



Former W H Shaw Pallet Works

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Former W H Shaw Pallet Works

Archaeological Watching Brief and Strip, Map and Record Report

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Summary

In June 2019, Oldham Borough Council (OC) granted planning permission for the demolition of the unlisted buildings and structures at the former W H Shaw Pallets Works, Huddersfield Road, Diggle (NGR SE 00155 07284), ahead of the construction of a new High School on the site. An historical assessment of the site had demonstrated the potential for the remains of an eighteenth-century fulling mill, known as Wrigley Mill, to be exposed at the northern end of the area. In addition, to the south it was anticipated that the remnants of the mid-nineteenth-century Dobcross Loom Works might be preserved beneath the existing concrete surface. A condition of the planning permission therefore stipulated a requirement to undertake archaeological monitoring of the site during the clearance works to ensure an appropriate record was made of any archaeological remains exposed. Oxford Archaeology (OA) North was commissioned to undertake this monitoring, as well as to conduct limited targeted strip, map, and record investigations of key elements, which was completed over a period of six weeks from the beginning of April 2020.

The resulting fieldwork exposed the fragmentary remains of Wrigley Mill in the anticipated location, including the near-complete footprint of its south-eastern wing, its intact waterwheel pit and elements of the building's south-western wing, but the remainder of the building had been lost. To the south, almost nothing was identified of the earliest site of the Dobcross Loom Works, but in the area of its later nineteenth-century expansion, the foundation of an engine house was exposed, which was of the dimensions to accommodate a steam engine likely to date to an early phase, perhaps during the third quarter of the eighteenth century.

To the south of this engine house, the fragmentary remains of a possible boiler house were identified in the area previously occupied by the main chimney of the works. These elements, however, appeared to date to the turn of the twentieth century.

Acknowledgements

Oxford Archaeology (OA) North would like to thank The Jessop Consultancy for commissioning the project on behalf of WRT Developments, as well as Interserve Construction Ltd for funding advanced elements of the project, including the reporting. Thanks are also extended to D Hughes Demolition for their assistance during both elements of fieldwork, and especially to Oliver Jessop, who provided consultancy on behalf of the client, and Norman Redhead (GMAAS), who monitored the work on behalf of Oldham Borough Council.

The project was managed for OA North by Adam Tinsley and Paul Dunn. The fieldwork was directed by Aidan Parker, who was supported by James Hodgson and Anne Templeton. Thanks are also extended to Rachel Newman for editing this report, and Karen Barker for preparing the archive.

1 INTRODUCTION

1.1 Scope of work

- 1.1.1 In June 2019, Oldham Borough Council (OBC) granted planning permission for the demolition of the unlisted buildings and structures at the former W H Shaw Pallet Works, Huddersfield Road, Diggle, and the subsequent construction of a new High School on the site. An historical assessment of the area (WYG 2015), prepared as part of the application, identified the potential to encounter historic remains associated with both the eighteenth-century Wrigley Mill, towards the northern extent of the site and sub-surface elements belonging to the mid-nineteenth-century Dobcross Loom Works to the south. In the light of these potential remains, a condition (no 10, planning ref: 337301/15) was placed on the granting of planning permission:

‘to ensure that any archaeological remains present are investigated and a proper understanding of their nature, date, extent and significance gained, before those remains are damaged or destroyed and that knowledge gained is then disseminated’.

- 1.1.2 In compliance with this condition, Oxford Archaeology (OA) North was commissioned by The Jessop Consultancy on behalf of WRT Developments to conduct a watching brief, following which Interserve Construction, advised by The Jessop Consultancy, engaged OA North to conduct a strip, map, and record exercise to complete a programme of archaeological works on the site to an agreed Written Scheme of Investigation (The Jessop Consultancy 2020). The initial works comprised monitoring the removal of concrete slab from across the site, to identify any evidence for archaeological remains beneath. The secondary stage of strip, map, and record was then agreed with the Greater Manchester Archaeological Advisory Service (GMAAS), to investigate areas of potential in more detail. The fieldwork commenced on 2nd April 2020, with work continuing for a period of six weeks thereafter, during which the watching brief continued and areas of interest were subject to more detailed strip, map, and record. A final visit was made to the site on 21st July 2020 to monitor the drainage of the wheel pit at the northern end of the site, and the demolition of the retaining wall in this area.
- 1.1.3 The following report documents the results of the programme of archaeological works and discusses them in their historical and archaeological context.

1.2 Location, topography and geology

- 1.2.1 The site lies 0.5km to the south of Diggle, a village within the parish of Saddleworth in the Metropolitan Borough of Oldham, and on the south-eastern edge of the Greater Manchester conurbation (Fig 1). It occupies a position on the eastern slope of the meandering line of the Diggle Brook (NGR SE 00155 07284), a tributary of the river Tame, which descends from the Pennine moorland to the east and forms the western boundary of the site (Fig 2). The eastern boundary is defined by the line of the Huddersfield Canal, which follows the contour of the slope above, while to the north, a public footpath divides the land from the amenity parkland beyond, with an area of

agricultural land to the south. The site is at a height of 185m aOD, sloping gradually from north to south.

- 1.2.2 The underlying geology comprises mudstones and siltstones of the Hebden Formation, a sedimentary bedrock formed during the Carboniferous Period approximately 322 million years ago in a local environment previously dominated by swamps, estuaries and deltas. These formations are overlain by sedimentary deposits of Devensian Till, detritus laid down in glacial conditions up to two million years ago (BGS 2020). The local soils are slowly permeable, seasonally wet, acid, loamy and clayey, with impeded drainage resulting in low fertility, best suited to grass production for livestock and limited cereal production (Farewell *et al* 2011).

1.3 Archaeological and historical background

- 1.3.1 The relevant archaeological and historical background of the site was compiled in a desk-based assessment (DBA) of the site (WYG 2015). The following section largely represents a summary of this material.
- 1.3.2 A fulling mill appears to have stood on the site since at least 1766, when it is mentioned in the local Quarter Sessions records, and a John Wrigley appears to have bequeathed the mill to his sons James and Jonathan ten years later (SHSB 1983, 42). The DBA identified a fulling mill, as depicted on Jeffreys map of 1771, in the approximate position of the present site, which is reportedly also seen in more detail in a vestry map of 1822, where it is shown as two structures with a mill pond to the north fed from the Diggle Brook (WYG 2015, 16). The first edition Ordnance Survey (OS) 6" map (1854; Fig 3) depicts the mill as two main structures, both aligned broadly north-west/south-east, with a leat branching off the Diggle Brook to the north, and intersecting the northernmost building. This is identified as Wrigley Mill (Woollen) on the 1894 OS map (Fig 4).
- 1.3.3 In 1853, the mill and the surrounding land were advertised for sale, being described as 'newly constructed and strongly built', with reference to a waterwheel, gearing and machinery, reservoirs, weirs and goits. The wheel was reportedly 33ft in diameter, 5ft wide (c 10 x 1.5m) and free of backwater (Manchester Times, 24th September, 1853, quoted in SHSB 2015). This last reference might imply that the wheel was a pitch back or undershot, which turned in the opposite direction to the flow of water. As such, a wheel in poor condition might create undesired backwater, or water thrown back by turning.
- 1.3.4 A photograph, purportedly to be of the Mill and dated to 1863, shows two adjoining rectangular buildings on a linear plan (SHSB 2015, 91; Plate 1). Both buildings are of two storeys, the left-hand one featuring chimney stacks at each end, and the lower floor of the right-hand building apparently terraced into the slope. To the rear a circular chimney can be seen, while in the foreground is a small rectangular detached outbuilding, perpendicular to the main range and featuring a single pitched roof. The mill reportedly provided room for the growing congregation of the village's early Methodist church (*ibid*), and the photograph is labelled 'Wrigley Mill. Old School. Founded by Matthew Bailey. A.D. 1864'.



Plate 1: Nineteenth-century photograph of Wrigley Mill, possibly facing south (Saddleworth Museum Archive M/PDg/9; from SHSB 2015)

- 1.3.5 In 1867, Wrigley Mill was operated by Benjamin Sykes and his son John, producing flannel from raw wool to a finished product, and providing employment for 26 people. Its waterwheel was reportedly supplemented by a small steam engine (SHSB 2015, 90).
- 1.3.6 In 1861, Hutchinson and Hollingworth opened the Dobcross Loom Works on land to the south of Wrigley Mill, for the manufacture of a new form of dropbox loom to supply the woollen and worsted weaving industries. By 1874, it provided employment for over 200 men and the success of the business led to the expansion of the factory, with the addition of new buildings to the north, and it had also acquired the rights to manufacture the American Knowles woollen loom (WYG 2015, 17).
- 1.3.7 The 1894 OS map shows this extension as a large rectangular building, to the north of the original works and immediately adjacent to the Huddersfield Narrow Canal on its eastern side (Fig 4). While no contemporary detailed plan survives of the site, other contemporary establishments would suggest that the Dobcross Works would have included provision for a foundry, cutting and grinding rooms, assembly sheds (Plate 2) and perhaps display rooms. The works would certainly have required power, which would presumably have been provided by one or more steam engines.

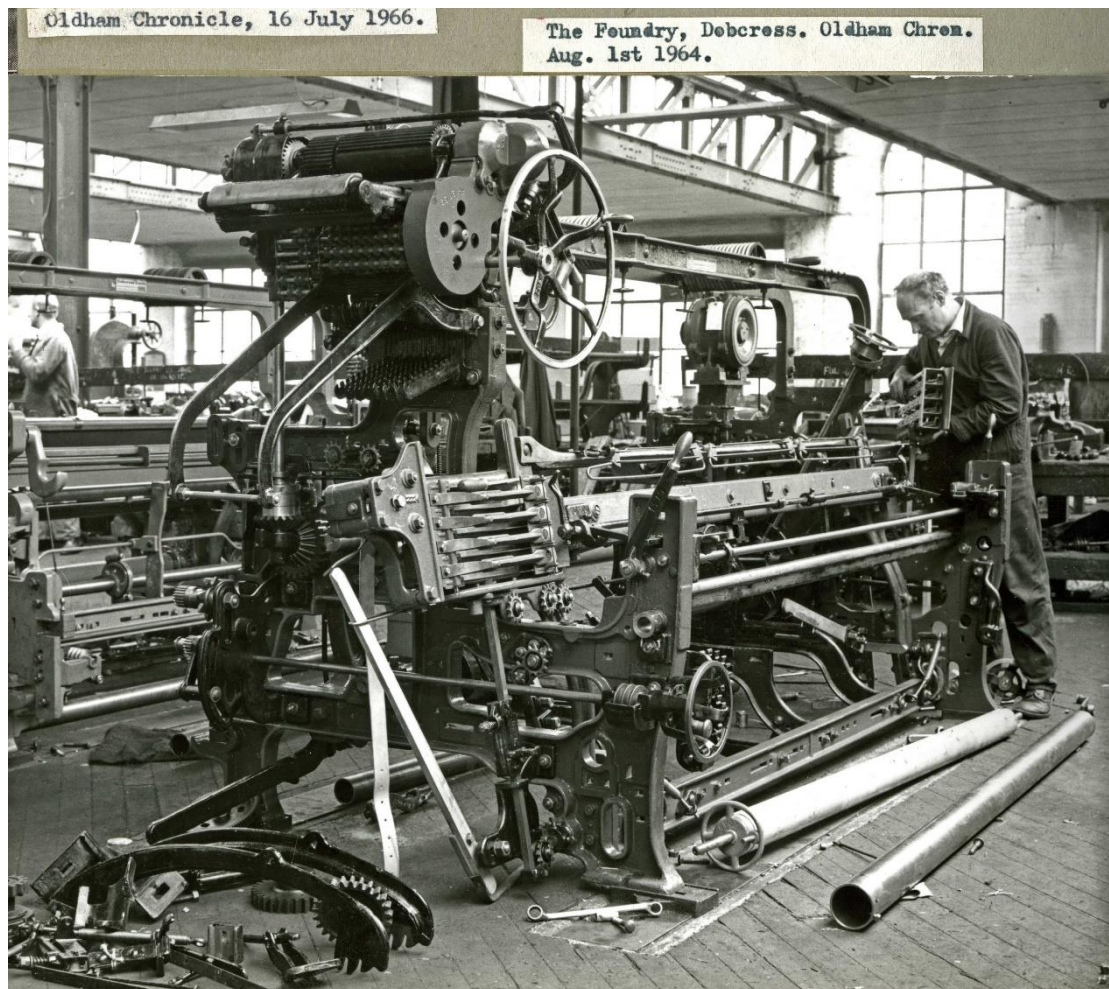


Plate 2: Interior of the Dobcross Works assembly rooms c 1964
Oldham Chronicle 16 July 1966
(<https://www.saddleworth-historical-society.org.uk/archives/>)

- 1.3.8 By 1904, Wrigley Mill had fallen out of use and around 1910 it seems to have been demolished to make way for a substantial extension of the Dobcross Loom Works (Mounteer 2015, 6). During the First World War, the works produced munitions for the war effort and parts of the building seem to have suffered serious fire damage during the following decade, with extensive rebuilding on a similar plan (*ibid*; Plate 3). During the Second World War, the factory was once again pressed into service to manufacture parts for Russian submarines, but following increasing competition from overseas markets in the post-war years, and the decline of the nation's textile industry from the second quarter of the twentieth century, the Works went into liquidation in 1969 (WYG 2015, 17).



*Plate 3: Dobcross Loom Works in 1926, following reconstruction after a significant fire
(Britain from Above.org.uk)*

- 1.3.9 In 1979, the vacant site was bought by W H Shaw and converted to use as a pallet works. It continued as such until 2006, when this enterprise also closed and the site once again became redundant.

2 OBJECTIVES AND METHODOLOGY

2.1 Objectives

2.1.1 The project objectives were as follows:

- to identify and record any archaeological deposits, structures or built fabric within the identified areas of interest;
- to determine the extent, condition, character, significance and date of any encountered or exposed archaeological remains;
- to record accurately the location and stratigraphy of areas excavated;
- to recover artefacts;
- to prepare a comprehensive record and report of archaeological observations during the site work; and
- to place the results of the work within their context and contribute towards answering the research questions identified in the WSI (The Jessop Consultancy 2020).

2.2 Methodology

2.2.1 A three-stage strategy was designed to achieve these objectives: watching brief on site clearance; strip, map and record areas of potential; and the production of a report following the completion of the fieldwork.

2.2.2 **Stage 1: watching brief:** following the demolition of the standing buildings, the concrete slab that covered the site was broken up with a hydraulic pecker and removed using a 49-ton tracked excavator under the careful supervision of an experienced archaeologist. Overburden was then removed across the site to a depth of up to 300mm, or to the level of the uppermost archaeological deposits.

2.2.3 The exposed surface was then cleaned by hand sufficiently to allow the location and character of any archaeological features to be recorded. All features were accurately mapped with a Leica 1200 survey grade GPS using RTK corrections, to provide sub-centimetre accuracy ($\pm 0.03\text{cm}$) and the results were tied into the national grid.

2.2.4 **Stage 2: Strip, map, and record:** following consultation with GMAAS and the client's archaeological consultant (TJC Heritage Ltd), a targeted excavation strategy was devised, focusing upon those areas in which significant archaeological deposits had been encountered (Fig 2). These principally comprised the site of the eighteenth-century Wrigley Mill in the northern part of the site, the site of the mid-nineteenth-century engine house belonging to the Dobcross Loom Works, uncovered near the eastern boundary, and the possible remnants of its boiler house, to the south of the engine house.

2.2.5 All features were excavated and cleaned by hand, with the exception of bulk deposits of limited archaeological interest. Where welfare considerations precluded this method, these were removed under constant archaeological observation.

- 2.2.6 A daily record of the nature, extent, and depths of groundworks was maintained throughout the duration of the project. All archaeological contexts were recorded on OA North's pro-forma sheets, using a system based on that of the English Heritage (now Historic England) former Centre for Archaeology, and in adherence to agreed current professional standards and best practice, using a system of context recording (ClfA 2014a; 2014b).
- 2.2.7 A full photographic record was completed using a Canon Powershot sx540 digital camera, capable of producing 21.1mp images, and a combination of detailed and general shots were produced using appropriately graduated scales. A photographic archive was created simultaneously, noting the detail of each photograph.
- 2.2.8 **Stage 3: Reporting:** a report setting out the results of the fieldwork has been prepared in accordance with the guidance produced by the ClfA (2014b) and the approved WSI (The Jessop Consultancy 2020). Details of the site were submitted online to OASIS (Online Access to the Index of Archaeological Investigations) on the inception of the project, and a copy of the final report will be uploaded on completion.
- 2.2.9 A full professional archive has been compiled in accordance with current ClfA (2014c) and Historic England guidelines (Historic England 2015), and in accordance with the *Guidelines for the Preparation of Excavation Archives for Long-Term Storage* (UKIC 1990). The paper and digital archive will be deposited with Saddleworth Museum on completion of the project.

3 RESULTS

3.1 Introduction and presentation of results

- 3.1.1 The results of the watching brief and strip, map, and record exercise are presented below, and comprise a stratigraphic description of the areas that contained archaeological remains. The full details of all areas, with the dimensions and depths of all deposits, can be found in *Appendix A*.

3.2 General soils and ground conditions

- 3.2.1 The remaining buildings of Dobcross Mill had been levelled prior to the archaeological programme, leaving extensive areas of demolition rubble across the site. A concrete slab covered most of the area, the removal of which exposed a mixed sand and rubble deposit of variable character, which had been used to level the area prior to the pouring of the slab. It was evident that substantial elements of the site had been disturbed or destroyed by later activity associated with the construction of the W H Shaw Pallet Works.
- 3.2.2 Natural sands and gravels were identified at a height of 1.81m aOD in the area surrounding Wrigley Mill. These were not exposed across the remainder of the site.
- 3.2.3 Ground conditions throughout the archaeological work were generally good, and the site remained relatively dry throughout. Archaeological features, where present, were generally easy to identify, following clearance of the demolition rubble and the upper elements of the levelling material.

3.3 Watching Brief

- 3.3.1 The watching brief phase identified three principal areas in which significant sub-surface deposits survived. Area 1 was towards the centre and east of the site, where the base of an engine house was exposed in plan, extending from the eastern retaining wall (Plate 4). Area 2 occupied a position to the south of this, exposing a series of brick surfaces, flues and associated walls in close proximity to the former site of the chimney (Plate 5). Area 3 was at the northern end of the site, where a subterranean chamber was exposed, in association with the fragmentary remains of several sandstone walls in the location of the former Wrigley Woollen Mill (Plate 6). The removal of the slab from across the southern end of the site failed to reveal any substantial evidence for the original Dobcross Loom Works, which mainly comprised cellar walls, however, these will not be discussed further as they were described in the building survey report (Munteer 2015).



Plate 4: Removal of the concrete slab from above Area 1, exposing mixed rubble levelling adjacent to the retaining wall, facing south-east



Plate 5: Area 2, during removal of the overburden, exposing brick structures, facing west (1m scale)



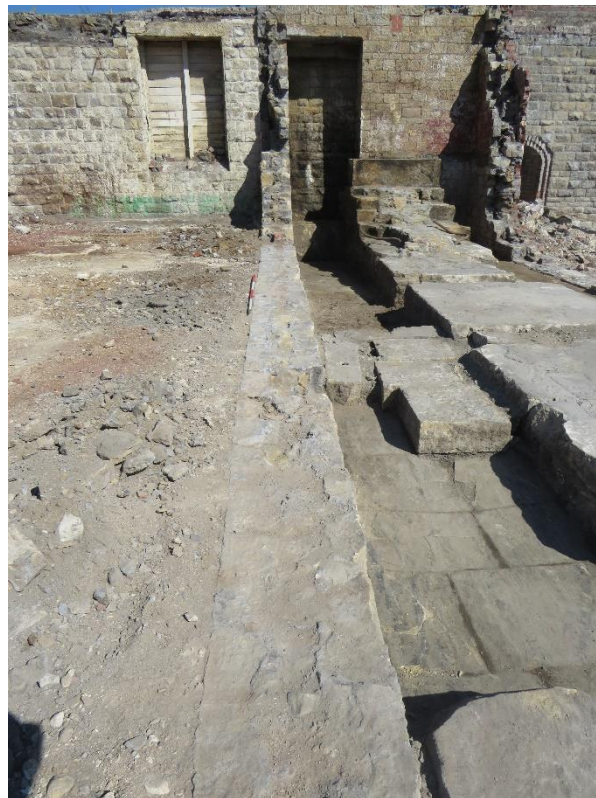
Plate 6: Area 3 during removal of the concrete slab, facing south-east, with voids appearing in the centre ground, denoting the position of the subterranean chamber

3.4 Strip, Map and Record

- 3.4.1 **Area 1: Engine House:** the removal of the concrete slab and 300mm of rubble overburden revealed a pair of substantial parallel sandstone walls in Area 1, defining a narrow, elongated structure with an internal width of 4.3m (Plate 7). The northern wall (**100**; Fig 5) was 13.7m in length, 0.6m thick, and constructed of rectangular cut stones bonded to a rubble core with a light whitish-grey lime mortar (Plate 8). The core of the wall incorporated occasional fragments of red brick, and although it typically survived to a height of no more 0.66m, to the east, where it abutted the retaining wall, it stood to over 3m.



*Plate 7: Foundation of the engine house looking west,
following excavation (with 2 x 1m scales)*



*Plate 8: Wall **100**, facing east (with 1m scale)*

- 3.4.2 At 16.1m in length, the southern wall (**101**) extended slightly further to the west, but its construction was otherwise identical to wall **100**. It typically survived to a height of only 0.3m, but again, to the east, it was preserved as a fragmentary stub, 3m in height, where it joined the retaining wall (Plate 9).



*Plate 9: Wall **101** (right) facing east, with engine beds (left) and floor **108** (centre)*

- 3.4.3 Between walls **100** and **101**, and sharing their alignment, lay several raised platforms, 2m in width and divided by a series of narrow voids 0.5m across. The largest platform (**102**) was to the east, measured 6m long and was constructed with a series of rectangular sandstone blocks defining its northern, southern and western sides (Plate 10). Between these blocks, a rubble core, bonded with a compacted lime mortar, comprised the remainder of the platform, which typically stood to a height of 0.58m but survived to over 1.5m at the eastern end, where it abutted the retaining wall. To the west, a pair of circular-sectioned iron bars protruded vertically from the sides of the rubble core (Plate 9), but had been bent over horizontally during demolition.



*Plate 10: Engine beds **102** (background) and **103** (with 2 x 1m scales)*

- 3.4.4 Platform **103** was to the west of platform **102**. This was smaller and square, 2.1m long, but of a similar construction. However, it had been reduced to just 0.47m in height and did not feature the same iron-bar protrusions (Plate 10).
- 3.4.5 A third platform (**104**), with a length of 2.5m, lay to the west and survived to a height of 0.38m, with a smaller fourth platform (**105**) beyond, that was 1.8m long and stood to a height of just 0.34m. To the west again, there was evidence to suggest there had been a fifth platform (**106**) of similar dimensions to the last, but its south-western corner had been removed, leaving the feature in a fragmentary condition (Plate 11).



*Plate 11: The remains of platform **106**, with the northern end of wall **112** (bottom) and wall **109** (top left)*

- 3.4.6 The remnants of this platform appeared to abut the western wall of the structure (**112**). This was a north/south-aligned wall of sandstone rubble, 0.8m wide, that extended for a length of 20.4m, continuing well beyond the southern wall of the present structure (Plate 12).



*Plate 12: Wall **112**, facing south*

3.4.7 Between wall **100** and the raised platforms (**102-106**) lay a channel, 1.3m wide, that extended nearly the full length of the structure from east to west. Although lost from the central portion, the base was covered with rectangular flagstones (**107**) that bore evidence of soot staining (Plate 13). Towards the western end, some of these stones had been raised as a small platform, but it was unclear if this represented a later alteration, as their appearance perhaps suggested that these were secondary (Plate 14). At the western end of floor **107**, a short section of single-skinned sandstone wall (**109**), 1.6m long and 0.2m wide, extended in plan south from the projected continuation of wall **100** to intersect with platform **106** (Plate 11).



*Plate 13: northern channel, showing flagstone floor **107** at the eastern end, facing north*



*Plate 14: Raised stone floor at the western end of **107**, facing south (with 1m scale)*

- 3.4.8 There was another channel to the north of wall **101**, slightly narrower than that to the north at 1m wide, and the floor there had been laid in concrete (**108**), abutting both the platforms to the north and the wall to the south (Plate 9). The western end of this channel was raised via a low step, continuing to the west as a series of broken and disturbed flagstones. A section of concrete floor near the western end of this channel partially covered wall **101**, and therefore must have been applied following demolition of this portion of the structure, presumably following the disuse of the building.
- 3.4.9 Both walls **100** and **101** appeared to have been tied into the eastern retaining wall, which was itself constructed in coursed sandstone blockwork laid in a firm lime mortar. It incorporated a tall single-width recess at its northern end, lying beneath a single-piece stone lintel, and had a tall step at its base (Plate 15). The recess extended back approximately 0.5m and its rear wall was constructed of coursed sandstone blocks with a rockface finish.



Plate 15: Recess at the northern end of the eastern retaining wall, facing east (with 1m scale)

- 3.4.10 Further rubble clearance 2.7m to the north of wall **100** revealed a pair of rectangular sandstone post-pads (**111** and **110**), each 1.2m long and 0.9m wide. The pads were separated from each other by a distance of nearly 3m from east to west, and their upper faces were stained a dark brown-red colour by apparent exposure to iron oxide (Plate 16).



Plate 16: Rectangular pads to the north of engine house, facing west, with iron staining to the upper surface

3.4.11 **Area 2: Boiler House:** wall **206** abutted the southern end of wall **112** (Fig 5). This foundation was exposed in plan and was 0.6m thick, constructed of red brick bonded with a lime mortar. Wall **206** then extended on a perpendicular alignment to the east for a distance of 11.5m before abutting the canal-retaining wall at right-angles. At its eastern end, an elongated channel or flue (**200**), 1m wide and 0.36m deep, extended from the southern face of wall **206** along the base of the retaining wall for a length of 12.4m (Plate 17). A smooth render had been applied to the base of the channel and a substantial cast-iron pipe, partially encased in concrete, ran along its western edge. The channel had been interrupted at several points along its length by a series of low red-brick cross-walls, although it was not apparent if these were a later insertion.



*Plate 17: Channel **200**, facing south (with 1m scale)*

3.4.12 Towards its northern end, the channel branched off at an angle of 45° before intersecting wall **206** again at its mid-point (Plate 18). The channel appeared to have been truncated at its centre by another brick wall (**207**), capped with a concrete render and extending from the main channel at its eastern end, westwards for a length of 4.7m, before having been apparently destroyed.



Plate 18: The channel branch, facing south-east (with 1m scale)

3.4.13 A compacted lime mortar floor (**203**) to the west of channel **200** had been laid over made ground to cover a roughly rectangular area some 9m long by 7.4m wide, although its south-western extent appeared to have been disturbed by later activity (Plate 19). A narrow east-west-aligned channel extended across the centre of this floor, perhaps denoting the scar of a wall that had been a single brick in thickness, or a pipe trench, and to its north was a raised rectangular brick structure set upon the mortar floor (Plate 20).



*Plate 19: Area 2, facing south-west (with 1m scale), with the light brown mortar floor (**203**) beneath the brick structures*



*Plate 20: Floor **203** with the narrow channel at its centre, facing east (with 1m scale)*

3.4.14 This structure was built of frogged, machine-made red brick, aligned east/west and defined along its the northern side by the remains of a substantial wall of the same material on a shared alignment (Plate 21). There was a small rectangular cell at its western end, 1.1m wide and 2.1m long, with a soot-stained, sunken brick-floor (**205**) and an apparent entrance to the south (Plate 22). The eastern end of the structure comprised a rectangular area 2m square, with a raised mortar surface lying upon a brick base (**201**) (Plate 23). This mortar surface was divided at its centre by an axial brick wall that appeared to have been lost at the eastern end.



*Plate 21: The northern brick structure (**201**), facing south-east (with 1m scale)*



*Plate 22: Sunken brick floor **205**, facing east (with 1m scale)*



*Plate 23: Raised brick floor **201**, facing west (with 1m scale)*

3.4.15 To the south, there was a second raised brick structure, ostensibly the same as the other, but while its raised floor (**202**) to the east survived in a similar condition to floor **201**, its western cell (**204**) had been almost completely destroyed, save for a fragment of its northern wall (Plate 24). At the eastern end of both raised floors, a concrete step negotiated the drop into channel **200**, while the removal of overburden to the west of these structures revealed the fragmentary remains of further brick floor surfaces.



*Plate 24: The southern structure, with floor **202** (foreground) (1m scale)*

3.4.16 During clearance of the land to the south of Area 1 and north of Area 2, a hollow void was identified, which upon inspection appeared to be a brick-built flue (**208**) (Plate 25). The flue was constructed of hand-made red brick, forming a parabolic arch, the top of which was traced to the south-west for a distance of at least 6.5m, its continuation disappearing beneath the remnants of the brick floor to the west of Area 2.



Plate 25: The brick-built flue arch (208) between Areas 1 and 2, facing south

3.4.17 Area 3: Wrigley Mill South-western Wing: at the northern end of the site, the retaining wall that formed the remnants of the demolished W H Shaw Pallet Works still stood to a height of over 3.5m as a red-brick structure clad externally in cut sandstone (Plate 26). The rear wall of the recess that had once formed a projecting four-sided bay differed in its construction, however, since the lower 1.95m was built in rectangular rubble block-work bonded with a firm mid-yellow-brown lime mortar and rendered in the same (Plate 27). This section of wall (**303**; Fig 6) measured 11.1m in length, was 0.6m thick and was aligned north-east/south-west. The vertical scar of a single-skin brick wall (**304**) was noted at the centre of the wall, a modification clearly relating to the early twentieth-century phase of the W H Shaw Pallet Works. At its north-eastern end, and partially hidden behind a cement render, there appeared to be a perpendicular return wall (**300**), extending to the north-west for a length of 3.4m and standing to a height of nearly 4m.



Plate 26: Wall 303, visible below the later red brick of the W H Shaw Pallet Works, facing south-east



Plate 27: Wall 303, facing north-east (with 1m scale), following the removal of the later brick wall from above

3.4.18 With these elements identified, the higher ground to the east of wall **303** was then cleared of demolition rubble in order to expose any further evidence relating to this sandstone structure. Although a degree of truncation had occurred immediately to the east of wall **303**, another section of wall, 8.3m long, was identified to the east. This wall shared the alignment and constructional character of wall **300**, clearly indicating it was a continuation, but it stood to just 1.6m in height. It preserved, near its head, an elongated horizontal stone, 1.4m long and 100mm thick, that gave the appearance of a window sill, although an additional course of sandstone had been laid upon this sill, suggesting that the opening had been blocked (Plate 28). There may have been a second sill, 0.6m to the south-east of the first and at the same height, but the masonry of this had been disturbed during demolition.



*Plate 28: Internal south-west-facing elevation at the south-eastern end of wall **300**, showing a probable window sill near the head*

3.4.19 At its eastern end, wall **300** turned through a right-angle, continuing on for an additional 12.5m and at a consistent height, to define the south-eastern limits of the structure. This section of the wall was the best preserved, with two further sandstone lintels arranged at intervals of approximately a third across its length, both with two courses of infill surviving above (Plate 29; Fig 7). There was a projecting plinth at its base, 0.1m wide and 0.6m high, which had been latterly rendered in cement; although there was no evidence of plaster on the remainder of the wall, there were traces of the application of limewash to its face.



Plate 29: The south-eastern wall of Wrigley Mill, facing north

3.4.20 At its south-western end, wall **300** turned once again at a right-angle back towards wall **303** for an additional 7.4m, preserving at its north-eastern end another horizontal sill with evidence on this example of blocking in machine-made red brick (Plate 30). Much of the remainder of this south-western length of wall **300** survived to a height of no more than six courses, but towards its centre the lower three courses stepped forward as a low plinth. The north-western end of the wall survived in poor condition, but where it adjoined wall **303**, it was just possible to see that it had continued on to the north-west, beyond the line of **303** (Plate 31).



Plate 30: North-east-facing elevation of the south-western wall, facing south-west, with a window lintel (left) and the remnants of a floor (centre)



Plate 31: The north-western end of the south-western part of wall 300, with the continuation of wall 300 beyond wall 303 (right)

3.4.21 Clearance of the building's interior revealed a row of four concrete post-pads (**301**), extending along the north-eastern side of the building (Plate 32). The pads measured between 0.75m and 0.8m square and had been laid directly upon the natural sand. Only the south-eastern two pads survived of what must have been a corresponding second row along the opposing side of the building, the most easterly of which, at 1.2m square, was the largest and had been rotated at 45° to the remaining pads.



Plate 32: View of Wrigley Mill, facing north-west (with 2 x 1m scales), with post-pads (301) (centre)

3.4.22 At least one of the post-pads retained the impression of having borne the weight of a square-section post (Plate 33). The height of the pads and the identification of the undisturbed natural sands and gravels beneath them determined that the approximate floor level had stood 1.8m above the apparent floor level to the west of wall **303**. Very little of the original floor to the east of wall **303** survived, consisting of just a small area of concrete abutting the south-western wall, and another section lying against the centre of the south-eastern wall (Plate 30).



Plate 33: Impression of a post on a post-pad

3.4.23 **Area 3: Wrigley's Mill, Waterwheel Pit:** to the west of wall **303**, the removal of the concrete floor slab had been temporarily suspended after the identification of a subterranean chamber of apparently two levels, in excess of 4m deep (Fig 6; Plate 34), and with a steel ladder bolted to its south-western end. The subsequent removal of the floor slab from across the remainder of this feature revealed the chamber to be an elongated pit, 12.3m in length, 2.9m wide and 6m deep (Plate 35).



Plate 34: The subterranean chamber, during the removal of the concrete slab, facing north



Plate 35: The waterwheel pit, facing south

3.4.24 This pit was defined on each of its longer sides by retaining walls, comprising 13 visible courses of substantial elongated rectangular blockwork (**305**), tooled to a rusticated finish, with drafted margins and bonded with lime mortar (Plate 36). Evidently the uppermost courses of the longer walls had been replaced with cast-in-place shuttered concrete to bring it up to the height of the base of the concrete slab, and a concrete bridge had been installed across the south-western end of the pit, mounted upon lateral steel joists. Beneath this bridge, a modern concrete sluice had been installed to control the flow of water passing through the channel (Plate 37).

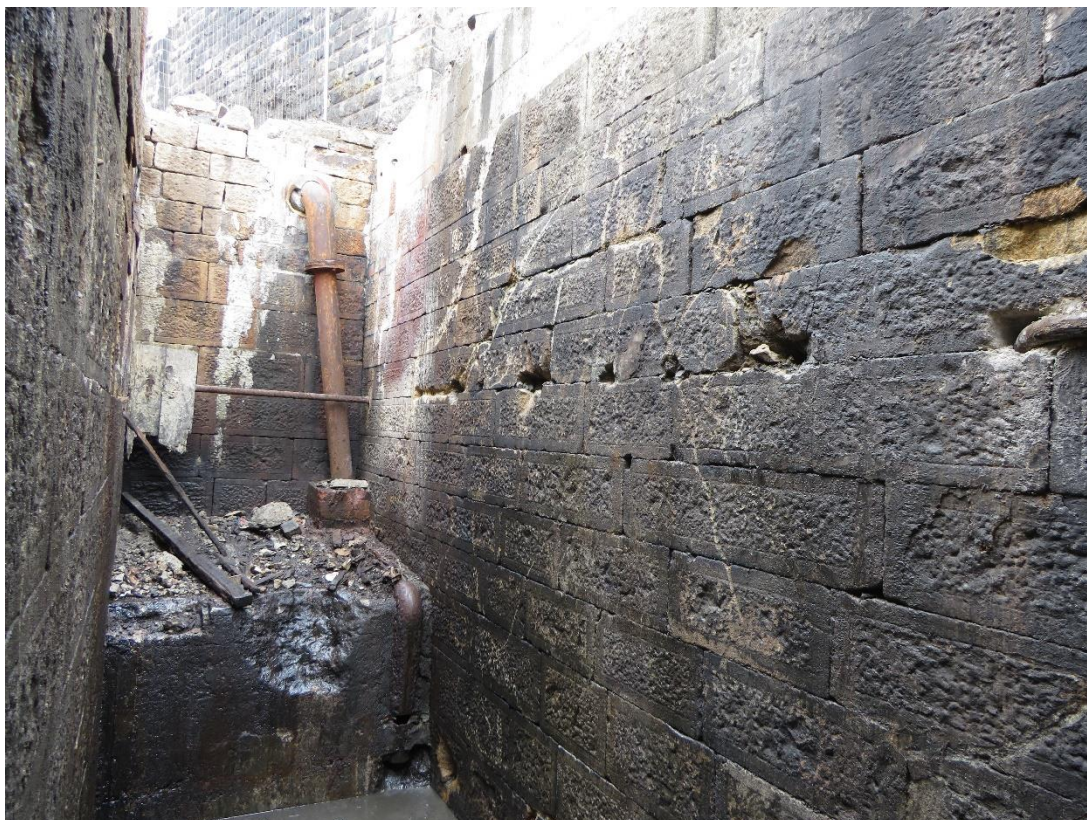


Plate 36: Interior view of the wheel pit, facing north-east

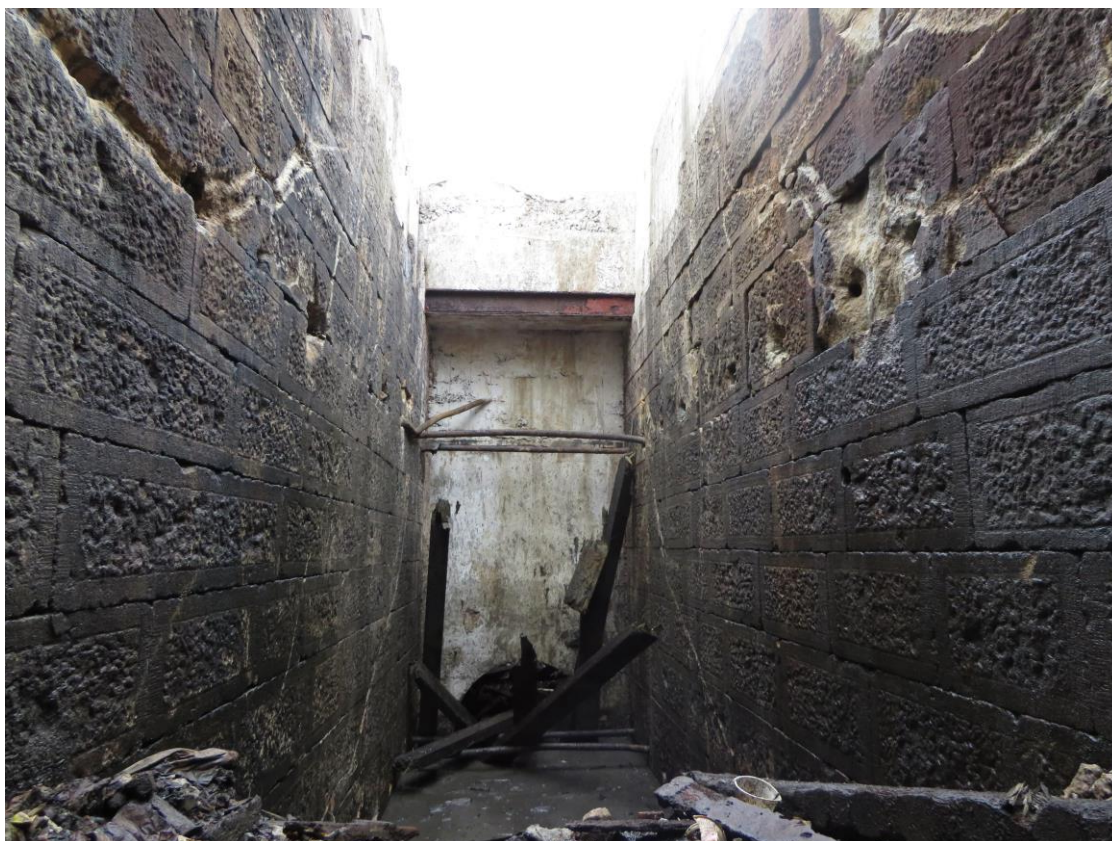


Plate 37: The wheel pit, facing south-west, with the modern concrete sluice

3.4.25 The lower portions of the shorter sides of the pit were constructed using the same tooled and drafted masonry blockwork seen in the longer sides, but in both instances rectangular blocks, similar in form to those used in the construction of walls **300** and **303**, formed the upper five courses (Plate 38). In addition, the south-western wall of the wheel pit incorporated a semi-circular arch at its base, formed in voussoirs of various widths (Plate 39). At the opposing end, a raised concrete platform had been latterly inserted into the base of the pit, spanning its full width and extending for a length of approximately 1m to the south (Plate 36). An iron pipe protruded vertically from the eastern corner of this platform, before returning via a flanged U-bend to the north-east.



Plate 38: Coursed sandstone blocks at the south-western end of the wheel pit



Plate 39: Semi-circular arch at the south-western end of the wheel pit

3.4.26 There were several features of historic interest identified on the longer sides. Towards the centre of the south-eastern side, an elongated block with a wide channel cut into its upper face was noted immediately below the base of the shuttered concrete, with another of identical appearance recorded on the opposing face (Plate 40). The profile of a semi-circular depression was seen beneath the former, presumably to accommodate some form of bearing. The position and character of these features almost certainly identifies them as the axle-mounting points for a waterwheel, although the concrete above prevented inspection of the mounts in any detail.



Plate 40: Recess for the waterwheel bearing below the axle-mounting point, facing south-east (with 1m scale)

3.4.27 Perhaps due to the limitations of access, no wear marks associated with the likely circumference of the wheel were detected on either face of the wheel pit. Near the north-eastern end of the north-western wall, however, there was the tell-tale circular wear pattern of what may have been a smaller spur wheel (Plate 41).



Plate 41: Recess for possible spur gear on the north-western wall

3.4.28 In addition, at the north-eastern end of the south-eastern wall, the first five blocks of the uppermost course exhibited an enigmatic triangular symbol cut into their centres (Plate 42; Fig 8) reminiscent of a mason's mark. Again, limited access prevented any certainty of interpretation, but their position on a level with the centre of the wheel and apparent absence from the remainder of the elevation suggests that they may have been used as assembly marks, perhaps for levelling the axle during construction.



Plate 42: Possible assembly mark, indicating the centre line of the waterwheel

3.4.29 Following the disuse of the waterwheel, iron tie-bars had been inserted across the width of the pit and a wooden platform supported by steel tie bars inserted, presumably to aid inspection and clearance of the pit when necessary. In addition, a vertical steel pipe had been inserted into the centre of the pit, perhaps as a drain (Plate 34).



*Plate 43: Drystone-lined well **302**, located to the south of the wheel pit (with 1m scale)*

- 3.4.30 Unfortunately, attempts to drain the wheel pit and identify the base of the feature failed, as it appeared that the watercourse was still active. Notably, a distance of 39m to the south of the wheel pit, a small drystone-lined well (**302**; Fig 2) was uncovered beneath the concrete slab (Plate 43). Its internal diameter was 0.7m, its base being identified at 4.8m, and its present water level was 3.7m below the modern ground surface. It matched the projected alignment of the tail race and is likely to have given access to this water source.
- 3.4.31 The subsequent demolition of the retaining wall to the north of the waterwheel was monitored, to identify the route of the pipe protruding from this wall (Plate 44). It revealed a series of lengths of steel pipe, each approximately 5m long, 0.5m in diameter, and fastened together with a riveted flange (Plate 45). The pipework extended in a north-easterly direction for a distance in excess of 15m, continuing beyond the limits of excavation in this area.



Plate 44: The demolition of the retaining wall and removal of pipework entering the waterwheel pit, from the north-west, facing south



Plate 45: The removed pipework associated with the demolition of the retaining wall

3.4.32 Area 3 Wrigley Mill: North-western Wing: initial stripping across the projected north-western wing of the mill had been delayed for operational reasons, but the removal of the access ramp and spoil heap from this area revealed approximately 300mm of sand and hardcore below the concrete slab. No evidence of any structure was identified in

this area and the remainder of the building appears to have been destroyed by later activity (Plate 46).



Plate 46: The reduction in levels across the western part of Wrigley Mill revealed no trace of the earlier mill

3.4.33 Area 3 Wrigley Mill: South-western Wing: to the south of the waterwheel pit, the removal of the concrete slab and 300mm of overburden revealed the fragmentary remains of a series of further structural elements, none of which extended to a height of more than one course. The most substantial of these was a sandstone wall, aligned north-east to south-west, 0.6m wide and destroyed at its centre, creating two sections (**306** and **307**; Plate 47). The larger section (**306**; Fig 6; Plate 48) was 2.65m in length and lay 1m to the north-east of the remaining 2m-long section, but both were identical in construction, employing faced rubble without any evidence of a formal bonding material.



Plate 47: Wall 307, facing south (with 1m scale)



Plate 48: Wall 306, facing south (with 1m scale)

3.4.34 Approximately 2m to the south-east of these, there were two further fragments of masonry (**309** and **310**), both sharing the same alignment, approximate width and sandstone construction. The smaller section (**310**; Plates 49) to the south-west was 1.6m long and was double skinned, with a rubble infill, while wall **309** (Plate 50) to the north was 1.7m long and incorporated a T-junction at its northern end. The wall was primarily constructed of rubble, but the northern end was formed of roughly squared sandstone blocks, similar to those used in wall **300** (Sections 3.4.19-20) and arranged in pairs. The western arm, however, was just a single block wide and its position suggests it may have formed the return of an internal partition.



*Plate 49: Wall **310**, facing south (with 1m scale)*



*Plate 50: Wall junction **309**, facing south-west (with 1m scale)*

3.4.35 To the east of walls **309** and **310** were two other sections (**311** and **312**) of what had probably once formed a single length of sandstone wall. Wall **311** (Plate 51) lay to the north, where it extended as a single course of sandstone rubble 0.4m wide in a southerly direction for a length of 1.4m. Wall **312** lay 2m to the south of this, where it continued south for a further 2.5m as a double-skinned rubble-built sandstone wall, 0.6m wide (Plate 52). The ground immediately to the west of this wall, and south-east of walls **309** and **310**, had been infilled with large stone chippings, covering a rectangular area 6m long and 3m wide.



Plate 51: Wall 311, facing south (with 1m scale)



Plate 52: Wall 312, facing south (with 1m scale)

3.4.36 North of wall **311** was a possible compacted floor (**314**; Plate 53). The area, which measured 3m from north to south and 1.5m from east-west, was composed of a series of fragmentary sandstone blocks or flags set within a dark brown sandy matrix.



*Plate 53: Area of cobbles **314**, facing south (with 1m scale)*

3.4.37 An additional section of wall was revealed to the north-west of walls **306** and **307**, 2m in length and 0.6m wide (**308**; Plate 54). This fragment was just a single course thick and its alignment was different from the other walls, appearing to be slightly north of east-west.



*Plate 54: Wall **308**, facing west (with 1m scale)*

3.4.38 A pair of flagstones were identified at the southern limits of the excavation area on a similar alignment to wall **308** (Plate 55). The flags were 100mm thick, had a smooth upper face and had a visible extent of 1.5 x 0.8m, extending beyond the limit of excavation.



*Plate 55: Stone flags **313**, facing west (with 1m scale)*

4 DISCUSSION

4.1 Interpretation

- 4.1.1 Although the sub-surface deposits showed evidence of significant disturbance and destruction by later activity, elements of both the later eighteenth-century Wrigley Mill and mid-nineteenth-century Dobcross Loom Works were identified during the present excavations.
- 4.1.2 The surviving elements of Wrigley Mill were primarily the waterwheel pit and the south-eastern wing of the mill, both of which matched the projected position and alignment of the structures shown upon the earliest OS mapping (1854; 1894; Figs 3 and 4 respectively). The south-eastern wing was in a fragmentary condition but demonstrated that the building was 16m long and 12.5m wide, with a roof, or perhaps more plausibly a first floor, supported by lateral joists resting upon pairs of cast-iron columns or timber posts. Little further internal detail remained of this structure, although fragments of concrete flooring confirmed continued investment into at least the late nineteenth century. The surviving sills identified in several of the walls presumably related to windows, and as such their apparent infilling suggests a multi-phase structure. The cartographic evidence (Figs 4 and 5) suggests that the south-eastern wing was added to the existing structure between 1854 and 1894.
- 4.1.3 The waterwheel pit to the west survived in relatively good condition, no doubt as a result of the need to maintain the mill race to prevent flooding. The documentary record suggests this wheel was 33ft (10m) in diameter and 5ft (1.5m) wide (Manchester Times 24th September 1853, quoted in SHSB 2015), which was in accord with the surviving fabric. The fragmentary walls and flooring identified to the south of the waterwheel can also be broadly aligned with the cartographic evidence (Fig 4) and appear to be the remains of the L-shaped southern wing of the building.
- 4.1.4 A photograph of Wrigley Mill, apparently dating to 1864 (Plate 1), perhaps confirmed some of the details identified in the archaeological record, such as the terraced north-western wing. Certain elements, however, such as the blocked windows, cannot be readily identified on this photograph, and it is plausible that the building depicted is actually one of the other structures on the site to the north.
- 4.1.5 The structure identified in Area 1 (*Section 3.4.1*) is likely to be the foundation of a mid-nineteenth-century engine house, the fabric of which probably partially survived within the existing building prior to demolition. The engine would have been required to run the machinery in the works, such as the lathes and grinding tools. The dimensions of this building suggest it accommodated a beam engine, a design commonly installed throughout the nineteenth century (Giles and Goodall 1995, 136), but superseded during the last quarter of that century by more efficient designs. As such, although the engine may have remained in use into the twentieth century, it is likely to have been built for the Loom Works before the 1890s. At some point, perhaps following the fire in the first quarter of the twentieth century (*Section 1.3.8*), the engine was removed, and the engine beds covered with a concrete slab. It is unclear if another engine was installed at this time, or if the company then made the switch to electricity.

- 4.1.6 The two rectangular structures identified to the south of the engine house appear from the cartographic sources to lie in close proximity to a chimney (Fig 4), although the base of this chimney was not actually identified. These were fragmentary and difficult to interpret with any confidence, but given their position, they may represent loading bays, with the boilers themselves lying just to the west, within the area disturbed by later activity. This interpretation is supported by the retention of hatches and chutes above these features seen prior to demolition (observed from Google Earth Street View and during demolition), allowing coke arriving by railway or canal to be unloaded directly onto the boiler-house floor. The character of the brick, and development of the building, suggest this arrangement dated to the end of the nineteenth or early twentieth century, probably between 1893 and 1906, when this part of the site was provided with a roof (Mounteer 2015, 130).

4.2 Significance

- 4.2.1 The remains identified at the former pallet works are of interest for their contribution to an understanding of the function and development of the woollen industry in Saddleworth over a period of 200 years, between the mid-eighteenth and mid-twentieth centuries. Although its remains were fragmentary, the mid-eighteenth-century Wrigley Mill belongs to the earliest period of the Industrial Revolution and its excavation has afforded a valuable opportunity to examine details regarding its power system, constructional form, and surprising longevity in the face of increasing competition from larger, more efficient, mills.
- 4.2.2 The Dobcross Loom Works, in developing and producing mechanised looms for the woollen and worsted industry, belongs to the next generation in the evolution of the textile industry, being built at a time when the smaller water-powered mills like Wrigley's, were supplanted. The absence of any substantial remains associated with the earliest buildings of the Dobcross Loom Works (*Section 4.2.2*) from the southern end of the site indicates the level of redevelopment that has taken place across the site. However, the identification of a seemingly previously unknown engine house, which is likely to have belonged to either this early phase or shortly after, provides an important addition to knowledge of the development of the works. While the structural remains identified in Area 2 appear to belong to around the turn of the twentieth century, they also hold value in demonstrating the continued redevelopment of the loom works during the peak of the textile industry's success.

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APPENDIX A DESCRIPTIONS AND CONTEXT INVENTORY

Area 1					
General description					
Remains of the engine house at Dobcross Loom Works lying beneath levelling material and concrete slab					
Context No	Type	Length	Width	Description	Date
100	Structure	13.7m	0.6m	Sandstone wall	19 th century
101	Structure	16.1m	0.6m	Sandstone wall	19 th century
102	Structure	6m	1m	Stone platform/engine bed	19 th century
103	Structure	2.1m	1m	Stone platform/engine bed	19 th century
104	Structure	2.5m	1m	Stone platform/engine bed	19 th century
105	Structure	1.8m	1m	Stone platform/engine bed	19 th century
106	Structure	1.6m	1m	Stone platform/engine bed	19 th century
107	Structure	13.3m	1.3m	Flagstone floor	19 th century
108	Structure	5.3m	1m	Concrete floor	19 th century
109	Structure	1.6m	0.2m	Sandstone wall	19 th century
110	Structure	1.2m	0.9m	Column pad	19 th century
111	Structure	1.2m	0.9m	Column pad	19 th century
112	Structure	20.4m	0.8m	Sandstone wall	19 th century

Area 2					
General description					
Possible industrial remains associated with boiler house lying beneath levelling material for the concrete slab					
Context No	Type	Length	Width	Description	Date
200	Structure	12.4m	1m	Sunken channel/flue system	19 th Century
201	Structure	2m	2m	Raised mortar floor	Late 19 th Century
202	Structure	2m	2m	Raised mortar Floor	Late 19 th Century
203	Layer	9m	7.4m	Compacted lime mortar floor	19 th Century
204	Structure	2.1m	1.1m	Sunken brick floor	Late 19 th Century
205	Structure	2.1m	1.1m	Sunken brick floor	Late 19 th Century
206	Structure	11.5m	0.6m	Wall	19 th Century
207	Structure	4.7m	0.5m	Wall	19 th Century
208	Structure	6.5m	0.9m	Brick flue	19 th Century

Area 3						
General description						
Structural remains associated with of Wrigley Mill, including Waterwheel Pit, south-eastern wing, and elements of south-western wing. An outlying well was identified to the south of the principal area of excavation.						
Context No	Type	Length(m)	Width(m)	Description	Finds	Date
300	Structure	16m	12.5	Walls of Wrigley's Mill south-eastern wing	-	Late 18 th century
301	Structure	0.8m	0.75m	Post pads	-	Late 19 th /early 20 th century
302	Structure	-	-	Circular dry stone lined Well 0.7m diameter	-	Late 18 th century
303	Structure	11.1m	0.6m	Western wall of south-eastern wing of Wrigley's Mill	-	Late 18 th century
304	Structure	0.5m	0.26m	Red brick wall	-	Early 20 th century
305	Structure	12.3m	2.9m	Wheel pit retaining walls	-	Late 18 th century
306	Structure	2.65m	0.6m	Sandstone wall	-	Late 18 th century
307	Structure	2m	0.6	Sandstone wall	-	Late 18 th century
308	Structure	2m	0.6	Sandstone wall	-	Late 18 th century
309	Structure	1.7m	0.6	Sandstone wall	-	Late 18 th century
310	Structure	1.6m	0.6	Sandstone wall	-	Late 18 th century
311	Structure	1.4m	0.4m	Sandstone wall	-	Late 18 th century
312	Structure	2.5m	0.6m	Sandstone wall	-	Late 18 th century
313	Structure	1.5m	0.8m	Flagstone floor	-	Late 18 th century
314	Structure	3m	1.5m	Compacted sandstone floor	-	Late 18 th century

APPENDIX B SITE SUMMARY DETAILS / OASIS REPORT FORM

Site name:	Former W H Shaw Pallet Works
Site code:	SWSEX20
Grid Reference	SE 00155 07284
Type:	Watching Brief and Strip, Map and Record
Date and duration:	The watching brief and other works were conducted intermittently between 2 nd April 2020 and 21 st June 2020
Area of Site	Areas as defined in the WSI
Location of archive:	The archive is currently held at OA, Mill 3, Moor Lane Mills, Lancaster LA1 1QD, and will be deposited with Saddleworth Museum under accession number 2020.09.01, with the report being submitted to GMAAS and the local HER in due course.
Summary of Results:	The fieldwork exposed the fragmentary remains of Wrigley Mill in the anticipated location, including the near-complete footprint of its south-eastern wing, its intact waterwheel pit and elements of the building's south-western wing, but the remainder of the building had been lost. To the south, almost nothing was identified of the earliest site of the Dobcross Loom Works, but in the area of its later nineteenth-century expansion, the foundation of an engine house was exposed, which was of the dimensions to accommodate a steam engine likely to date to an early phase, perhaps during the third quarter of the eighteenth century. To the south of this engine house, the fragmentary remains of a possible boiler house were identified in the area previously occupied by the main chimney of the works. These elements, however, appeared to date to the turn of the twentieth century.

FIGURES

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Figure 1: Site location

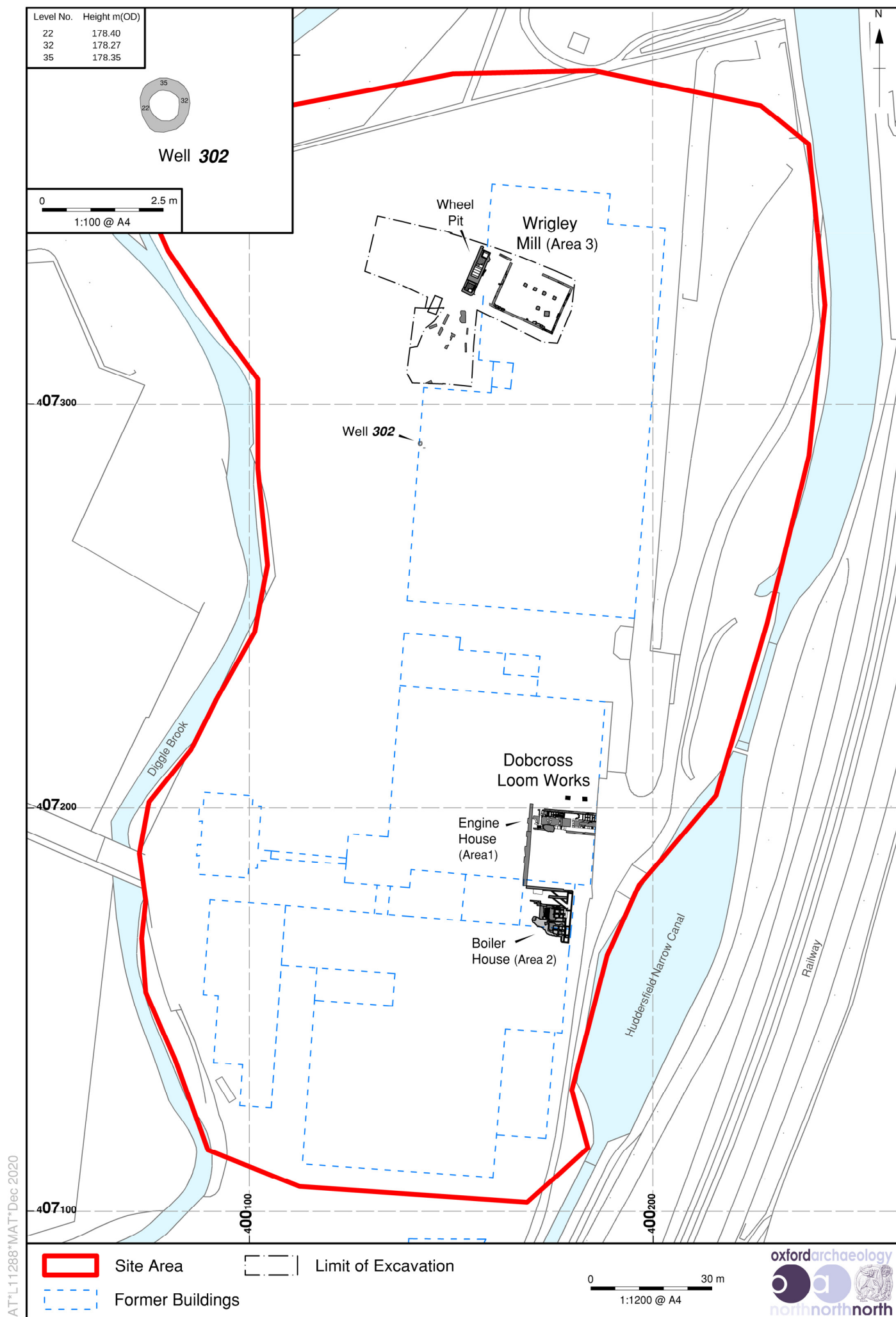


Figure 2: Plan of features found by strip, map and record process

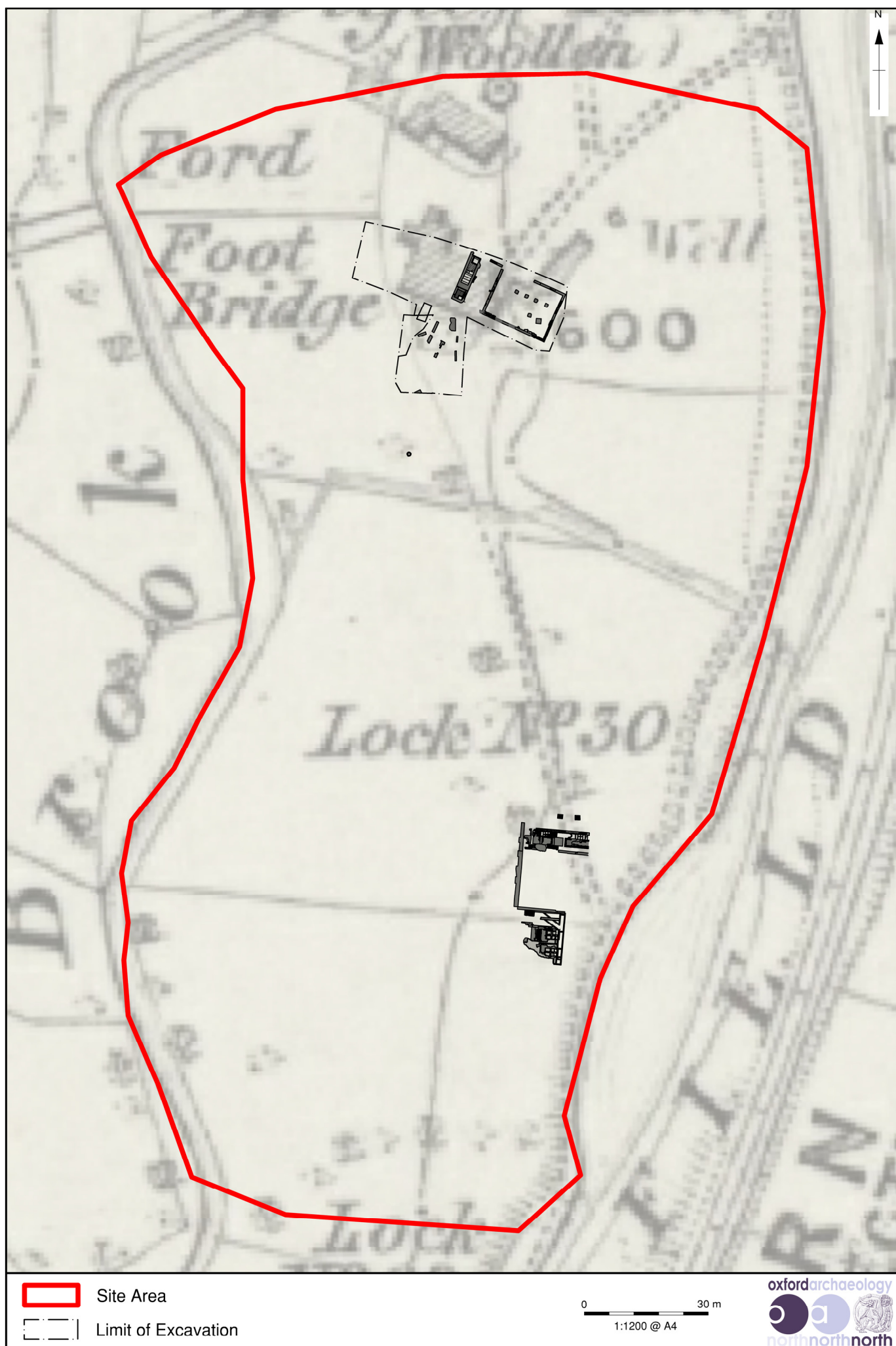


Figure 3: Strip, map and record features superimposed on the Ordnance Survey 6":1 mile map
Surveyed 1849-51, Published 1854

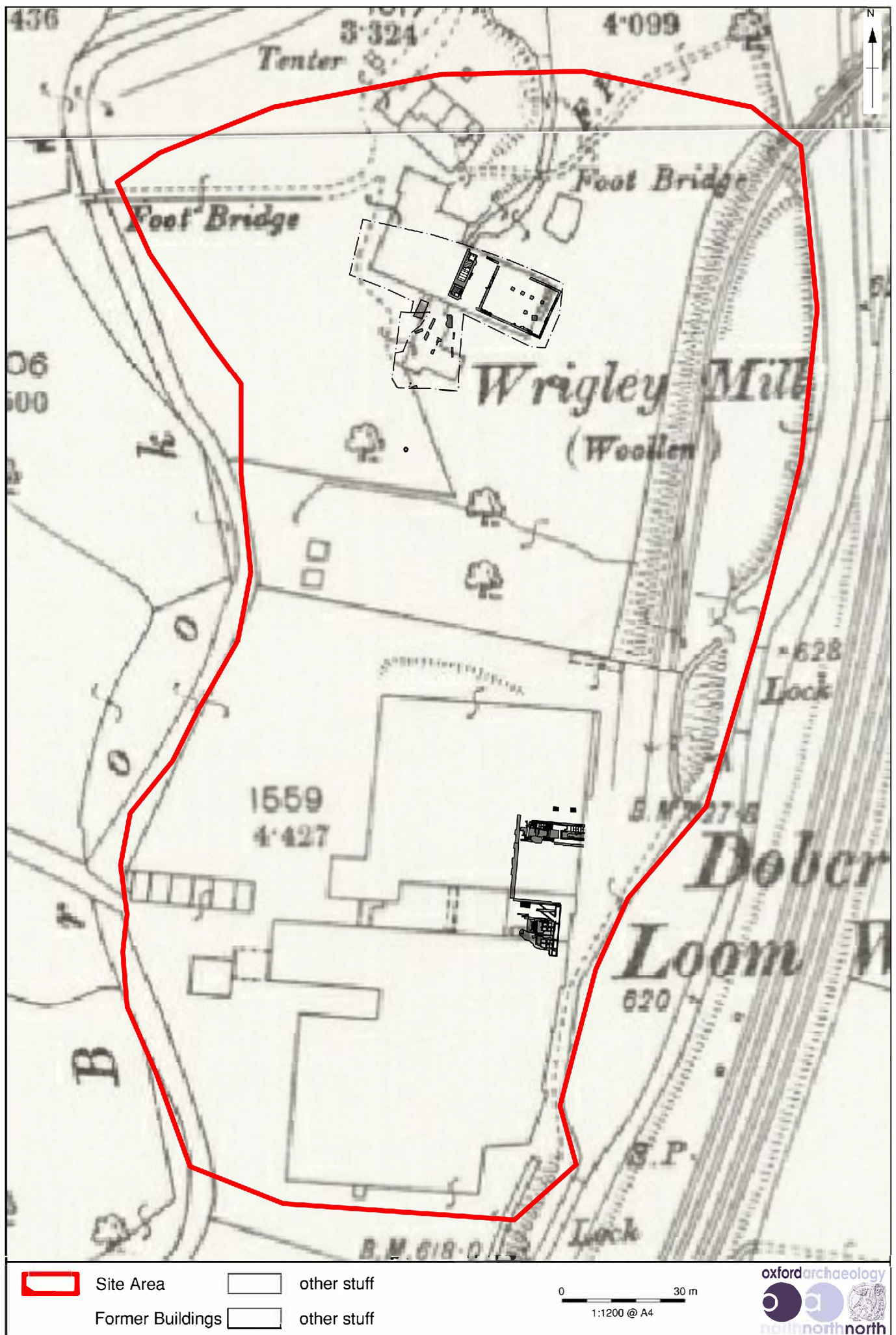


Figure 4: Strip, map and record features superimposed on the Ordnance Survey 25":1 mile map Surveyed 1890, Published 1894

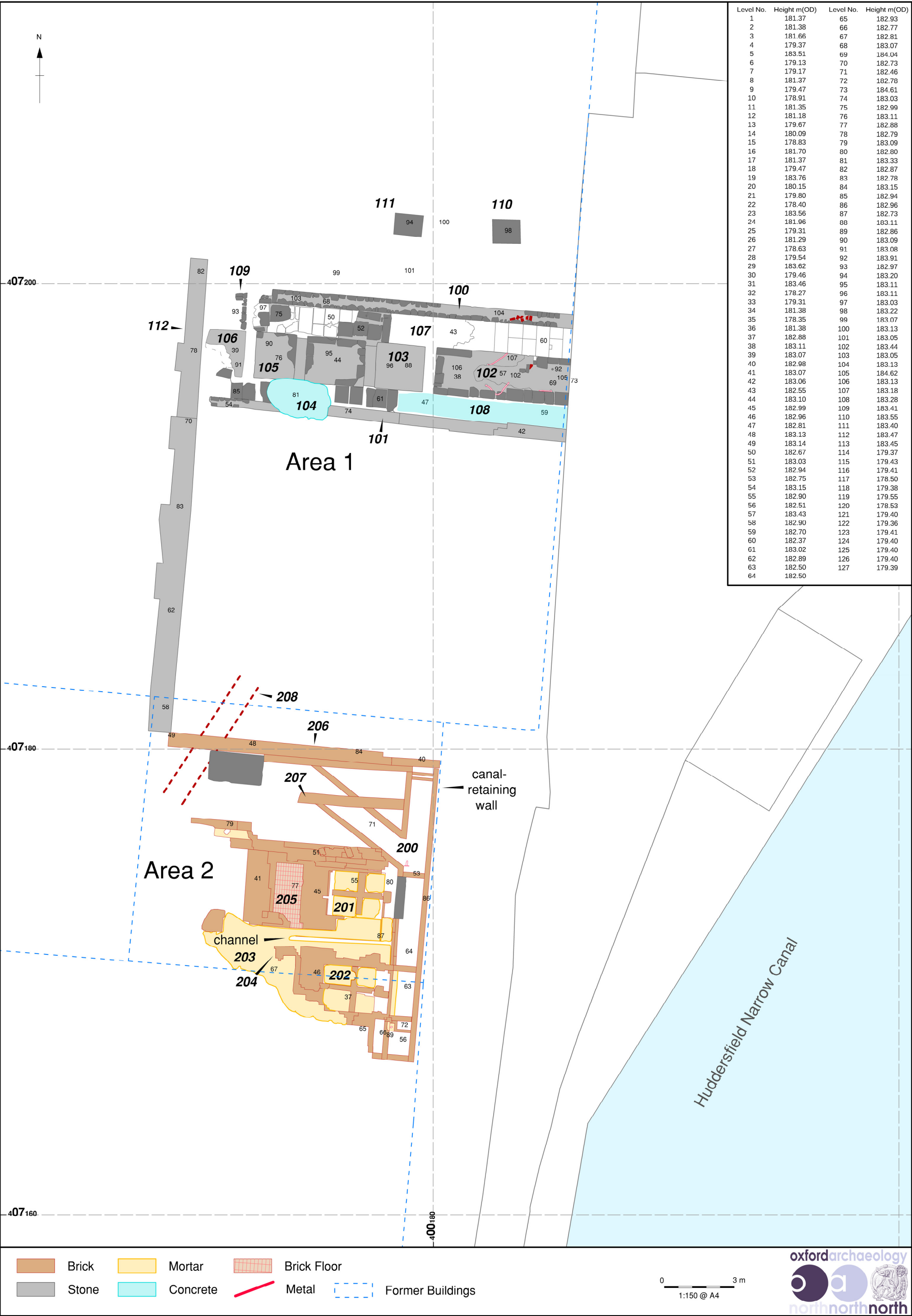


Figure 5: The remains exposed during the strip, map and record of Dobcross Loom Works, Areas 1 and 2



Figure 6: The remains exposed during the strip, map and record of Wrigley Mill, Area 3

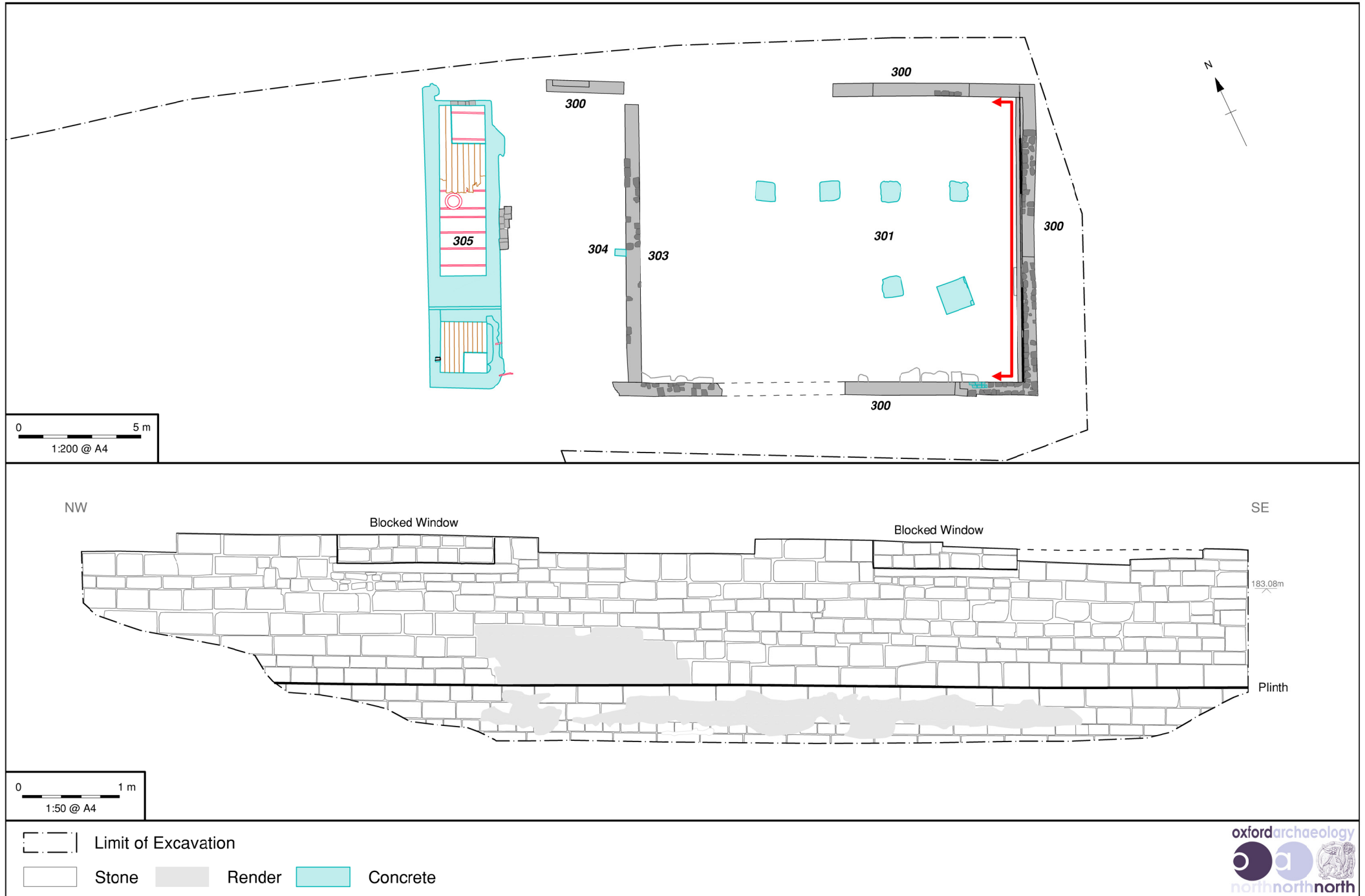


Figure 7: North-west-facing internal elevation of wall **300**, Wrigley Mill, Area 3

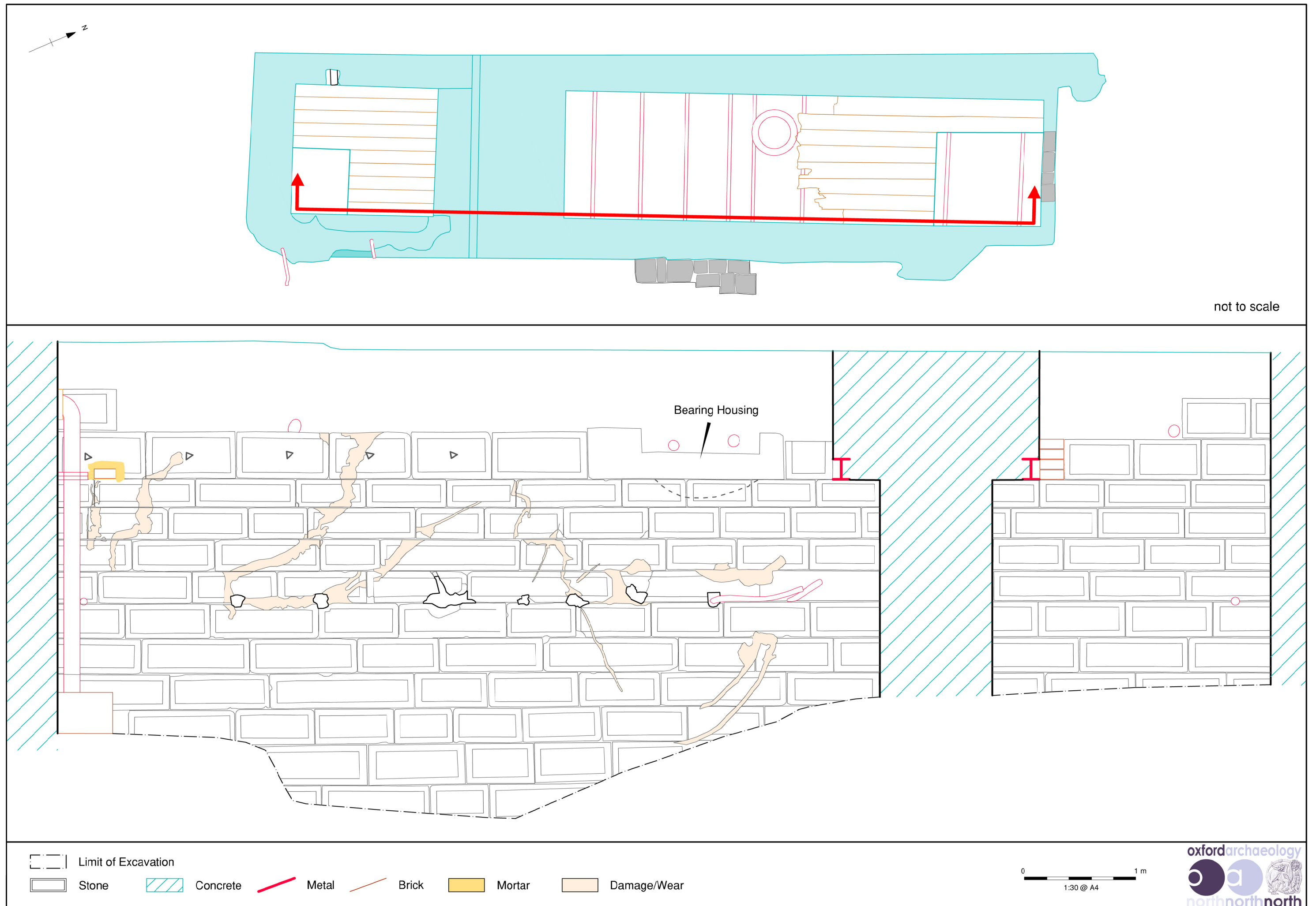


Figure 8: North-west-facing elevation of wheel pit, Area 3



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