that the lack of a corresponding increase in workers meant that the quality of life of those already employed was maintained without the pressures on housing and sanitation which were witnessed in the larger towns around Manchester.

Mellor Mill has been an important part of the growth and life of the area around Mellor and Marple for the past 220 years, whether as a catalyst for population growth, technological innovation, employment or exploration. The recent excavations at the site have enabled its early history to be retold and reassessed in order for new generations to understand the contribution Samuel Oldknow and his successors have made to the development of the area. The excavations have been able not only to uncover the structural form and function of various elements of the mill complex but also shed light on the life of those who worked there.

7. Archive

The archive comprises archaeological photographs, drawings and research notes as well as a large collection of ceramic, metal and glass finds. This archive is currently held by Salford Archaeology and Mellor Archaeological Trust and a copy of this report will be forwarded to the client following the publication of the site report.

A copy of this report will be deposited with the Greater Manchester Historic Environment Record held by the Greater Manchester Archaeological Advisory Service.

8. Acknowledgements

Salford Archaeology would like to thank Fiona Turpin, Pamela Pearson, John Hearle and Bob Humphrey-Taylor from the Revealing Oldknows Legacy Project for commissioning the archaeological works and Norman Redhead for providing monitoring, support and advice through GMAAS.

The TAMAS excavations were conducted by local volunteers under the supervision of Robert Humphrey-Taylor and Rachel Miller. The Salford Archaeology excavations were conducted by local volunteers under the supervision of Sarah Cattell, Kirsty Whittall, Mandy Burns, Rachael Reader, Simon Hinchliffe and Vicky Nash. This report was written and illustrated by Sarah Cattell, Rachel Miller, Richard Ker and Stuart Harris.

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Mapping. (OS Licence no: 100050261)

1885 1st Edition, County Series OS Map 1:2500 Original scale.

1908 1st Edition, County Series OS Map 1:2500 Original scale.

Appendix 1: Figures

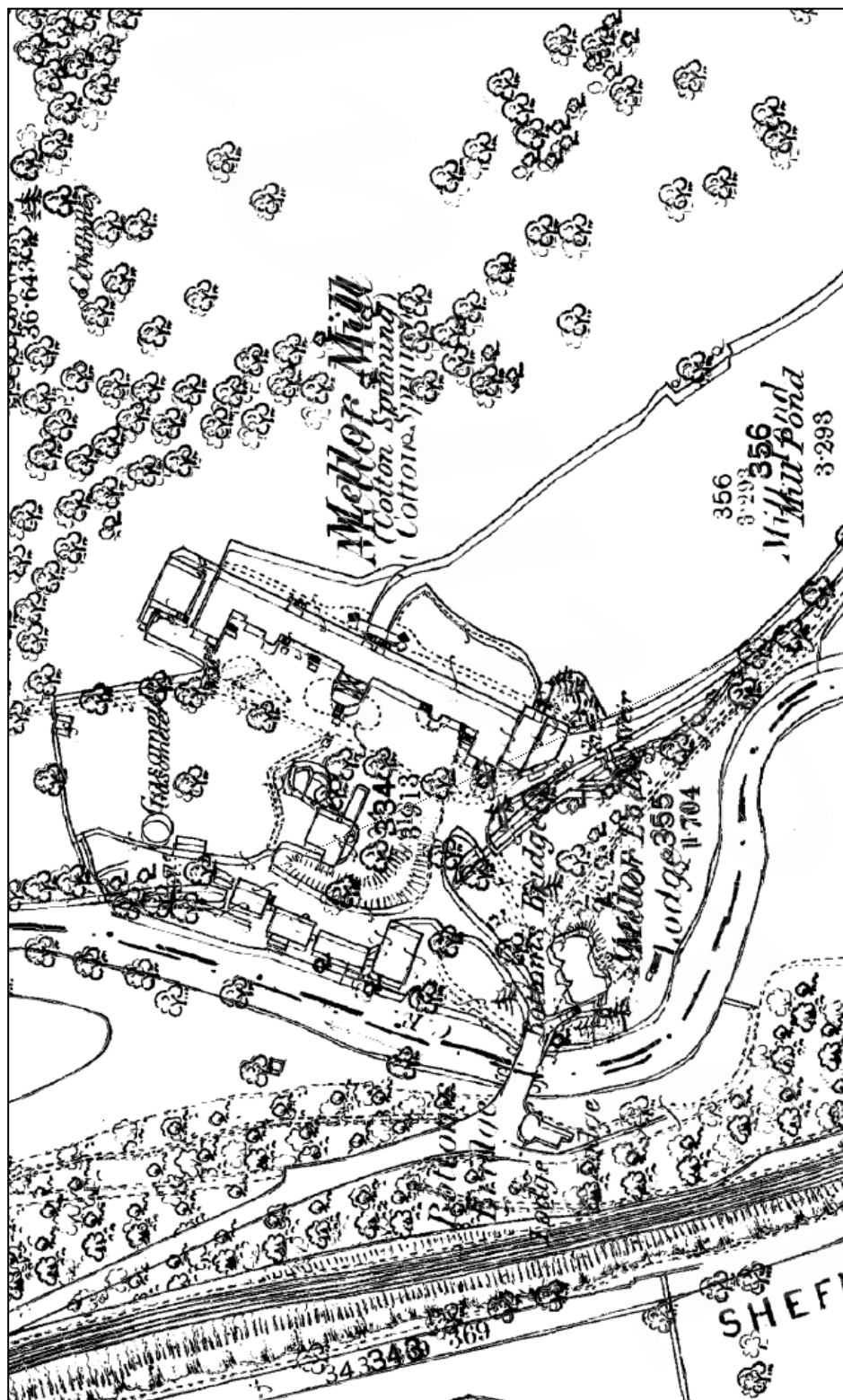


Figure. 46. Detail of 1885 OS map.

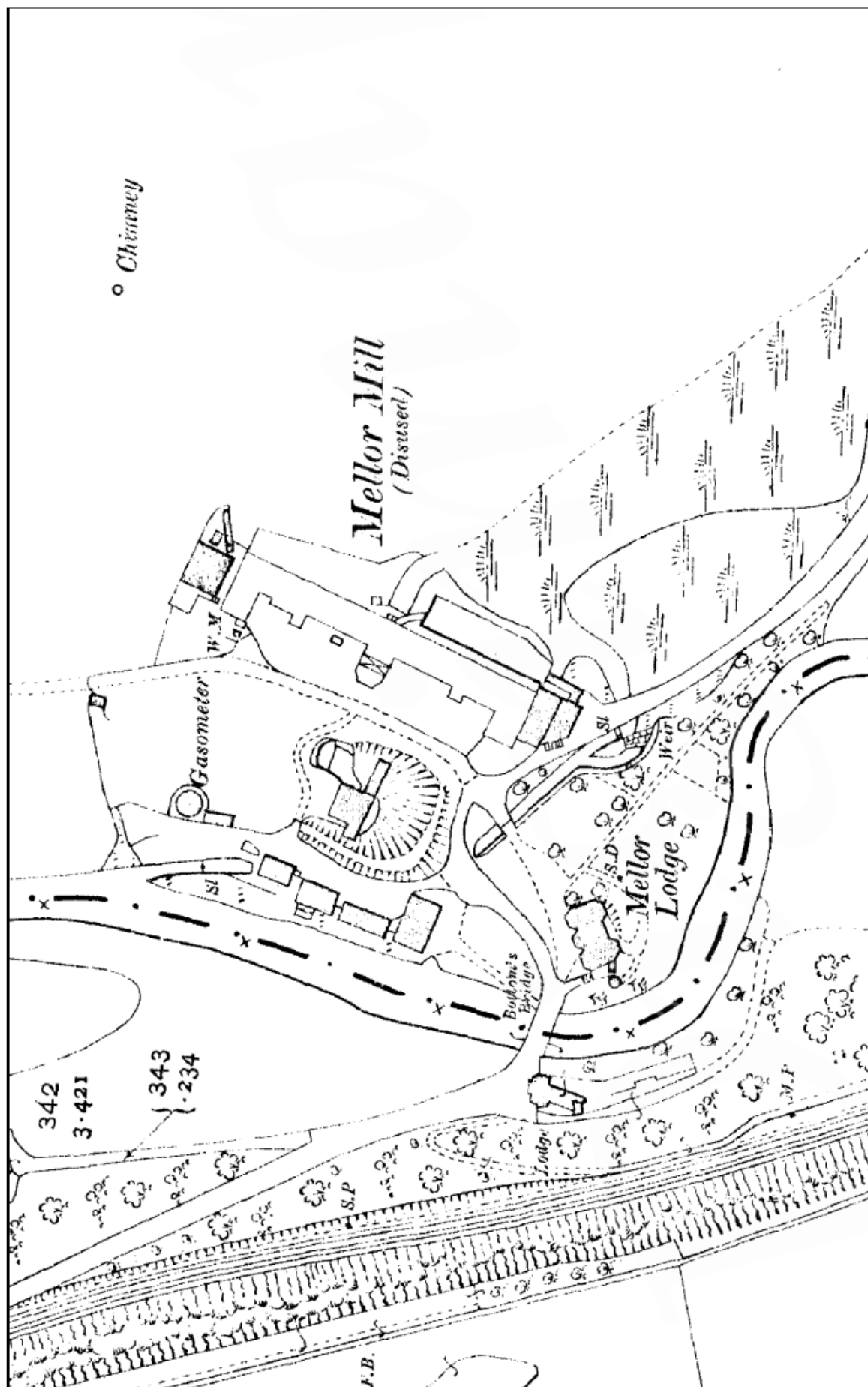


Figure. 47. Detail of 1908 OS map.

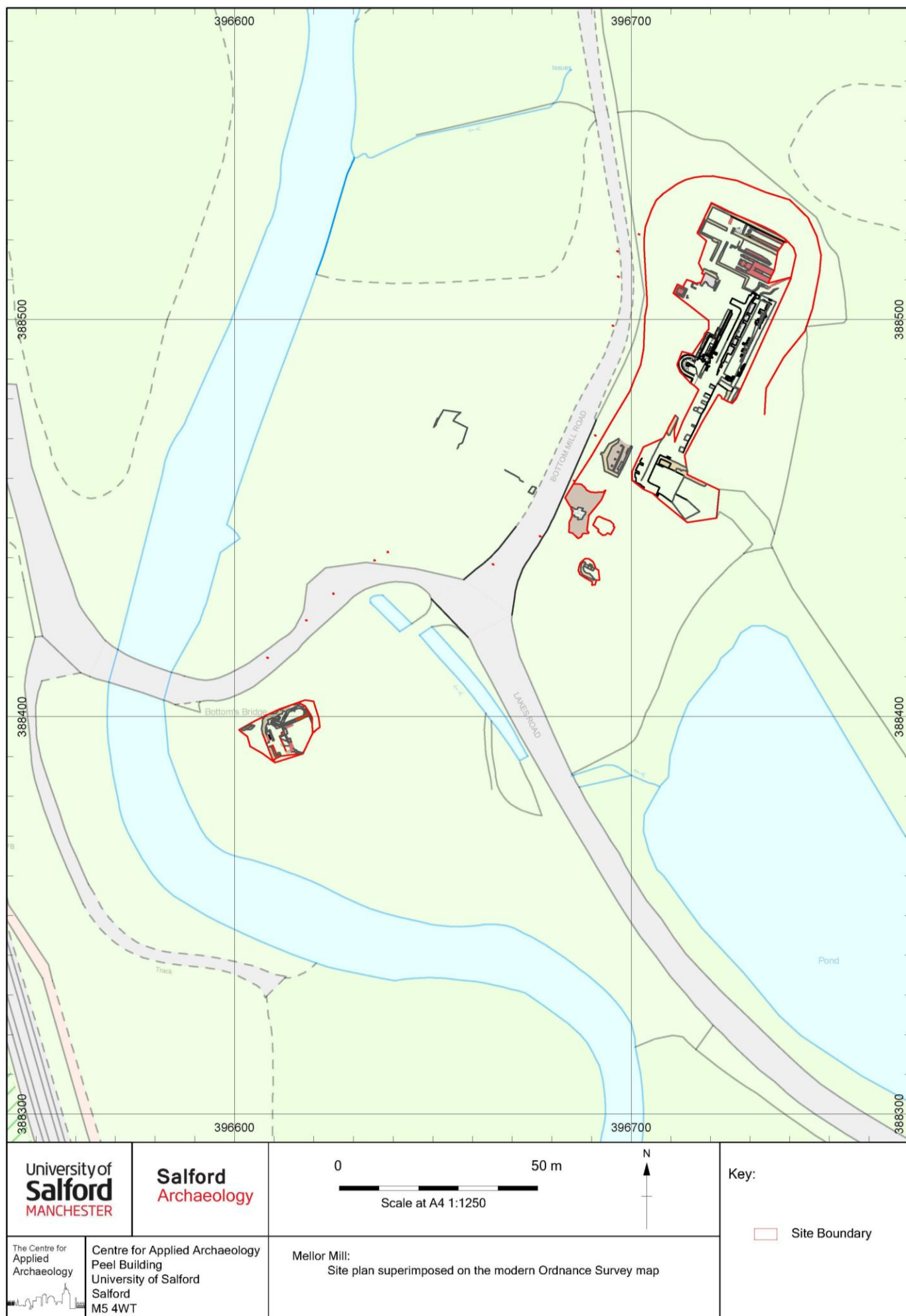
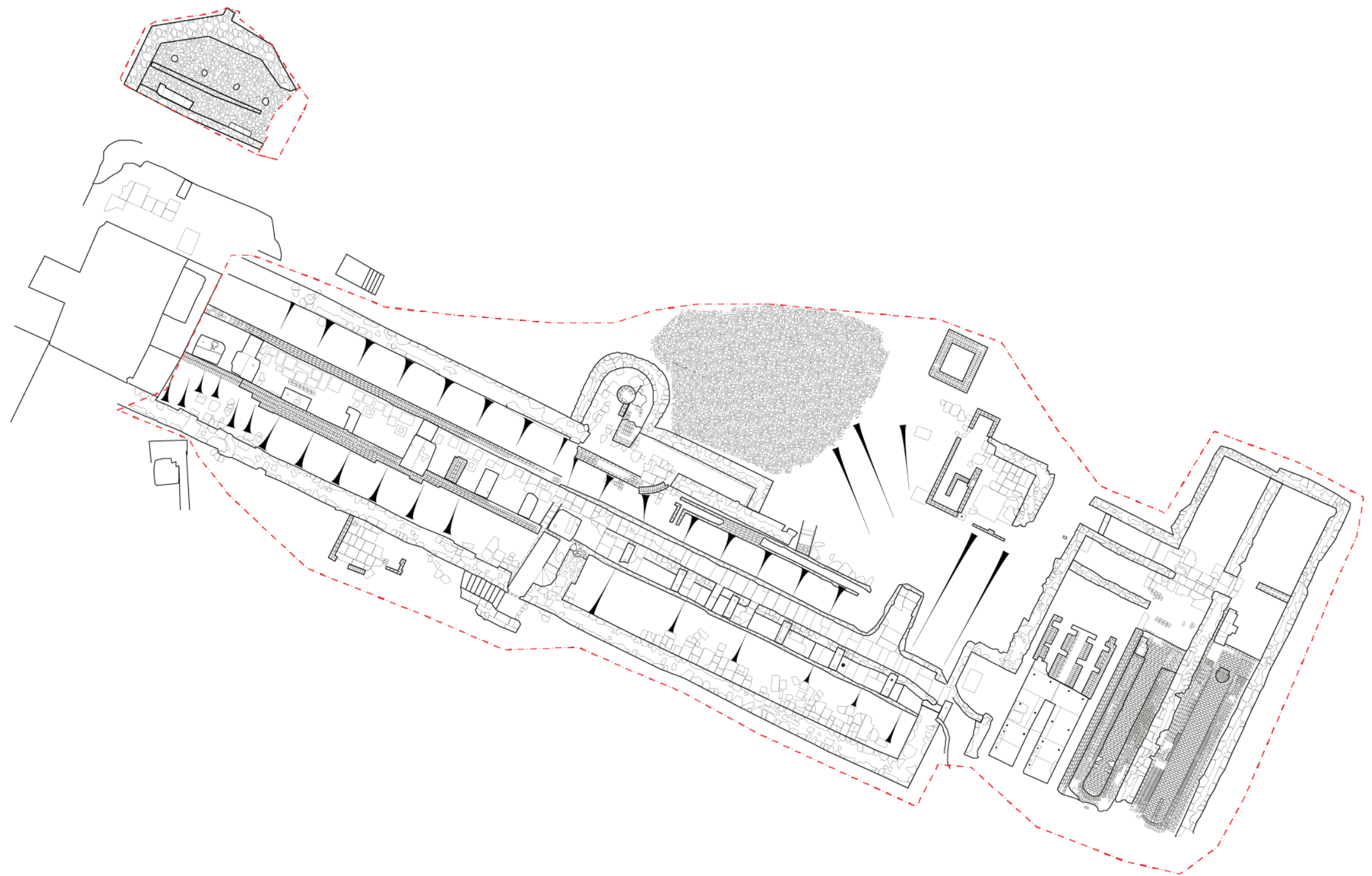


Figure. 48. Site plan superimposed on modern OS Mapping.



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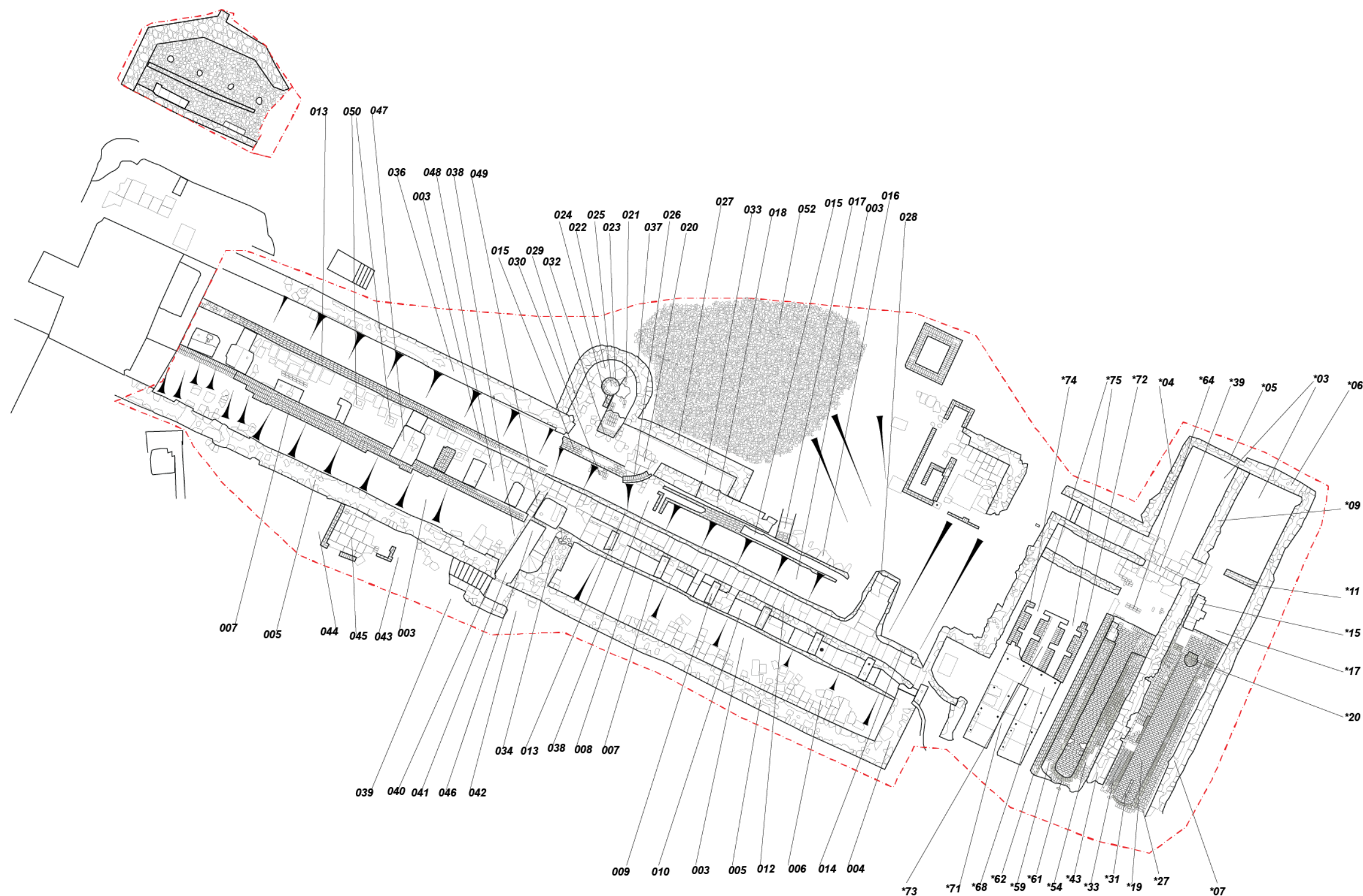
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Mellor Mill

Figure 49. Mellor mill plan drawing.



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Mellor Mill

Figure 50. Mellor Mill plan showing contexts.

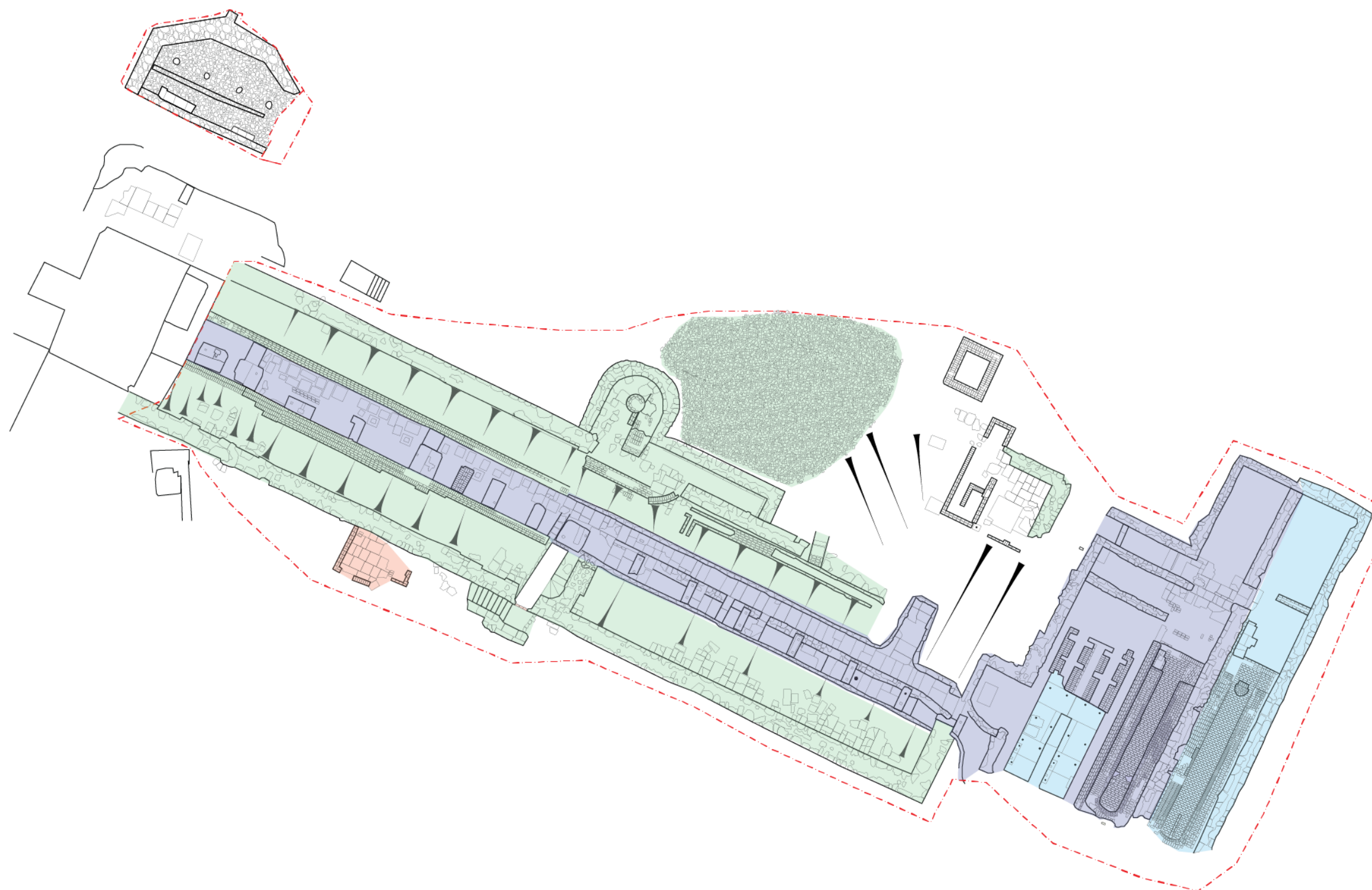


Figure 51. East facing section drawing of Sub-Division 1.



<p>University of Salford MANCHESTER</p>	<p>Salford Archaeology</p>	<p>The Centre for Applied Archaeology</p>	<p>Centre for Applied Archaeology Environment and Life Sciences The Crescent Salford M5 4WU</p>	<p>0 1m</p>	<p>N</p>	<p>Southern Face of Wall *07</p>	<p>Key:</p> <table border="0"> <tr> <td>-----</td> <td>section edge</td> <td></td> <td>Lime mortar</td> <td></td> <td>Rubble core</td> </tr> <tr> <td>=====</td> <td>structure/wall</td> <td></td> <td>Stone</td> <td></td> <td>Coal staining</td> </tr> <tr> <td>=====</td> <td>feature/stones/wood</td> <td></td> <td>Brick</td> <td></td> <td></td> </tr> </table>	-----	section edge		Lime mortar		Rubble core	=====	structure/wall		Stone		Coal staining	=====	feature/stones/wood		Brick		
-----	section edge		Lime mortar		Rubble core																				
=====	structure/wall		Stone		Coal staining																				
=====	feature/stones/wood		Brick																						

Figure 52. Section drawing of southern face of wall *07.



<p>University of Salford MANCHESTER</p>	<p>Salford Archaeology</p>	<p>The Centre for Applied Archaeology</p>	<p>Centre for Applied Archaeology College of Science and Technology The Crescent Salford M5 4WU</p>	<p>0 ————— 10 m Scale at A3 1:250</p>	<p>Mellor Mill Phasing</p>	<p>Key</p> <ul style="list-style-type: none"> Phase 1 - 1793-1800 Phase 3 - 1860-1877 Phase 4 - 1870s Phase 5 - 1880-1890
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Figure 53. Phased plan of Mellor Mill.

Appendix 2: Context List

TAMAS Area

Context Number	Area	Description
(*01)	Sub Div 1	Dark blackish brown topsoil.
(*02)	Sub Div 1	Dark greyish brown subsoil.
(*03)	Sub Div 1	Natural light brownish yellow geological deposit, sits below all archaeological features.
(*04)	Sub Div 1	Southern exterior wall of coal cellar. Abuts (*05) to west. Constructed from gritstone blocks, aligned E-W.
(*05)	Sub Div 1	Western exterior wall of coal cellar. Abuts (*04) to south and (*06) to north. Constructed from gritstone blocks, aligned N-S.
(*06)	Sub Div 1	Western exterior wall of coal cellar, continuation of (*05). Abuts (*07) to north. Constructed from gritstone blocks, aligned N-S.
(*07)	Sub Div 1-2	Northern exterior wall of coal cellar, extends along entire northern length of Sub Div 2. Abuts (*06) to west. Constructed from gritstone blocks, aligned N-S.
(*08)	Sub Div 1	Fill of coal cellars. Dark black brown material with frequent root incursions and rubble.
(*09)	Sub Div 1	Central dividing wall of coal cellar abutting (*05) and (*06) at west. Constructed from gritstone blocks, aligned E-W.
(*10)	Sub Div 1	Fragmentary remains of two field drain pipes lying on (*03) and slightly under (*06), aligned NW-SE.
(*11)	Sub Div 1	Red brick channel with slate base (*12) abutting (*07). Possible drain. Aligned N-S.
(*12)	Sub Div 1	Slate sections sat under (*11). Possible part of drain. Aligned N-S.
(*13)	Sub Div 1	Fragmented field drain pipe lying along foundations of (*07). Aligned E-W.
(*14)	Sub Div 2	Circular crevice formed in the centre of (*07) creating a vertical shaft 0.51m depth.
(*15)	Sub Div 2	Remains of York stone flagged surface to the north of (*35). Abuts (*17) to east.
(*16)	Sub Div 2	Fill of Sub Div 2. Dark brown silty rubble rich deposit.
(*17)	Sub Div 2	Handmade red brick wall. Abuts (*07) at north and (*35) at south. Aligned N-S.
(*18)	Sub Div 2	Hollow iron pipe running through (*35) slightly protruding at either end. Possible drain. Aligned N-S.
(*19)	Sub Div 2	Red brick flooring of upper boiler bed. Aligned N-S.
(*20)	Sub Div 2	Semi-circular firebrick single layer feature sat on (*19) at

		western end of upper boiler. Possibly for diverting hot gases.
(*21)	Sub Div 2	Degraded firebrick feature forming rounded end of northern upper boiler wall with square cut channel of indeterminate length at its base. Abuts (*23) to east and (*07) to north.
(*22)	Sub Div 2	Fill of (*21). Gravel and small stones with organic material.
(*23)	Sub Div 2	Red brick sloping feature lying between (*21) and northern wall of upper boiler. Leans at an approximate 45 degree angle towards (*07). Possibly for diverting gases.
(*24)	Sub Div 2	Red brick sloping feature lying between (*25) and southern wall of upper boiler. Similar in construction to (*23).
(*25)	Sub Div 2	Degraded firebrick feature forming rounded end of southern upper boiler wall. Abuts (*24) to east and (*35) to south.
(*26)	Sub Div 2	Single course firebrick wall lying between (*07) and (*27). Aligned E-W.
(*27)	Sub Div 2	Red brick wall lying directly between (*26) and (*28). Aligned E-W.
(*28)	Sub Div 2	Wall constructed of firebrick, lies against (027). Abuts (*30) to east and (*23) to west. Aligned E-W.
(*29)	Sub Div 2	Seven surviving large shaped blocks, forming a section of boiler support, sits on (*28).
(*30)	Sub Div 2	Rear curved wall of upper boiler bed, constructed of lower courses of firebrick and upper courses of red brick. Abuts (*28) at north and (*32) at south.
(*31)	Sub Div 2	Badly degraded firebrick 'feather' feature lying central on the eastern base of the upper boiler, probably used to divert hot gases. Abuts (*30) at east. Aligned E-W.
(*32)	Sub Div 2	Firebrick wall truncated in the centre of its length, similar in construction to (028). Abuts (*30) at east and (*24) at west. Aligned E-W.
(*33)	Sub Div 2	Red brick wall similar in construction to (*27), truncated in the centre. Lies directly between (*32) and (*35). Aligned E-W.
(*34)	Sub Div 2	Degraded large firebrick supporting blocks similar to (029). Sits on (*32).
(*35)	Sub Div 2	Wall constructed of red brick and firebrick, lying directly between (*33) and (*43). Aligned E-W.
(*36)	Sub Div 2	Exposed section of large field drain pipe, lying in the hillside outside the northern wall of boiler rooms.
(*37)	Sub Div 2	Possible foundations linked to (*48), single course of degraded red brick sat on slate base.
(*38)	Sub Div 6	Fill of Sub Div 6. Mid to dark brown rubble rich sub soil.
(*39)	Sub Div 2	York stone flagged floor forming surface between coal cellars (Sub Div 1) and boiler beds. Abuts (*48), (*43) and (*09) at north, and (*05) at south.
(*40)	Sub Div 2	Square shaped vertical shaft within (*39). Probable drain with iron grid cover.
(*41)		Void

(*42)		Void
(*43)	Sub Div 2	Central large gritstone wall separating upper and lower boiler beds. Aligned E-W.
(*44)	Sub Div 2	Firebrick wall similar to (*26), lies along southern edge of (*43) and against (*54). Aligned E-W.
(*45)		Void
(*46)		Void
(*47)		Void
(*48)	Sub Div 2	Dressed stone steps abutting (*43) at east and (*39) at south.
(*49)		Void
(*50)		Void
(*51)		Void
(*52)		Void
(*53)		Void
(*54)	Sub Div 2	Wall constructed of red brick and fire brick, lies directly between (*44) and (*56). Aligned E-W.
(*55)	Sub Div 2	Red brick sloping feature similar to (*23) and (*24). Abuts (*44) to north.
(*56)	Sub Div 2	Wall constructed of firebrick, lies against (*54) with a curved return wall to north. Aligned E-W.
(*57)	Sub Div 2	Curved rear wall of lower boiler constructed of firebrick. Abuts (*56) at north side and (*58) at south side. Similar construction to (*31).
(*58)	Sub Div 2	Firebrick wall aligned E-W with curved return wall to south at western end. Abuts (*59) to south and (*57) to east.
(*59)	Sub Div 2	Red brick wall similar to (*27), truncated at west end and lies directly between (*58) and (*60). Aligned E-W.
(*60)	Sub Div 2	Firebrick wall of single width lying between (*59) and (*62). Aligned E-W.
(*61)	Sub Div 2	Handmade red brick floor of lower boiler.
(*62)	Sub Div 2	South exterior wall of boiler rooms, constructed of red brick. Abuts (*63) at west end and (*60) along northern edge. Aligned E-W.
(*63)	Sub Div 2	Stone lintel abutting (*61) and (*64), aligned E-W.
(*64)	Sub Div 2	Red brick square feature, probable drain, with short single course wall aligned N-S. Abuts (*39) and (*63).
(*65)	Sub Div 2	Eight surviving sections of curved firebrick supporting blocks, situated at eastern end of (*56). Aligned E-W.
(*66)	Sub Div 2	Three degraded sections of firebrick supporting blocks, similar to (*65). Situated at eastern end of (*58).
(*67)	Sub Div 2	Two firebrick large curved blocks, sit on floor (*61) of lower boiler at east end. Probably related to diversion of hot gases.
(*68)	Sub Div 2	Large dressed stone blocks of steam engine bed.
(*69)	Sub Div 2	Stone block sat on (*68).

(*70)	Sub Div 2	Fill of (*71). Black oily deposit probably from steam engine.
(*71)	Sub Div 2	Curved feature within (*68) for fly wheel. Unexcavated.
(*72)	Sub Div 2	Red brick narrow plinth, support for steam engine bed. Sits on (*75) at western end of steam engine room.
(*73)	Sub Div 2	Central red brick supporting plinth. Sits on (*75) at western end of steam engine room, mortar visible.
(*74)	Sub Div 2	Red brick plinth similar in construction to (*72).
(*75)	Sub Div 2	Yorkstone flagged floor within entire steam engine room. Abuts (*62) to north. All archaeological features related to steam engine beds sat on (*75).
(*76)	Sub Div 2	North-western wall of engine house corridor. Constructed from gritstone blocks. 5.50m long.
(*77)	Sub Div 2	Dressed stone block wall with a rubble and lime mortar core measuring 0.35m wide and extending 2.50m north from (*79), abuts (*39). Central opening 2.50m wide with dressed stone blocks with ironwork protruding from eastern faces.
(*78)	Sub Div 2	Dressed stone block wall with a rubble and lime mortar core measuring 0.35m wide and extending 2.50m north from (*79). abutted handmade brick structure (*101).
(*79)	Sub Div 2	Southern boundary wall of Sub Division 2. Measured 0.90m x 15.00m, constructed from gritstone blocks, east-west alignment rising to the west. 0.90m high which rose to 1.50m where it was abutted by walls (*78) and (*77).
(*80)	Sub Div 2	Southern engine house wall. Gritstone blocks maximum height of 1.30m. Enclosed (*82).
(*81)	Sub Div 2	Remains of flagged surface. Single stone flag with scars visible on surrounding three walls.
(*82)	Sub Div 2	Sub-rectangular area of flagged flooring enclosed by (*80).
(*83)	Sub Div 2	Wall constructed from dressed gritstone with a rubble and mortar core. 0.90m x 4.50m. Opening to south for abutting U shaped brick structure (*89). North-western wall of 3 storey wing.
(*84)	Sub Div 2	Wall constructed from dressed gritstone with a rubble and mortar core. 0.90m x 4.50m northern wall of 3 storey wing.
(*85)	Sub Div 2	South-eastern boundary wall of (*86). Two courses of degraded brick laid on single course of gritstone blocks with a central square stone block with circular hole.
(*86)	Sub Div 2	Flagged stone surface, varying sized flag stones between 0.30m-0.80m. Abutted walls (*83), (*84) and (*85).
(*87)	Sub Div 2	Handmade brick wall, 2.60m long, 2 courses wide (0.24m) stretcher bond with fragmented projecting foundation course. Lay along southern edge of (*86). Abutted in the centre by (*91)
(*88)	Sub Div 2	Handmade brick wall 2 courses wide and 2.50m long extending NW from (*85). Abuts southern remains of (*83).
(*89)	Sub Div 2	U shaped brick structure 0.90m x 0.90m. 2 course brick walls 0.80m high with two small square openings supported by stone lintels on the southern and western sides.

(*90)	Sub Div 2	Fragmentary remains of a stone culvert.
(*91)	Sub Div 2	Handmade segmental brick arch 0.23m x 0.75m running northeast-southwest. Abutted by (*92).
(*92)	Sub Div 2	Handmade brick wall (*92) 0.23m x 1.30m laid in header bond.
(*93)	Sub Div 2	Rectangular handmade brick feature 2.50m x 2.80m, 0.48m wide outer walls surrounding an inner brick surface (*94).
(*94)	Sub Div 2	Brick surface surrounded by (*93) at a depth of 0.48m (4 courses) 1.50m x 1.80m.
(*95)		Canted gritstone wall (*95). Constructed from dressed stone blocks with a rubble and mortar core 1.00m x 17.50m in total, abuts wall (*96).
(*96)		Gritstone wall 0.50m in width and formed the eastern boundary of (*97).
(*97)		Area of sub-rounded cobbles of varying sizes between 0.05m-0.25m (*97) enclosed by (*95).
(*98)		Flagged surface abuts the western face of (*96) 0.70m wide abuts (*95) to the north and south. The northern and southern halves of the surface had been separated by a 2.40m wide continuation of (*97).
(*99)		Four large cobbles with square holes measuring 0.12m x 0.13m at 1.85m intervals across the centre of (*97).

SA Area

Context number	Area	Description
(001)		Dark blackish brown topsoil.
(002)		Dark greyish brown rubble rich subsoil.
(003)		Natural gravel, sits below all archaeological deposits.
(004)		Northern exterior wall of mill. Constructed from gritstone blocks, aligned NW-SE.
(005)		Eastern (rear) exterior wall of mill. Same construction as (004) aligned NE-SW.
(006)		Yorkstone flagged floor (internal) to the west of wall (005).
(007)		Eastern wall of transmission run. Constructed from gritstone blocks aligned NE-SW.
(008)		Western wall of transmission run. Constructed from gritstone blocks, aligned NE-SW.
(009)		Row of stone machine mounting beds between walls (007) and (008).
(010)		Stone surfaces between beds (009).
(011)		Stone footings below (010) within transmission run.
(012)		Flagged floor between (008) and (013).

(013)		Wall lying to the west of (012). Constructed from gritstone blocks aligned NE-SW. Curving westward return at northern end.
(014)		Wall lying to the west of (008) and north of (013). Constructed from gritstone blocks. Aligned NE-SW with curving western return at southern end. Mirror image of (013).
(015)		Stone channel with handmade brick base and barrel vaulted top. Possible hot air flue. Aligned NE-SW
(016)		Fragmentary remains of stone flagged floor to the west of (015).
(017)		Stone pipe/culvert with handmade brick floor abutting (015), aligned E-W.
(018)		Western exterior wall of 3 storey block of mill, lies against (015) and abutted by (033). Constructed from gritstone blocks aligned NE-SW
(019)		Fill of (015). Very dark black brown loam with frequent root intrusions and animal bones.
(020)		Flagged stone surface to the south of (018) and cut by (026)
(021)		Handmade brick channel with barrel vaulted top. Aligned NW-SE. Unexcavated.
(022)		Stone flagged surface to south of (021) within curve of (037).
(023)		Circular handmade brick feature lying between (021) and (022). Single course of bricks with central void.
(024)		Single course handmade brick wall abutting (023). Aligned NW-SE.
(025)		Fill of (023). Very dark black brown humic material with frequent root incursions.
(026)		Curved handmade brick feature lying flush within (020). Aligned N-S, 3 courses wide.
(027)		Far western exterior wall of 6 storey block of mill. Abuts (018) to north and (037) to south. Constructed from gritstone blocks with single internal course of handmade bricks. Aligned NE-SW.
(028)		Wall linking (013) and (014), constructed from gritstone blocks aligned NE-SW.
(029)		Degraded crushed brick layer below (022).
(030)		Handmade brick feature to east of (015). Single course U shaped in plan.
(031)		Possible truncated second curved handmade brick feature crossing (020). Composed of broken brick fragments.
(032)		Possible handmade brick feature lying between (015) and (035). Two courses with mortar visible.
(033)		Layer of broken stone flags abutting (018) and overlying the

		western side (015).
(034)		Large interior wall lying between 3 and 6 storey blocks of mill. Constructed from gritstone blocks aligned NW-SE.
(035)		Deposit of dark black brown humic soil indicating former location of a tree bole.
(036)		Exterior wall of mill. Constructed from gritstone blocks, in same alignment as (018), abuts southern end of (027) aligned NE-SW.
(037)		Curved gritstone wall. Dressed blocks with rubble core. Abuts (027) to north and (036) to south, encloses (021) and (022).
(038)		Gritstone wall constructed from dressed blocks c.0.25m x 0.40m laid with white lime mortar. Runs NW-SE between (007) and (005).
(039)		NE-SW gritstone wall measures 0.50m x 3.83m in two stepped sections. Dressed blocks on outer courses, rubble core.
(040)		External flight of 8 stone steps enclosed by (039).
(041)		Single course machine made brick wall, frogged machine made bricks stamped with 'Tymm'. Blocked doorway in (005).
(042)		Sill in (039) approx 1m below ground level. Composed of 2 gritstone slabs.
(043)		L shaped machine made frogged brick wall. Lies against (045) and contains (051).
(044)		L shaped machine made frogged brick wall to south of (043). Contains (045). Stands to a max of 4 courses (0.50m).
(045)		Truncated flagged stone floor within (044). Flags measure c.0.30m – 0.50m
(046)		Single course handmade brick wall blocking an earlier opening in wall (007).
(047)		8 gritstone blocks in southern part of channel enclosed by (007) & (013). Two types -4 large measuring c.1.50m x 1.70m with 4 fixing holes and 2 central T shaped grooves and 4 smaller, measuring c.0.80m x 1.70m with 2 holes and a rectangular recess, similar to the blocks of (009). Northern block measured 1.36m x 1.45m with the same square and rectangular holes plus a large recess 1.00m from western edge measuring 0.25m wide, lying to northeast of centre.
(048)		Rough, compact sandy silt lying against (012) and below (047).
(049)		Small stone capped culvert runs from (012) and below (046). Not excavated.
(050)		3 square stone features measuring 0.65m across with a 0.30m central hole, 2 partially covered by the brick plinths for two of

		(047).
(051)		Handmade brick surface contained by (043). Not excavated.
(052)		Large area of sub-rounded cobbles lying immediately north of (027) and (037). Measures c.10m x 8m. original yard surface.

CONSULTANCY



DESK BASED ASSESMENTS



WATCHING BRIEF & EVALUATION



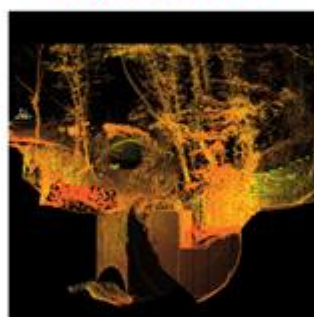
EXCAVATION



BUILDING SURVEY



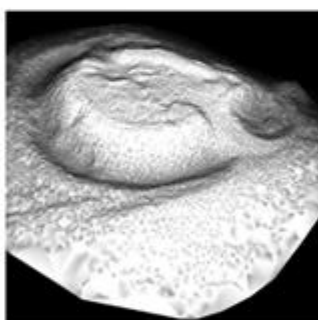
3D LASER SCANNING



COMMUNITY INVOLVEMENT



LANDSCAPE SURVEYS



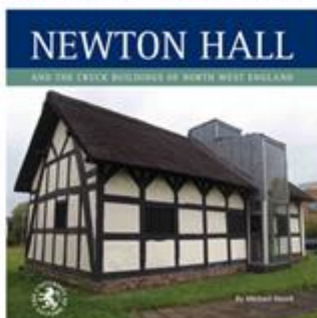
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