



OAKENROD MILL, ROCHDALE

Greater Manchester

Archaeological Evaluation



Oxford Archaeology North

November 2006

Vincentian Homes & Services Ltd

Issue No: 2006-07/601

OA North Job No: L9751

NGR: SD 8874 1306

Document Title: OAKENROD MILL, ROCHDALE, GREATER MANCHESTER

Document Type: Archaeological Evaluation

Client Name: Vincentian Homes & Services Ltd

Issue Number: 2006-07/601

OA Job Number: L9751

National Grid Reference: SD 8874 1306

Prepared by: Chris Wild
Position: Project Officer
Date: November 2006

Checked by: Ian Miller
Position: Project Manager
Date: November 2006
Signed.....

Approved by: Alan Lupton
Position: Operations Manager
Date: November 2006
Signed.....

Oxford Archaeology North

Storey Institute
Meeting House Lane
Lancaster
LA1 1TF
t: (0044) 01524 848666
f: (0044) 01524 848606

© Oxford Archaeological Unit Ltd (2006)

Janus House
Osney Mead
Oxford
OX2 0EA
t: (0044) 01865 263800
f: (0044) 01865 793496

w: www.oxfordarch.co.uk
e: info@oxfordarch.co.uk

Oxford Archaeological Unit Limited is a Registered Charity No: 285627

Disclaimer:

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Oxford Archaeology being obtained. Oxford Archaeology accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person/party using or relying on the document for such other purposes agrees, and will by such use or reliance be taken to confirm their agreement to indemnify Oxford Archaeology for all loss or damage resulting therefrom. Oxford Archaeology accepts no responsibility or liability for this document to any party other than the person/party by whom it was commissioned.

CONTENTS

SUMMARY	3
ACKNOWLEDGEMENTS.....	4
1. INTRODUCTION.....	5
1.1 Circumstances of Project	5
1.2 Site Location and Geology.....	5
2. METHODOLOGY.....	6
2.1 Introduction.....	6
2.2 Evaluation Trenching.....	6
2.3 Finds.....	6
2.4 Archive.....	7
3. BACKGROUND.....	8
3.1 Historical and Archaeological Background	8
4. EVALUATION RESULTS.....	11
4.1 Introduction.....	11
4.2 The Trenches.....	11
4.3 The Finds	17
5. DISCUSSION.....	19
5.1 Introduction.....	19
5.2 Phase 1: Pre-1800	19
5.3 Phase 2: c1833 - 1851	19
5.4 Phase 3: 1851 - 1890.....	21
5.5 Phase 4: 1905 - 1920s	22
5.6 Phase 5: 1920s - Present	22
6. IMPACT OF THE DEVELOPMENT.....	23
6.1 Introduction.....	23
6.2 Impact of Development.....	23
7. RECOMMENDATIONS FOR ARCHAEOLOGICAL MITIGATION	24
8. BIBLIOGRAPHY	25

8.1	Primary and Cartographic Sources	25
8.2	Secondary Sources	25
	APPENDIX 1: PROJECT DESIGN.....	26
	APPENDIX 2: SUMMARY FINDS CATALOGUE.....	33
	ILLUSTRATIONS	35
	Figures.....	35
	Plates	35

SUMMARY

Vincentian Homes & Services Ltd has submitted a proposal to redevelop the site of Oakenrod Mill in Rochdale, Lancashire (centred on SD 8874 1306). The site is of some archaeological significance as it was occupied since the early seventeenth century by a series of textile mills. The first of these was a fulling mill, which was reported to have incorporated in its build a datestone marked '1606' (Fishwick 1889). By the early nineteenth century, a water-powered woollen mill occupied the site (GMSMR 5054), although it is unclear whether this was a newly-built structure, or represented the conversion of the fulling mill. The woollen mill, known as Oakenrod Mill, was seemingly adapted to steam power by the mid-nineteenth century. By the end of the nineteenth century, the mill had been remodelled for use as a cotton waste mill, and an additional factory block had been added to the site. Documentary evidence also suggests that the mill had been powered, at least in part, by a turbine during the nineteenth century.

In order to secure archaeological interests, the Assistant County Archaeologist for Greater Manchester recommended that the site be subject to a programme of evaluation prior to development to establish the presence or absence of buried remains. This programme of work included the excavation of six targeted trenches, of which four were to be placed across the site of Oakenrod Mill and its immediate environs, the remaining two placed across the area to the north-east to establish whether that part of the site had been occupied by the fulling mill.

In September 2006, Oxford Archaeology North (OA North) was commissioned by Mr Martin MacDonald, acting on behalf of Vincentian Homes & Services Ltd, to undertake this work, which commenced immediately. The evaluation demonstrated that significant remains of Oakenrod Mill survived *in situ* across the southern part of the study area. In particular, the remains of the water-power system were represented by two well-preserved head-race tunnels, with an intact waterwheel pit and later turbine pit observed within the basement of the earlier nineteenth-century block of the mill. Five broad archaeological phases of activity were recognised, with well-preserved remains encountered for the three principal constructional phases.

The design proposals for redevelopment have yet to be devised, although it is likely that they will have a significant negative impact upon the sub-surface archaeological resource, given the shallow depth at which buried remains survive. As such, it is anticipated that a further programme of archaeological work will be required to provide a mitigation record in advance of the ultimate loss of buried remains. In particular, the footprint of the original mill block, together with a small element of the mid-nineteenth-century block, are considered to be of high archaeological sensitivity, which may require further detailed investigation. Other parts of the site are considered to be of low archaeological sensitivity, although a watching brief maintained during any earth-moving works may be an appropriate mitigation response.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to express thanks to Martin Macdonald, for commissioning, funding and supporting the project on behalf of Vincentian Homes & Services Ltd. Thanks are also due to Norman Redhead, the Assistant County Archaeologist for Greater Manchester, for his advice and support.

The evaluation was directed by Chris Wild, assisted by Simon Gibson. The report was written by Chris Wild, Rebekah Pressler examined the finds, and the illustrations were prepared by Marie Rowland. The report was edited by Ian Miller, who was also responsible for project management.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 In March 2006, Oxford Archaeology North (OA North) was requested by Mr M Macdonald, acting on behalf of Vincentian Homes and Services Ltd, to submit a costed project design for an archaeological evaluation of land at Oakenrod, Rochdale (centred on SD 8874 1306). The project design was devised to meet the requirements for an archaeological evaluation specified in a project brief prepared by the Assistant County Archaeologist for Greater Manchester. This required a total of six targeted evaluation trenches to be placed across the site, which were intended to establish the presence or absence of any buried archaeological remains, and assess their extent, character and significance. In particular, the evaluation was intended to establish whether an *in situ* buried remains of Oakenrod Mill survived across the site. It was envisaged that the results of the evaluation could determine whether any further archaeological investigation would be required, and inform the final design proposals for the redevelopment of the site.

1.2 SITE LOCATION AND GEOLOGY

1.2.1 The study area (centred on SD 8874 1306) is situated c1km to the south-west of Rochdale town centre, occupying a site on the north bank of the river Roch, a short distance downstream of its confluence with the river Spodden (Fig 1). The site comprises a disused parcel of land that has been largely cleared of buildings, except for a small two-storey structure that lies in the approximate centre; the building is derelict and is to be demolished. Much of the land has been colonised by invasive weeds. *Looking south-west across the site, prior to the evaluation*



1.2.2 The underlying solid geology, as mapped by the Ordnance Survey Geological Survey, consists of the Lower Coal Measures (Westphalian A) of the Carboniferous period.

1.2.3 The study area lies within the Manchester Pennine Fringe, which occupies the transitional zone between the open moorlands of the Southern Pennines and the densely populated urban conurbation of Manchester (Countryside Commission 1998, 121). The topography of the development area is generally level, lying at a height of 114m aOD.

2. METHODOLOGY

2.1 INTRODUCTION

2.1.1 The project design (*Appendix 1*) allowed for the excavation of six trenches across the proposed development site, targeted broadly on the former Oakenrod Mill and the site of an earlier, seventeenth-century, fulling mill (Fig 2). The fieldwork was undertaken during September 2006, and was consistent with the relevant standards and procedures provided by the Institute of Field Archaeologists.

2.2 EVALUATION TRENCHING

2.2.1 The uppermost levels of each trench were excavated by a machine fitted with a toothless ditching bucket. The same machine was then used to define carefully the extent of any surviving walls, foundations and other remains, after which all excavation was undertaken manually. The floor and sides of each trench was cleaned and recorded in an appropriate manner.

2.2.2 All information was recorded stratigraphically with accompanying documentation (plans, sections and both colour slide and black-and-white print photographs, both of individual contexts and overall site shots from standard view points). Photography was undertaken with 35mm cameras on archivable black-and-white print film as well as colour transparency, all frames included a visible, graduated metric scale. Digital photography was also used, primarily for illustrative purposes.

2.2.3 The precise location of the trenches, and the position of all archaeological structures encountered, was surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process generated scaled plans and sections within AutoCAD, which were then subject to manual survey enhancement. The drawings were generated at an accuracy appropriate for 1:20 scale, and all information was tied in to Ordnance Datum.

2.3 FINDS

2.3.1 **Artefacts:** all finds recovered were bagged and recorded by trench or context number, as appropriate, and processed and stored according to current standard practice based on guidelines set by the Institute of Field Archaeologists. The finds have been analysed by an OA North in-house specialist. The finds are discussed in *Section 4.3*, and a summary catalogue is presented in *Appendix 2*.

2.3.2 **Environmental Samples:** no palaeo-environmental samples were taken during the course of the evaluation as none of the deposits encountered were deemed appropriate.

2.4 ARCHIVE

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

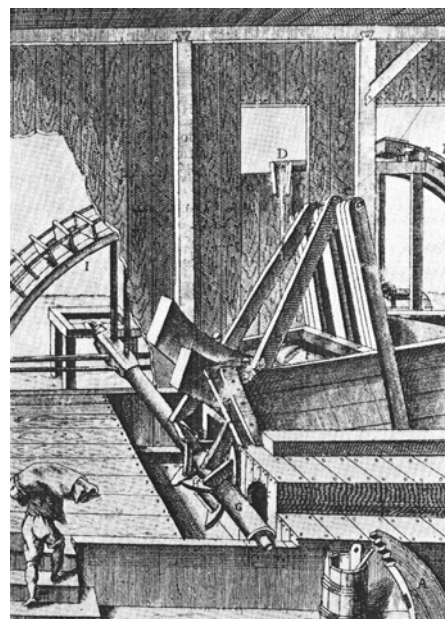
3. BACKGROUND

3.1 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

3.1.1 **Introduction:** a summary historical and archaeological background of the site is presented in order to place the results obtained from the archaeological evaluation into a wider context. However, whilst archaeological remains from earlier periods have been identified in Rochdale, most notably the discovery of a Roman coin hoard within the proposed development area during the nineteenth century (GMSMR 2634), these periods of the town's history are omitted as they are of little direct consequence to the present study area. The historical and archaeological background has been compiled largely from a survey of the ruinous remains of the mill undertaken in 1966 (Marshall 1994, 27-41), combined with the sequence of available historic maps.

3.1.2 **Origins of the Oakenrod Mills:** the earliest reference to a mill on the site appears to be that recorded in a Manor Survey of 1621 (Fishwick 1889), referred to as a mill at Oakenrod 'held of the King by Sir William Radcliffe of Ordsall, who died seised of them and the Manor of Ordsall on 12th October 1567'. Fishwick himself observed that 'on the site of the present Oakenrod Mill stood within a comparatively recent date, an old fulling mill, over the door of which was carved 1606' (*ibid*).

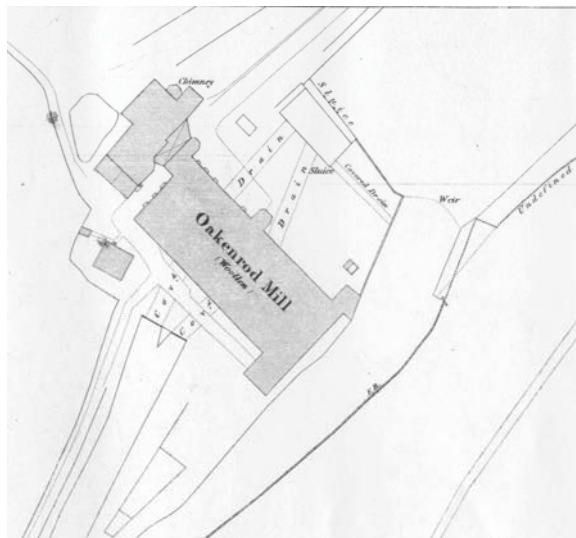
The fulling mill appears to have remained in use during the eighteenth century and, in 1784, was occupied by James Heaward, who occupied several other mills in the area (*ibid*). The fulling of woollen cloth after weaving was the earliest textile process to be mechanised and power driven (Ashmore 1969, 37-8). The fulling process involved beating the woollen cloth in water and treating it with fuller's earth, which cleaned and scoured the cloth and also resulted in thickening and shrinking. Water-powered fulling mills (Plate 1) were active in Burnley, Colne, Manchester and Salford by 1300 (Cossons 1975, 255), and were numerous in all woollen-manufacturing area by the late eighteenth century (Baines 1825).



Interior of a fulling mill (from Zonca 1607)

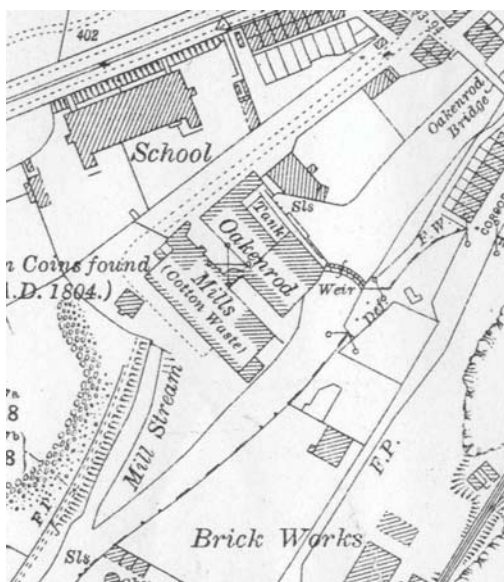
3.1.3 A previous study of Oakenrod Mill (Marshall 1994) refers to correspondence between Peter Ewart, water turbine engineer, and Messrs Boulton and Watt, with reference to the premises of Mr Lodge of Oakenrod, near Rochdale. The letter details elements of the premises, which housed three water wheels, but the description appears to be at odds with both Marshall's own description of the mill, and with the archaeological evidence recovered (*see Section 5*).

3.1.4 Oakenrod Mill is first shown on the Ordnance Survey map of 1851 as a Woollen Mill (Fig 3). Although the map only shows a block plan of the main mill structure, it depicts significant detail of the associated water power system, including the weir, lodge, sluice, and two 'Drains', which presumably formed head-race and tail-race tunnels to two waterwheels within the basement of the mill. The flow of water into the head-race appears to have been regulated by a large rectangular feature. This was connected to the river at a point below the weir by a 'covered drain', which presumably provided an overflow mechanism. To the north-east of the main mill building a further range of structures, which included a chimney, appear to represent a steam-power plant, with a small associated reservoir, presumably for the engine and boilers. The site of these elements of the complex lie beneath an access road, beyond the boundary of the present study area.



Extract from the Ordnance Survey map of 1851

3.1.5 The next available detailed plan of the site is provided by the Ordnance Survey 25":1 mile map, published in 1890 (Fig 4), which shows a much altered complex. The lodge above the weir was partially infilled, with a new structure placed within its infilled western part. A new block was constructed to the north-east of the earlier mill, similar in overall size and alignment, but apparently comprising distinct northern and southern elements. Whilst the water management tunnels are no longer illustrated, the position of the new building evidently respected the rectangular structure, labelled as a 'Tank', which regulated the flow of water into the head-races. Similarly, the sluice and open section of the tail-race, marked 'Mill Stream', suggest the continued use of water power. Moreover, the engine house associated with the earlier mill also appears to have been demolished by that date. These factors suggest that the power for the mill was derived from the turbines by 1890.



Extract from the Ordnance Survey map of 1890

3.1.6 Water turbines became widely available for industrial applications from the mid-nineteenth century, and presented an attractive alternative to waterwheels.

Turbines employed a wheel that was a fraction of the size of an equivalent waterwheel, and rotated faster. This attribute reduced the gearing required to drive high-speed machinery, and increased the efficiency of the power train. Water turbines were also particularly suited to being coupled to a generator to produce electricity, which was beginning to be employed in textile mills by the early twentieth century. Mill owners in Rochdale adopted power extensively during this period in a determined effort to reduce the level of pollution from steam power, as the town was identified in 1915 as having the most polluted atmosphere in Lancashire, and possibly the whole county (Ashworth 1919, 109-19). The precise function of the water turbine at Oakenrod Mill cannot yet be established, although it is unlikely to have been capable of generating more power than a contemporary steam engine. It is perhaps more likely that the turbine was used in conjunction with a steam engine, although the location of the putative steam plant is not evident from the available historic maps.

- 3.1.7 The subsequent Ordnance Survey map, published in 1910, shows little alteration to the site relative to the map of 1890, with the exception of the demolition of the north-eastern structure of the complex, and the insertion of a breakwater above the weir. It seems that the mill ceased production during the 1920s (Marshall 1994, 41), but the component buildings survived largely extant until the 1960s.

4. EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 This section presents the results obtained from the programme of archaeological evaluation of Oakenrod Mill. In total, six evaluation trenches were excavated, with Trenches 3, 4 and 5 expanded to further elucidate significant archaeological features observed within the original trench positions. The locations and detail of the evaluation trenches, superimposed upon extracts from historic mapping, are shown in Figures 2-5.

4.1.2 Natural subsoils were only revealed within the north-eastern part of the site, whilst the remaining areas contained a significant depth of made ground, demonstrating that reductions of ground level had been undertaken historically. However, *in situ* archaeological features survived within these areas, the majority preserved immediately below the present ground surface. The results obtained from the evaluation are presented within each trench, with a discussion of the results for the whole site in *Section 5*.

4.2 THE TRENCHES

4.2.1 **Trench 1:** this north/south-aligned trench (Fig 2) was placed in the north-eastern part of the proposed development area to investigate the suspected site of the earliest fulling mill, and was excavated for a length of 15m and to a maximum depth of 1.5m. A deposit of yellowish-brown, plastic clay, clearly of natural origin, was exposed across the northern part of the trench at a depth of 0.5m below the present ground surface, and was observed throughout a sondage, a further 0.8m in depth, excavated to ensure that the clay did not represent a re-deposited layer within later back-filling.

4.2.2 In the southern 8m of the trench, the natural clay shelved sharply to the south, to a depth of 1.3m below ground level at the southern limit of excavation. This appears to represent a reduction of ground level, rather than a geological tilting of the natural deposit, and may relate to the construction of a large reservoir, or lodge, shown on the first edition 25":1 mile Ordnance Survey map of 1851. This was placed to the north of the extant weir, and provided water to power the nineteenth-century textile mill to the south. The natural clay in this part of the trench was overlain by a deposit of dark brown silty-clay, 0.4m thick, which contained several fragments of brick, pottery and slate, typical of nineteenth- and twentieth-century demolition material. The silty nature of the soil, and the dispersed nature of the demolition fragments, suggests that the feature may represent the northern extent of the mill lodge, with demolition rubbish being thrown into its edge. A sealing deposit, 0.2m thick and composed almost entirely of brick rubble, mortar and associated demolition material, appears to represent a more concerted infilling of the feature, possibly relating to the remodelling of the lodge during the erection of structures to the north of the original nineteenth-century mill. These new structures, and the remodelled lodge, are shown clearly on the Ordnance Survey map of 1890 (Fig 4). The demolition layer was sealed by a 0.15m thick

spread of alluvial gravels, containing rounded pebbles and abraded brick and pottery fragments. This perhaps relates to dredging of the water course to either the south or south-east of the trench. This was in turn overlain by a thin spread (0.1m) of black loose boiler ash, which filled the feature to the level of the natural clay observed in the northern part of the trench.

- 4.2.3 Two features were observed to cut the natural clay subsoil in the northern part of the trench. The southern of these was sub-rectangular in plan, measuring 1.23 x 0.70m, on an approximately east/west alignment. Excavation of the feature revealed it to be only up to 50mm in depth, with vertical sides and an irregular base. This suggests that it simply represented an imprint of a large piece of debris within the natural clay, the object, possibly a flagstone or other architectural fragment, having been removed subsequently. At the northern end of the trench the natural was cut by a brick wall, the majority of which lay on a north-west/south-east alignment, but with a right-angled return to the north-east, within the eastern part of the trench, marking the south-eastern corner of the structure. It was of a single brick in thickness and comprised mould-thrown bricks, typically 9¼ x 4¾ x 2¾" (235 x 111 x 70mm), laid in English Garden Wall bond, bonded in a pale grey lime mortar (Plate 1). The southern side of the wall butted up against the natural clay, with no perceivable cut, suggesting that the wall represented part of a cellar, constructed from the internal side. This was further supported by a deep deposit of dark brown silty-clay backfill to the north of the wall, containing broken brick, mortar, slate, pottery and clay pipe fragments, most probably representing an infilling of the cellar following demolition of the structure. A test pit was excavated to expose 17 courses of the wall, at a maximum depth of 1.35m. Floor levels were not exposed, but further excavation was impractical due to Health and Safety considerations, and the ingress of ground water.
- 4.2.4 A brick and slab surface was revealed above the backfill of the putative lodge in the southern part of the trench. It was aligned on an approximately north-west/south-east orientation, and was 2.15m wide, extending beyond the limit of excavation on either side of the trench (Plate 2). It was of only a single brick/flag thickness, comprising both mould-thrown and machine-made brick (several exhibiting stamps of 'Rochdale Brick Works' within the frog), sandstone flagstone fragments and concrete slabs, suggesting a mid- or late-twentieth-century date. A short row of edge-set brick formed part of its northern boundary, extending beyond the eastern limit of excavation, positioned 70mm higher than the remainder of the surface. It is unclear whether the feature represents a rough surface or an ordered infilling of a depression in the late ground surface, but it appears to be of little archaeological significance.
- 4.2.5 **Trench 2:** as with Trench 1, this trench was also aligned approximately north/south, and measured 15m in length (Fig 2). Natural yellowish plastic clay subsoils, similar to those observed in Trench 1, were only observed *in situ* at the southern end of the trench, at a depth of 1.83m below the present ground level, although their depth was not tested to the same depth as in the previous trench. To the north, the deposit appeared to dip sharply, disappearing below the water table, at a depth of 2.1m, 6m from the southern end of the trench.

Further to the north, the lowest deposit was a gravelly-silt, revealed at a depth of between 2.3 and 2.4m, which seemingly represented a natural silting of the lodge. This was overlain by a 0.2m thick deposit of silty gravel, which contained fragments of brick, coal and pottery, possibly representing rubbish thrown into the lodge. This was sealed by re-deposited pinkish plastic clay, containing broken and whole bricks, pottery and coal fragments. It was 0.5m thick at its junction with the yellowish plastic clay, which it overlay to the south, and dipped slightly from the north, widening to 1.0m in thickness at the northern limit of excavation. This was overlain by a lens of silty-gravel, 0.2m thick at its southern extent, but thinning to the north, containing abraded brick fragments. It was sealed at the southern end of the trench by a thin lens of re-deposited yellowish plastic clay, 0.15m thick, whilst to the north it was overlain by a thin lens of purplish-black fine boiler ash. Both were sealed by a deposit of silty-clay, 0.5m thick and containing brick, pottery and clay tobacco pipe fragments, sloping gently from south to north. In the southern part of the trench this was overlain by a further deposit of what appeared to be alluvial gravels containing abraded brick and pottery. All the tilted deposits were overlain by a horizontal layer of boiler ash, similar to that below, and apparently representing a levelling layer, quite possibly truncating the deposits towards the northern part of the trench. This layer slumped in the southern 5m of the trench, being sealed by 0.3m of brown silty-clay containing demolition material, with reddish boiler ash accumulations towards its base. All deposits were sealed subsequently by a layer of terram matting, presumably of late twentieth-century date, which lay below 0.1m of loose grey aggregate hardcore sealed by the turf.

4.2.6 **Trench 3:** this L-shaped trench comprised an initial 10m long, 2m wide north-east/south-west-aligned element, which was extended subsequently to the south-east in order to investigate significant archaeological deposits (Fig 2). The trench was targeted on a holding tank from the main lodge, shown on the Ordnance Survey plan of 1851 (Fig 3), and marked as a 'Tank' on the Ordnance Survey plans of 1890 and 1910 (Figs 4 and 5). Removal of the turf in the original area of the trench revealed 2.2m of late twentieth-century backfill. This mainly comprised a dark silty-clay, containing broken bricks and general demolition rubble, but also incorporated large quantities of waste relating to the sites final use as a vehicle repair garage. The lowest 0.5m of the deposit comprised almost entirely tyres and wheels, with occasional exhaust and other car parts. The 'Tank' structure itself had a concrete floor, which presumably continued beyond the limit of excavation to the stone-built lodge wall to the north (Fig 4). Along its south-western side it butted a 2' (0.61m) thick sandstone wall forming the northern extent of an extension to Oakenrod Mill, constructed some time between the publication of Ordnance Survey maps in 1851 and 1890. Within the evaluation trench, however, this was concealed in elevation behind a two-brick-thick blocking wall, comprising machine-made engineering bricks laid in English Garden Wall bond, with a bull-nosed return at its northern end (Plate 3). The southern 0.7m of the brick wall was raised 2' (0.61m) higher than that below, to the extant height of the mill wall, and was of single brick thickness, also with a bull-nosed return. Immediately to the north, level with the top of the lower wall, was a

rectangular opening in the stone mill wall. It measured 0.18m wide and 0.27m high, and appears to represent an overflow for the tank (Plate 3).

- 4.2.7 Further excavation to the south-west, within the footprint of the late nineteenth-century mill block, revealed the arched capping of a large tunnel, measuring some 4m wide (Plate 4), marked as a '*Drain*' on the Ordnance Survey map of 1851. This strongly suggests that the brick wall observed on the opposite side of the mill wall represents a blocking of the feature, which formed a head-race to a waterwheel, located within the earlier block of the mill. The crown of the arch, which appeared to be segmental in profile, was formed of edge-set narrow sandstone flags, typically 50mm wide and between 0.15 and 0.45m long, bonded with a pale yellow lime mortar. At its northern end the tunnel was continuous through the north external wall of the later mill, which was constructed over the top of its crown (Plate 5). The trench was extended for a distance of approximately 7.5m to the south-east, to expose the entire width of the tunnel, which was oriented on an approximately north/south alignment (Fig 6). The side wall of the tunnel projected a further 0.45m beyond the arch, and appeared to be of dry-stone construction, with a ragged external face, which thickened up to 0.75m wide in parts of the exposed eastern wall. The feature was sealed with re-deposited mid-orangey-brown, slightly plastic silty-clay, containing fragments of brick, slate and small quantities of pottery. The layer may have been deposited, at least in part, as a levelling associated with the construction of the new mill block before 1890.
- 4.2.8 **Trench 4:** this sub-rectangular trench was targeted on the new mill block, and measured 16.7m in length, by up to 10.1m wide, on an approximately north-west/south-east alignment (Fig 2). Removal of turf and topsoil revealed the floor of the mill, at a depth of between 10mm and 150mm below present ground level. The trench was extended subsequently to locate the western wall of the mill block, which was 0.51m wide and of similar construction to the eastern wall, comprising dressed sandstone facing stones with a rubble core, bonded in pale lime mortar. The majority of the floor was of concrete (Plate 6), which appears to have replaced an earlier flagstone floor, elements of which were observed within the evaluation trench.
- 4.2.9 A series of four large sandstone blocks was exposed at regular intervals along the trench, with a further example protruding through the vegetation to the north of the trench (Fig 6). All differed slightly in size and style, but each represented the sandstone footing for a column supporting the first floor of the mill. These were positioned centrally within the mill, which was 43'6" (13.26m) wide internally, and formed the divisions between each bay. Within the area of the evaluation trench, the bays were uniformly 12' (3.66m) wide (Fig 6). Three of the blocks, which were typically 1m², and projecting 0.1m above the concrete floor, had square scars/stains, demonstrating the position of the bases of the column feet, whilst the southern and central bases had sockets to house the column feet, cut into their surfaces. Both sockets were 1' (0.30m) square, that in the central block being 25mm deep, whilst that in the much larger southern block (measuring 1.21 x 1.83m) was 31mm deep (Plate 7). The central column base block was also butted on its north-east face by a partition wall, of single brick thickness, surviving only to floor level (Plate 6). It was of

mould-thrown brick construction and was butted by the concrete floor, suggesting that it was an original feature, and was also observed in the western part of the mill block. It was not present in the position of the surviving flagstones, possibly indicating the position of a doorway (Fig 6). Several groups of bolts projecting from within the concrete floor were also revealed, most probably representing tying-down bolts for late machinery.

- 4.2.10 **Trench 5:** this trench was targeted on the power system within the north-eastern part of the original mill block, namely the turbine pit shown on a plan of the basement in 1966 (Marshall 1994). The northern part of the trench revealed the north-eastern corner of the basement within the original mill block (Fig 7), confirming that the engine house and associated structures lay further to the north, almost entirely beyond the boundary of the proposed development area. The external wall of the mill was 2' (0.61m) thick and of similar construction to the later mill block exposed in Trench 4. The junction at its north-eastern corner appeared remodelled, and was heavily obscured by mortar, most probably resulting from alterations undertaken during the addition of an engine house to the north. A large dressed sandstone block, greater than 1.15m in length, observed within the wall face of the northern elevation at the western end of the trench, was of 0.4m thickness, with bolts protruding from the upper right and lower left corners of the exposed face (Plate 8); it may have related to power transfer from the structures located to the north, although this could not be confirmed.
- 4.2.11 The basement was well-preserved, with the northern and eastern walls surviving to a height of 2.1m above the damaged sandstone flag floor (Plate 9). Several features were exposed within the evaluation trench, most notably a straight stair at the northern end of the eastern elevation (Plate 10). This comprised nine sandstone steps, which led from the basement floor up to an almost completely destroyed flagstone floor, approximately 0.3m below present ground level. The four steps beyond the external wall of the mill were enclosed by sandstone stair-walls on either side, comprising a single skin of dressed sandstone blocks, typically 0.24m thick. The stair-walls abutted the external face of the mill, but the door aperture appears to be original, suggesting that the stair was also original, and the side-walls were not keyed into the main structure as they had no structural load.
- 4.2.12 To the south-east of the doorway, a 5' (1.53m) wide window with splayed reveals was observed, positioned 5' (1.53m) above the basement floor level (Fig 7). The external sill comprised a flat sandstone block, flush with the wall face, butted on the internal side by a sloping brick sill with bull-nosed internal face (Plate 11). Although this appeared to comprise mould-thrown brick, it most probably represented an early remodelling of the window, as a similarly-sized example in the north elevation, 2.3m from the junction with the east wall, had a flat sandstone internal sill. Another window aperture in the eastern elevation comprised mould-thrown brick walls, butting the external face of the mill, and having what appear to be machine-cut sandstone cappings, 0.75m above an indurated, possibly metalled, base. This was sealed with 0.2m of plastic clay to sill level, below loose ash and rubble backfill.

- 4.2.13 Further to the south-east, a doorway was observed in the eastern elevation. It was of similar width to the window to the north, and had moulded splayed reveals, suggesting that it was original, but it was heavily modified subsequently, most probably in the early twentieth century. The remodelling comprised the addition of internal cheek walls in machine-made brick, one-and-a-half-bricks thick, and extending beyond the limit of excavation to the north-east (Plate 12). This suggests that the feature was possibly turned into an underground passage or, more likely, an additional room was created to the north-east. The *in situ* remains of a sturdy metal door frame (Plate 12) also suggest the presence of a fireproof door following the alterations.
- 4.2.14 A floor level aperture in the northern elevation, approximately 0.3m wide and 0.46m high, with a segmentally arched head (Plate 13) was observed centrally below the window. Given the depth and instability of this part of the trench, it was not possible to examine the feature in detail, and it therefore remains of unclear function, but it possibly relates to a steam pipe from the boilers to the north, used to heat the basement of the mill.
- 4.2.15 In the south-eastern part of the trench, excavation revealed a second head-race tunnel, a waterwheel pit, and the early twentieth-century turbine pit. The head-race tunnel, also marked as a 'Drain' on the Ordnance Survey map of 1851 (Fig 3), appears to be of similar dimensions to that revealed in Trench 3, and a small area of the crown, revealed in plan (Fig 7), appeared to be of similar construction. Unlike in Trench 3, however, the tunnel ended at the internal face of the mill wall (Fig 8), and surviving springing stones for the tunnel in the mill wall (Plate 14) suggest that it originally had a dressed sandstone arch, set slightly higher than the tunnel below (Fig 8). The flagstone floor of the tunnel was observed in part, at its entrance, suggesting that the internal height of the tunnel was approximately 6' (1.83m). The internal walls of the 16'9" (5.11m) wide tunnel, and its crown were of small dressed sandstone blocks, with irregular longitudinal joints (Plate 15) suggesting that the tunnel had been constructed in sections of approximately 10' (3.05m).
- 4.2.16 The tunnel opened onto a 2' (0.61m) wide forebay, comprising large dressed sandstone blocks, which formed the northern edge of the waterwheel pit (Fig 7). Although heavily altered by the insertion of a later turbine, the feature appeared to be largely intact, measuring 17'6" (5.33m) wide and 14' (4.27m) across. The feature was partially excavated to a depth of 2.3m below basement floor level, but only oily, silty fills were encountered, the base most probably lying at a significantly greater depth (15' (4.57m) according to documentary sources (Marshall 1994)). The north-east elevation of the pit was observed to have a slight curve, following the outline of the waterwheel itself, to minimise the loss of water. The south-western elevation of the pit was only partially excavated within the trench, revealing the crown of the arched opening into the tail-race (Fig 8). This was approximately 7' (2.13m) lower than that of the head-race, positioned below the floor of the mill, suggesting that the wheel sat quite low within the pit, and was therefore most probably of high breast-shot type. A 1' (0.30m) wide aperture at the northern end of the wall appears to relate to an overflow for the wheel pit, and its cast-iron lintel and brickwork patching to the south suggest later remodelling. The side walls of the pit were

obscured, for the most part, by the later turbine pit, which presumably masked evidence of the waterwheel's axle mountings. Only the western end of the southern side wall was revealed in plan, and several features were exposed. Three metal fixings were observed (Plate 16), the north-eastern two most probably relating to the fixing for a ladder, a vertical bar of which appeared to remain *in situ* within the pit. A sandstone column base, with circular column foot scar (Plate 16), was revealed partially underlying the south-western section of the trench (Fig 7).

4.2.17 A broken cast-iron vertical pipe, projecting 1.45m above the water level within the pit (Fig 8; Plate 16), represented the remains of a vertical driveshaft from the early twentieth-century turbine to a large horizontal cogwheel, still *in situ* and described by Marshall during his survey of 1966 (*op cit*, 37f). This was the only remnant of machinery relating to either power source exposed during the evaluation, although the inserted turbine pit walls survive almost completely intact. These comprise three-brick thick machine-made brick, in English Garden Wall bond, with black soot and cement mortar. Where visible, the external corners of the pit were observed to be bull-nosed, and the walls were capped with concrete flagstones (Plate 17). The chamber created measured 9'6" (2.90m) by 16'6" (5.03m), and was 7' (2.13m) high.

4.2.18 **Trench 6:** this trench was targeted in the western part of the earlier mill block, and was intended to further examine the interior of the structure and possibly identify its western extent. The trench was shortened to 7.5m in length, in order to respect an existing boundary fence around the western edge of the site. Excavation of the north-east/south-west-aligned trench revealed a further deep deposit of demolition material, very similar in nature to that observed within Trench 5, and almost certainly representing a continuation of the same deposit. Excavation was undertaken to a depth of 2.1m, at which point floor deposits had not been encountered. The western wall of the mill was also not identified, the cartographic evidence suggesting that it lay approximately 5m to the south-west.

4.3 THE FINDS

4.3.1 **Pottery:** in total, 40 sherds of pottery were recovered from Oakenrod Mill, all of which are of a mixed eighteenth- to twentieth-century date, some in a poor, badly abraded condition. There are several transfer printed sherds; one, a lake scene is probably 'Italian Lakes' (*Tr 1 Cellar/1009*) by J & P Bell & Company, and has 'Porcelain Opaque' impressed into the base and probably dates to the mid-nineteenth century. A sherd of willow pattern from the same context is Mason's Patent Ironstone China, and probably dates from 1813-54. Within the Trench 4 assemblage (*Unstratified/1004*) is a small base/body sherd of delft or enamelled earthenware, dating to the late eighteenth century. Large pieces of a porcelain cup and saucer from Trench 1 (*Unstratified/1001*) both probably date from the 1930s - 50s period.

4.3.2 Of the coarser types there are seven sherds of blackware (*Unstratified/1004, 1009*), two sherds of later Midlands-type yellow ware (*Tr 1 Cellar/1009*), a fragment brown lead glazed buff coloured earthenware (*Tr 1*.

Unstratified/1000), all of eighteenth- to nineteenth century-date. Also present in the assemblage were sherds five of salt-glazed stoneware vessels (*Unstratified/1004*), and a large rim sherd of eighteenth- or nineteenth-century Nottingham stoneware (*Unstratified/1008*).

- 4.3.3 **Glass:** the glass is all of a nineteenth- to twentieth-date, the majority of which are bottles within Trench 5 (*Unstratified/ 1012*). A milk bottle with ‘The Cheshire Sterilised Milk Company’ on the front probably dates to 1940s or 50s, and another with ‘Padiham Aerated Water Co Ltd’ probably held ginger beer and dates from the late nineteenth to mid-twentieth century. Otherwise, a twentieth-century decanter top was recovered from Trench 1 (*Unstratified/ 1003*).
- 4.3.4 **Tile:** a single fragment of decorative (kitchen?) transfer printed tile was recovered from an unstratified context. This is rather impressive with neo-classical Greek design. On the base are the letters ‘Elgin. Wedgwood & Co’ which, interestingly, is the mark used at Knottingley Pottery at Ferrybridge, Yorkshire dating the tile to 1798-1801 period.
- 4.3.5 **Clay tobacco pipes:** in total, 13 fragments of clay tobacco pipe were recovered from the evaluation. Two decorated bowls (*Tr 1 Cellar/1010*) and (*Tr 2 Unstratified/1005*) can be dated to the late seventeenth or early eighteenth century.
- 4.3.6 **Metal:** Trench 3 (*Unstratified/1007*) produced a small iron building tool, probably of very recent, either late twentieth- or early twenty-first-century, date.

5. DISCUSSION

5.1 INTRODUCTION

- 5.1.1 The programme of evaluation trenching has revealed that extensive, well-preserved buried remains of archaeological significance survive within the proposed development area. In particular, considerable remains of the water-power system associated with Oakenrod Mill were encountered, providing physical evidence for the chronological development of the mill. Five broad phases of activity were recognised, as outlined below, although it should be noted that this has been based on the physical evidence encountered during the evaluation, which has examined only a small percentage of the whole mill complex, coupled with limited documentary sources, and should therefore be considered as provisional.
- 5.1.2 The physical evidence encountered during the evaluation fieldwork, and the description of the upstanding fabric undertaken prior to the mill's demolition (Marshall 1994), appear very much at odds with a description by Peter Ewart in 1792, ascribed to Oakenrod Mill. Firstly, Marshall describes the mill as being of fireproof brick arch construction, a form first used in the region in the Salford Twist Mill in 1802 (Williams with Farnie 1992, 59) and is not known to have been used in the Rochdale area until several years later. Secondly, Ewart (quoted in Marshall 1994) describes three waterwheels, all of which are of similar diameter, but two of which are very narrow (c0.6m). The cartographic and physical evidence at Oakenrod Mill suggest that the mill was only fitted with two waterwheels, and that both were larger, most especially wider, than those described by Ewart. It is therefore considered likely that the 'premises' described are elsewhere, simply belonging to Mr Lodge of Oakenrod, rather than *at* Oakenrod.

5.2 PHASE 1: PRE-1800

- 5.2.1 Although the documentary sources identified structures within the proposed development area from at least the sixteenth century, no physical evidence for them was encountered during the evaluation trenches. However, almost the entire area enclosed by the trenches had been subject to major changes in ground level from the nineteenth century, and it is considered unlikely that elements of a structure from an earlier period may survive elsewhere within the proposed development area.

5.3 PHASE 2: c1833 - 1851

- 5.3.1 The earliest block of the nineteenth-century Oakenrod Mill was relatively large for its period, measuring approximately 54m in length and 20m in width. The nearby Spotland Bridge New Mill that was erected c1833, for instance, measures only 38m by 18m, and has been described as having 'typical proportions for the early 1830s' (Williams with Farnie 1992, 175). It was of non-fireproof construction, the floors supported by a double row of columns (*ibid*). Oakenrod Mill, however, was of fireproof construction, each brick-arched ceiling supported on three rows of columns. These factors suggest that

it was probably later than that at Spotland, or at the earliest, broadly contemporary, although it was certainly operational by 1851, when it was depicted on the Ordnance Survey map as a woollen mill (Fig 3).

- 5.3.2 The evaluation has revealed that many features associated with this structure are well-preserved, most especially the two head-race tunnels, and the associated northern waterwheel pit. Water-powered mills were generally confined to the rural districts of the county by the mid-nineteenth century, steam having become dominant in Manchester and the surrounding districts by that time. However, the majority of these were relatively small, unlike in other regions (*op cit*, 88), with Oakenrod Mill being more typical in size to a steam-powered structure. Few comparable structures survive within the Manchester region, although a similar example at Crimble Mill, near Heywood, and erected in 1829, was also powered by a pair of wooden waterwheels located centrally in the basement (*ibid*).
- 5.3.3 The position of both head-race tunnels tallies well with the 1851 Ordnance Survey map, suggesting that its accuracy, as a block plan, is high. Although only the northern pit was examined, and only in limited detail, it is probable that both waterwheels were of similar size and style, most probably comprising high breast shot wheels of 14' (4.27m) diameter and 17 or 17'6" (5.18, or 5.33m) width. The internal elevations of the waterwheel pit were partially obscured by the turbine housing (*Phase 4, below*), although the possibility that original features survive in the fabric behind this later insertion cannot be discounted; detailed excavation of the turbine house at Portwood Mills in Stockport revealed that many internal fittings of the waterwheel had been retained when it was converted for use as a turbine house (UMAU 2004, 24).
- 5.3.4 The column base observed next to the wheel pit, within Trench 5, tallies with the alignment shown in Marshall's sketch plan of 1966 (Marshall 1994, 32) and is aligned with a projection at the north-east corner of mill.
- 5.3.5 To the north of the main mill structure, a further range of buildings is depicted on the Ordnance Survey map of 1851. The presence of a chimney at its northern corner suggests that this was the steam-power plant. Evidence of remodelling in the northern part of the basement within Trench 5 might suggest that this represents a later addition to the mill, but features possibly related to power transmission within the north elevation appear contemporary with the original build. The use of two power sources was not uncommon, Crimble Mill, for instance, having an engine added in the 1850s (Williams with Farnie 1992, 88).
- 5.3.6 Evidence for the lodge above the weir was observed within Trenches 1 and 2, with several of the deposits suggesting that dredging was undertaken to maintain the feature. The exact nature and extent of the lodge, however, could not be established within the confines of the evaluation trenches.

5.4 PHASE 3: 1851 - 1890

- 5.4.1 The phase is dated by the editions of the Ordnance Survey mapping, and comprises the construction of the second block of Oakenrod Mill, approximately 7.5m to the north-east (Fig 4). The new block, which was not recorded by Marshall in 1966, appears, from Ordnance Survey mapping, to have comprised two elements; a narrower northern end, c14.5m wide, and a wider southern section, c23m wide. It is noteworthy that the accompanying annotation marks the mills as 'Cotton Waste' rather than the 'Woollen Mill' of the previous edition.
- 5.4.2 Excavation again revealed well-preserved *in situ* archaeological remains pertaining to the new block and, in the absence of available documentary sources for this structure, previously unknown details of the mill interior were recorded. Only the northern part of the structure was observed within Trenches 3 and 4, and this appears to originally have had a flagstone floor, with the ceiling supported by a single row of most probably cylindrical section columns with squared bases. The fact that these were supported on sandstone, rather than cement pads, would suggest an earlier date of construction within the phase, concrete examples having become widespread by the late nineteenth century. This area also did not have a basement, which is hardly surprising given the two large head-race tunnels running below the floor.
- 5.4.3 It is not clear how power was supplied to the new structure. Excavation revealed that the supply to the two waterwheels in the earlier block was maintained, even though the lodge was partially backfilled (as observed in Trenches 1 and 2), and a new sluice and header 'Tank' were created to the south of a further new structure built within part of the former lodge. The new header tank was wide enough to supply a third head-race tunnel, into the northern part of the new structure, beyond Trench 4, but the lack of evidence for a tail-race within either Trenches 4 or 5, suggests that this was highly unlikely. More probably, the northern bay housed an engine at ground floor level, with a rectangular structure extending from the north-eastern corner possibly representing a boiler house. It is noteworthy that the presumed Phase 2 power plant was removed by the production of the 1890 Ordnance Survey map.
- 5.4.4 Trench 1 provided evidence for a structure shown on the Ordnance Survey map of 1890 (Fig 5), towards the northern boundary of the site. Its position would appear to represent a partition between a cellared section of the building and the remainder which was not, although the lack of evidence for a wall continuing to the south-west suggests that the ground level may have been heavily truncated in this part of the site, with all the footings of the building removed subsequently. The late surface also observed within Trench 1 is on a similar alignment to a boundary shown from the south-western corner of this structure to the river, and may well represent a repaired path within the mill complex boundary.

5.5 PHASE 4: 1905 - 1920S

- 5.5.1 This represents the final phase of production at Oakenrod Mill, and commences with the remodelling of the power system in the earlier block of Oakenrod Mill. This comprised the replacement of the two waterwheels with a single 75BHP turbine, supplied by Joesph J Armfield & Co (Marshall 1994, 40f), and was placed within the north-eastern part of the wheel pit of the northern waterwheel. The survey of the ruinous mill suggests that it supplied vertical and horizontal shafting, similar in principal to that used by the waterwheels, and presumably much of the power train system was retained. Evidence within Trench 3 clearly demonstrated that the head-race tunnel to the southern waterwheel was blocked at this time, although the overflow void into the tunnel next to the blocking wall suggests that it remained in use as part of the water-management system.
- 5.5.2 The installation of water turbines at Oakenrod Mill represents an important stage in the development of power systems in textile mills, yet it is a topic that has been little studied and is poorly understood. Indeed, whilst their use at Quarry Bank Mill at Styal in Cheshire is well documented, the only example to have been studied archaeologically in the region is that at the former Portwood Mills in Stockport (UMAU 2004). There, it was postulated that the water turbine had been employed to generate electricity for use in the mill (*op cit*, 70), whilst preliminary findings of the archaeological work at Oakenrod Mill suggest that the turbine had been connected directly to the power shafting.
- 5.5.3 The concrete floors observed with the Phase 3 extension to the mill would appear to relate to the earlier part of this phase, their quality and hardness suggesting that they were not of late-nineteenth century date.
- 5.5.4 The Phase 3 structure to the north of the sluice also appears to have been rebuilt during this phase, as it is not shown on the Ordnance Survey map of 1910, although it was excluded from the present project.

5.6 PHASE 5: 1920S - PRESENT

- 5.6.1 This phase represents the abandonment, collapse and demolition of the structures following closure in the 1920s (*op cit*, 41). Marshall's site plan of 1966 (*op cit*, 30) suggests that the southern part of the site had been demolished by this time, and that those structures still present were highly ruinous. Backfill material was typical for the period, the homogenous nature of the material suggesting that demolition was undertaken rapidly, with a distinct lack of rubbish or vegetation layers within the lowest fills of the basement. Large voids within the demolition material also support the idea of rapid demolition rather than gradual decay and collapse.
- 5.6.2 The structure to the north of the sluice, remodelled during Phase 4, remained in use as an automotive garage until the late twentieth century. Much of Trenches 3 and 4 were filled with associated tyre and car-part debris, suggesting that the deterioration of this part of the site is a relatively recent phenomenon.

6. IMPACT OF THE DEVELOPMENT

6.1 INTRODUCTION

6.1.1 The programme of archaeological evaluation has demonstrated that significant, well-preserved archaeological structures associated with the former Oakenrod Mill survive *in situ*, lying immediately beneath present ground surfaces. The quality and extent of their survival suggest that there is significant potential for additional buried remains to exist beyond the excavated area. In particular, the head-race tunnels, and associated tail-races almost certainly survive elsewhere within the proposed development area, lying almost immediately beneath the modern ground surface. It is also highly likely that the wheel pit associated with the second waterwheel survives intact to the south of Trenches 4 and 5. Whilst that within Trench 5 was heavily remodelled to accommodate a water turbine in the early twentieth century, that to the south is likely to be preserved in its original condition, allowing the potential for much better understanding and analysis of the waterwheel and its associated power transmission system. Many other features relating to the water management system elsewhere within the site, most notably the weir and sluice, survive as above-ground remains. These are currently unrecorded features.

6.1.2 The evaluation has allowed areas of high archaeological potential to be identified (Fig 9). The area within the footprint of the first Oakenrod Mill block in particular is considered to be archaeologically sensitive, especially the remains pertaining to the water- and turbine-power systems. Similarly, any physical evidence for the steam-power system in or beyond the north-western end of the mill block would be of archaeological significance. Elsewhere on the site, the north-eastern part of the later mill block may contain physical evidence for power systems, which would again be of archaeological significance.

6.2 IMPACT OF DEVELOPMENT

6.2.1 Whilst the final design proposal for the site have yet to be finalised, the shallow depth at which archaeological remains were encountered across the site have demonstrated that elements of the *in situ* archaeological remains will almost certainly be destroyed by any form of development; the excavation of bore holes, test pits, service trenches, or piling are likely to have a substantial negative impact upon buried remains of archaeological significance. If preservation *in situ* is proven to be an impractical option for future design proposals, it is envisaged that a programme of archaeological mitigation will be required. This should be targeted upon generating a permanent record of any significant buried remains that would be ultimately damaged or destroyed by redevelopment.

7. RECOMMENDATIONS FOR ARCHAEOLOGICAL MITIGATION

- 7.1 The scope of any programme of archaeological mitigation would be specified by the Assistant County Archaeologist for Greater Manchester, and will be influenced by the detailed design proposals for redevelopment. However, it may be anticipated that several key archaeological issues may necessitate resolution:
- Further detailed recording of the two waterwheel pits to elucidate the nature of the waterwheels employed;
 - Further detailed recording of the water turbine housing;
 - Investigation of the putative steam-power plant in the north-eastern end of the mid-nineteenth-century mill block.
- 7.2 These archaeological priorities could be addressed through further investigation targeted on the footprint of Oakenrod Mill, and the northern part of the mid-nineteenth-century block, which are considered to be areas of high archaeological sensitivity (Fig 9).
- 7.3 The excavation of Trenches 1 and 2 revealed a considerable depth of modern infilling, although only a small percentage of that part of the site was examined. It is possible that buried structural remains pertaining to early phases of the mill may survive beyond the boundary of the putative lodge, although this part of the site is considered to be of low archaeological sensitivity. An appropriate response to any earth-moving works in this part of the site may be the implementation of an archaeological watching brief.
- 7.4 At the time of the evaluation, elements of the site were heavily overgrown with invasive vegetation, obscuring surviving above-ground features associated with the mill. It is therefore recommended that a rapid topographic and fabric survey of the extant above-ground remains of the complex is undertaken, following removal of vegetation from the site. In particular, this should be focussed upon any surviving remains pertaining to the water-management system.

8. BIBLIOGRAPHY

8.1 PRIMARY AND CARTOGRAPHIC SOURCES

Published Maps

Ordnance Survey map 1851 6": 1 mile

Ordnance Survey map 1890 25": 1 mile

8.2 SECONDARY SOURCES

Ashmore, O, 1969 *Industrial Archaeology of Lancashire*, Newton Abbot

Ashworth, JR, 1919 Atmospheric Pollution in Rochdale, *Trans Rochdale Lit Scien Soc*, **14**, 109-19

Baines, E, 1825 *History, Directory and Gazetteer of the County Palatine of Lancaster*, **2**, Liverpool

Cossons, N, 1975 *Industrial Archaeology*, Newton Abbot

Countryside Commission, 1998 *Countryside Character Volume 2: North West*, Cheltenham

English Heritage, 1991 *Management of Archaeological Projects*, 2nd Edn, London

Fishwick, H 1889 *History of the Parish of Rochdale in the County of Lancashire*, Rochdale

Marshall, A 1994 *In the Beginning and Later*, Rochdale

UMAU 2004 *Portwood Mills, Tivot Way, Portwood Stockport: an Archaeological Excavation*, unpubl client rep

Williams, M, and Farnie, DA, 1992 *Cotton Mills in Greater Manchester*, Manchester

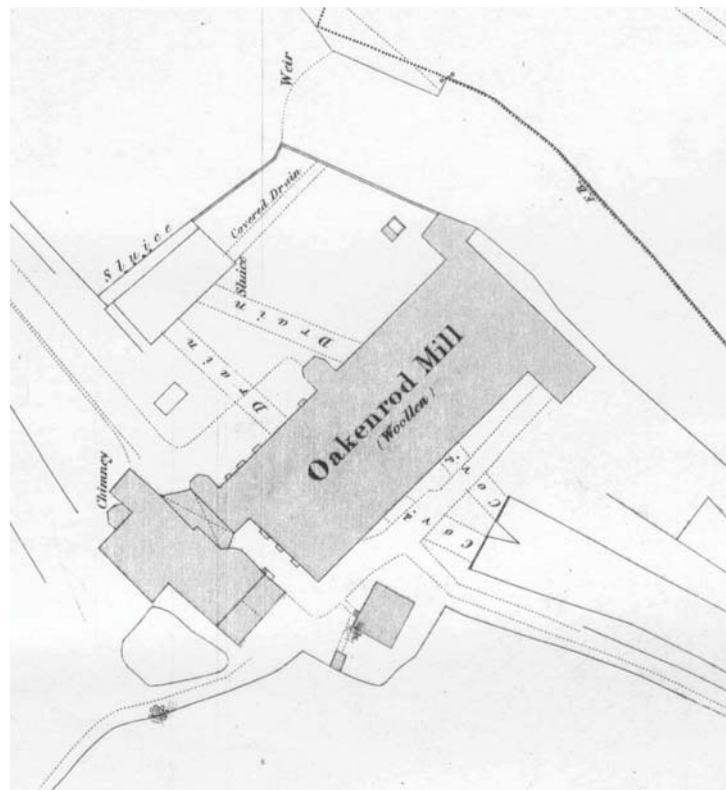
Zonca, V, 1607 *Novo Treatro di Machine ed Edificii per Varie e Sicure Operationi*, Padova

APPENDIX 1: PROJECT DESIGN

March 2006

Oxford
Archaeology
North

LAND AT OAKENROD MILL, ROCHDALE, GREATER MANCHESTER



ARCHAEOLOGICAL EVALUATION PROJECT DESIGN

Proposals

The following project design is offered in response to a request from Mr Martin Macdonald, development consultant, for an archaeological evaluation in advance of the proposed development of land at the former Oakenrod Mill, Rochdale, Greater Manchester.

1 BACKGROUND

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 In March 2006, Oxford Archaeology North (OA North) was requested by Mr M Macdonald, acting on behalf of Vincentian Homes and Services Ltd, to submit a costed project design for an archaeological evaluation of land at Oakenrod, Rochdale (centred on SD 8874 1306). The project design has been devised to meet a project brief prepared by the Assistant County Archaeologist for Greater Manchester, and aims to assess the presence, extent and significance of any buried archaeological remains that may survive within the proposed development area. It is intended that the evaluation will inform a strategy aimed at securing the early release of an archaeological condition to planing consent, and avoid unseen delays and costs that may otherwise occur during the development construction phase.

1.1.2 The proposed development area is thought to contain remains of potential archaeological interest. In particular, a water corn mill, converted subsequently to a woollen fulling mill, is believed to have occupied the site from the sixteenth century. Fulling was the first textile process to be mechanised, and as early as the thirteenth century there were primitive fulling mills in England, all of which were powered by waterwheels. The process of fulling involved pounding newly-woven woollen cloth in an alkaline liquor, which absorbed natural oils and greases added during weaving, and thickened the woollen fabric to give a stronger and denser material.

1.1.3 The study area also contains the remains of a nineteenth-century textile mill, known as Oakenrod Mills. This originated as a water-powered woollen mill, but was converted to a cotton-waste mill during the early part of the twentieth century. A Roman coin hoard was also reported in the nineteenth century to have been found within the study area. However, no other remains of a Roman date are known in the vicinity, suggesting that this was an isolated, chance find.

1.2 OXFORD ARCHAEOLOGY

1.2.1 Oxford Archaeology has over 30 years of experience in professional archaeology, and can provide a professional and cost effective service. We are the largest employer of archaeologists in the country (we currently have more than 200 members of staff) and can thus deploy considerable resources with extensive experience to deal with any archaeological obligations you or your clients may have. We have offices in Lancaster and Oxford, trading as Oxford Archaeology North (OA North), and Oxford Archaeology (OA) respectively, enabling us to provide a truly nationwide service. Watching briefs, evaluations and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA is an Institute of Field Archaeologists Registered Organisation (No 17), and is thus bound by the IFA's Code of Conduct and required to apply the IFA's quality standards.

- 1.2.2 The project will be co-ordinated from our northern office in Lancaster, though the project team will use the most appropriate resources from both offices. Between our two offices our company has unrivalled experience of working on post-medieval sites, and is recognised as one of the leading archaeological units in the country with regard to dealing with industrial archaeological projects.
- 1.2.3 OA North has considerable experience of the assessment, evaluation and excavation of sites of all periods, and has particular experience of industrial archaeology in the North West having undertaken in recent years excavation, survey, building recording and post-excavation projects in both urban and rural environments; *inter alia* (locally to Manchester) the survey, excavation, recording, analysis, consolidation, publication and consultancy relating to the 'Hotties' continuous glass tank furnace at St Helens, the excavation of the former Calprina Works in Stalybridge, the excavation and survey of the Macintosh Mill in Manchester, a continuing programme of archaeological investigation at the Kingsway Industrial Park in Rochdale, and the archaeological work associated with the New Islington development, within the Ancoats area of Manchester.

2 AIMS AND OBJECTIVES

2.1 ACADEMIC AIMS

- 2.1.1 The main research aim of the investigation will be to characterise the level of preservation and significance of the archaeological remains relating to the former mill sites.

2.2 OBJECTIVES

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

- to determine the presence or absence of buried remains pertaining to the earliest mill site, including external walls and any surviving internal features;
- to determine the presence or absence of buried remains pertaining to the sluice and headrace of the early mill, and any other surviving water-management features;
- to the presence or absence of buried remains pertaining to the nineteenth-century mill, including its external walls and any surviving internal features;
- to the presence or absence of buried remains pertaining to the turbine pit, and associated water-management features;
- to facilitate the implementation of a strategy that will take account of the archaeological resource of the site in the final design proposals, and satisfy the requirements of the curatorial archaeologist.

3 METHOD STATEMENT

3.1.1 The following work programme is submitted in line with the aims and objectives summarised above.

3.2 FIELDWORK

3.2.2 The site will be investigated initially via six trenches, placed in the positions specified in the project brief (Fig 1). The trenches will have a combined total length of 105m, and all will have a minimum width of 1.6m, although may be stepped out for Health and Safety reasons if deep stratigraphy is encountered.

3.2.3 Trenches 1 and 2, each 15m in length, will be placed across the northern part of the study area, and will investigate the presence or absence of remains of the earliest mill. Trench 3 will be placed within the centre of the study area, across the projected site of the mill sluice and headrace. Trench 4 will be excavated for a distance of 20m, and will aim to establish the presence or absence of buried remains pertaining to the nineteenth-century mill. Trench 5 will be placed across the western corner of the study area, and will investigate the remains of the turbine pit associated with the nineteenth-century mill. Trench 6 will be excavated for a distance of 25m, and will aim to investigate the buried remains of the mill block.

3.2.4 Excavation of the uppermost levels of modern overburden/demolition material will be undertaken by a machine fitted with a toothless ditching bucket to the top of the first significant archaeological level. The work will be supervised by a suitably experienced archaeologist. Spoil from the excavation will be stored adjacent to the trench, and will be backfilled upon completion of the archaeological works.

3.2.5 Machine excavation will then be used to define carefully the extent of any surviving foundations, floors, and other remains. Thereafter, structural remains will be cleaned manually to define their extent, nature, form and, where possible, date.

3.2.6 All information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage, with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features.

3.2.7 Results of the evaluation will be recorded on *pro-forma* context sheets. The site archive will include both a photographic record and accurate large-scale plans and sections at an appropriate scale (1:50 and 1:20). All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration.

3.2.8 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the evaluation will be generated. Photography will

be undertaken using 35mm cameras on archivable black and white print film as well as colour transparency, and all frames will include a visible, graduated metric scale. Extensive use of digital photography will also be undertaken throughout the course of the fieldwork for presentation purposes. Photographs records will be maintained on special photographic *pro-forma* sheets.

- 3.2.9 The precise location of the evaluation trenches, and the position of all archaeological structures encountered, will be surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process will generate scaled plans within AutoCAD software, which will then be subject to manual survey enhancement. For the recording of detail from inaccessible locations or in areas where the safety of staff may be compromised by working, for instance, on an unstable wall face, a reflectorless EDM will be used. This generates a laser beam and is able to extract a distance measurement by reflection from wall surfaces. All information will be tied in to Ordnance Datum.
- 3.2.10 **Finds policy:** finds recovery and sampling programmes will be in accordance with best practice (following current Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC).

3.3 ARCHIVE PREPARATION AND REPORT PRODUCTION

- 3.3.1 **Archive:** the results of the fieldwork will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects, 2nd edition, 1991*) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct.
- 3.3.2 The paper and finds archive for the archaeological work undertaken at the site will be deposited with the nearest museum which meets Museums' and Galleries' Commission criteria for the long term storage of archaeological material (MGC 1992). This archive will be provided in the English Heritage Centre for Archaeology format, both as a printed document and on computer disks as ASCII files (as appropriate).
- 3.3.3 Except for items subject to the Treasure Act, all artefacts found during the course of the project will be donated to the receiving museum.
- 3.3.4 A synthesis (in the form of the index to the archive and a copy of the publication report) will be deposited with the Greater Manchester Sites and Monuments Record. A copy of the index to the archive will also be available for deposition in the National Archaeological Record in London.

- 3.3.5 **Report:** four copies of a bound and collated final report will be submitted to the Client within six weeks of the completion of the fieldwork. At the Client's discretion, further copies will be sent to the Assistant County Archaeologist, the Greater Manchester Sites and Monuments Record, and Rochdale Museum. The final report will include a copy of this project design, and indications of any agreed departure from that design. It will include an historical and archaeological background to the study area, an outline methodology of the investigation, and present, summarise, assess, and interpret the results of the programme of archaeological works detailed above. In addition, recommendations for any further mitigation works and details of the final deposition of the project archive will also be made.
- 3.3.6 **Confidentiality:** the final report is designed as a document for the specific use of the Client, and should be treated as such; it is not suitable for publication as an academic report, or otherwise, without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project brief and project design, or for any other explicit purpose, can be fulfilled, but will require separate discussion and funding.

3.4 OTHER MATTERS

- 3.4.1 **Health and Safety:** OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy; further details are presented in *Appendix 1*. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties. OA North uses a CAT-Scan device prior to any excavation to test for services as a matter of course, and will pay particular attention to the service information supplied by the Client. All OA North staff will be equipped with hard hats, safety boots, and high-visibility jackets.
- 3.4.2 Given the past use of the site, the presence of some contaminated soils should not be discounted. However, it is not envisaged that this cannot be mitigated by mitigated by appropriate measures taken during the course of the evaluation. All OA North staff will be equipped with the appropriate PPE, and welfare facilities will be provided.
- 3.4.3 **Contingencies:** the costings attached towards the rear of this document has not allowed for either the installation of secure fencing, nor the use of a mechanical breaker to remove hard-standing surface. It is anticipated that the site will be securely fenced from the public prior to the commencement of any archaeological works. OA North can supply and erect appropriate fencing if required, although this will be subject to additional costing.
- 3.4.4 **Insurance:** the insurance in respect of claims for personal injury to or the death of any person under a contract of service with the unit and arising out of an in the course of such person's employment shall comply with the employers' liability (Compulsory Insurance) Act 1969 and any statutory

orders made there under. For all other claims to cover the liability of OA North, in respect of personal injury or damage to property by negligence of OA North or any of its employees, there applies the insurance cover of £2m for any one occurrence or series of occurrences arising out of one event.

- 3.4.5 **Monitoring:** it is recommended that the Assistant County Archaeologist and other interested parties are invited to view the archaeological evaluation during the course of the fieldwork. Any such meeting can be arranged by OA North.

4 WORK TIMETABLE

- 4.1 A two week period should be allowed to excavate, record and backfill the evaluation trenches.
- 4.2 A report will be submitted within six weeks of the completion of the fieldwork.
- 4.3 OA North can execute projects at very short notice once an agreement has been signed with the Client.

5 STAFFING PROPOSALS

- 5.1 The project will be under the overall charge of **Ian Miller BA** (OA North Project Manager) to whom all correspondence should be addressed. Ian has considerable experience and particular research interests in Industrial Archaeology and, amongst numerous other projects, was involved in the excavation recording, analysis and publication of the Netherhall blast furnace site in Maryport, Cumbria, the excavation, recording and publication of work at Carlton Bank alum works in North Yorkshire, and the excavation of Macintosh Mill in Manchester. He is currently managing the major programme of conservation-based archaeological investigation at Murrays' Mills in Ancoats, and the on-going scheme of works associated with the Kingsway Business Park development in Rochdale.
- 5.2 The evaluation is likely to be undertaken by **Sean McPhillips BA** (OA North Project Supervisor). Sean is an highly experienced field archaeologist, who has a particular interest in Industrial Archaeology, and especially that of the Manchester region. Sean recently directed the archaeological investigation of a complex of textile mills at the Torrs in New Mills, and a programme of archaeological evaluation of the textile mills in Ancoats associated with the Millennium Village project. Sean also played a key role in the recent excavations at Calprina Works, Stalybridge, and Macintosh Mill, Manchester. Sean will be assisted an appropriate number of field technicians.
- 5.3 Assessment of any finds from the excavation will be undertaken by OA North's in-house finds specialist **Christine Howard-Davis BA** (OA North Finds Manager). Christine has extensive knowledge of all finds of all periods from archaeological sites in northern England, and is a recognised expert in the analysis of glasswork.

APPENDIX 2: SUMMARY FINDS CATALOGUE

OR No	Context No/ Trench No	Description	Material	Date	Quantity
1000	U/S Tr1	Transfer printed pearlware	Pottery	C19th	2
1000	U/S Tr1	Green-glazed white earthenware	Pottery	C20th	1
1000	U/S Tr1	Brown lead-glazed earthenware	Pottery	C18th	1
1001	U/S Tr1	Transfer printed tile	Ceramic	C1798-1910	1
1002	U/S Tr1	Clay tobacco pipes	Ceramic	C18-19th	2
1003	U/S Tr1	Decanter top	Glass	C20th	1
1004	U/S Tr2	Blackware pancheon fragments	Pottery	C18th-19th	4
1004	U/S Tr2	Salt-glazed stoneware:- pancheon and bottle fragments	Pottery	C19th	4
1004	U/S Tr2	Nottingham stoneware	Pottery	C18th-19th	1
1004	U/S Tr2	Orange-glazed red earthenware	Pottery	C18th -19th	1
1004	U/S Tr2	Pearlware	Pottery	C19th-20th	3
1004	U/S Tr2	Enamelled earthenware/delft	Pottery	C18th	1
1004	U/S Tr2	Lead-glazed buff coloured earthenware	Pottery	C18th	1
1004	U/S Tr2	Striped transfer printed pearlware	Pottery	Late C19th	2
1004	U/S Tr2	Pearlware with inlaid chequered design	Pottery	Late C19th	1
1004	U/S Tr2	Transfer printed pearlware	Pottery	C19th	2
1004	U/S Tr2	Transfer printed pearlware - willow pattern	Pottery	C19th	1
1004	U/S Tr2	Transfer printed pearlware - floral design	Pottery	C19th	1
1005	U/S Tr2	Clay tobacco pipes	Ceramic	C17th-19th	6
1006	U/S Tr2	Glass bottle fragment	Glass	C19th/20th	1
1007	U/S Tr3	Modern building tool	Iron	C20th	1
1008	U/S Tr3	Nottingham stoneware	Pottery	C18th-19th	1
1008	U/S Tr3	Transfer printed pearlware	Pottery	C19th	1
1009	Cellar Tr1	Midlands yellow ware (later)	Pottery	C18th	2
1009	Cellar Tr1	Brown lead-glazed buff coloured earthen ware	Pottery	C18th	1
1009	Cellar Tr1	Midlands Blackware	Pottery	C18th-19th	3
1009	Cellar Tr1	Transfer printed pearlware - 'Italian Lakes'?	Pottery	Mid C19th	1
1009	Cellar Tr1	Transfer printed pearlware - Mason's	Pottery	Early - mid	1

		patent ironstone		C19th	
1009	Cellar Tr1	Transfer printed pearlware - chinoiserie	Pottery	Early - mid C19th	1
1009	Cellar Tr1	Transfer printed pearlware - unidentifiable	Pottery	C19th	1
1010	Cellar Tr1	Clay tobacco pipes	Ceramic	C18th-19th	6
1011	U/S Tr5	Porcelain cup and saucer (cup with geometric/flowery decoration)	Pottery	C1930s-50s	2
1012	U/S Tr5	Two beer/ale-type bottles	Glass	19th-20th	2
1012	U/S Tr5	Milk bottle with 'The Cheshire Sterilised Milk Company' on the front	Glass	1950s	1
1012	U/S Tr5	Bottle with 'Padiham Aerated Water Co Ltd'	Glass	C19th?	1
1012	U/S Tr5	Various bottles	Glass	C20th	4

ILLUSTRATIONS

Figures

- Figure 1: Site location
- Figure 2: Trench location plan, superimposed upon Ordnance Survey map of 1890
- Figure 3: Extract from Ordnance Survey First Edition map, 1851
- Figure 4: Extract from Ordnance Survey map, 1890
- Figure 5: Extract from Ordnance Survey map, 1910
- Figure 6: Plan of Trenches 3 and 4
- Figure 7: Plan of Trench 5
- Figure 8: Elevations of the head-race tunnel in Trench 5
- Figure 9: Areas of archaeological potential, superimposed upon the Ordnance Survey map of 1890

Plates

- Plate 1: Remains of brick structure at northern end of Trench 1
- Plate 2: Rough floor / yard surface, Trench 1
- Plate 3: Brick stopping of southern head-race tunnel
- Plate 4: Crown of southern head-race tunnel
- Plate 5: Relationship between head-race tunnel and later mill wall
- Plate 6: General view, Trenches 3 and 4, from north-west
- Plate 7: Detail of southern column base, Trench 4
- Plate 8: Detail of large sandstone block in north elevation, Trench 5
- Plate 9: Well-preserved remains of basement, Trench 5
- Plate 10: Stair from basement, Trench 5
- Plate 11: Window in north-east elevation, Trench 5
- Plate 12: Doorway in north-east elevation, Trench 5
- Plate 13: Floor-level aperture, north elevation, Trench 5
- Plate 14: Dressed sandstone springer for head-race tunnel arch
- Plate 15: Internal detail of northern head-race tunnel, Trench 5
- Plate 16: Detail of features associated with wheel pit, Trench 5
- Plate 17: General view, Trench 5, showing turbine pit walls at rear



Figure 1: Site Location

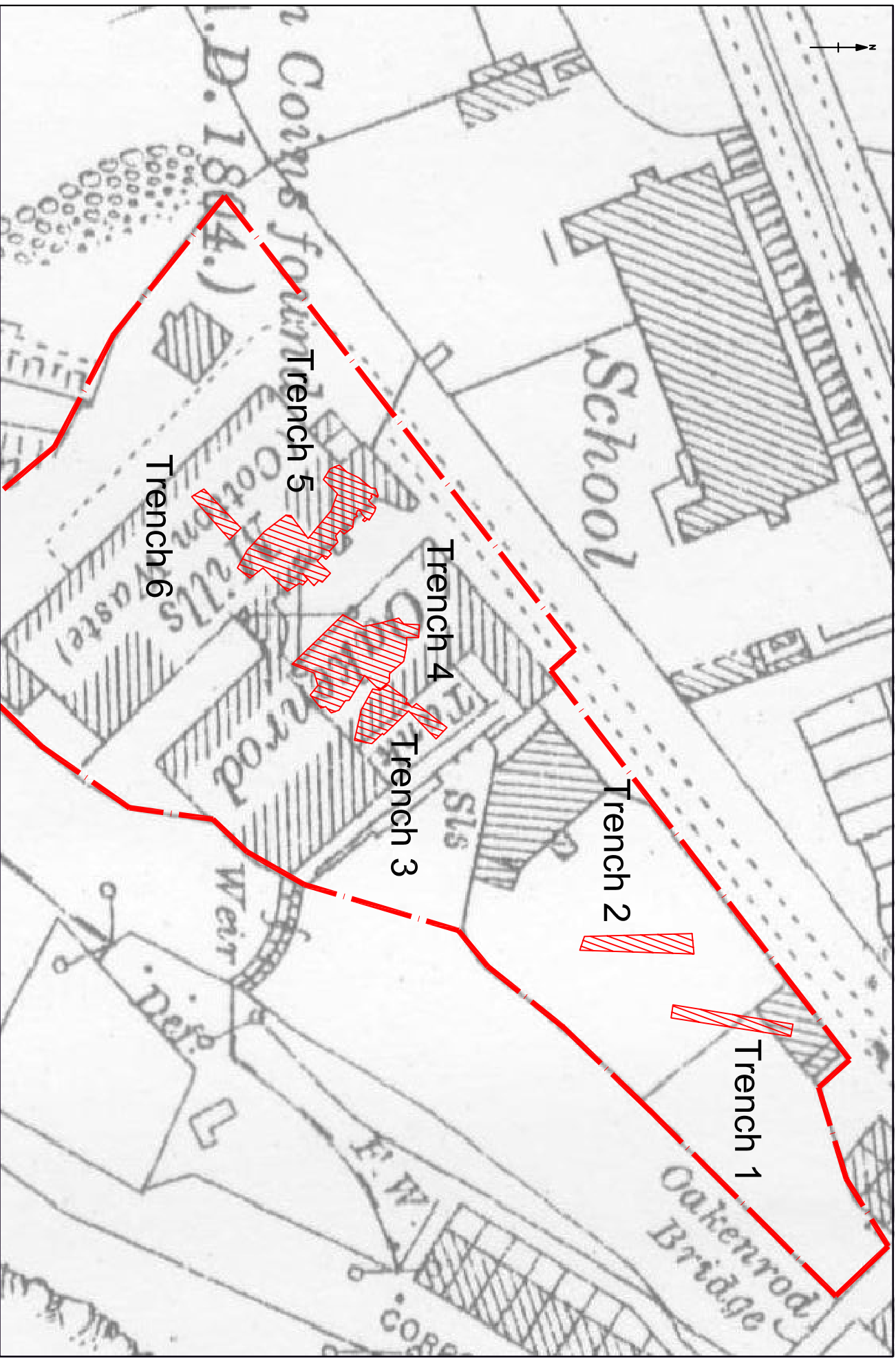


Figure 2: Evaluation trench location overlain onto 1890 OS map



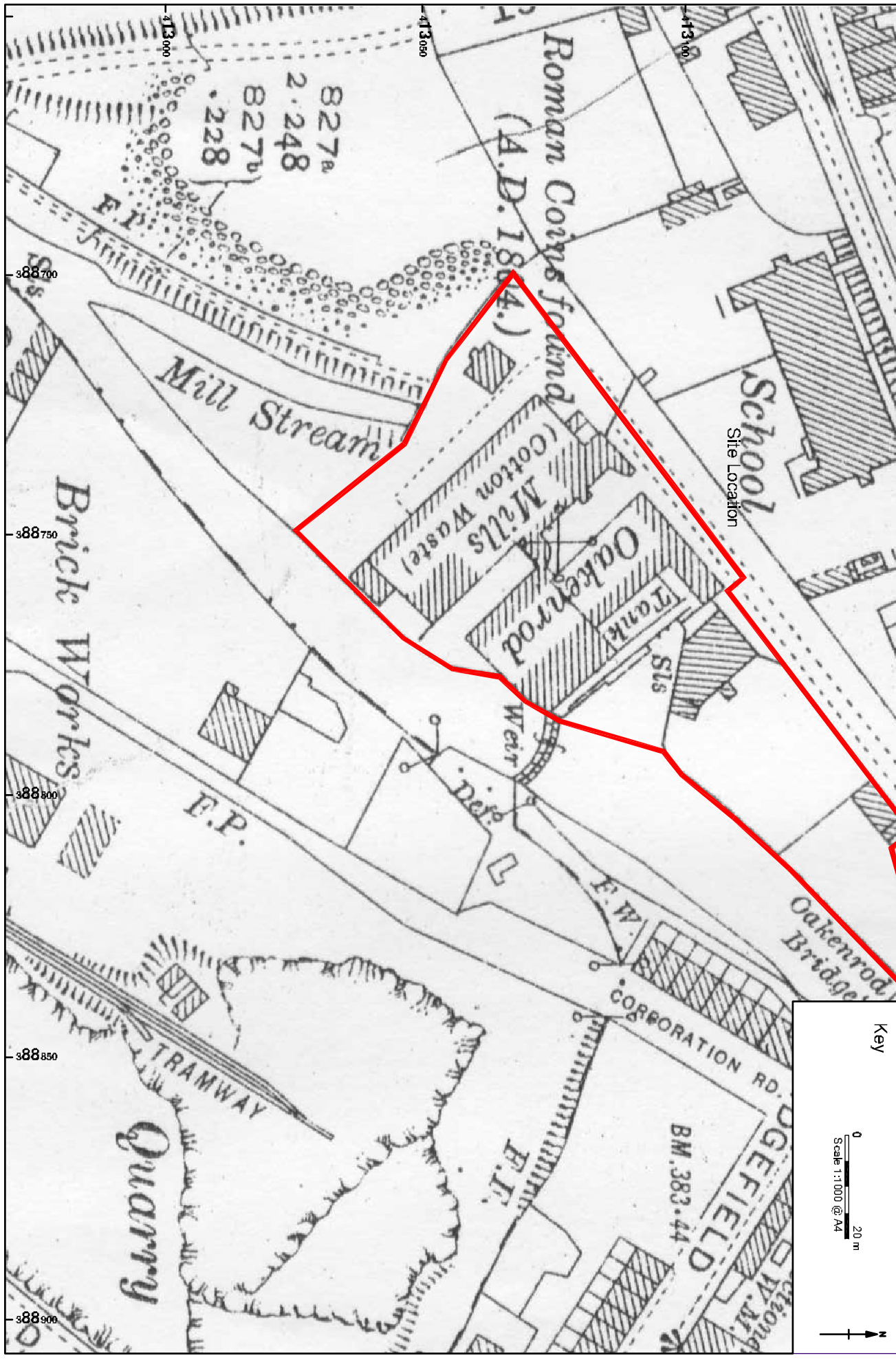


Figure 3: Extract from First Edition Ordnance Survey map, 1851



Figure 4: Extract from Ordnance Survey map, 1890

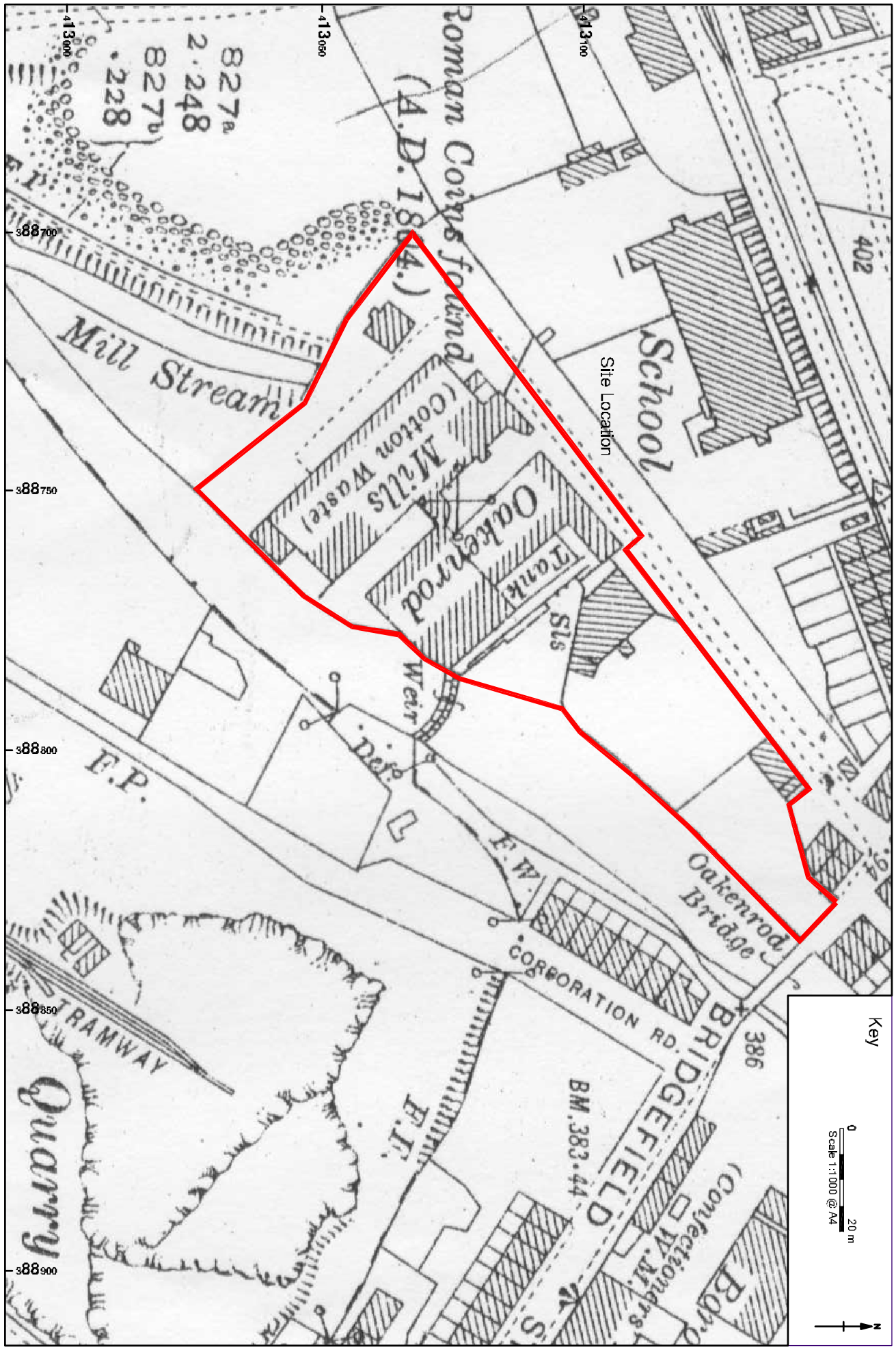


Figure 5: Extract from Ordnance Survey map, 1910

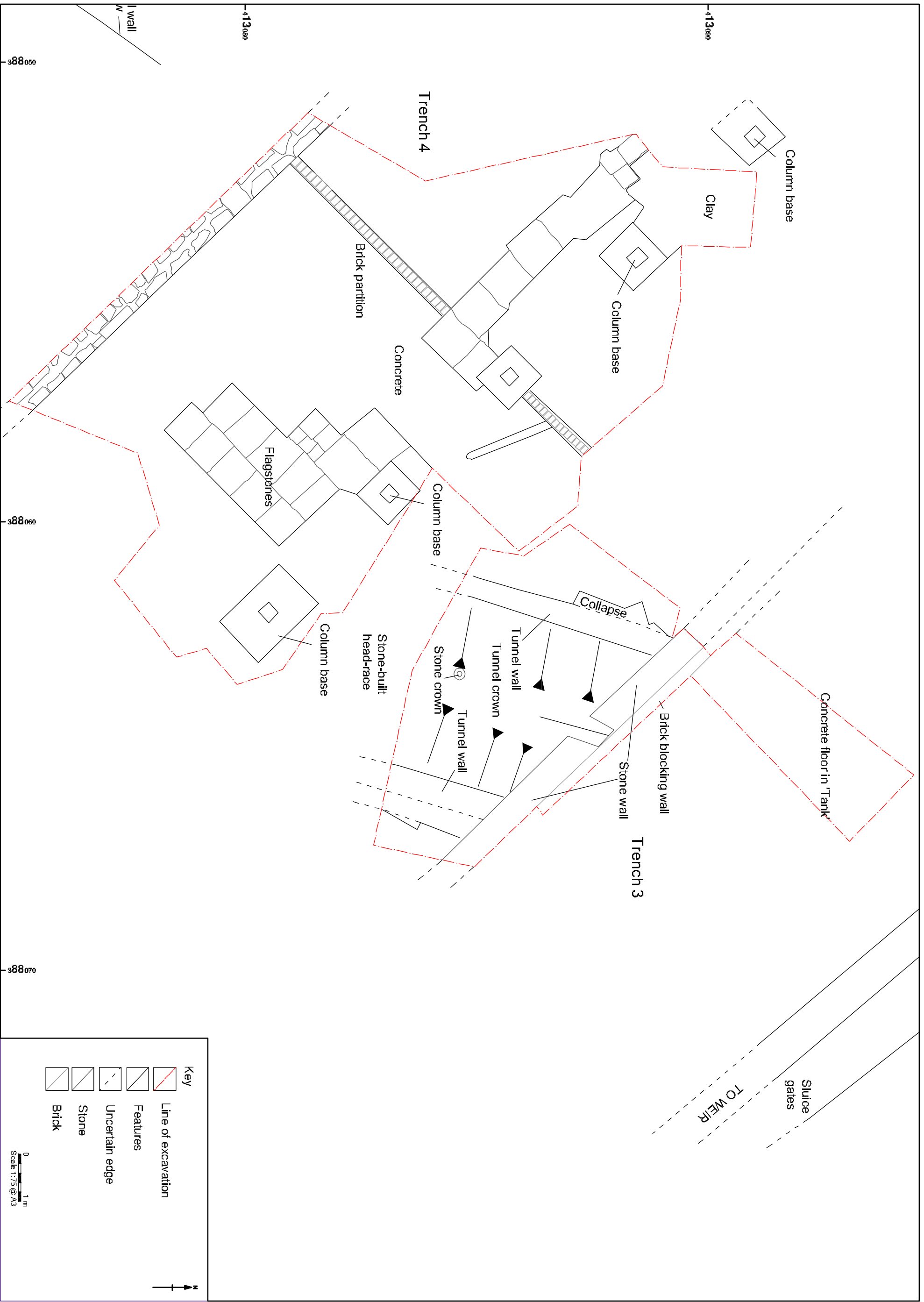


Figure 6: Plan of Trenches 3 and 4



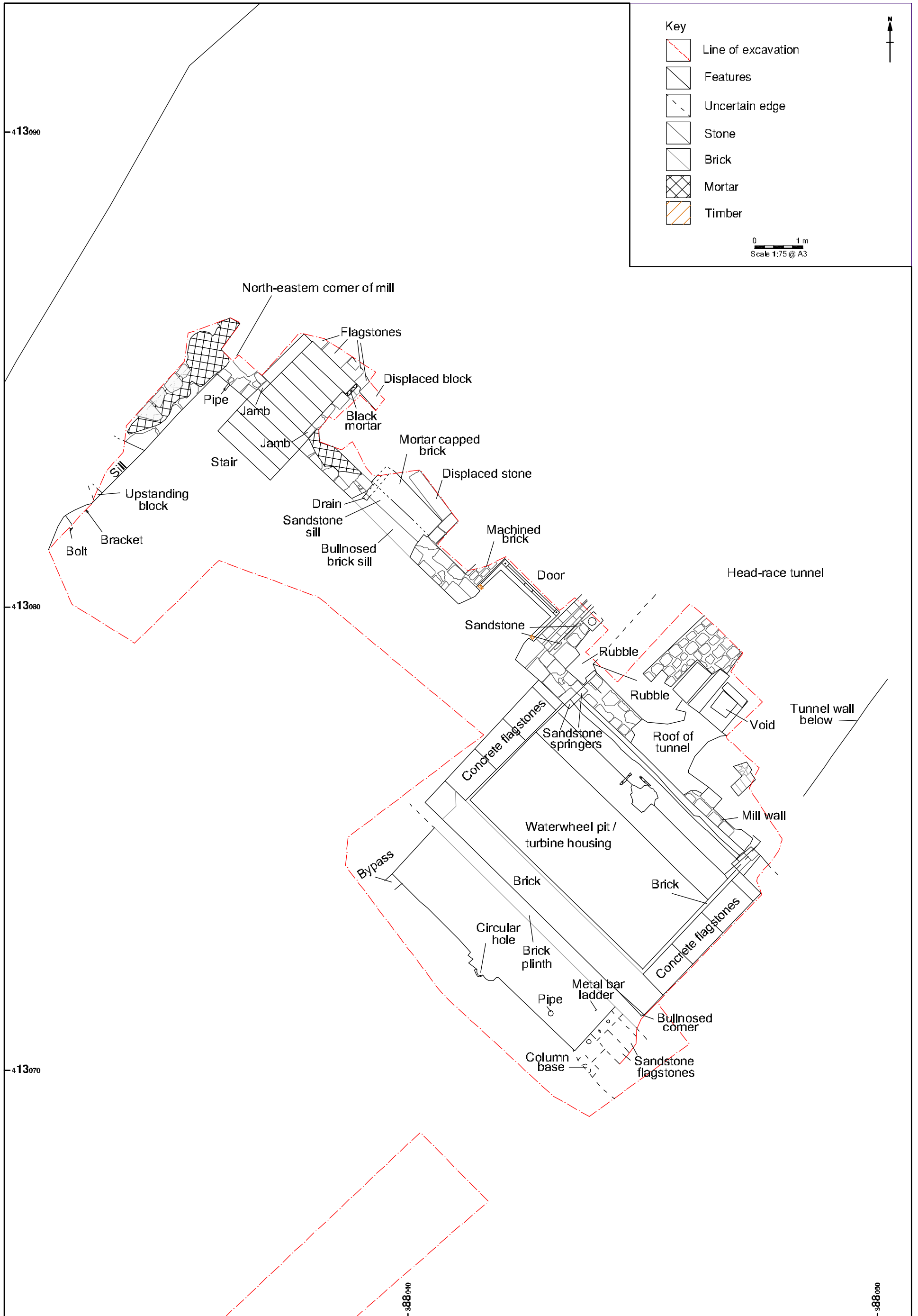
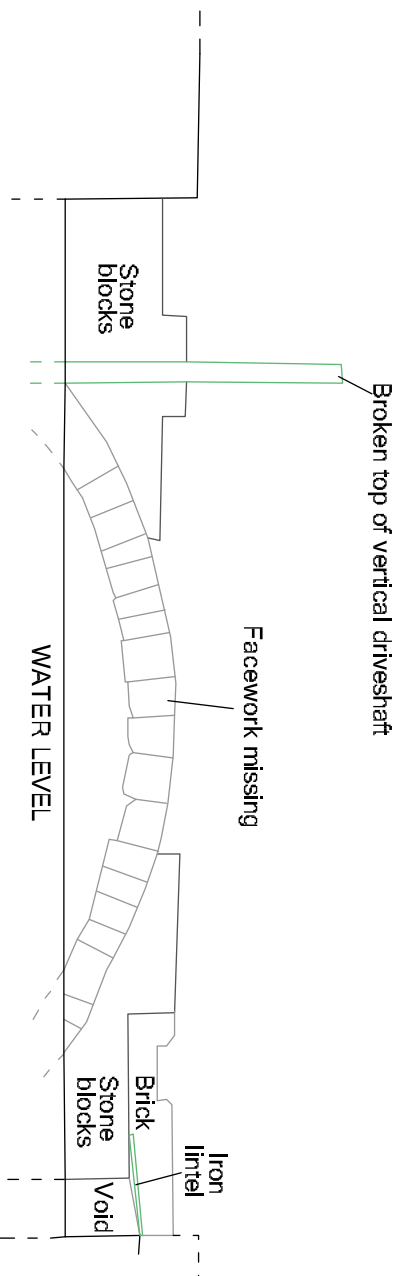








Figure 7: Plan of Trench 5





Key

-  Features
-  Uncertain edge
-  Stone
-  Brick
-  Iron

0  1 m
Scale 1:40 @ A4

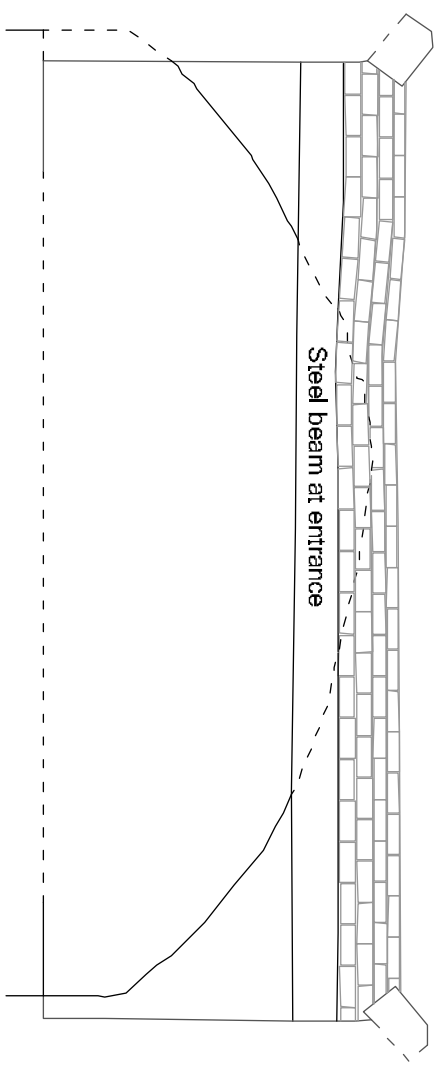


Figure 8: Elevations of the head-race tunnel in Trench 5

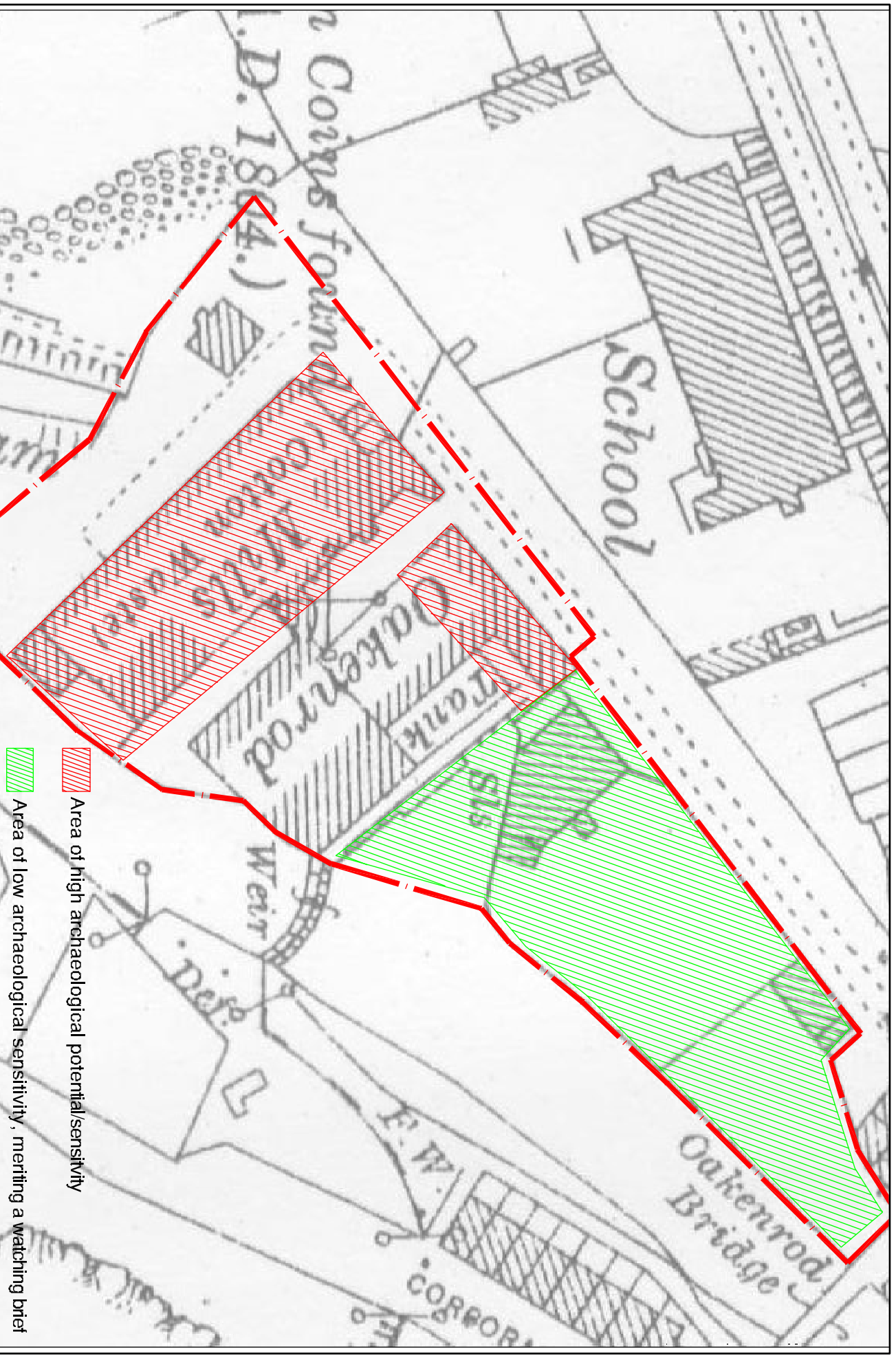


Figure 9: Areas of archaeological potential, superimposed upon the Ordnance Survey map of 1890

1:750

0 15 m



Plate 1: Remains of brick structure at northern end of Trench 1



Plate 2: Rough floor / yard surface, Trench 1



Plate 3: Brick stopping of southern head-race tunnel



Plate 4: Crown of southern head-race tunnel



Plate 5: Relationship between head-race tunnel and later mill wall



Plate 6: General view, Trenches 3 and 4, from north-west



Plate 7: Detail of southern column base, Trench 4



Plate 8: Detail of large sandstone block in north elevation, Trench 5



Plate 9: Well-preserved remains of basement, Trench 5



Plate 10: Stair from basement, Trench 5



Plate 11: Window in north-east elevation, Trench 5



Plate 12: Doorway in north-east elevation, Trench 5



Plate 13: Floor-level aperture, north elevation, Trench 5



Plate 14: Dressed sandstone springer for head-race tunnel arch



Plate 15: Internal detail of northern head-race tunnel, Trench 5



Plate 16: Detail of features associated with wheel pit, Trench 5



Plate 17: General view, Trench 5, showing turbine pit walls at rear