NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Historic Building Recording
(Volume 1 – Text and Figures)

Matrix Archaeology

January 2012

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(Volume 1 – Text and Figures)

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Summary

A detailed English Heritage Level IV building recording exercise of this estate corn mill revealed that the earliest mill structure survived as a basement, and was probably dated to 1595-7, on documentary grounds. The mill was rebuilt on a larger scale, probably in about 1746, and possibly by the engineer James Brindley. The remains of the existing brick corn kiln may have been erected at the same time, or shortly afterwards. All of the surviving mill machinery dates from the mid to late 19th century, and was refurbished by the eminent millwright Cyril Boucher in the 1960's. The water management system, adjoining the mill, was also investigated and recorded, and is thought likely to be contemporary with the rebuilding and refurbishment of the mill in c.1746 as a consequence of the in-situ datestone and fabric analysis.

1. Introduction

1.1 A programme of archaeological building recording at Nether Alderley Mill, Nether Alderley, Cheshire (OSNGR 384340 376240) was undertaken by Matrix Archaeology during September and October 2011 (**Figure 1**). This was commissioned by Jamie Lund, Archaeologist (North West) for the client, the National Trust. The work was undertaken in advance of proposed repair and refurbishment of the existing building.

1.2 The building was in use as visitor attraction at the time of the survey, although it was no longer milling corn for any commercial use. It was a Grade II* Listed Building, and was located within the Nether Alderley Conservation Area.

1.3 The mill was listed in the National Trust HBSMR as No.56700. The building has been the subject of a considerable amount of historical investigation from the 19th century onwards.

1.4 The survey was undertaken to accord with Level IV in the English Heritage publication 'Understanding Historic Buildings: A guide to good recording practice', 2006.

Acknowledgements
The building recording and drawings were undertaken by Mark Fletcher, Peter Middleton, and Tarnia McAlester. The AutoCAD drawings and report were compiled by Mark Fletcher and Tarnia McAlester. Dr Peter Arrowsmith compiled the Historical Background and obtained Figures 2 to 25. Mike Redfern, former curator, made available the results of his own research, and first raised the possibility of the involvement of James Brindley at Nether Alderley. Martin Watts, millwright and author, contributed Section 6 and added much to the discussion regarding the development of the mill. Andrew Russell of Russell Geomatics Ltd undertook the laser scanning and the initial AutoCAD survey drawings. Barry Cook, Head of Engineering at Quarry Bank and Nether Alderley Mills, provided access. Peter Crew, formerly Archaeologist with the Snowdonia National Park, produced the note on the kiln tiles (Appendix 3). The cover illustration was produced by Peter Middleton.

2. Scope and Methodology

2.1 A detailed field record of the building was required, both by drawn and photographic means, along with a textual description of features. This was to be augmented by interpretation and a statement of significance.

2.2 Fieldwork was undertaken in two phases. Firstly, a full external and internal laser scan of the building was undertaken by Russell Geomatics Ltd, who then prepared a topographic plan, and a series of floor plans, elevations, and cross-sections in AutoCAD. Hard copies of these, at scales of 1:20 and 1:50, were then draughted. Secondly, a team from Matrix Archaeology Ltd then modified these field drawings, with additional dimensions being taken by Disto laser and hand measurement. Consecutively numbered 'Building Feature Sheets' were also filled in, cross-referenced to the field drawings. The external water supply system, located to the south and east of the mill, was also investigated, as far as was possible, given constraints of Health & Safety.

2.3 Colour digital photos were taken with a Canon EOS 1100D camera, fitted with a Tamron SP 10-24mm lens. A selection of the colour digital photos was used to produce the Plates.

2.4 Historical research was undertaken by Dr Peter Arrowsmith, who visited a number of archive collections, and produced Section 4, and Figures 2 to 25.

2.5 Millwright and author Martin Watts visited the mill during the fieldwork, and produced Section 6.

3. Building Location

3.1 The mill was located on the A34 Congleton Road, 2km to the south of the town of Alderley Edge, and 7km to the west of Macclesfield, in the village of Nether Alderley. The mill was part of the Alderley estate of the Stanley family, and remained within the estate until it was broken up in 1938.

3.2 Alderley Edge comprises a heavily wooded sandstone escarpment, which lies to the south-west of the town of the same name. This rises to over 100m above the surrounding Cheshire plain, and although the Edge falls away abruptly towards the north-east, the gradient is much more gentle towards the south-west. The mill is located at the westward limit of this slope, at a height of about 100m AOD, and is within the minor valley of a small stream.

3.3 Geologically, the ridge of Alderley Edge developed as an upstanding horst block, elevated between two major north-south faults, namely the Alderley Fault on the west, and the Kirkleyditch Fault on the east. The Alderley Fault broadly follows the A34 past the mill, and to the east of the fault (upthrow side) is the Keuper Sandstone formation, with basal conglomerates. This unit dips towards the south-west, at between 5 and 15 degrees. On the west side of the fault (downthrow side) is the Lower Keuper Marl unit. A number of quarries are known on the Edge as possible sources of building material, including one now recognised as being located immediately to the south-east of the mill.

4. Building History, by Peter Arrowsmith

4.1 Land Ownership

Historically, the mill lay in the township of Nether Alderley, one of three townships, along with Over Alderley and Great Warford, which made up Alderley parish. The church was originally founded as a chapel of ease within Prestbury parish but was independent by 1328 (Dodgson 1970, 94). The early history of Nether Alderley and its corn mill is closely linked with the Arderne family. In the early 13th century they acquired the manor of Nether Alderley as heirs to the Cheshire estates of the Aldfords of Aldford in the west of the county. The Aldfords themselves had inherited the Alford fee from the Norman knight Bigot, whose Cheshire estates listed in the Domesday survey included land in Alderley.

In the early 14th century, while the Ardernes' ancestral estates passed down the family line to Sir John de Arderne, his younger brother Peter de Arderne acquired his own manorial estate in Over Alderley along with property in Nether Alderley. This estate ultimately passed to his granddaughter Margaret and her husband Richard de Weever, who held the manor of Weaver near Middlewich. Their son and heir, Thomas de Weever, succeeded to the family estate on coming of age in 1392 (Earwaker 1880, 595-6). In preparation of that event, in 1391 a survey was made of this property and is of significance in that it provides the earliest known reference to a mill in Nether Alderley. (Although Cyril Boucher stated that a mill was mentioned in 1290 (Boucher 1974, 5), this has not been confirmed). According to the survey of 1391, Thomas de Weever's inheritance included:

'*the demesne land of Alderley, with a water mill [molendium aquaticum] there, of the yearly value of 13 marks [£8 13s 4d]; and there were six tenants, including Thomas de Haywode; and of rents terminable Edmund del Egge, Hawis de Haywode, William de Akedon and ten others paid £6 14s 4d: site of the manor with a dovecote worth nil; rents resolute to John son of Thomas de Ardern, for a water mill at Alderley, yearly 34s 5d; and to John duke of Lancaster, as of his manor of Halton, 2s 9½d'* (Ormerod 1882, vol 1, 574; Dodgson 1970, 97).

The reference to a rent payable to John de Arderne confirms that the water mill was in Nether Alderley; the rent payable to the duke of Lancaster was for the land in Over Alderley, which fell under the overlordship of the manor of Halton.

The last of the male line of the family, Thomas de Weever, died in 1445 leaving as his heir his daughter Elizabeth. King Henry VI made her a ward of Sir Thomas Stanley, the controller of the royal household and head of the most powerful family in the North-West, who married her to his third son, John Stanley. The union marked the beginning of a Stanley dynasty which continued to hold its Alderley estate for nearly five centuries. In 1602 that estate was increased by the purchase by Thomas Stanley IV of the manor of Nether Alderley from its then owner, Sir Edward Fitton of Gawsworth Hall

(Earwaker 1880, 599, 613). The family were granted a baronetcy in 1660, and in 1839 the seventh baronet was created Baron Stanley of Alderley (Earwaker 1880, 599-600). The Stanley succession until the time of the first Baron Stanley is shown in Table 1.

Table 1: The Stanley owners of Alderley Hall and Nether Alderley Mill, late 15th century to 1850 (after Earwaker 1880, 603-5)

John Stanley		
Thomas Stanley I		d 1526
Thomas Stanley II		1506-1557
Thomas Stanley III		*c* 1532-1591
Randle Stanley		*c* 1562-1595
Sir Thomas Stanley IV		1577-1605
Sir Thomas Stanley V,	first baronet	1597-1672
Sir Peter Stanley,	second baronet	1626-1683
Sir Thomas Stanley VI,	third baronet	1652-1721
Sir James Stanley,	fourth baronet	d 1747
Sir Edward Stanley,	fifth baronet	d 1755
Sir John Thomas Stanley,	sixth baronet	1735-1807
Sir John Thomas Stanley,	seventh baronet, Baron Stanley of Alderley	1766-1850

The Stanleys' ownership of their Alderley estate ended in 1938 when the family's financial difficulties resulted in its sale. The mill was included in the same lot as the Old Hall (CRO DDX 169, 139). The auction itself was largely unsuccessful but some farms were bought by their tenants using a government low-mortgage scheme. The Old Hall and the mill were bought by the hall's tenant, Mr John Armitage Shelmerdine. In 1950 Major Shelmerdine, as he then was, and his wife donated the mill to the National Trust (Redfern 2003, 3; 2011, 3).

4.2 The Early History of the Mill, Pre-17th century

Following the survey of 1391, the next known reference to a mill in Alderley is provided by the *inquisition post mortem* carried out following the death in 1591 of Thomas Stanley III. It records that he was in possession '*of the manor of Over Alderley, and 6 other messuages, one water mill, one windmill*' and other land in Nether Alderley (Earwaker 1880, 598). A windmill is known to have given its name to Windmill Wood to the west of the Alderley Edge escarpment but this is reported to have been built in the 1800s for the purposing of crushing mineral ore (Carlon 1979, 49; Timberlake *et al* 2005, 139-41). It is possible that the water mill was also the mill listed in 1435-6 alongside the 'manor' of Nether Alderley as part of the dower of Elizabeth, the widow of Edward de Weever (Ormerod 1882, vol 2, 209). There is a general supposition in the published sources that the water mill documented in 1391 was probably located on the site of the present building (Earwaker 1880, 596 n 'g'; Norris 1968, 52; Bott 1983, 64).

There is good documentary evidence for building work at the mill in the late 16th century. A volume of antiquarian notes on Alderley compiled in the early 19th century by Sir John Thomas Stanley, the seventh baronet, includes two

separate transcripts of the court leet records for 12 May 1598, which make reference to the mill.

The first of these reads:

'When a Payne was set that the Jury at ye last Court should the Mill should be new builded as by that order appearith which was not done in respect that Mr Stanley was absent from home at such time as the Jury should have met, it is agreed that the Jury shall meet at the said Mill and make presentment of their verdict according to the Order at the last court and it is ordered that the Jury shall meet all at the Church having a day appointed them by the Steward and a days warning upon payne that such of the Jury as shall not keep his day and time shall forfeit 2s each.

Thursday in Whitsunweek to meet at Findlow hill & view all the Mears of this Manor as also the Mears of the turf owners at Soss moss and the Surveying of the Mill & making presentment if time will serve to do it that day sub peena each of XIId' (CRO D 8065/1, p 132).

The other reads:

'When a Pain was sett that the Jury at the last Court should view the Mille now builded as by that Order appeareth which was not done in respect that Mr Stanley was absent from home at such time as the Jury should have met, it is agreed that this Jury shall meet at the said Mill and make presentments by their verdict according to the Order of the Court and it is ordered that the Jury shall meet all at the Church having a day appointed them by the foreman and four days warning on pain that such of the Jury as shall not keep his day & time to forfeit IIs a piece.

Thursday in Whitsun week to meet a finlow hill to view the Mears of this Manor as also the Mears of the turf rooms of Soss Moss and the surveying of the mill and making presentments as time will serve to do it that day sub peena every one XIId' (CRO D 8065/1, p 288).

According to the court leet, then, in 1597 the jury of the court had been due to inspect the mill but had been prevented by the absence of 'Mr Stanley'. They were now to carry out this inspection at Whitsuntide, on the same day as they were to inspect the boundaries of the manor and of local moss rooms. Whether the court leet records described the mill as '*now builded*' or '*new builded*', the purpose of the jury's visit is likely to have been the same, that is to inspect the site following major construction works.

Such works are confirmed by the contemporary Memoranda of the Stanley family, which recorded that '*The Alderley milnes were begune in 1595*' and in 1597 that '*Alderley milnes were finished before Xtmas this yeare*' (Redfern 2011, 17, citing Lawson 1922, 84-5). These works which took two years or so to complete are likely to have amounted to the building, or rebuilding, of the mill.

4.3 The Hall and the Mill Ponds

The earliest known documentary evidence for a hall in Nether Alderley is also provided by the 1391 survey of the de Weevers' estate, which includes reference to the *'site of the manor with a dovecote worth nil'* (see above), ie unlike other parts of the estate, the hall itself brought in no revenue. It is possible that the hall was originally built in the early 14th century by Peter de Arderne when he acquired his estate in Nether and Over Alderley. However, until the 16th century successive owners of this estate seem to have used the hall as only a secondary residence. Peter de Arderne's son and successor, also named Peter, was commemorated along with his wife in a stained glass window in Alderley parish church. However, the inscription on the window described him as '*of Etchells*' (Earwaker 1880, 628). This was an area, now largely occupied by Manchester's Wythenshawe estate, where the Ardernes also possessed lands and are known from about the mid 14th century to have owned a hall at the moated site of Peel Hall Moat (Arrowsmith 2007). The de Weevers after acquiring their Alderley estate were still primarily associated with the manor of Weaver. So too initially were their successors the Stanleys who were styled as of Weaver and buried in the parish church at Middlewich (Earwaker 1880, 598 n 'w').

The first of the Stanleys known to have been buried at Alderley parish church was Thomas Stanley III who inherited the family estates in 1557 and who died in 1591. Moreover, according to the inscription on his memorial, Thomas '*rebuilt the houses of Alderley and Wever*' (Earwaker 1880, 598; Ormerod 1882, 571). The rebuilding of the Stanley family's halls at this time reflects the wider phenomenon of the 'Great Rebuilding', which by the latter part of the 16th century saw the gentry of the region replacing their medieval houses with buildings of a more fashionable style. The rebuilding of the hall at Nether Alderley also appears to mark its promotion to the Stanleys' chief residence, in place of Weever. William Webb in the early 17th century described the hall at Nether Alderley as '*a very gallant house and seat of that worthy stem of the Stanleys...late the possession of Sir Thomas Stanley, knight, of much esteem, and now of Thomas Stanley, esquire, his heir*' (Ormerod 1882, vol 3, 545).

The last named Thomas Stanley, the first baronet, made his own alterations to the hall at Nether Alderley. According to the early 19th century Cheshire historian George Ormerod,

'*He died in 1672 at his seat of Alderley, which he had much improved, having built a handsome stone arched gateway in front of the mansion, and spacious stables. By him also was planted the beech wood bordering on the Mere, for which purpose beech mast was procured from his father-in-law's seat in Worcestershire, the tree being then of rare occurrence in Cheshire*' (Ormerod 1882, vol 3, 576).

In about 1710 his grandson, Sir Thomas Stanley VI, sold the hall and land at Weaver (Ormerod 1882, vol 2, 209; vol 3, 578). In 1754 the hall at Nether Alderley was remodelled by Sir Edward Stanley, who added a new frontage but retained a great hall said to have been part of the Elizabethan house built

by Thomas Stanley III. In 1779, however, the building was destroyed in a disastrous fire which left only the office wing standing (Lysons & Lysons 1810, 481; Ormerod 1882, vol 3, 567).

A brief description of the hall standing prior to the fire was provided in an account by Louisa Dorothea Stanley published anonymously in 1843 (Stanley 1843, 56-7). Fuller details are found within volumes of antiquarian notes compiled in the early 19th century by her father Sir John Thomas Stanley, the seventh baronet (CRO D 8065/1, pp 181-2; DSA 5/10, pp 40-3; DSA 3752/1a, pp 68-9). These include sketch plans of the hall and illustrations of the building in the form of a drawing and a watercolour (*Figures 16 & 17*). A further drawing is found within an estate account book of 1798-1800 (CRO DSA 241/1A). The illustrations all show the hall from the same direction and differ chiefly in the surrounding detail, with the estate book drawing also showing the north-west end of the mill and an outbuilding to the north of the hall (*Figure 18*). The original illustration from which these were evidently derived is uncertain. An oil painting in the possession of Lord Stanley (*Figure 19*) depicts the hall from the same viewpoint but also gives particular prominence to the mill and may itself be a later variation. In his history of East Cheshire published in 1880, J P Earwaker wrote that '*Miss Stanley very kindly sent me, some years ago, an excellent water-colour drawing of the Old Hall, copied from one in the possession of the family, from which the accompanying illustration (much reduced) is taken*' (Earwaker 1880, 601). Earwaker's published version, which is from the same viewpoint as the others, again shows only the hall and might possibly be derived from the watercolour in the 1798-1800 account book. From the illustrations, the date of 1754 for the rebuilding of the hall has been called into question, on the grounds that the architectural style shown seems more in keeping with the early 18th century (Figueiredo & Treuherz 1988, 20). However, the attribution to Sir Edward Stanley is found not only in early 19th century histories of Cheshire but also in the antiquarian notes compiled by his grandson, the seventh baronet, who was born at the hall in 1766 (CRO DSA 5/10, p 43; DSA 3752/1a, p 68).

From the Stanley material, it is known that the hall occupied most of the moated platform, which is still extant on the north side of the mill pond, and was built around a central courtyard. Its main frontage was on the west, rebuilt by Sir Edward Stanley, of brick with stone detailing. This contained a central entrance, accessed directly by a stone twin-arched bridge over the moat. On the west this bridge led from a stone terrace, approached via steps from a garden or court which was separated from the roadway by the ornamental arch built by the first baronet. This arch was taken down after the fire, as also was the twin-arched bridge which was sold and rebuilt in the township of Siddington. The main rooms lay in the south wing, which was also part of the 1754 rebuilding. The great hall, a survival from the pre-1754 house, occupied the south part of the east wing and contained timber framing. The north wing, brick-built with stone mullions, contained the brewhouse, laundry and steward's offices and survived the fire, having being shielded from the worst of the blaze by a party wall. A small bridge led over the north arm of the moat, on which side was a yard containing the stables. From the sketch plans, it is clear that on the north and west the hall extended almost to the edge of the

moat platform, a situation which was repeated on the east, while the south part of the moat platform was used as a garden area.

It is likely that the hall prior to the 1754 rebuilding was of a similar extent. The Hearth Tax returns for 1673/4 show that Sir Peter Stanley was charged for 26 hearths. This is a very high figure for the region and is compatible with a large courtyard hall (CRO MF 13/2). In 1664 Sir Thomas Stanley, the first baronet, was charged for 27 hearths, but the figure seems to have been emended from 'xxvi' to 'xxvii', perhaps to include the mill (see below). The probate inventory of Sir Thomas Stanley IV in 1607 includes the 'Gatehouse Chamber' (CRO WS), a feature again consistent with a courtyard house.

Following the fire in 1779, the Stanleys moved to a house within the park to the south of the former hall. The wing which remained from that building became known as the Old Hall and by the early 19th century was divided into separate tenancies, part being used as a farmhouse and part as a mill house (see below). Now a Grade II* Listed Building, this is described as being built in the early to mid 17th century, with additions and alterations of 1912. The bridge over the north arm of the moat, accessed between gate piers and short wing walls, all Listed Grade II, also survives, as do gate piers on Congleton Road, also Listed II.

An evaluation and watching brief carried out at the Old Hall in 1994 and 1995 respectively by Earthworks Archaeological Services revealed a burnt layer possibly associated with the fire of 1779, along with 17th and 18th century features including a brick-lined culvert and well (Earthworks Archaeological Services 1996; Clark 2003, 3).

It has been supposed that the moat dates from the late 16th century rebuilding of the hall (Boucher 1974, 3-4; Listed Building Description of Old Hall). This is a relatively late date for such a feature. Dating evidence for the construction of moats in the region is sparse but in both Cheshire and Greater Manchester known examples seem to generally fall within the medieval period, with a heyday perhaps in the late 13th and 14th centuries (Wilson 1987, 151-2; Tindall 1985, 69-70). The existence of an earlier hall by 1391 would be consistent with the moat itself being of a medieval origin. Likewise, the available evidence suggests that in the late 16th century a large courtyard house was squeezed into the relatively restricted space of an earlier moated platform.

The dam to the rear of the mill must be no later than the moat, since this feature was required to create a sufficient height of water around the moat platform. A medieval date for the moat would thus also be keeping with the earliest documentary evidence for a water mill in Nether Alderley. On the present evidence both could be of a 14th century date.

Historic mapping shows that the present extent of the mill pond dates back to at least the 18th century, when it is recognizable on a Stanley estate plan of 1787 (*Figure 2*). To maintain an adequate water supply, Radnor Mere was constructed as a storage reservoir from which water could be sent down to the mill pond when the need arose (Boucher 1974, 3). Its construction may be no

later than the 17th century, given the tradition that the first baronet planted the beech wood next to the mere (see above). Boucher believed that the purpose of three other reservoirs, known as the Lady's Upper, the Lady's Lower, and the Woodend reservoirs, was also to supply the mill pond (Boucher 1978, 3; 1989). However, by the early 19th century, at least, the millers were expressly prohibited from drawing water from sources other than the mill pond and the mere (see below).

4.4 History of the Mill, 17th Century to Closure, *c* 1939

The Millers

The earliest known miller in Alderley may be Benjamin Tasker, who died in March 1693/4. His will and probate inventory describe him as of Over Alderley, leaving open the possibility that his mill was not Nether Alderley Mill. His inventory shows that he also made a living from farming, with livestock comprising seven milking cows, one twinters, two calves, one mare, three sheep and pig, and hay and corn worth £5, but provides no details of the content of his mill, which he presumably rented (CRO WS). It has been stated that John Burgess was the miller at Nether Alderley Mill in the 1730s (National Trust 1994, 19). This appears to be an inference from graffiti at the mill which includes both 'IB 1736' and 'T: Burgess', and has not been confirmed by other evidence.

Between 1800 and the 1860s it has been possible to trace a continuous sequence of the millers (Table 2). Unfortunately, the earlier occupants of the mill cannot be readily identified in a group of documents which include Stanley rentals of 1773 and 1781-2, Land Tax Assessments of 1784-99, and a survey of Nether Alderley carried out for the poor rate in 1800 (MA 127/C7, pp 79-83; JRULM Eng MS 1097; CRO QDV 2/305; CRO P143/17). It is possible that within these documents the mill was counted as part of the hall.

The sequence of 19th century millers begins in 1800 with Peter Mottram (b *c* 1760). He was succeeded in 1816-7 by John Bradley (b *c* 1780), in turn followed in 1828 by Edmund Hatton, who gave up the occupancy after only a year. The mill seems to have fallen vacant until 1831 when William Wilde (b *c* 1786) took it over. In 1843, however, the Mottram family's association with the mill was resumed by James Mottram, believed to have been Peter Mottram's son (b *c* 1790). He operated the site with his own son William (b *c* 1813), who was previously the miller at Birtles (Redfern 2004, 3). William seems to have taken over sole control in about 1847 (CRO DSA 3752/4), but gave up the mill in 1851 and subsequently was a corn miller in Wilmslow (Slater 1855, 134). He was succeeded at Nether Alderley in 1851 by James Beech, whose own length of occupancy is uncertain but had ended by 1855 when the mill was taken over by William Pickering (b *c* 1802).

For the next two or three decades the known evidence for the millers is derived from trade directories and census returns (Table 2). These show that Pickering's occupancy ended at some time between 1865 and 1871, when

William Davis was the miller. His own tenure ended between 1874 and 1878 when the mill was being worked by brothers Henry and Frederick Blease, who were still here in 1883.

The year 1884 saw the beginning of the Rawlins family's association with the mill which was to continue until its closure. John Rawlins (b 1860) was given the lease of the mill as a wedding present by his father, the miller at Great Warford Mill, who had bought the lease for £100. Rawlins ran the mill until his death in 1924, when the business was continued by his sons John (b *c* 1894) and Ernest (b *c* 1898), the latter being the miller for at least the last five years before the mill closed in or shortly before 1939 (Redfern 2004, 3; 2011, 23).

In the 19th century, successive millers occupied part of the Old Hall (Table 2). However, in 1920 Lord Stanley built Mill House for John Rawlins and his family, which they leased along with eight acres of land for their cattle and vegetables (Redfern 2004, 3). In the 19th century, the millers are known to have also leased farmland from the estate.

4.5 The Mill

The mill is named in the probate inventory of Sir Thomas Stanley IV, compiled in 1607 (CRO WS):

'In the milne

Impr: three oulde fowle Arkes, one booteinge pype & one scrue	*xs*
Itm one Iron Croe, two Cheesells, and xii pickes	*iiis vid'*

The list gives only a partial picture of the contents of the mill, referring to movable goods. These were principally chests (arks) and tools (a crow, chisels and picks) but also included a 'bolting [sieving] pipe', possibly a detached or spare part of a sieving mechanism.

In the Hearth Tax return for Nether Alderley in 1673/4, '*The mill*' is listed immediately after Sir Peter Stanley and was charged for 1 hearth (CRO MF 13/2). It may also perhaps account for the additional hearth which seems to have been charged to Sir Thomas Stanley, the first baronet, in 1664. The mill's hearth presumably served a drying kiln, and the Hearth Tax returns provide the earliest evidence for such a feature at this site.

The earliest cartographic source for the mill is Burdett's map of Cheshire surveyed *c* 1772-4, which indicates a water mill on this site. The earliest plan to show any detail is provided by the Stanley estate map of 1787 *(Figure 2*), which shows the millbody and the drying kiln wing. On both this map and the Nether Alderley tithe map of 1842 (*Figure 3*) the front elevation of the wing is depicted as contiguous with the millbody, suggesting that the wing may have been fronted by a pentice. Ordnance Survey mapping of 1872 and 1907 shows the plan form which is also evident on early illustrations and photographs, with the front elevation of the wing set back except for steps giving access to the upper storey (*Figures 4-5, 7-13 & 19).*

After a hiatus in the 18th century, the written documentary evidence resumes in the early 19th century. Deeds of this period are known to have regulated the water supply to the mill. In December 1808 the miller Peter Mottram agreed '*not to draw off the water from the ponds in the Park land and Coach house Pasture Wood*' (MA 127/C7, p 171). When Edmund Hatton rented the mill in 1828, it was stipulated that he was '*not to have Water from any of the Ponds only the Radnor Mere from the north west paddle and that no lower than the Stone Copeing and to have the use of Water in the Hall pond the other ponds not to be used without leave be given*' (CRO DSA 238, p 6).

From a series of Stanley rentals of 1825-7 we also know of repairs and improvements to the mill. In 1825-6 John Bradley was given a reduction of £50 from his rent, '*Allowed for sundry repairs in Mill'*. In 1831 William Wilde received a reduction of £4 from his own rent, '*Allowed for loss of water when cleansing the Mill Pool*' *Mill*' (CRO DSA 3752/2). Prior to that time the mill seems to have been vacant for a year or so, and remedial works on the pond may have necessary before it was put into operation again. Wilde subsequently made alterations within the building itself. A note against his entry in the rental for 1837 records '*Applies for improvements in Mill*' (CRO DSA 3752/3), and in the following year he received a reduction of £10 from an annual rent of £80, '*Allowed towards £20 7s 6d expended on new Cast Iron Segments for the Wheel of the Wheat Mill*'. When he gave up the mill in 1843, Wilde was awarded a final reduction of £50, of which £40 was '*for cast iron wheels and other improvements*', and £10 '*for scarcity of water*'. In 1843 James and William Mottram, who took over the tenancy from Wilde, were themselves given a reduction of £3 '*for scarcity of water*'. In 1846 they were allowed a reduction of £5 '*for loss of time*', in this case due to a '*New Water Wheel*', against which was set a cost of £63 9s (CRO DSA 3752/34).

This last wheel is possibly the surviving lower water wheel, which Cyril Boucher believed to date from about 1850. The reference in 1838 to the '*Wheat Mill*' may be in keeping with the observation made in the 1960s by both Boucher and Norris that the two waterwheels in the mill had each formerly driven separate millstones.

In the late 19th century a portable steam engine was installed, built by Robey & Co of Lincoln. It was positioned at the north-west corner of the mill, and was connected via a belt drive and pulleys to a line shaft on the mill's upper floor, in turn connected by a crown wheel and pinion to the great spur wheel (Redfern 2004, 4). An early photograph shows the engine standing in the open air (*Figure 8*), but other photographs show it encased in a timber shed with the chimney poking through the roof *(Figures 9 and 10*). A photograph by Francis Frith showing this shed is dated to 1896 (Pye 2004, 36), and the shed is also evident on OS mapping of 1907 (*Figure 5*). Boucher (1987) dated the installation of the engine to the 1880s, while trade directories show that steam-power was in use alongside water-power at the mill by 1892. They also indicate that between 1910 and 1914 the engine went out of use, with the mill apparently being powered solely by water for the remainder of its working life (Table 2). It was possibly with the end of steam-power that the lower millstones ceased to be used and the lower waterwheel was linked to the

gearing off the upper wheel to help drive the upper millstones. It was later reported of the closure of the mill that '*For some years before this the only corn brought to the mill had been poor quality corn meant for feeding cattle*' (*Manchester Guardian* 30 May 1945, 3).

Details of the closure were also given by Boucher, who wrote that '*a diminished business was still being conducted in 1939 by the last miller, Mr Rawlins. Shortly after that date the machinery had become so derelict that it could be worked no longer. The wooden axle of the lower wheel had rotted and the wheel leant against the walls, immovable. Expensive repairs were necessary and the decision was reluctantly taken to close down. The mill remained derelict and unusable. The wooden culvert conveying water to the wheels rotted away and was eventually removed and the dam was sealed with clay*' (Boucher 1974, 4). It was during this period, in about 1940, that the drying kiln roof and upper storey are said to have collapsed (Redfern 2004, 21).

Table 2: The Occupants of Nether Alderley Mill

Date	*Occupant*	*Source*
1694	?Benjamin Tasker of Over Alderley, miller	CRO WS
1800-16	Peter Mottram	Land Tax (CRO QDV 2/305)
1807-8	Peter Mottram, mill	Rental (MA 127/C7)
1811	Peter Mottram, aged 51, miller James Mottram, aged 21, miller	Census (CRO P143/13/15)
1817-28	John Bradley, mill and part of Old Hall	Land Tax (CRO QDV 2/305), rentals (CRO DSA 240/1a; DSA 3752/2).
1821	John Bradley, aged 41	Census (CRO P143/13/15)
1828	John Bradley, miller, Alderley mills	Pigot, 62
1828-9	Edmund Hatton, Alderley Mill	Rental (CRO DSA 3752/2), survey (DSA 238, p 6).
1830-1	Late Hatton, house and mill	Land Tax (CRO QDV 2/305)
1831-43	William Wilde, mill and part of Old Hall	Rentals (CRO DSA 240/1b, p 119; DSA 3752/2 & 3)
1841	William Wilde, aged 55, miller, Old Hall John Wilde, aged 25, miller, Old Hall	Census
1843-51	James & William Mottram, mill and part of Old Hall	Rentals (CRO DSA 240/1b, p 119; DSA 3752/4)
1850	William Mottram, corn miller	Bagshaw, 166
1851	William Mottram, aged 38, miller, Old Hall	Census
1851	James Beech, mill	Rental (CRO DSA 240/1b, p 28)
1855	William Pickering, mill	Rental (CRO DSA 240/1b, p 130)
1857	William Pickering, miller	Kelly, 7
1860	William Pickering, corn miller	White, 658
1861	William Pickering, aged 59, miller	Census
1864	William Pickering, miller	Morris, 300
1865	William Pickering, miller	Kelly, 9
1871	William Davis, aged 48, Welsh Road cottage, miller	Census
1874	William Davies, Old Hall, miller	Morris, 754
1878	H F Blease & Co, farmers & millers	Kelly, 13
1881	Frederick Blease, aged 31, Congleton Road, corn miller Henry Blease, aged 33, Congleton Road, corn miller	Census
1883	H F Blease & Co, farmers & millers	Slater, 355

1884-1924	John Rawlins	Redfern 2004, 3
1890	John Rawlins, miller	Slater, 723
1891	John Rawlins, aged 32, Old Hall, corn miller for hire	Census
1892	John Rawlins, corn miller (water & steam)	Kelly, 20
1896	John Rawlins, corn miller (water & steam)	Kelly, 20
1901	John Rawlins, aged 42, part of Old Hall, corn miller	Census
1902	John Rawlins, corn miller (water & steam)	Kelly, 20
1906	John Rawlins, corn miller (water & steam)	Kelly, 24
1910	John Rawlins, corn miller (water & steam)	Kelly, 24
1914	John Rawlins, corn miller (water)	Kelly, 26
1923	John Rawlins, corn miller (water)	Kelly, 30
1928	John Rawlins, corn miller (water)	Kelly, 30
1934	Ernest Rawlins, corn miller (water)	Kelly, 28
1939	Not listed	Kelly, 31-3

4.6 Repairs and Alterations Post-1939

Structural Repairs, 1940s and 1950s

In May 1945 it was reported that the mill had been offered to the National Trust by the then owners, Major and Mrs Sheldmerdine. However, the National Trust lacked the funds needed for putting the mill into repair and considered that it could only accept the offer if money was made available from elsewhere and the necessary repairs carried out. On the 30 May of that year, an appeal to raise £1000 for this work was jointly launched by the Royal Manchester Institution, the Council for the Preservation of Rural England (East Cheshire Committee), the Lancashire and Cheshire Antiquarian Society, and the Ancient Monuments Society (*Manchester Guardian* 30 May 1945, 4). In November 1945 it was reported that £544 had been raised so far and that work was to begin on repairing the roof (*Manchester Guardian* 6 November 1945, 4).

By June 1946, this initial work had been completed: '*So far £718 has been subscribed towards the target figure of £1,000, and the balance is urgently required in order that the mill may be handed over to the National Trust in good condition. The roof and gable ends are now completely restored. As a first step towards repairing the machinery of the mill a new water inlet gate is to be erected. The old one permits considerable water seepage*' (*Manchester Guardian* 2 May 1946, cited by Redfern 2011, 23). In 1950, when the donation of the mill to the National Trust finally took place, the significance of the earlier appeal was noted: '*In 1945, as the result of a general appeal to the public and the generous support of the Royal Manchester Institution, the Council for the Preservation of Rural England (East Cheshire branch), the Lancashire and Cheshire Antiquarian Society, and the Ancient Monuments Society, a sum of money was raised sufficient to carry out repairs and put the structure in order*' (*Manchester Guardian* 28 June 1950, 5).

The full extent of the works carried out as the result of the appeal is uncertain. Harold Norris later reported that '*local funds paid for repairs and general tidying up of the interior*' (Norris 1968, 52), while Boucher wrote that '*a start on the restoration was made by putting the fabric into good order and relaying the stone flag roof*' (Boucher 1974, 4). Their accounts also suggest

that the works involved some internal alterations, particularly in an area which had once contained the millstones driven by the lower wheel (see below). Externally, Mike Redfern has noted that at some point following the collapse of the roof and upper storey of the drying kiln, '*the front wall at least, was tidied up at waist height and the void between the furnace and the drying floor was filled with the building rubble and capped with concrete*'. In addition, '*Shortly before being acquired by the National Trust, some renovation work was carried out. The work included brickwork and stonework. Outside the brickwork around the former drying room floor was tidied up and capped with stone sections. The former wooden panelling (or wooden door) above the tailrace was bricked up. Probably also at this time, the outside steps to the first floor of the drying room were removed and the doorway to the furnace anteroom bricked up*' (Redfern 2004, 21).

Restoration of the Machinery, 1967 and Later

Whatever their full extent, the early restoration works seem to have been primarily concerned with structural repairs and alterations, allowing the mill to be open to the public. In 1967 a further programme of restoration was carried out to return the mill to working order. This work was undertaken on behalf of the National Trust by Dr Cyril Boucher, of the University of Manchester Institute of Science and Technology, assisted by his two sons and others, and is reported to have been completed in 1970.

Boucher later gave a summary of these repairs in the guidebook to the mill, written by himself and published in 1974, revised with slight additions a few years later (Boucher 1974 & 1978). According to his account, '*The upper wheel was first rebuilt with completely new woodwork, and the machinery was eased, repaired and repainted'*. This work included the replacement of the wooden teeth with new teeth of birch. Next the culvert from the mill pond was rebuilt, with a concrete base, and the lower wheel and millstones were restored to working condition. A new axle of oak was constructed for the lower wheel, '*six-sided through the wheel, changing to eight-sided where the pit wheel was mounted on it*', with cross-tailed gudgeons morticed into each end, secured by three iron bands. Each of the runner and bed stones was recut (Boucher 1974, 11-12). A modern mechanical sifter was donated by Ranks, the millers. The original sifter had also survived within the mill, described by Boucher as '*an openwork cylinder lined with sieves of varying degrees of fineness, and inside this, revolving arms tipped with brushes*' (Boucher 1974, 9).

In the 1974 guide book, Boucher also noted that '*a stone nut and quant have recently been retoothed and mounted in its original top bearing to run on the side of the great spur wheel*', to illustrate the drive from the lower waterwheel to its own millstones.

Other Repairs

The mill pond was dredged in 1995 and subsequently repuddled. Followng this work, water began to leak into the mill at both ground-floor and basement level. The higher leak was stopped in 1999 by digging a trench on the dam

crest, filling this with puddled clay and installing a drain to carry seepage away to below the building. The lower leak had worsened by 2001 but the problem is reported to have been solved by lowering the water level in the mill pond (Thorp & Wheeler 2001).

4.7 Studies and Surveys of the Mill

Pre-20th Century
Accounts of the 19th century show that the mill's roadside position and distinctive appearance made it a prominent local landmark, but otherwise it seems to have received scant interest from antiquarians and the like. In 1843, in what was essentially an early guide book to Alderley Edge and its surroundings, Louisa Dorothea Stanley mentions the mill only as a reference point for the site of the former hall (Stanley 1843, 56-7). Later in the century, J P Earwaker in his history of East Cheshire observed in a footnote that the water-mill documented in 1391 '*not improbably occupied the site of the well-known picturesque mill in Alderley, now on the high road*' (Earwaker 1880, 596 n 'g'). The local antiquarian John Owen visited the mill at some time in the late 19th century but has left only a sketch entitled 'On a door at Alderley Mill', which shows a circular ring handle attached to a lozenge-shaped bracket inscribed with 'IxS', 'MxS' and '1746' (MCL Owen Mss vol 24, 1). The first initials are possibly those of James Stanley, who held the lordship between 1721 and 1746/7. In the early 20th century, interest in the mill still centred on its visual quality. A local guide book of the time wrote of '*the Old Corn Mill, a picturesque old building resting on the lower margin of a grassy incline which slopes gently downwards from the road. It is an old landmark and a favourite spot for artists and photographers*' (Prince 1923, 31).

Harold Norris, 1960s
The earliest known detailed description of the mill was that by Harold Norris, which forms part of a study of corn mills in Cheshire published in 1968 in the *Transactions of the Lancashire and Cheshire Antiquarian Society*. Notes on the mill, compiled during visits made in September 1963 and June 1964, together with photographs taken and collected at the time, also survive within Norris's papers held in the Cheshire Record Office (CRO D 4744/4). These visits fell after the initial period of structural repairs to the mill but before Boucher's restoration of the machinery (*Figures 20-23*).

In his published account Norris wrote that '*Architecturally, this is the most interesting of the Cheshire mills*', but his attention was mainly occupied with the workings of the site. He noted that '*Originally, it was two mills divided vertically across the roof slope, but later both wheels were connected by gearing to drive the same two pairs of stones...Some of the old machinery lies on the lower ground floor, including the overdrift quants and the stone nuts for the lower wheel. It is unfortunate that repairs and improvements necessary to open the mill to the public have destroyed some of the old details, but it is now in a very suitable state for public inspection and it is hoped that following work by Dr. Cyril Boucher and his son, this mill may be returned to working condition by 1968*' (Norris 1968, 52).

Norris also provided a description of the arrangement of the mill machinery at the time of his visit:

'*The upper wheel is fed through a culvert from the dam sluice and into a wooden pentrough, where another sluice operated by a lever arm and pinion released the water, to the overshot wheel 13′ 0″ x 4′ 0″, mounted on an iron shaft with wood arms or spokes, an iron rim and wood buckets, the water then passing along a trough to feed the lower wheel 12′ 0″ x 3′ 0″ of similar construction, except that the shaft is of wood. The drive from the upper wheel is transmitted through the wheel shaft to a spur gear pit wheel which drives a pinion on a short shaft running under the cast iron hurst frame and driving by bevelled pinion the iron upright shaft on which is mounted the great spur wheel driving to the iron stone nuts with wood cogs. The drive from the lower wheel is by a bevel pit wheel driving a wallower on the wooden upright shaft, near the top of which is mounted a wooden compass arm great spur wheel with a ring of iron face and bevel gears. The great spur wheel is strengthened by struts from the rim to half way down the upright shaft. From the great spur wheel a short shaft on which are mounted two belt pulleys, one for the sack hoist and one for the auxiliaries, drives through an iron bevel wheel to a similar wheel with wood cogs, mounted on the short shaft of the upper wheel drive gearing. Thus the two wheels now drive the same set of two pairs of stones. It is possible, if required, to disconnect each drive separately by sliding pinions out of mesh. The hurst frame, possibly of mid-nineteenth century construction, is of iron with ring and screw disconnections for the stone nuts and has iron bridge trees with single screw adjustment for setting the gap between the stones. In front of the hurst frame, the two spouts from the stones above was fed into a wooden box with an Archimedean screw device to pass the flour to the sacks fastened underneath. The two pairs of stones on the floor above are fed with grain from the granary floor by chutes feeding the hoppers mounted on the hurst on top of the circular metal vats or casings. The sack hoist is fitted near the stones and driven by a belt from the pulley mentioned before, the slack being adjusted by the usual lever arm lifting the end of the shaft*'. There were, he added, '*two sets of trap doors serving the two sections of the mill*' (Norris 1968, 52-3).

Cyril Boucher, 1970s and 1980s

Boucher's guidebook of 1974, and its revision of 1978, provided a summary overview of the mill with sections on the mill's history, the building, the machinery (*Figure 26*) and the restoration work of the 1960s. This included a phasing of the machinery, in which Boucher noted that,

'*The gear wheels, hurstposts and shafts associated with the upper water wheel have the date 1871 cut on their pedestal, but the lower water wheel and the great spur wheel of oak, framed on an octagonal pitch pine vertical shaft, are somewhat earlier, of about 1850. The heavy cast iron pitwheel is later, and came from elsewhere, for it is made to fit on an eight-sided axle, while the water wheel requires six sides*' (Boucher 1974, 8).

Like Norris, he also made reference to the former arrangement of millstones turned by the lower wheel:

'*At the turn of the century there were two more sets of stones at a lower level motivated by overdrift stone nuts and quants, running on the side teeth of the great spur wheel. The wooden floor at the entrance did not then exist and the stones were mounted just above the wallower, the big horizontal gear wheel in the basement. All this machinery was dismantled soon after, but it was never taken out of the mill, and still lies in parts in the basement*' (Boucher 1974, 9).

Measured Surveys of the Buildings 1960s-2000s

The earliest known measured survey of the mill was carried by Nigel Clegg and Austin Longsdale of University of Manchester's Department of Architecture, reportedly in the 1960s. This produced a set of detailed drawings which include north, west and east elevations, floor plans and cross-sections. As well as depicting the building, the drawings also included a record of the mill machinery (*Figure 24*).

In 1984 drawings were produced of the building by Anthony Short and Partners, presumably based on a measured survey carried out at that time. These later served as the basis for a set of drawings of the mill made by Wiles and Macguire in July 2002 which included floor and roof plans, elevations and a cross-section.

During the period 1998 to 2002, Jeremy Milln, National Trust Archaeologist, prepared a site plan and a number of other plans and elevations of the mill. These imply that a geophysical survey of the moat platform was also undertaken at the time (NTSMR, Drawing Nos. NAL/S3 & S8).

In 2002-3 Mike Redfern carried out a measured survey of the north, south and west elevations of the mill. On 2004 he published these in an account of the building, which included a description of the fabric, a record of its graffiti, and an attempt to identify the various phases of construction (Redfern 2003). This account was updated in 2011 (Redfern 2011).

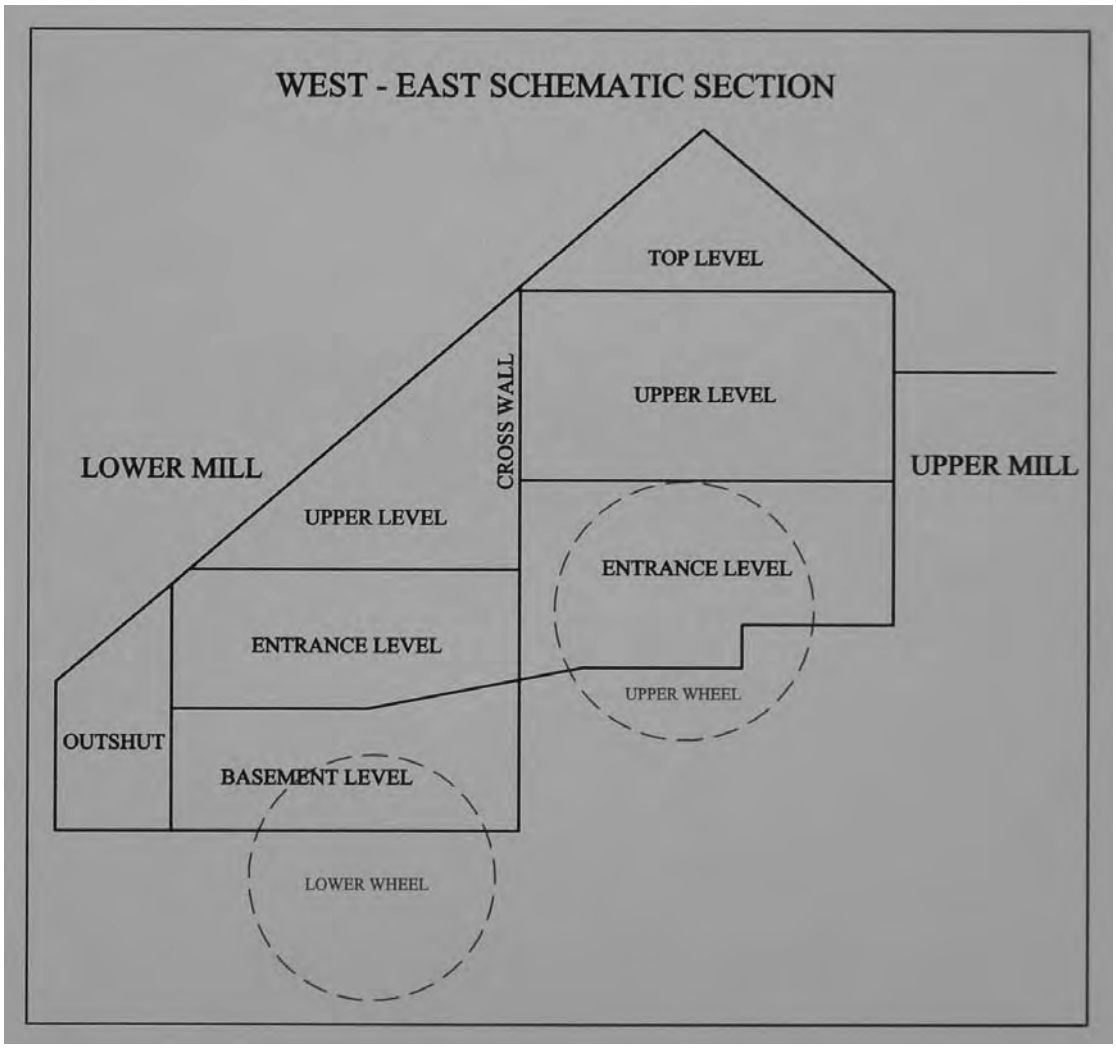
In 2003 the Manchester Region Industrial Archaeology Society carried out survey work on the mill dam, including sections through the dam taken on the north and south side of the mill and a profile of the base of the mill pond against the dam's east face.

In 2007 Wiles and Macguire produced a suite of drawings, again including floor and roof plans, elevations and a cross-section and annotated with the results of a structural survey.

5. Building Description

5.1 External description

General
For descriptive purposes for the mill exterior and interior, the north-west facing wall was defined as the north wall, and all other relative directions follow this orientation, defined as 'site north'. Furthermore, because of the way in which the floors were split internally, the mill was subdivided into an eastern upper mill, and a western lower mill, which reflected how the mill originally functioned, with respective upper and lower waterwheels. Internally, the two mills were subdivided by a north-south cross wall, and the floor levels between the two mills were split by this wall. The lower mill comprised a basement level, an entrance level above this, and an upper level above this. Within the upper mill, the lowest level was the entrance level (just above that of the lower mill). Above this was the upper level, and above this, within the roof, was the top level (see Schematic Section below).



Externally, the mill footprint comprised a rectangular block, which measured 12.26m north-south, by 10.96m east-west. The final form of the mill comprised a structure which measured three bays north-south (subdivided by

the two large roof trusses); by two bays east-west (subdivided by the cross wall). The walls were constructed of ashlar blocks of local sandstone and conglomerate. The mill had been built into the west face of the dam which retained the millpond, and the mill cross-profile reflected this, with the roof ridge being above the upper mill to the east. The short eastern facing roof pitch was offset by the great expanse of the west-facing pitch, which swept down almost to ground level. The roof had a graduated covering of Pennine flagstone, which was allegedly quarried at Kerridge Ridge, near Bollington. A series of four swept ventilation louvres broke the pitch of the roof.

The building stone of the mill comprised four types:
Type 'A' – Current bedded, medium grained, relatively soft red sandstone.
Type 'B' – Medium grained, tough grey sandstone, with barite cement.
Type 'C' – Current bedded, medium grained, relatively soft yellow sandstone.
Type 'D' – Coarse grained hard red-brown conglomerate.

The building had been partially extended on the west as an outshut, and a truncated corn-drying kiln, built of brick, was contiguous with the south elevation.

East elevation
This elevation (29) backed onto the mill dam, and for this reason was only about 1.0m high. It was wholly of type A sandstone. Towards the south end, a small two light window with a timber frame had been inserted within the northern half of a larger blocked window (154), which had measured 2m wide by 0.7m high. A second blocked window (153), which was 2.8m wide, was located at the north end of the elevation. At the north end of this wall there was originally a brick chimney stack related to internal feature (156), but this has been removed and roofed over. The stack had originally risen to a height equal to, or greater than, the roof ridge of the mill. It is suggested that a greater depth of wall (29) was exposed originally, but that the ground levels may have been raised at some point, possibly in the 20th century, to create a level walkway along the dam, between the mill and the parapet wall of the millpond.

North elevation
This elevation was abutted by the mill dam wall (39), and the eastern part of the wall was raised over the dam. The western, lowermost part of the north elevation comprised a heavy plinth developed by a series of three offsets (08). The visible base course was of type D stone, which suggests that the conglomerate may have been preferred for its compressive strength, or for its resistance to rising damp from the ground. The upper blocks of the plinth were of type A stone, and a pair of blocked putlog holes (71) were identified here, as well as a pair of probable small apertures (72 & 73), now blocked. The latter opening appears to have a surviving section of a cut splay below it. The remainder of the stonework (10) in the elevation comprised mainly type B stone, with type A being restricted to the upper parts. There was a considerable amount of graffiti on the plinth and the lower part of this wall, from the late 18th century onwards (Plate 9); and also a single mason's mark (Plate 18). To the east of the plinth was a large cart doorway with a timber

door (43), 1.86m wide, which had not been opened for some years. The door surround was plain, and of type A stone. The lintel comprised a flat arch of three blocks. The doorway was no longer accessible to any wheeled traffic, as the west end of the door cill was well above existing ground level. A similar condition obtained on the mill interior.

Above this doorway was re-used mullioned window (158), complete with moulded splayed surrounds. This had originally been of four lights, but only the central mullion had survived intact. This window seems to have been partially blocked by brickwork to facilitate attachment of a small access platform for the wheel shown in Figure 8. To the west of doorway (43) was rectangular window (171), which had a shallow flat reveal to house the grille shown in Figures 8, 11 and 12. This window appeared to have been inserted into the wall (10) at a later date. A single small putlog hole (71) was located to the east of this window.

The pike of the gable comprised a timber-framed truss (205), with a tie-beam, principal rafters, a king post, and multiple raking struts in a herringbone pattern, with infill of lathe and plaster. Although the main components appeared to be well weathered and of some antiquity, some of the struts had been replaced, probably during the late 20th century.

Immediately beneath the west part of the truss, a section of stone coursing had been removed, and replaced by brickwork in two phases (157). The stonework beneath here was stained by oil. This was the location at which a lineshaft had extended through the wall, and terminated in a large cast-iron gear wheel, with S-shaped spokes (this wheel is now in the mill basement). The wheel is clearly visible in Figures 8 and 11, and was driven from a belt drive attached to the small portable steam engine shown in Figure 8.

West elevation and outshut

As this elevation faces the main road, it could be assumed that this was always the mill frontage. The present access door (01) to the mill is located at the north end of this elevation. The threshold was elevated upon some crudely constructed stone slabs, with a worn Pennine millstone being placed half-buried to the front of these. The doorway itself was constructed largely of re-used moulded jambs, probably derived from a 17th century building. However, there was no door lintel, as the wallplate of the roof spanned over the doorway instead. This low headroom gave the impression that the doorway may have been inserted as an afterthought.

To the right (south) of the doorway, the original mill fabric (05, all of stone type A), comprised a large cart door (04), framed by a pair of buttresses with a lintel over formed of a flat arch of three sandstone blocks. At some point, this doorway had been reduced to form a small pedestrian entrance, visible in Figures 7 and 8. However, this had then been removed, and the large doorway blocked during the 1960's, according to Jeremy Milne's survey. The door cill extended below the present ground level. The left hand buttress had been mutilated, but that to the right, now part of the north wall of the outshut, appeared to retain its original profile.

The southern part of this elevation was broken forward as an outshut (23), with the left-hand buttress being integrated into the north wall. The west wall of the outshut was of sandstone for two thirds of its length. Within the north part was a blocked window (74), and to the right (south) of this was a window (115), which had originally been a doorway (Figure 11). Immediately to the right of this window was a small blocked aperture (75), the lower arris of which was worn, as if by a moving belt. Early photographs (Figures 10 - 13) suggest that this was the upper one of a pair of such apertures, and it seems likely that the portable engine could be located against this elevation, to deliver rotary power into the outshut by means of an endless belt, which was passed through both apertures.

The south wall of the outshut (26) was constructed of handmade brick, which measured 230 by 105 by 70mm, and was a westward extension of the south mill wall (31). Between (23) and (26), the west wall comprised a 2.0m wide aperture blocked by reclaimed brick. Early 20th century photographs (Figures 11 - 13) show this aperture as having a timber covering, and Jeremy Milne's survey suggested that the brickwork blocking was constructed in the 1960's.

South elevation

The south-facing gable of the mill (31) was composed of stone types A and B. The kiln had been constructed against the central lower part of the elevation, and had therefore obscured much of the earlier fabric. The lowermost two courses of the wall had offsets which thickened the wall towards ground level, similar to those at the base of the north mill wall. Above here, just under the roof line, the fabric had been suffered some damage (76), and this is assumed to have occurred when the staircase to the kiln first floor was removed. The footings of the west end of the staircase were still visible at ground level (95). When the kiln was erected, it had obscured a three-light mullioned window (37), which is now infilled, and only the top of this feature could be seen above the kiln roof. Immediately above this window was a series of six infilled joist holes (77), the height of which does not seem related to the kiln as shown on the pre-1946 photographs (Figures 11 and 12). It is possible that these represent roof or floor joist positions for an earlier kiln structure.

In the upper gable, the existing doorway (166), which gives egress from the upper level of the upper mill, onto the kiln roof, appears originally to have been a window. The moulded jambs are still present, and it is suggested that this would have been a two- or three-light window; which may have been broken through to form a doorway after the upper part of the kiln collapsed in the 1940's. Just to the right (north) of this doorway was the ghost impression of a vertical partition, either constructed of timber, or of a single skin of brickwork, possibly the rear (east) wall of the upper section of the kiln.

The gable pike comprised a timber truss (206) identical to that in the opposite (north) gable, again some of the timber members had been replaced, probably during the late 20th century.

Kiln exterior elevations
The brick kiln was contiguous with the south wall of the mill, and was originally a two-storey structure with a pitched roof over, and a stone access stairway in the angle between mill and kiln, to the upper level. In about 1940, the kiln roof had collapsed, and the upper storey had been demolished, leaving the sub-structure as a flat topped terrace-like feature. Externally, the kiln measured 7.75m north-south by 5.78m east-west, and the building rear (east) was set into the mill dam, which left the front elevation (27) as a 3m high battered wall with a blocked recessed doorway (06). The upper part (80) of this wall had been rebuilt (after c1940), for as much as half of its height at the south end, where it butted against retaining stone wall (81). At the north end, a rectangular section (79) comprised C20 infill, this represented the point where the stone staircase had been removed. The original full height wall was constructed of handmade brick in a Flemish bond (Figure 8), with the small gabled porch being located at first floor level, in the angle between the mill and kiln roof pitches.

The south elevation appeared to comprise a plain vertical brick wall (27), but this was heavily overgrown, and was on the boundary of the ownership of the National Trust. The east elevation was entirely buried within the body of the mill dam.

5.2 Internal description

Lower Mill Basement
The basement of the lower mill was located within the west part of the mill, and was contiguous on the south with the lower wheelpit. It was accessed by a steep flight of timber steps from entrance level, and was located partially below the external ground level. Internally, it was rectangular in plan, two bays in length, measured 7.40m by 4.5m, and had been enlarged slightly on the west by the addition of an outshut.

The north (11) and east (12) walls were underpinned by bedrock, into which the basement had been partially excavated. The bedrock was highest in the north-east corner, and stepped down towards the west and the south, indicating a local dip towards the south-east. Above this, the walls were raised in large ashlar blocks of local red and yellow sandstone. The east wall comprised an apparent earlier northern section (12), which terminated at a straight joint with several offsets against wall (65), which was assumed to be later and contemporary with contiguous gearing wall (52). However, two sections of wall (12) had been rebuilt against the straight joint. Firstly, a large gritstone bearing block had been inserted to support gearing (67), underpinned by several ashlar sandstone blocks (66); and beneath here an area of probable C20 masonry (68) had been rebuilt.

At the west end of the north wall (11) was a doorway (114), 1.2m wide, which had been blocked by sandstone ashlar. The original door lintel must have been located above ceiling level, but the wall had been truncated when the ceiling

was inserted, and the back (north) of the blocked door had been infilled when the passage at entrance level was created.

In the west wall (05), blocked doorway (04) extended the full height of the basement level, and up into the entrance level above. To the south of here, the original west wall had been removed and opened up when the outshut was attached. An external doorway had been located against the north side of this gap, judging from the nature of the wall end here, and the timber beam over (113) may have comprised the *ex-situ* door lintel. Above this level, the roof was supported on a substantial but crude timber beam (82), which may have comprised the original wallplate. The space beneath this beam may have comprised a broad window, of which the northern reveal remained intact. The south end of timber (82) was seated upon the top of a substantial masonry column (56), which appeared to have been erected during the 20th century, probably as a rebuild of a section of the original walling here. This column was built to abut walls (52) and wall stub (83) over.

The gear cupboard (101) was reduced in level below the basement floor (100), and was defined on the north by crude sandstone wall (108), and on the west by wall (107). Horizontal timber baulk (111) was part of the hursting, but may not have been an original component. The pitwheel pit (101) housed the cast-iron lower pitwheel, the teeth of which engaged the lower wallower and the octagonal main shaft, formed of pitch pine (110), which sat upon a small footstep bearing, which in turn was located in the centre of a substantial gritstone block. The gearing wall (52), to the south of the gear cupboard, had an offset (106) at a lower level, with no discernible explanation.

The remainder of the basement floor, apart from the gear cupboard was flagged over or excavated to bedrock, with no evidence surviving for former mill machinery. The timber floor above was supported on a series of three east-west beams (112), and suspended beneath this ceiling, to the north of the gear cupboard, was a short iron driveshaft, evidently intended to link to an item of machinery.

Placed within the basement were four Pennine millstones (50), a heavy cast-iron circular plate, and other *ex-situ* elements including a quant. These are described below in Section 6.

Outshut interior

Within the outshut interior, at floor level beneath window (115), was a partially-buried splayed aperture (116) in the face of the wall. Within the south outshut wall, and visible from within wheelpit (102), at a level below that of the outshut floor, was a circular aperture (51), clearly intended to allow a waterwheel shaft to pass through. A small trial pit (TP2) was excavated to investigate this aperture on the north side of the wall. The floor of the outshut here was formed of substantial sandstone flags, about 150mm thick. Beneath this was an infill of compact yellow clay, and although excavation proceeded to the base of the circular aperture in the adjoining wall, no evidence was revealed for any other features. It is assumed that aperture (116) had been

intended to contain the west perimeter of a pitwheel, but only excavation here could demonstrate this suggestion.

Lower wheelpit and waterwheel
The lower wheelpit was located directly to the west of the upper one, and occupied the south-east corner of the mill building. To a considerable degree, the wheelpit had been been excavated into bedrock. On the east face of the pit, the bedrock cut was crudely finished, and this effect was exacerbated by fracturing on the bedding planes, and movement which required underpinning with blocks of ashlar masonry. An iron ladder provided access from the entrance level, from where a roughly-finished bedrock platform was reached. The south bearing stool of the waterwheel (109) was central to the shelf, and to the south of this a deep aperture (103) had been cut out from the bedrock beneath the south mill wall (07) and the kiln, in order to provide working space for use of a large spanner to release the nuts on the bearing stool. The east flank of the recess had been faced in machine-made brick, presumably to retain the bedrock and underpin the mill wall above. The waterwheel is described below in Section 6.

The gearing wall (52), which formed the north side of the wheelpit, was of well-executed close-fitting ashlar masonry blocks, wholly of type B sandstone. The aperture for the axle-tree (86) was large and irregular (almost certainly an enlargement of the original), and had been partially infilled with machine-made brick. A pair of equal-radius scour marks were visible inside the wheel circumference, at 11 o'clock to 1 o'clock and at 5 o'clock to 9 o'clock respectively, but these may have been formed by the existing wheel. A third scour mark, beyond the wheel circumference, at 1 o'clock to 3 o'clock, was evidently attributable to an earlier wheel, of slightly greater diameter.

The timber launder (84), above the wheel, was probably no more than ten years old, but immediately beneath this were two large sockets into the gearing wall which probably housed beams supporting an earlier launder. The gearing wall extended westwards from the wheel, to abut the much cruder masonry of the tailrace tunnel (53), and brick wall (58) above. Sub-circular aperture (51) was located here, with a horizontal centreline coincident with that of waterwheel (109). This aperture was almost certainly intended to house the axle tree of a third, but long-forgotten waterwheel, the theoretical radius (c.1.2m) of which was limited by the roof slabs of tailrace (53). However, no scour marks were recorded which could have indicated a waterwheel presence. Above this putative waterwheel, a pair of sockets in the gearing wall may have housed timbers to support an extended launder (85), and blocked aperture (57) may have allowed for regulation of water flow onto the waterwheel, from inside the outshut.

Above the putative launder position, the gearing wall terminated, and the south wall of the outshut had been constructed using type A sandstone. Small rectangular window (55) was located just below roof level, and to the right (east) of here, north-south wall (83) had been crudely truncated so as to be flush with the east-west wall. Wall (83) seems to have been part of the original

west mill wall, and had spanned over the wheelpit supported by a thick slab of type B sandstone.

Opposite to aperture (51), on the south side of the wheelpit, was a rectangular platform (104), supported by wall (61). To the south of (104) was a large rock-cut aperture (59). It was assumed that the south end of the axle-tree of the putative third waterwheel must have been located on this platform, and therefore a small trial-pit (TP1) was excavated here. This encountered a pair of large blocks of sandstone at 0.3m depth, with no evidence for any bearing for a waterwheel. It is possible that any gritstone block had been removed. The aperture (59) is assumed to allow for turning of a large spanner, as at aperture (103) adjacent to the lower waterwheel. Above this aperture, in the base of wall (26), was a series of sockets for north-south timbers, which probably supported a single pitch roof to protect the putative bearing from the weather, before the mill roof was extended over here when the outshut was constructed.

Wall (61), beneath platform (104), comprised a section of type C ashlar, 2m high, which extended down to the base of the wheelpit, and appeared to infill a broad gap in the bedrock, which otherwise formed the wheelpit flank here. The stonework was not as competently constructed as the gearing wall opposite, and it is assumed to represent a later modification. The fill behind the wall was visible as voided rubble, and it was presumed that this stonework represented the blocking of an earlier rock-cut tailrace tunnel, which pre-dated the existing mill tailrace. This had a maximum possible width of 1.5m, and the downstream end of this feature was proven by later investigation of the byewash tunnel system to the south of the mill (Section 5.3 below).

The tailrace tunnel (53) was cut partially through bedrock, and the upper walls and roof were constructed of a mixture of stone types A, B, and C. However, the massive roof slabs were formed of type D, conglomerate being considered as having the greatest load-bearing capacity. From an initial height of 2m, the culvert height reduced sharply towards the west. Just above the tunnel portal, a large slab of concrete had been poured in situ, presumably to support the construction of the overlying wall (25).

Lower Mill Entrance Level

Access into this space was through doorway (01), which led into a ramped concrete passage, parallel to the north wall of the mill. This passage contained a weighing machine (13), probably of 20th century date. To the right (south) of the passage, the room space was defined on the east by wall (12), rising above the basement, and by wall (11), a truncated section of which was present on the east side only, most of the wall having been demolished on the west side.

Wall (12) did not rise to ceiling level, but was capped by timber (69), which at the north end was trenched to seat a series of common rafters. Mike Redfern suggested that this was evidence to suggest that wall (12) represented the external east wall of the earliest mill building, with timber (69) representing the original wall plate. Just above floor level, a pair of large sockets in wall (12) may have indicated that the original floor level was perhaps 0.4m higher.

In a southward direction, both wall (12) and wallplate (69) had been truncated by infill (66) and gearing (67). Wall (11), the putative north gable end of the early mill, was truncated at a level just below adjacent wall (12), then rebuilt in brick above here. The western end of wall (11) at this level may have represented the eastern jamb of a first floor doorway.

Blocked doorway (04), within wall (05), extended 0.75m above the existing (C20?) timber floor, which implied that an open loading bay had existed here, with the floor in part missing, to facilitate loading/unloading of loaded carts.

The inserted timber floor did not extend across the south half of this level, where a safety cage surrounded the position of the upright shaft and lower great spur wheel (21). Beyond here, wall (65), rising from basement level, contained a number of apertures, including the outlet from the upper waterwheel, which fed water onto the modern timber launder (84).

Access to the south part of this level was via a modern timber walkway, which extended along the west and south interior walls. The south mill wall (07) had a 0.3m offset at 1.75m height, which may have implied that the fabric beneath this level was part of the earlier mill, as this level was coincident with the base of the wallplate (69) on wall (12). Crudely-formed doorway (16) had been inserted through wall (07), to provide access into the kiln from the mill. Within the west doorway return was preserved the moulded jamb of a splayed mullioned window, and it is suggested that this window was converted to a doorway when the kiln was abutted to the external wall.

Kiln interior
Access into the kiln was only possible from doorway (16), which led from the entrance level of the lower mill. This entered into a brick-vaulted north-south chamber (35), which had no natural illumination. At the east end of the north wall was a doorway (06) which extended through the mill south wall, and provided access to the upper waterwheel chamber and south bearing. Central to the south wall of the vaulted chamber was a doorway (18) which led into the kiln structure itself. This comprised a brick vaulted passageway which extended to follow a square plan around the kiln fireplace. The fireplace itself (19) was located immediately opposite the access doorway, and comprised a brickwork aperture with a lintel of three wrought iron bars. The interior was choked with collapsed rubble from the kiln, and this included broken kiln tiles. Above the fireplace, it is assumed that the infilled kiln interior comprised a funnel-shaped brickwork structure (44), and that the kiln floor may have been located at or just below the level of the existing concrete roof of the kiln. Upon the evidence of kiln structures elsewhere, the kiln floor will comprise a grid of wrought or cast-iron beams, with the grid spaces being of a suitable size to accommodate an interlocking pattern of kiln tiles made of fired clay.

Upper Mill Entrance Level
This space was gained by walking eastwards up the ramped passage from the entrance doorway. This was the lowest level of the upper mill. However, it was apparent that the flagged area which occupied most of the floorspace had been reduced in level at some point, by about 0.6m. The original floor levels

were still retained within a broad 'shelf' on the east side of the building (33), and also to the south, peripheral to the pitwheel pit. The upper mill sack hoist would drop sacks into the southernmost part of this reduced level area. Furthermore, the cill of external doorway (43) was elevated by about 0.6m above the floor, and the lower part of wall (12) was very crudely finished, suggesting that this was originally buried, and therefore not visible .

The original difference between the unmodified entrance levels of lower and upper mills must have been about 1.3m, and this was probably accommodated by a set of timber steps located to the north of the junction of walls (12) and (11). At some point, possibly in 1871 when the new hursting resulted in integration of the two mills as one working unit, the upper mill entrance level was partially reduced, and a ramp created within the entrance passage, to improve access within the integrated mill. This would result in doorway (43) becoming redundant, and possibly steps (03) becoming used as a loading bay.

Fireplace (17), in the north-east angle of the mill, appears to have been an ordinary domestic feature, to provide for the miller's needs; and a substantial brickwork chimney stack (156) rose above here, to vent off smoke above the mill roof. The historic risk of explosions in corn mills, involving flour dust, may have been exaggerated, as the concentrations of dust required would rarely be achieved, especially if the mill was well ventilated, as at Nether Alderley.

The rear (east) wall of the mill (29) contained a broad irregular bulge (152) in the centre, where it had been crudely rebuilt. This feature continued to the upper level above, and appeared to represent evidence for a collapse or near-collapse of the masonry, possibly caused by hydraulic voiding of the fills behind, as a result of an undetected leak from the millpond.

Within the central bay of the building, and backing onto wall (12), was the cast-iron hursting frame which was installed either in 1871 or in 1877, according to the date inscribed upon the stone bed beneath the north end of the hursting. To the south of the hursting was the pitwheel pit (89), which appears to have been enlarged to accommodate the existing cast-iron pitwheel (90). The original western limit of the pit survives as an offset against gearing wall (14), the pit appears to have been enlarged and expanded both northwards and westwards to accommodate the existing pitwheel, probably in 1871 (see Section 6 below). The gearing wall retains a pair of shallow rectangular sockets, symmetrical to the cast-iron axle-tree, where the inner ends of the timber bridge trees were located, but this is the only surviving evidence for the original millstone layout, which was probably obliterated when the existing hursting and gearing were installed.

Upper wheelpit and waterwheel

The upper waterwheel was contained within a pit perhaps better described as a close-fitting masonry box located at the south end of the upper mill. Access into the pit was through doorway (88) from the corn kiln. To the east of the waterwheel (15), the breastwork, which curved peripheral to the upstream quadrant of the wheel, appeared to be of cut bedrock, which would not be

eroded as it did not retain water on the wheel because the latter was overshot. From the 3 o'clock position upwards, the pit was masonry built, but it was clear that the wheelpit had been widened significantly, from an original width of about 0.85m, to a new width of about 1.3m, to accommodate the existing waterwheel. The change in width is indicated at the east and west ends of the pit, where crude vertical bedrock and masonry offsets survive to mark the slightly longer, but much narrower, original wheelpit. A narrow masonry shelf extended along the south side of the wheelpit to facilitate access for repairs; the south bearing stool was located in the centre of this shelf, turning space for a spanner here being provided by adjacent doorway (88).

The north wall of the wheelpit (93), effectively the gearing wall, appeared to be wholly constructed of neat ashlars of type 'B' stone. The axle tree passed through aperture (62), neatly formed with a segment-cut head. Towards the east end of this wall was large infilled aperture (63), which was at a similar height to (62), but had no obvious function, unless at some point a rim-drive had been utilised on a waterwheel here, but this seems unlikely.

Wall (65/165) formed the west end of the masonry box, and appears to have been constructed as an afterthought. To the south, this abutted stub wall (70), with an obvious vertical straight joint, whilst to the north, it retained a straight joint down to the base of the lower pitwheel pit, abutting earlier wall (12) and other later fabric. Above the level of gearing (67), wall (65/165) returned eastwards as north wheelpit wall (93), which gave the impression of a large masonry box built into the south-east corner of the mill. On its east face, where it could be inspected, wall (65/165) appeared to be crudely coursed, giving the impression of a later infill between (70) and (12)/(93), possibly having replaced a timber partition here.

Lower mill upper level
This level was closely confined beneath the roof eaves, and was accessed from a steep timber stair from the entrance level below. On the east, it was overlooked from the upper mill, upper level, which was accessed by a short set of timber steps. In the north internal wall, just above floor level, the cut initials 'JB' (94) have been identified by Mike Redfern as possibly indicating the involvement of James Brindley at Nether Alderley (see Plate 89 and Section 7.3 below).

Within the central bay, a C20 meal sifter (41) had been installed during the 1970s restoration; this had been presented by Ranks (see Section 6 below). Within the southern bay, and attached between a purlin and a horizontal rail, a timber lifting pulley and winding barrel had been installed; this was driven by an endless belt from a similar pulley wheel attached to gearing (67) below. Also within the southern bay, and within the south wall, was a blocked three-light mullioned window (37, Plate 92), the upper part of which could also be seen on the exterior wall.

The northernmost bay had been floored originally with wide Deal boards, extending east-west, but these had been partially replaced by C20 Pine boards with the same trend. Within the central bay, the boarding was all of C20 Pine,

this time extending north-south. Over the southernmost bay, the boards and some of the floor joists had been removed, possibly to allow some natural light to extend to the floor area below.

Upper mill upper level
This level was a spacious open area, which was accessed by a steep timber stair from the entrance level below, but also had an external access doorway from the kiln roof to the south. The existing floor comprised narrow C20 pine boards, which appeared to represent a replacement floor, as there was good evidence to suggest an earlier floor level at about 350mm higher, which would explain a large mortice hole in the north face of principal post (200), presumed to have contained a north-south floor beam. Other evidence included joist holes in wall (157) to the north, and an offset at the correct level in the east wall. Brick chimney stack (156) rose through this level in the north-east corner.

East wall (151) had a deep offset at about half its height (which coincided with external ground level), then lesser offsets below this, significantly thickening downwards as the *de facto* mill dam. Below the major offset, and beneath truss (200), was an irregular area of crudely rebuilt masonry (152), at the base of which a timber baulk (155) had been inserted into the wall, spanning across (152) (Plate 96). This feature is interpreted as the upper part of (152) seen at the entrance level below.

Also in the east wall, above the major offset, and extending almost the whole length of the northern bay, was a blocked window (153), only identifiable on the external wall (see Section 5.1 above). Similarly, a large blocked window (154) was identified in the southern bay; this had been partially blocked to leave a single small window.

Within the southern bay, and directly above the upper waterwheel, was the penstock (87) installed by Boucher in the 1960's. This comprised an enclosed timber trough which extended through the east wall, which fed into a large timber box, which filled with water to the level of the external millpond. A timber lever initiated a paddle within here which allowed water to flow onto the upper waterwheel.

On the western side of the central bay were the two stone cases, containing the millstones, which were fed by raking timber meal chutes from the meal floor above. Between these was a vertical steel or wrought iron shaft, to the upper end of which was affixed a cast-iron crown wheel with integral teeth set on a bevel. This meshed with a gear wheel, now removed, which was located at the south end of an overhead lineshaft (175), driven from the external auxiliary steam engine. The north end of the lineshaft was located at an intact bearing stool, located beneath the tie-beam of the north gable truss (205). The lower end of the vertical shaft is staked onto the upper great spur wheel, which in turn meshes with the teeth of the pair of stone nuts.

Roof structure and upper mill top level
Given the extent and mass of the external roof covering, the timber roof structure was substantial and complex. It comprised two timber queen post trusses (200 and 201) over the upper mill, which subdivided the building into north, middle and central bays.

The eastern ends of the two trusses were bedded onto the top of the east wall (Plate 112). The west ends were carried upon a pair of substantial principal oak posts, which were seated upon the top of wall (12) at entrance level below (Plate 83). At the upper level, both posts were jewelled, and supported both tie-beams and purlins, the latter of which appeared more similar to wall plates. Arched braces extended from the posts to triangulate against the tie-beams and purlins. The whole of the assembly was pegged with tree nails.

The two queen post trusses were wholly of timber, fully pegged and supported a single purlin to each pitch, with lower pairs of windbraces on the east pitch only. On the south truss, the west end of the time beam had a short length of chamfer with plain stops, indicative of a doorway beneath it, but the presence of an arched brace here precluded the existence of a doorway. The obvious inference was that the tie-beam was reused from an earlier building. From the presence of the carpenters' assembly marks, and the direction in which the pegs were applied, the truss 'facing' was in opposing directions, so that the north truss 'faced' north, and the south truss 'faced' south. Many of the roof timbers contained mortice and peg holes which suggested re-use, and it is even possible that the trusses were wholly derived as trusses from another building, although the direction of truss 'facing' does not necessarily confirm this.

From the west faces of the two principal posts, substantial principal rafters underpinned the roof of the lower mill, supporting two purlins on this pitch. Excessive deflection of the rafters has necessitated remediation by bolting of steel flitch plates to the flanks.

The meal floor (202) was located in the central bay of the roof, within the top level. A pair of north-south timber beams had been attached to the soffits of the respective tie-beams, and east-west floor joists extended between these beams. North-south pine boards (C20?) were laid over these, with a rectangular hatch being formed in the centre for the sack hoist. On the west side of the meal floor, the open ends of two timber chutes were located, for delivering meal onto the millstones beneath.

In the southern bay of the roof, a timber tie-beam has been extended between the purlins, and linked to the ridge piece by a king post. It is suggested that this was a secondary insertion, intended to provide a means of attaching lifting tackle for working on the upper waterwheel and adjacent pitwheel.

5.3 External water system

Original byewash channel
Within the north-east section of the peripheral passage around the kiln, an upstanding section of bedrock was visible within the external wall. This bedrock had clearly been cut through when the kiln was constructed; and a small trial pit was excavated within the passage floor to investigate the infilled to the north-west of the original cut. This revealed that the bedrock face, at 45 degrees, was at least 1.0m high, and the base of the cut was not located. Furthermore, within the bedrock face was a cut vertical slot, c.60mm wide, for a probable timber stop board, which would have been used to halt the water flow within the channel. Within the excavated rubble fill, there were three fragments of tile kiln, of a small size and thickness and crudity, quite unlike the C18/19 kiln tiles seen by the author at Norbury Mill, Stockport and Hopwood Mill, Rochdale. These fragments probably pre-dated the existing kiln, and also suggested that the earlier kiln was in close proximity.

Byewash weir and tunnel
The byewash weir was a masonry structure located on the south side of the millpond, this functions to remove excess water from the pond. It comprised a short stone-lined channel, slightly funnel shaped in plan. Water from the moat fell over a masonry slab into a small pool, then ran over a second slab, before entering the portal of the byewash tunnel, where it curved sharply westwards and fell steeply, being cut into the bedrock.

The central section of the byewash tunnel was investigated, after being accessed from the millpond drain. It was 1.1m wide, with vertical masonry sides, and a brick arched vault over. It had a maximum height to the crown of about 1.1m. The tunnel downstream portal was located in the garden to the west of Congleton Road, adjacent to the portal of the tailrace tunnel.

Millpond drain
Within the plot of land located to the south-east of the kiln, there was a section of quarry face, about 1.5m high, formed of coarse red sandstone. This was in two sections, which defined an obtuse angle in plan. The eastern section extended uphill to merge with the natural slope, and the western section had been cut away at its west end to contain a brick-built tunnel portal (‘A’ on Figure 26). The arch keystone was of sandstone, and appeared to be incised with the date ‘1746’ (Figure 31). Within the western section of the quarry face was a large stemple hole, which may have been related to construction of the tunnel, or related to earlier quarry works.

The portal gave access into the upper section of the millpond drain, which extended northwards from here. The drain was originally intended as a means by which the millpond could be wholly emptied of water, in the event that works such as dam repair or silt removal were required. Internally, this was 1.1m wide and 1.45m high. The lower walls were of sandstone, and the upper walls and arch of handmade brick. At the point where the tunnel coincided with the kiln south-east wall, the upper section of the tunnel terminated in a cross wall of large sandstone blocks, and the drain reduced in width beneath

here, to form a narrow rock-cut channel. This extended to the north-east to a point where it was blocked by a vertical stone slab, about 2m away from the millpond ('B').

A pair of rotted upright timber posts were observed within the millpond, which coincided with the 'Sluice' position first shown on the OS plan revised in 1907 (Figure 5), but offset further to the north-west from the projected line of the drain. This offset arrangement implied that a small masonry or brick chamber existed within the body of the dam, providing a link between the drain and the sluice. This putative chamber was probably entered from a manhole in the top of the dam.

Returning to the portal at 'A', the lower part of the millpond drain was entered by crawling beneath a thin sandstone lintel, and southwards beyond here, the brick arched tunnel roof stepped down twice, and the tunnel floor, after stepping down beneath the entrance portal, plunged steeply down a rock-cut face, which appeared to represent the south-westward projection of the original quarry face. On the face of the step in the tunnel floor were the rotted remains of an iron grille, which originally would have been raised upwards, like a miniature portcullis, into the portal, to prevent any unauthorised access.

The total drop of the tunnel, across the quarry face position at 'A', was about 2m in total, and to the south of here the drain fell away gently towards the byewash tunnel at point 'C', with masonry flanks, and a brick arched roof.

Former tailrace tunnel
The entrance to the former tailrace was located at the south-west end of the lower wheelpit, and was identified as a possible feature at an early point during the mill survey. On the assumption that this tunnel must link to the byewash tunnel, the north face of the byewash was inspected for any surviving evidence. At point 'E' within the byewash, a blocked tunnel portal was identified; this was well sealed by masonry, and it is possible that the tailrace tunnel is still open beyond here.

Present tailrace tunnel
The existing tailrace tunnel drained the lower wheelpit, and extended in a direct line to the open channel in the garden on the west side of Congleton Road. This tunnel was narrow when compared to the former tailrace, and the roof, formed by large blocks of local conglomerate, stepped downwards to form a fairly restricted passageway. The channel floor and walls were largely cut into the bedrock.

5.4 External water system interpretation

Former quarry
The above-ground quarry face, to the east of point 'A', was visible within the millpond drain, projecting towards the south-west. To the north-east, at the south end of the byewash weir, the steep fall over a bedrock outcrop implied that this represented a projection of the quarry face in this direction. The

interpolated quarry face (shown on Figure 26), appears to have respected the millpond edge, as may be expected. Apart from the short length of visible quarry face at 'A', there was no obvious topographical evidence for a quarry here, and it is suggested that the quarry was relatively shallow in depth, perhaps only 2-3m below original ground level, and was infilled by waste from elsewhere.

As the local sandstones dip gently towards the south-west, it seems likely that the quarry was exploiting a relatively thin unit, with the working quarry face following the strike. Available cartographic evidence (Figures 2 – 6) does not suggest any evidence for quarrying here, and it is suggested that the quarry was probably is use during the late medieval or early post-medieval periods. Any dimensioned stone extracted from here may have been used in the hall, the church, the mill, or any other buildings within the area. The infill of the quarry could include material dug from the millpond, or material from periodic cleaning of the millpond.

Original byewash channel
The excavated rock face within the kiln passage appeared to represent the south-east flank of a rock-cut channel, which extended from south-west to north-east, at right angles to the mill dam. The cut slot within the face is interpreted as being intended to house a timber stop-board, which would temporarily restrict flow through the byewash, if it became necessary to impound all available water in the case of drought conditions.

However, the top edge of this channel would be about 3.5m below the existing millpond level, and it is therefore difficult to envisage this channel functioning as a byewash in association with the existing millpond. If this channel was indeed a byewash, the mill dam may well have been considerably lower than it is now, although the available head of water would have still been sufficient to drive a waterwheel within the lower wheelpit.

This putative byewash channel was destroyed when the existing kiln was constructed, and it seems likely therefore that the construction of the kiln coincided with the construction of the tunnel system to the south and east of the kiln.

Later byewash tunnel, millpond drain, and former tailrace
These three features appear to relate to a single construction phase, and this could reasonably be dated to 1746 from the incised legend on the access portal. All of these tunnels are similar in construction and profile, and appear to have been constructed by the 'cut & cover' technique, partly within the infill of the former quarry. The construction of the millpond drain appears to respect the existing kiln structure, and implies that the kiln was contemporary with the tunnels.

Later tailrace tunnel
The blocking of the former tailrace tunnel, and replacement with the existing tailrace tunnel, probably relates to either deliberate deepening of the lower wheelpit, or relieving backwatering within that wheelpit. A direct link between

points ‘D’ and ‘F’ would clearly give a better waterflow from the pit than the earlier link from ‘D’ to ‘E’ to ‘F’. During periods of heavy rainfall, where the byewash tunnel was heavily loaded with waste water, it might flow into the earlier tailrace and backwater onto the waterwheel.

5.5 Water Supply

The immediate water supply to the mill has always been from the moat/millpond adjoining the mill, which seems to have been created by damming a small stream, possibly at a point where a natural waterfall existed. At 0.85Ha, the pond is fairly substantial, and it is possible that it has been enlarged at some point by raising the dam. Measurement of the bed adjacent to the mill during the survey work revealed that the water was no deeper than about 2.4m.

There are two known water feeds into the millpond. The first of these comprises a broad channel (still active) which runs northwards to enter the south edge of the pond, this runs from a large but shallow artificial reservoir known as Radnor Mere, which was constructed to provide an additional water supply, possibly in the late 17th century. This feature was substantially enlarged in 1826. Three other water bodies, known as the Lady’s Upper, the Lady’s Lower, and the Woodend Pond, also within the park, may have been intended to supplement the supply, although it is at least probable that their primary intention may have been decorative.

The second water feed into the millpond comprises a sinuous contour channel which flows into the north side of the pond. This originates from a small stream at Flume Cottage on Artists Lane, about 500m to the north of the mill, where water is diverted via a small weir now on private land. Although this channel is now apparently redundant, it existed as early as 1799, and may be considerably earlier (M. Redfern, pers. comm.).

6. Report on the working parts of the mill, by Martin Watts

6.1 Introduction

The water-power arrangement at Nether Alderley Mill, with two overshot waterwheels in line one above the other, the lower being fed by the tailwater of the upper, may be regarded as an unusual survival. Such a layout was once more common, however, particularly for corn mills, as it allowed a large head or fall of water to be utilised with waterwheels of 'average' dimensions, say 3.5 – 4.5m diameter, typically driving two pairs of millstones and ancillary machinery. These average dimensions were dictated to a certain extent by the limitations of constructing waterwheels in timber. In the 19th century a single, larger diameter waterwheel was sometimes introduced to replace two smaller diameter wheels; such a change often resulted in complete re-gearing of the mill and alteration of the layout of the millstones. At Nether Alderley it appears likely that the earlier layout of the mill, basically that of two mills on two significantly different levels, precluded the replacement of two small overshot wheels by a single larger wheel, although it is of interest that the two gearing systems are mechanically linked. It is not clear, however, whether this linking dates from the 1870s (see below) or was introduced during the restoration of the mill in the 1970s. For the purposes of this report, the two mills will be referred to as the upper and lower mills.

A further interesting feature is that there was formerly a third waterwheel on the downstream side of the lower wheel. This appears to have been overshot, fed from an extension of the trough which feeds the lower wheel. This wheel would have been of similar diameter to the lower wheel, but is likely to have been the least powerful of the three wheels and was perhaps only run when the lower wheel was not being used. Its dating, exact function and drive take off are unclear, although there is a memory of it being used for 'grinding', perhaps driving a grindstone to sharpen tools (B. Cook, pers comm.).

6.2 Waterwheels

Upper mill

The upper mill waterwheel is fed from the mill pond or moat via an oak penstock, which forms a header box above the wheel. The waterwheel is overshot, 3.96m (13 ft) in diameter by 1.22m (4 ft) overall width. The wheel is carried on a cruciform section cast-iron shaft, with two sets of six timber arms radiating from circular cast-iron naves. There is historic damage to both naves, which has been repaired by strapping. The arms carry cast-iron shrouds, formed in six sections each side, the sections being bolted together midway between the arm ends. Integral flanges cast on the inner faces of the shrouds carry 30 elbow-shaped timber buckets and timber sole boards. There are journals at both ends of the wheelshaft which run in plain bearings.

Lower mill

The lower waterwheel is fed with the tailwater from the upper wheel via an open timber trough. This is now cross-boarded, but an earlier trough, which survives displaced over the lower set of machinery, is boarded lengthwise.

The lower wheel is overshot, 3.81m (12 ft 6 in) in diameter by 0.89m (2 ft 11¼ in) overall wide, 0.85m (2 ft 9½ in) effective width between the shrouds. It is carried on a hexagonal section timber shaft, with cross-tail gudgeons forming the bearings at both ends. Two sets of six arms radiate from cast-iron naves, of different pattern to those of the upper wheel, being 12 sided, with six longer sides between the arm pockets. Both naves show some historic damage which has been repaired by strapping. The arms carry cast-iron shrouds, in six sections each side bolted together midway between the arm ends. The shrouds have integrally cast flanges which carry 36 elbow-shaped timber buckets and timber sole boards. The inner wheelshaft bearing is mounted on a stone block which also supports the foot bearing of upright shaft. This block has subsided at its downstream end.

6.3 Gearing

Upper mill
A spur-geared pitwheel is mounted on the inner end of the upper wheelshaft, its lower part turning in a cog pit which is 0.94m wide. This gear is a single casting with eight 8 T-section arms and approximately 136 integral teeth of 64mm (2½ in) pitch and 115mm face. It drives a cast-iron spur pinion on its downstream side. This gear is about 0.62m overall diameter, with 4 I-section arms, with approximately 32-34 teeth. It is keyed to the south end of a 120mm diameter horizontal iron or steel shaft which runs south-north. Close to the north side of the spur pinion is a cast-iron mortise bevel gear with six T-section arms, carrying approximately 72 cogs of 50mm (2 in) pitch and 120mm face. This gear drives a cast-iron bevel pinion with four T-section arms, with approximately 38 teeth, which is keyed to a 75mm diameter horizontal iron or steel shaft that runs east-west. This shaft connects with the crown wheel of the lower gear (see below).

The drive to the millstones
The direction of the drive is changed from horizontal to vertical by a pair of bevel gears (mitre gears), both cast-iron gears with 6 T-section arms. One is keyed to the south-north horizontal shaft driven from the upper pitwheel, the second is mounted on a machined vertical iron or steel shaft, 83mm in diameter, with a larger diameter boss which carries the spurwheel from which the millstones are driven. The spurwheel is a cast-iron unit with 8 + section arms and approximately 80 teeth of 50mm (2 in) pitch and 115mm face. This gear drives two stone nuts, cast-iron spur pinions each with 39 inserted timber cogs which are pinned and wedged in place in the castings. The stone nuts are located on tapered cones keyed to the 70mm diameter stone spindles, and both or either can be raised out of mesh with the spurwheel teeth by jacking rings. The rings are located on two vertical rods which can be raised and lowered using a handle below the bridge which carries the spindle footstep bearing.

The vertical shaft is located in a bearing fixed to the cast-iron bedstone trays between the two pairs of millstones. Above the floor, between the millstone cases, the vertical shaft is joined with a flanged coupling with three bolts. The upper part of the shaft carries a cast-iron bevel gear with six T-section arms at

its head. This formerly meshed with a vertical bevel gear with timber cogs, now removed and stored in the lower mill. This gear was mounted on a horizontal iron or steel shaft which was driven from outside the north gable of the mill by an auxiliary engine. The displaced gear has four T-section arms and is bored for a 100mm shaft, with a single keyway. It is about 475mm maximum diameter with a 150mm face, and the remains of 32 very worn timber cogs of about 57mm (2¼in) pitch and 120mm face.

Millstones
Two pairs of millstones are carried on a cast-iron hurst mounted on stone blocks, one of which carries the date 1871. The stone blocks have subsided, with the result that both millstone spindles and the upright shaft are misaligned. Both bedstones are set in circular cast-iron trays and are levelled using vertical set screws. Each tray is carried on a pair of circular cast-iron columns with a fixed iron bridge carrying the footstep bearing of the stone spindle. Below the fixed bridge is an underslung steel bridge, pivoted at the west end and with a vertical screw and nut adjuster at the east (outer) end, to tenter the stones [to adjust the gap between the milling faces of the stones when grinding].

Both pairs of millstones are about 1.4m diameter French burrs. They are enclosed in circular metal and timber cases, the north case having been rebuilt using plywood. Both pairs have plain timber horses with sack platforms, timber hoppers and shoes. The iron damsels have four raps. Both meal spouts formerly fed into a horizontal screw conveyor (creeper) fixed to the front of the hurst, which indicates that both pairs of stones were intended to be run at the same time, milling the same product.

Lower mill
A cast-iron bevel pitwheel is mounted on the inner end of the timber wheelshaft. It is a split-cast gear, with eight T-section arms, the two half castings being bolted together along one pair of arms. It has approximately 208 teeth of about 67mm (2⅝ in) pitch. It meshes with the wallower, a single casting with eight inverted T-section arms and approximately 56 teeth of about 70mm (2¾ in) pitch and 146mm face. The wallower is wedged to an octagonal timber upright shaft, and also hung on four bolts. It is understood that this shaft was renewed in about 1970. Towards the head of the upright shaft is a combined spur and crown wheel, of timber construction with two pairs of compass arms and seven unevenly spaced angled timber braces supporting the cants [rim sections] from the vertical shaft. A wedge under one of the compass arms is dated 1981. There are cast-iron spur/bevel toothed gear segments bolted to the timber cants of the wheel, each segment having 13 teeth, giving a total of 104 teeth of about 75mm (3 in) pitch. This combined spur and bevel arrangement is a regional feature, having been recorded in other watermills and windmills in Cheshire. The spur drive was formerly used for millstones (see below), while the bevel drive is now connected to the upper mill machinery.

The drive to the stones, the millstones and the hurst frame in the lower mill have all been dismantled, although some mechanical elements and the stones themselves survive displaced in the lower mill.

Millstones
There are two pairs of millstones now displaced in the lower mill. A bedstone and runner stone built up of random segments of grit stone hooped with iron bands, are identified as being from Mow Cop (Bonson 2003, 20). Both stones are 1.42m in diameter and well worn. The runner stone has a gimbal rynd, which has superseded a stiff rynd with four straight arms.

The second pair are monolithic grit stones, about 1.14m diameter, with domed backs. The bedstone, which is now broken, has a cross cut into its back near the circumference. It is about 50mm thick at the periphery and 150mm thick at the eye. It has a cast-iron neck box and no visible dressing on the milling face. The runner is of similar section and appearance to the bedstone, 75mm thick at the edge and 145mm thick at the eye, which is about 230mm in diameter. It retains a four-armed stiff rynd with curved arms.

There is a displaced quant lying on the ground floor by the millstones. This is the top spindle in an over-driven arrangement, taking the drive from the spurwheel above. It is a heavy 75mm diameter machined iron or steel shaft about 2.7m long, with a forked lower end. It has four projecting raps, to form a damsel for shaking the shoe, near its lower end. At the top it carries a stone nut, a spur gear with a solid cast-iron centre about 395mm overall diameter with a 145mm face, with mortises for 21 cogs. Close above the stone nut is a double flanged pulley which is about 380mm effective diameter with a 105mm wide face.

A second quant was set up by Cyril Boucher to indicate its working position and has not been measured. There are also four stone spindles (lower spindles) displaced in the north-west corner of the ground floor; two of these are approximately 1m long; the other two are slightly longer.

6.4 Upper/lower mill drive connection

The connection between the upper and lower sets of machinery is shown on the attached drawing by Cyril Boucher (Figure 25). A horizontal shaft running east-west is driven from the mortise bevel gear on the horizontal shaft that takes the drive to the millstones in the upper mill. The driven gear is a cast-iron bevel pinion with four T-section arms. To the west of this is a cast-iron belt wheel or pulley with six arms; a slightly smaller diameter cast-iron flanged pulley, which drives the sack hoist by belt, and a large diameter cast-iron pulley with six arms. At the west end of the shaft is a bevel pinion, a cast-iron centre with four arms, which carries about 18 timber cogs which mesh with the teeth of the crown wheel.

6.5 Sack hoist

The sack hoist is a driven by slack belt from the east-west horizontal shaft, the belt being tightened by pulling a cord which raises the hoist bollard when required for use. The hoist drive wheel is a timber clasp arm wheel with

bolted timber flanges and cants, and appears to have been renewed during the 1970s restoration, although the timber drum on which it is fixed is 'original'. The hoist has been set up for demonstration and light use with a rope and lightweight chain tail and ring, rather than a full chain.

6.6 Other artefacts and working parts

At lower ground floor level, on the downstream side of the cog pit, is a massive, heavy cast-iron circular plate about 1.4m in diameter by 60mm thick. There are eight sets of four staggered square holes through the face. On the inner face (against the wall) is an integrally cast circular section with a journal projecting from its centre. This disc appears to have formed a 'false' wheelshaft end, and was bolted to the inner face of the existing pitwheel in the lower mill. There are four staggered holes bored through each arm of the pitwheel, except the pair along which the castings are bolted together, which coincide with the holes in the plate. It would appear that this was may have been a temporary expedient when the inner end of an earlier timber wheelshaft had decayed and was introduced rather than replace the whole shaft, although this seems an extraordinarily elaborate repair solution, considering the weight of the casting and the difficulty of access to the pitwheel.

At ground floor level in the upper mill there is the ribbed timber cylinder from a wire machine (flour dresser), which is about 1.72m long by 405mm (16in) internal diameter. There are also the remains of a reciprocating sieve in the lower mill.

6.7 Sifter

A sifter was installed during the 1970s restoration on the half floor between the upper and lower mills. It was set up to be driven by belt from the large diameter cast-iron pulley on the east-west horizontal shaft, in order to demonstrate the principle of sifting a finer flour from the wholemeal produced by the stones. It was presented by Ranks (Boucher 2004, 12) and is not truly representative of the type of sifting machinery that would be used in a water-driven corn mill using millstones.

6.8 Discussion

The hydraulic and mechanical layout of Nether Alderley Mill is unusual and, because of alterations carried out in the 1870s and during the 1970s restoration, somewhat complex to interpret. No inscriptions or dates have been noted on any of the working parts, other than the 1871 date under the hurst in the upper mill. There are notable differences between the two waterwheels, which do not appear to be strictly contemporary, although both have 19th century cast-iron components. Stylistically, the cruciform section iron shaft of the upper wheel is likely to date from the first half of the 19th century. The spur-geared pitwheel of the upper wheel is presumed to be contemporary with the introduction of the cast-iron hurst (and presumably the auxiliary engine drive) in 1871 and the finer gear pitches of this gear train and the large number of cogs in the stone nuts support this conclusion (see Stoyel 1997). The lower mill gear, in particular the pitwheel and wallower, is older, probably dating from after 1830-40 (Stoyel 1997, 13), although the combined

spur and bevel gear on the upright shaft is, as mentioned above, a regional feature that is difficult to date.

With regard to the millstone layout, it appears that both the upper and lower mills were set up with two pairs of stones mounted on hursts along the pit wall. There is evidence in both mills of where the inner ends of the bridge trees were located in the pit walls, which suggests a fairly conventional spurwheel drive arrangement in both cases, although the lower mill was over- rather than under-driven, an interesting anomaly. Over-driven watermills have never been particularly common in England and it has been suggested that there are usually physical or mechanical constraints that lead to the use of such a layout, rather than the conventional under-driven arrangement that is usually found (Jones 1978). The two longer millstone spindles at present stored in the lower mill most likely came from the upper mill.

It appears that Nether Alderley Mill was set up to grind flour and also to process oats. The presence of a wire machine cylinder suggests that wheat was ground and dressed to make finer flour and it is likely that this was carried out in the upper mill. The earlier arrangement of two pairs of stones on a hurst along the pit wall was superseded by the introduction of two pairs of French stones (the best for grinding wheat for fine flour) on a cast-iron hurst in 1871. The two pairs of grit millstones with stiff rynds suggest that oats, after being dried in the kiln, were shelled and processed in the lower mill, and the remains of a reciprocating sieve are probably connected with this process.

7. Building Interpretation and Significance

7.1 Construction Phasing

Phase 0 – Late medieval mill

The only evidence for a water mill at Nether Alderley during the late medieval period is from a documentary reference dated 1391 (see Section 4.1 above). No physical evidence has survived for such a building, and although it is probable that it was on the site of the existing mill, it may have been located elsewhere. The late medieval mill superstructure may well have comprised a timber-framed building upon a stone plinth, and this may have been wholly dismantled and destroyed when the phase 1 mill building was erected.

Phase 1 – 1595-7

There has been a common assumption that the existing external mill footprint represents the late 16th century mill. This seems somewhat excessive when considering the extent of the Stanley estate at Nether Alderley, and the likely estate population at that time. There is good documentary evidence to suggest that the mill was wholly rebuilt over a two year period, following the death of Randle Stanley in 1595. It is suggested that this rebuilding comprised the excavation of the existing basement of the lower mill, partially into bedrock, at the toe of the dam which retains the moat. Walls (05), (11), (12) and (07) appear to date to this phase, as does the timber wallplate (69). Blocked doorways (114) and (04) also seem to be original features. It seems likely that the waterwheel would have been in the vicinity of the existing lower waterwheel (109), but the rock-cut wheelpit has clearly been enlarged and deepened. There is now no visible evidence as to how the original pitwheel, gearing, and millstones were arranged. It seems likely that the early putative byewash channel, identified beneath the existing kiln, related to this mill building, although that would imply a millpond and dam at a much lower level. A sketch of the possible external appearance of this phase of mill building is included on the front cover of this report.

Phase 2 – c.1746

The mill enlargement to the existing footprint is assumed to date to about 1746, on the basis of a dated door knocker at the mill seen by the antiquarian John Owen, and the date inscribed upon the keystone of the drain channel to the south of the kiln. This enlarged building was developed effectively as a pair of mills, with the lower mill comprising the earlier, but partially rebuilt 16th century mill; and the upper mill being raised over (and cut into) the mill dam, with two waterwheels being arranged in tandem to share the same flow of water. The original upper waterwheel and upper pitwheel were certainly smaller than the existing features, and no evidence now survives as to how the millstones were driven within the upper mill. A third waterwheel was introduced, in the lower wheelpit, although the maximum possible size of this suggests that it was an ancillary power unit, possibly for use if the water supply had become compromised by freezing or drought.

Within the enlarged mill, it is clear that much of the material appears to have been re-used from earlier structures. The stonework in doorways and windows

(01), (16), (37), (158), and (166) is all suggested as being derived from an earlier building or buildings, of late 16th or 17th century date; this may have included the phase 1 mill, the nearby hall (partially rebuilt in 1754), or any other nearby buildings within the Stanley estate. Inspection of the large roof trusses and other structural timber has revealed extensive reuse of this material also. The trusses themselves may have been brought as disassembled entities from another building, the tie beam of the south truss (201) appears to represent a tie-beam over a first floor chamber, judging from the chamfer on its soffit. A single Baltic timber mark was noted on a purlin over the upper mill, although this may represent a later replacement of a roof member. This may suggest that the great stands of native hardwood, which would have been commonplace on the Stanley estate, were no longer available by the 18th or 19th centuries, and if timber could not be reused from other demolished structures, then it was having to be sourced from Manchester merchants, such as the Bellhouses.

The expanded mill would have required a substantial new water management system. The millpond drain is dated to 1746, and it is also suggested that the byewash weir, the byewash tunnel, and the former tailrace (Figure 30) are all components of this phase 2 work.

Recent work within the mill (M. Redfern, pers. comm.) has suggested that the engineer James Brindley may have been responsible for expanding the mill in this phase (see Section 7.3 below).

Phase 3 – mid to late C18

The existing brick-built kiln is clearly a later addition to the Phase 2 mill building; but kiln tiles found in Trial Pit 3 suggested that an earlier kiln had stood upon the same site; and the six blocked joist holes (77) appeared to relate to a pre-existing structure at this location. The 1787 estate plan (Figure 2) indicates a structure appended to the south of the mill had a frontage flush with the west front of the outshut, which may imply an earlier kiln building, although the brickwork of the existing kiln would suggest a construction date of the 18th century.

Phase 4 - early C19

In this phase, the upper wheelpit appears to have been widened, and the adjoining pitwheel pit enlarged, with a new waterwheel, and pitwheel, being affixed onto a symmetrical cast-iron cruciform shaft, similar to, but smaller than, the pair of *ex-situ* shafts which can be seen in the grounds of Quarry Bank Mill.

Phase 5 – mid C19

The lower mill gear is probably the earliest part of the surviving mill machinery, with the pitwheel and wallower probably dating from sometime after 1830-40. In 1843 and 1846, there are references to new works in the mill, with the latter date relating to a new waterwheel, probably the lower wheel (section 4.5 above). Installation of a new waterwheel here may have necessitated the cutting of the new tailrace tunnel to the west of the mill, to prevent backwatering via the former tailrace tunnel.

Phase 6 – 1871 or 1877

Possibly coinciding with a change in tenancy, in either 1871 or 1877, a new cast-iron hurst frame was installed within the entrance level of the upper mill, and a new pitwheel and gearing installed to connect the hursting to the waterwheel.

Phase 7 – c.1900

Over the period 1892 to 1910 (Table 2 in Section 4.5 above), water power was supplemented by a small portable steam engine, located external to the north mill gable. This engine was linked to the hursting by a lineshaft which extended through the west gable. It seems likely that this installation may have coincided with the dismantling of the millstones in the lower mill basement, and the gearing connection being made between the lower great spur wheel and the hursting. Boucher (1974, Figure 25), claimed that the lower millstones were removed 'about seventy years ago'.

Phase 8 – 1967-70

In 1967-70, the millwright Cyril Boucher undertook a programme of restoration at Nether Alderley Mill, on behalf of the National Trust. The upper waterwheel and the penstock were rebuilt, then the lower waterwheel rebuilt, with a new oak axletree being fitted.

7.2 Water Power and Mill Siting

It is clear that the mill is located within a small valley, the stream being dammed to create the millpond. However, the relationship between the mill and the moated site was not obvious. It is likely that the dam was first raised to create the moat, with the mill being established as a contemporary feature to make use of the resulting fall of water. However, it is also possible that the dam has been significantly raised, as the putative byewash channel beneath the kiln is located between four and five metres below the existing millpond level (Figure 31). If the dam and millpond level had been significantly lower in the past, it is difficult to visualise how the moated island could have existed.

Natural sandstone bedrock is visible within the lower mill basement, within both wheelpits, within the south-east corner of the kiln, and in the projected quarry face to the south of the kiln. It is also visible as a cutting on the east side of Congleton Road, about 30m to the north-west of the mill. At all of these outcrops, an impression is given that the mill occupies a gentle rock-cut valley; but the profile through the wheelpits (i.e. east to west, Figure 30), suggests a fairly steep localised gradient in that direction, of about 23 degrees from the horizontal.

The major discontinuity of the Alderley Fault is known to follow Congleton Road from north to south, although the exact position of the fault plane has not been locally identified. Given that the fault downthrow is on the west, it seems likely that the abrupt rise in ground level on the east side of the road, in the vicinity of the mill, is attributable to a local 'fault roll', where more resistant beds, to the east side of the fault, are brought into contact with softer beds to the west. Subsequent erosion would result in a sharp variation in rock-head

levels, which may help to explain the siting of the mill, on what was actually a natural waterfall. Such a feature could then be enhanced by raising a small earthen dam to retain a days' worth of water head to drive the waterwheel.

7.3 James Brindley at Nether Alderley?

Mike Redfern, former National Trust guide at the mill, drew attention to a possible signature by James Brindley on the north internal elevation of the upper level of the lower mill. Within the pantheon of great engineers of the early industrial period, James Brindley was within the first rank. His pivotal involvement with the Duke of Bridgewater on the Bridgewater Canal (1759-61) and his construction of the inverted siphon at Wet Earth Colliery in 1752, were just two of his better known works. In 1733 he was indentured as an apprentice to a millwright at Sutton, near Macclesfield, and according to Samuel Smiles, by 1735, whilst still an apprentice, he was already demonstrating superlative practical ability in his work.

In 1742, Brindley set up on his own account as a millwright at Leek, and it was here in 1752 that he erected the classically-elegant corn mill which survives to contain his signature, which is very similar to the putative signature at Nether Alderley. It is also known that he undertook work on corn mills at Tatton for Samuel Egerton, at Congleton for Phillip Antrobus, at Trentham, Wheelock, Matherso, Bucknall, and many other places. However, Brindley's notebooks only survive for the period 1754 to 1763, and there is little information surviving for what work he undertook between 1742 and 1754, which could have included dozens of major commissions. Given that Nether Alderley Mill was located on a major thoroughfare, and that Brindley would have travelled extensively within the east Cheshire area, it is virtually certain that he would have known the mill and the resident millers, if not the owners, the Stanley family. Further research may yet establish whether Brindley was employed at Nether Alderley.

7.4 Building Stones Geology and Provenance

The mill contained four types of local building stone. In order of proportions utilised within the building, these were:

(1) Current bedded sandstones, predominantly red, but also yellow, medium grained. This is relatively soft, and easily worked (stone types 'A' and 'C').

(2) Sandstone with barite crystals (stone type 'B'), known locally as 'Crow's Foot', due to the prominent but random pattern of barite lathes. The barite is a result of secondary cementation, and is commonly seen in sandstones at Alderley Edge which are peripheral to the major faults. Where this has occurred, the stone is strengthened and resists weathering (Plate 17). In 2009, the late Fred Broadhurst undertook a geological assessment of St Mary's Church at Cheadle, and identified this sandstone type, and suggested it was derived from quarries at Alderley Edge. Additionally, the Finlow Hill Quarry and the Bradford Lane Quarry (both formerly within

the Stanley Alderley estate) are said to produce 'Finlows building stone', which supplied the stone for the churches of St Mary at Nether Alderley, St James at Didsbury; and St Bartholemew at Wilmslow. Inspection of the church at Nether Alderley, and of Chorley Old Hall at Alderley Edge, by the author, revealed the presence of ashlars with barite crystals. This rock type has also been noted by the author at the Walkden Monument in Salford, and in the baptistry of St Martin's Church, at Ashton-upon-Mersey, during the English Heritage-funded Strategic Stone Study. This suggests that this stone type was valued for its resistance to weathering, and that it was employed not just on the Stanley estate, but much further afield. As well as new ashlars, re-used stonework within the mill was also of this type, which suggests that other buildings in the vicinity, possibly including the hall, were built of this material.

(3) Conglomerates (stone type 'D'). This rock type has been used within the mill tailrace, and to underpin parts of the mill walls (Figure 33). Being massive, without obvious bedding planes, it is clearly of value for uses which require high compressive/shear strength. A number of conglomerate units have been mapped on Alderley Edge, and quarries exist at some of these locations.

(4) Kerridge stone. The large roofing slabs, of fissile grey sandstone, are allegedly derived from Kerridge ridge near Bollington, although there is no apparent documentary proof for this.

7.5 Building Significance

During the medieval and late post-medieval periods, water powered corn mills were fairly commonplace features of the landscape. They were an integral element of every town, manorial holding and monastic foundation, and many large sub-manorial estates also contained them. Within Cheshire, Burdett's map of 1777 indicated 140 water mills (although some of these were probably for fulling); and even as late as 1964-5, Norris (1966) could still identify 45 mill buildings containing machinery and/or waterwheels and turbines. At the present day, only five intact corn mills survive: at Bunbury, Stretton, Swettenham, Trafford, and Nether Alderley. Only three of these, including Nether Alderley, are presently accessible to the public.

One consideration of particular significance is the close geographical and historical association of the Nether Alderley high status manorial elements, including the mill, the 17th century moated manor house, and the 15th century St Mary's Church. The manorial village itself (including the mill) seems to have been strung out along the main road (now the A34), in an archetypal pre-industrial arrangement whereby the dwellings occupied plots located between the church and the manor house.

The mill is recorded by historic documentary references from 1391 onwards, and a rebuild of the mill is closely dated within the late 16th century, shortly after the manor house was rebuilt, within a period when prominent Cheshire landed gentry engaged in extensive rebuilding of their properties, as part of the

period described by Hoskins as the ‘Great Rebuilding’. One probable consequence of a close association with the Stanleys of Alderley until 1938 may have been the survival of the building as a mill. As the advent of roller milling during the late 19th century resulted in the closure of many small scale corn mills after that period; the location of Nether Alderley Mill, within a private estate, with ingrained conservative approaches, may have ensured survival. The prominence of the mill, on a main road, has ensured a good pictorial and photographic record of the building, between the 18th and 20th centuries.

Other notable associations at Nether Alderley include the notable antiquarians John Owen, J.P. Earwaker, and G. Ormerod, and the well-known millwright and academic Cyril Boucher, and possibly the outstanding 18th century engineer James Brindley.

The surviving mill building contains significant fabric assumed to be of early post-medieval date, of both late 16th century and mid. 18th century. There is also extensive evidence within the fabric for multiple alterations and additions, including floor level changes, changes to the waterwheels and machinery, and alterations to the water management system. Likewise, there is surviving below-ground evidence for the early phases, and there is considerable potential for buried archaeology, including on the mill exterior.

Although none of the earliest hursting and stone-milling arrangements are intact, the surviving working machinery demonstrates advances in technological improvement throughout the 19th century, including the migration from timber components to iron and steel, and the small scale application of steam power.

8. Recommendations

8.1 Revised guidebook

This survey represented the first detailed archaeological survey of the building undertaken. It has produced a wealth of new information regarding the history and development of the building and the immediate site. The guidebook produced by Boucher in 1974 is now somewhat outdated, and now requires radical revision, to integrate much of the new evidence which has been revealed.

8.2 Watching brief

The proposed refurbishment works at the mill will probably reveal more evidence for the development and use of the building. An archaeological watching brief would significantly add to the know corpus of material already derived from the fabric.

8.3 Dendrochronology

Repairs to the mill roof will inevitably result in replacement of historic timberwork. This would provide an invaluable opportunity to undertake a dendrochronological assessment, which would determine whether any of the timber present could be subject to analysis, in order to provide secure dating for the tentative building phases outlined above.

8.4 Interpretation

The interior and exterior of the mill requires explanation by means of modern interpretation. This could be developed on a number of themes, including the late medieval/post medieval landscape; building materials & quarrying; water power; milling machinery; water management; corn milling processes; etc.

8.5 Geological research

Although less relevant to the building refurbishment, the survey of the mill has revealed links between quarrying at Alderley Edge, the mill building, and a number of local churches. This implies that some of the sandstone beds of Alderley Edge may have been highly valued regionally as building stone, and that the Stanley family, as landowners, would have profited from this. Further targeted research, preferably by someone with local geological knowledge, could shed further light upon this aspect of the history and geology of Nether Alderley.

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APPENDIX 1 – LISTED BUILDING DESCRIPTION

SJ 87 NW	NETHER ALDERLEY C.P.	CONGLETON ROAD (E Side)
4/130		Nether Alderley Mill and Dam Wall
25/7/1952		
GV		II*

Water mill: late C16, machinery of 1850 and 1871, restored 1967-70 for National Trust. Ashlar buff-pink sandstone. Kerridge stone-slate roof, stone ridge. Rectangular plan with water entering at roof level. West front has long cat-slide roof with 4 louvred raking dormers. 3 openings in low wall, with a 4-board door with iron strap hinges at left approached by 3 stone steps. Both gables have a herringboned timber truss and in the left side is a rebated 4-light chamfered stone mullion (one mullion surviving) and in right side a chamfered stone doorcase.

Interior: On 4 levels through which 2 massive oak posts pass, supporting arch braced queen post roof trusses, with wind-braced purlins and ridge. Contains 2 overshot water wheels, one below the other and the remaining working machinery to drive 2 pairs of French stones. Attached to south is complex of brick vaulted chambers of drying kiln, the perforated floor of which is now concreted over.

Immediately behind the mill and joined by the penstock is the ashlar dam wall, which is contemporary with the mill.

See C. Boucher, Nether Alderley Mill, National Trust Guide 1978.

APPENDIX 2 – CONTEXT LIST

01	Entrance level Lower Mill	Doorway – W. elevation
02	,, ,,	Graffiti on eaves piece – W. elevation
03	,, ,,	External steps + platform – W. elevation
04	Basement + Entrance level Lower Mill	Blocked opening – W. elevation
05	,,	W. elevation of Lower Mill – same as [56] [103]
06	Entrance level Kiln	Blocked doorway – W. elevation
07	,, Lower Mill	S. elevation of Lower Mill
08	,, ,,	N. ,, ,, - same as [157]
09	Upper level Lower Mill	Opening/window in [08] – same as [171]
10	Entrance level ,,	Internal reduction of wall [08]
11	Basement + Entrance level Lower Mill	Original N. elevation of Lower Mill
12	,,	Original E. elevation of Lower Mill
13	Entrance level Lower Mill	Weigh scales
14	,, Upper Mill	Gearing wall
15	,, ,,	Upper water wheel
16	,, Lower Mill	Window (modified to doorway) – S. elevation
17	,, Upper Mill	Fireplace
18	,, Kiln	Kiln entrance
19	,, ,,	Kiln fireplace
20	,, Lower Mill	Small window – same as [55]
21	,, ,,	Lower great spur wheel
22	,, ,,	Great spur wheel
23	Basement level ,,	W. elevation of outshut
24	,, ,,	Window (partially blocked doorway) in [23] – same as[115]
25	,, ,,	Blocked opening – same as [58]
26	,, ,,	S. elevation of enlarged outshut – same as [60]
27	Entrance level Kiln	Kiln Walls (brick)
28	Grounds	Boundary wall
29	Entrance level Upper Mill	E. elevation of Upper Mill
30	Grounds	Mill pond/moat wall
31	Upper level Upper Mill	S. elevation of Upper Mill – same as [164]
32	Entrance level Lower Mill	Joist holes to S. of [12]
33	,, Upper Mill	Plinth against [29]
34	,, Kiln	Passage around kiln structure.
35	,, ,,	Vaulted antechamber between kiln and mill.
36	Upper level Lower Mill	Floor – same as [168] [169]
37	,, ,,	Blocked mullion window – S. elevation
38	,, ,,	Joist holes to S. of [12]
39	Grounds	Retaining wall to N.
40	Upper level Upper Mill	Lifting pulley to sack hoist and winding barrel – same as [172]
41	,, Lower Mill	Meal sifter
42	Grounds	Steps up to millpond/moat
43	Entrance level Upper Mill	Doorway (cart entrance) – N. elevation
44	,, Kiln	Central structure around kiln fireplace (19).
50	Basement Lower Mill	Redundant machinery
51	,, ,,	Blocked circular opening
52	,, ,,	N. wall of Lower wheel pit – same as [105]
53	,, ,,	Tailrace culvert
54	,, ,,	Original S. elevation of outshut
55	,, ,,	Small window – same as [20]
56	,, ,,	Modern column of masonry on line of original west wall (05).
57	,, ,,	Blocked aperture in [52] [105]
58	,, ,,	Blocked opening – same as [25]

59	,, ,,	Platform/recess – same as [104]
60	,, ,,	S. elevation of enlarged outshut – same as [26]
61	,, ,,	Blocked opening - former tailrace?
62	Entrance level Upper Mill	Aperture in gearing wall of upper wheel pit
63	,, ,,	,, ,, - blocked
64	,, ,,	Stubs of walls
65	Entrance level Lower Mill	Tall rebuilt section of cross-wall at south end
66	Entrance level Lower Mill	Area of infill in cross wall, including large gritstone block below (67).
67	Entrance level Lower Mill	Gearing which takes power from lower great spur wheel, probably constructed 1871.
68	Entrance level Lower Mill	Late C20 replaced area of stonework in wall (12), cross-wall.
69	Entrance level Lower Mill	Original (now redundant) timber wall plate over wall (12).
70	Entrance level Lower Mill	Wall stub at south end of cross-wall, straight joint with wall 65/165.
71	North external mill wall	No.3 putlog holes.
72	North external mill wall	Aperture at west end of wall.
73	North external mill wall	Aperture just to west of doorway (43).
74	West external mill wall	Blocked window.
75	West external mill wall	Blocked aperture.
76	South external mill wall	Damage related to removal of kiln stairs.
77	South external mill wall	No.6 infilled joist holes above blocked window (37).
78	South external mill wall	'Ghosting' of east kiln wall against south mill elevation?
79	West external kiln wall	Blocking of kiln stairs.
80	West external kiln wall	Rebuild of top of kiln west wall.
81	West external kiln wall	Retaining wall which abuts kiln.
82	Basement Lower Mill	Timber beam over opening between outshut & basement.
83	Basement Lower Mill	Stub of truncated wall where original mill wall extended over lower wheelpit.
84	Basement Lower Mill	Modern timber launder over lower waterwheel.
85	Basement Lower Mill	Projected launder which extended over third waterwheel.
86	Basement Lower Mill	Partially infilled aperture where lower waterwheel axle-tree passes through wall (52).
87	Upper Level Upper Mill	Modern timber penstock.
88	Kiln interior	Doorway between kiln and upper waterwheel.
89	Entrance Level Upper Mill	Upper Pitwheel Pit.
90	Entrance Level Upper Mill	Upper Pitwheel.
91	Entrance Level Upper Mill	Gearing.
92	Entrance Level Upper Mill	Cast-iron hurst frame of 1871/1877
93	Entrance Level Upper Mill	Gearing wall between upper wheelpit and upper pitwheel pit.
94	Upper Level Lower Mill	Initials J.B. (James Brindley?) on north internal elevation.
95	South external mill wall	Visible masonry foundation of kiln stairs.
96	Basement Lower Mill	Aperture in wall (07), to south of waterwheel (103).
100	Basement Lower Mill	Floor
101	,, ,,	Gear housing + pit wheel pit
102	,, ,,	Lower wheel pit
103	,, ,,	Surviving W. elevation of Lower Mill, within Lower Wheelpit.
104	,, ,,	Same as [59]
105	,, ,,	Same as [52]
106	,, ,,	S. wall of gear housing
107	,, ,,	W. ,,
108	,, ,,	N. ,,
109	,, ,,	Lower water wheel
110	,, ,,	Pitwheel, wallower and upright shaft
111	,, ,,	Hurst frame
112	,, ,,	Floor (beams/joists) above
113	,, ,,	Beam – reset door lintel?
114	,, ,,	Blocked doorway in [11]

115	,, ,,	Same as [24]
116	,, ,,	Recess for removed pitwheel
117	,, ,,	Knife grinding workings?
150	Upper level Upper Mill	E. elevation of Upper Mill – same as [29]
151	,, ,,	,, - upper section
152	Entrance level ,,	Area of disturbance/re-build in [150]
153	Upper level ,,	Blocked window
154	,, ,,	,, + window
155	,, ,,	Same as [152]
156	,, ,,	Chimney stack
157	,, ,,	Aperture for lineshaft in north external mill wall.
158	,, ,,	Window in [157]
159	,, ,,	Section of floor
160	,, ,,	,,
161	,, ,,	Stonecase floor
162	,, ,,	Millstones, stonecases and associated workings
163	,, ,,	Penstock floor
164	,, ,,	S. elevation of Upper Mill
165	,, ,,	W. wall of upper wheel pit
166	,, ,,	Doorway in [164] – modified window
167	,, ,,	Oak posts + bracing
168	,, Lower Mill	Same as [36]
169	,, ,,	,,
170	,, ,,	Sack hatch
171	,, ,,	Opening/window in [08] – same as [09]
172	,, Upper Mill	Same as [40]
173	Entrance level Lower Mill	Lower great spur wheel + workings – same as [21] [22]
174	Upper level ,,	Timber framework for [173]
175	,, Upper Mill	Auxiliary engine line shaft + workings
176	,, ,,	Sack hatch
200	Top level ,,	N. truss
201	,, ,,	S. truss
202	,, ,,	Meal floor
203	,, ,,	Roof W. of ridge
204	,, ,,	,, E. ,,
205	,, ,,	N. gable truss
206	,, ,,	S. ,,
207	,, ,,	Timber ridge support?

APPENDIX 3 - Perforated kiln tiles from Nether Alderley Mill, by Peter Crew

Three types of perforated tile have been found, which are similar to the tiles already recorded from the site by Mike Redfern.

5S type. A corner fragment from a tile with square cells and 5 perforations, 45mm (1¾") thick. When complete, this tile would have been 12" square, with a grid of 8 by 8 cells. The coarse and well-fired fabric, with frequent multi-coloured inclusions is characteristic of the tiles made by several of the Buckley, Flintshire firms. Examples stamped with W. HANCOCK stamped on the edge are known. These tiles were machine made in very large quantities and have been found at mill sites all over Wales and much of west-central England.

12C type. A fragment of a tile with circular cells with 12 perforations, 45mm (1¾") thick. When complete this tile would also have been 12" square, with 9 rows of cells, with 8 and 7 cells in alternate rows, in an offset pattern. The fabric is an orange-red colour, evenly fired, with frequent small white and large grey-coloured inclusions. These are well-made tiles made in a mould, though the slightly irregular pattern of perforations suggests that these were done manually. Only a few other examples are known, from Northenden Mill, Manchester and possibly from Rode Mill, Staffs, which suggests a rather limited distribution of this type. Further research is needed to identify the distinctive clay type and a possible manufacturing site.

3C type. Several fragments of tiles with irregular sub-circular cells, in an alternate pattern, each with three perforations. These tiles are only 21 to 23mm thick. No complete examples are known, but they could have been 7" square or 7" by 6". Other examples are known with a maximum dimension of 8". These are hand-made tiles, with the cells being made either by thumb impressions, or sometimes with a rounded-end stick, and there is a variety of patterns of the cells. Tiles of broadly the same type occur at a large number of sites all over Britain, though only relatively small numbers have been found at any one site, with the exception of Standish Mill, near Wigan. A wide variety of fabrics have been recorded, suggesting that these tiles were probably made by a number of local small-scale manufacturers, using local clays, and supplying mills in their local areas.

The thicker 5S and 12C tiles would have been supported on a grid of T-shaped rolled iron bars, supported on cast-iron bars. The 5S tiles are the latest type (mid-19th century onwards) and may have replaced an earlier floor of 12C tiles. However, as both types are the same thickness and were found together, within the kiln fireplace, this suggests that they could have been used contemporaneously, with the 5S tiles replacing broken 12C tiles.

The 3C tiles are earlier, though they are not closely dateable. These tiles are much thinner and could not have supported much weight, suggesting that they are from an earlier kiln structure. This would, necessarily, have had a small floor area, which could have been worked from the sides, without being walked upon.

Such collections of different types of tile from the same mill are quite usual, representing a sequence of use and re-construction over a period of time, but little is yet known about the structure of early kilns.

Key to Figures

BA	**Blocked Aperture**
BD	**Blocked Doorway**
BU	**Buttress**
BW	**Blocked Window**
D	**Doorway**
DR	**Drain**
HA	**Hatch**
ID	**Inserted Doorway**
LS	**Lineshaft**
OD	**Original Doorway**
OF	**Original Floor**
RJ	**Ragged Joint**
SJ	**Straight Joint**
TP	**Trial Pit**

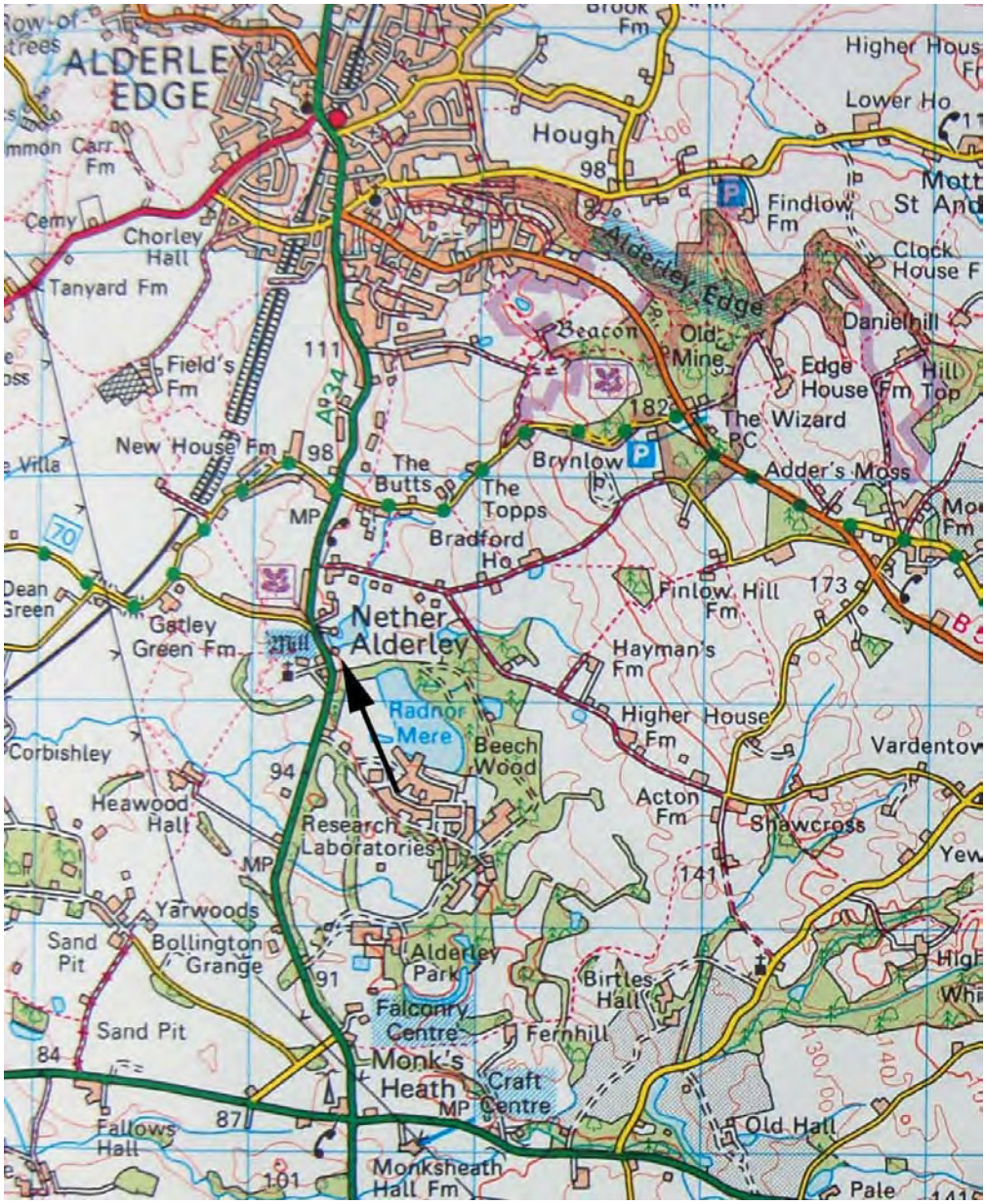


Figure 1. Map showing mill site (arrowed). O.S. Crown Copyright, Licence No.AL 100032621.

Figure 2: Nether Alderley Mill, centre, on the 'Map of Estates situate in Over Alderley, Nether Alderley and Chorley... the property of Sr. John Stanley, Bart, surveyed by William Crossley, 1787' (Cheshire Record Office). Scale *c* 1:2500.

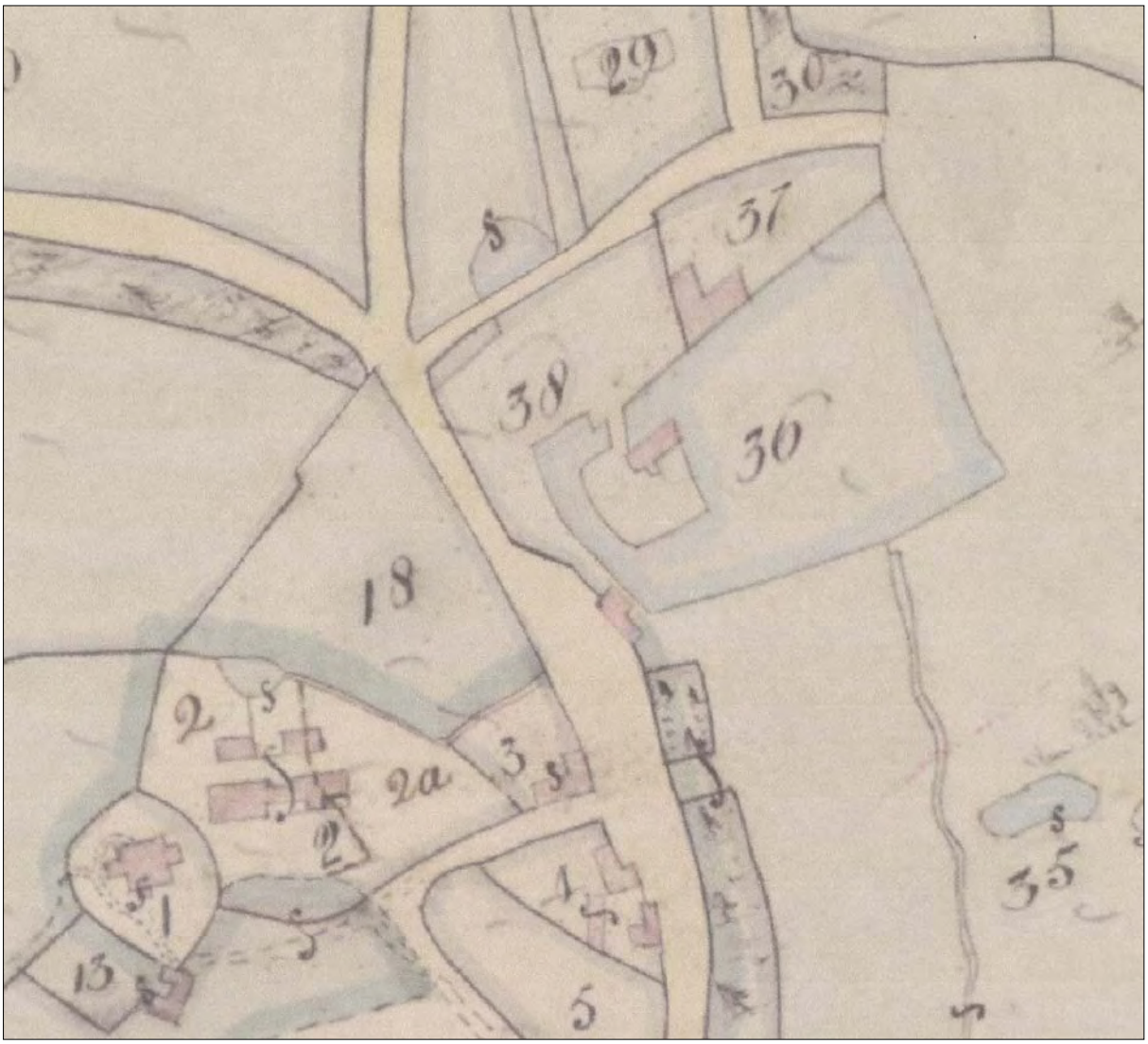


Figure 3: Nether Alderley Mill, centre, on the 1842 Nether Alderley tithe map (Cheshire Record Office). Scale *c* 1:2500.

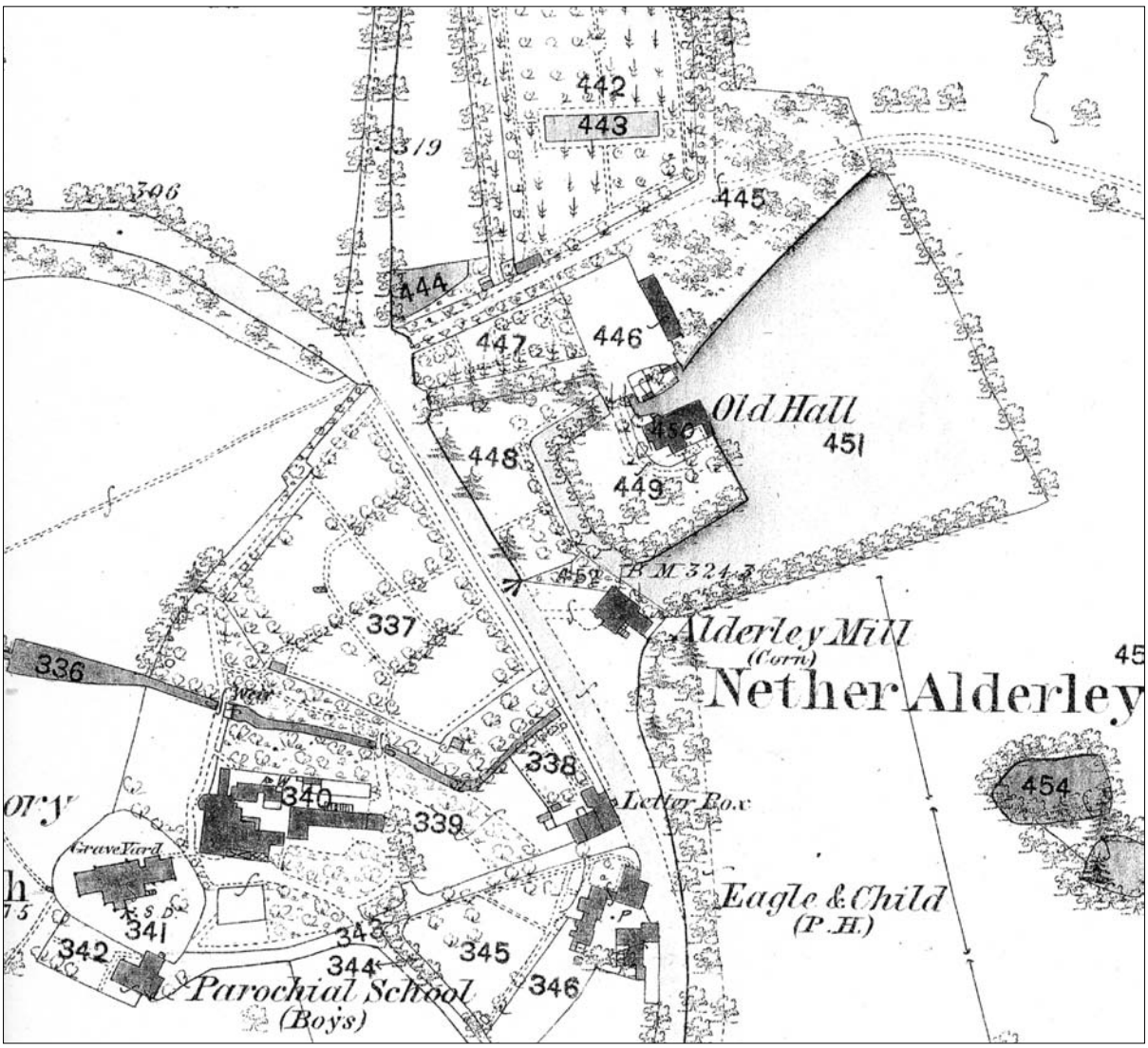


Figure 4: Nether Alderley Mill, centre, on OS 1:2500 Cheshire sheet XXXVI.1, surveyed 1872. Scale 1:2500.

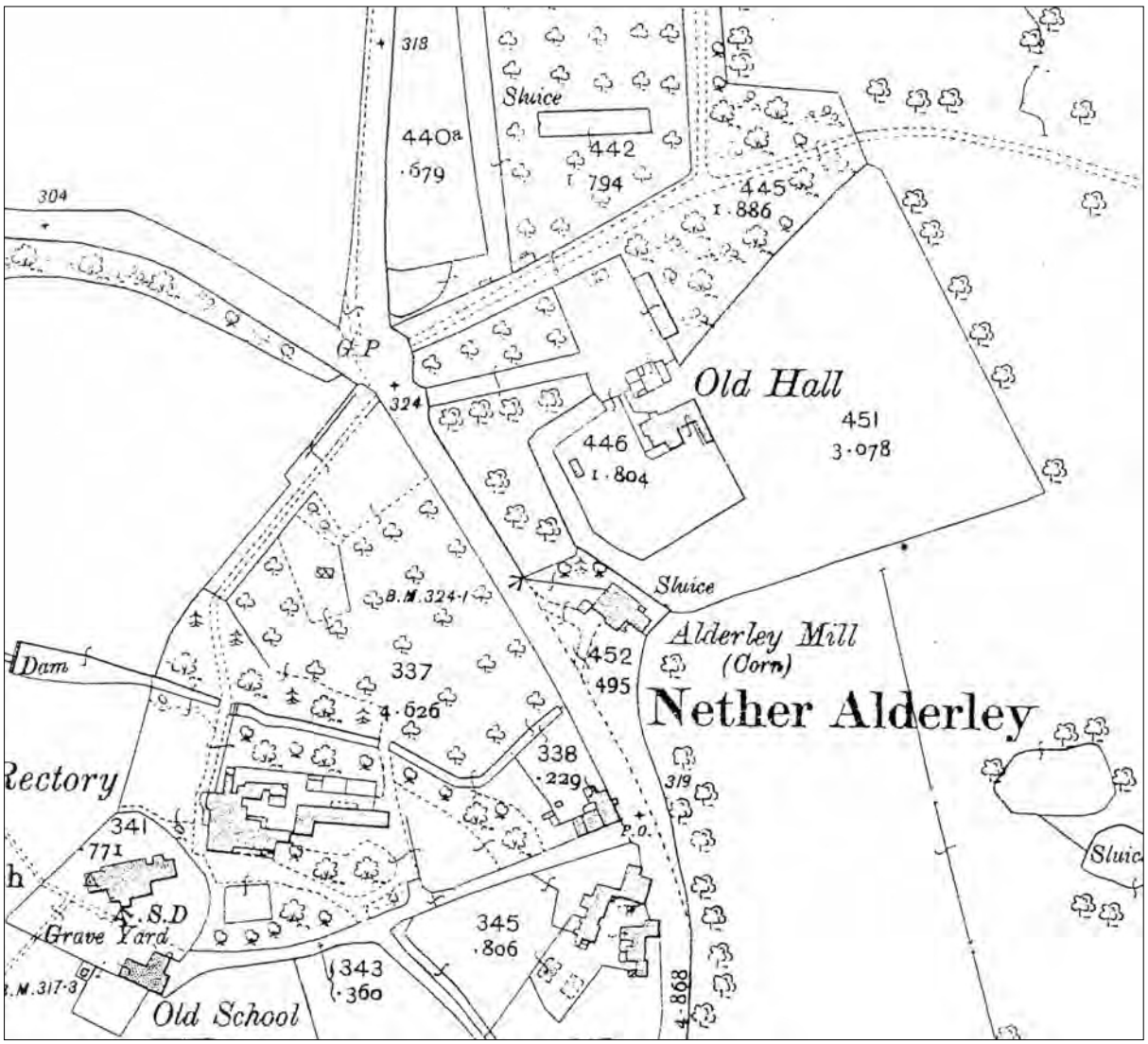


Figure 5: Nether Alderley Mill, centre, on OS 1:2500 Cheshire sheet XXXVI.1 Edition of 1909, revised 1907. Scale 1:2500.

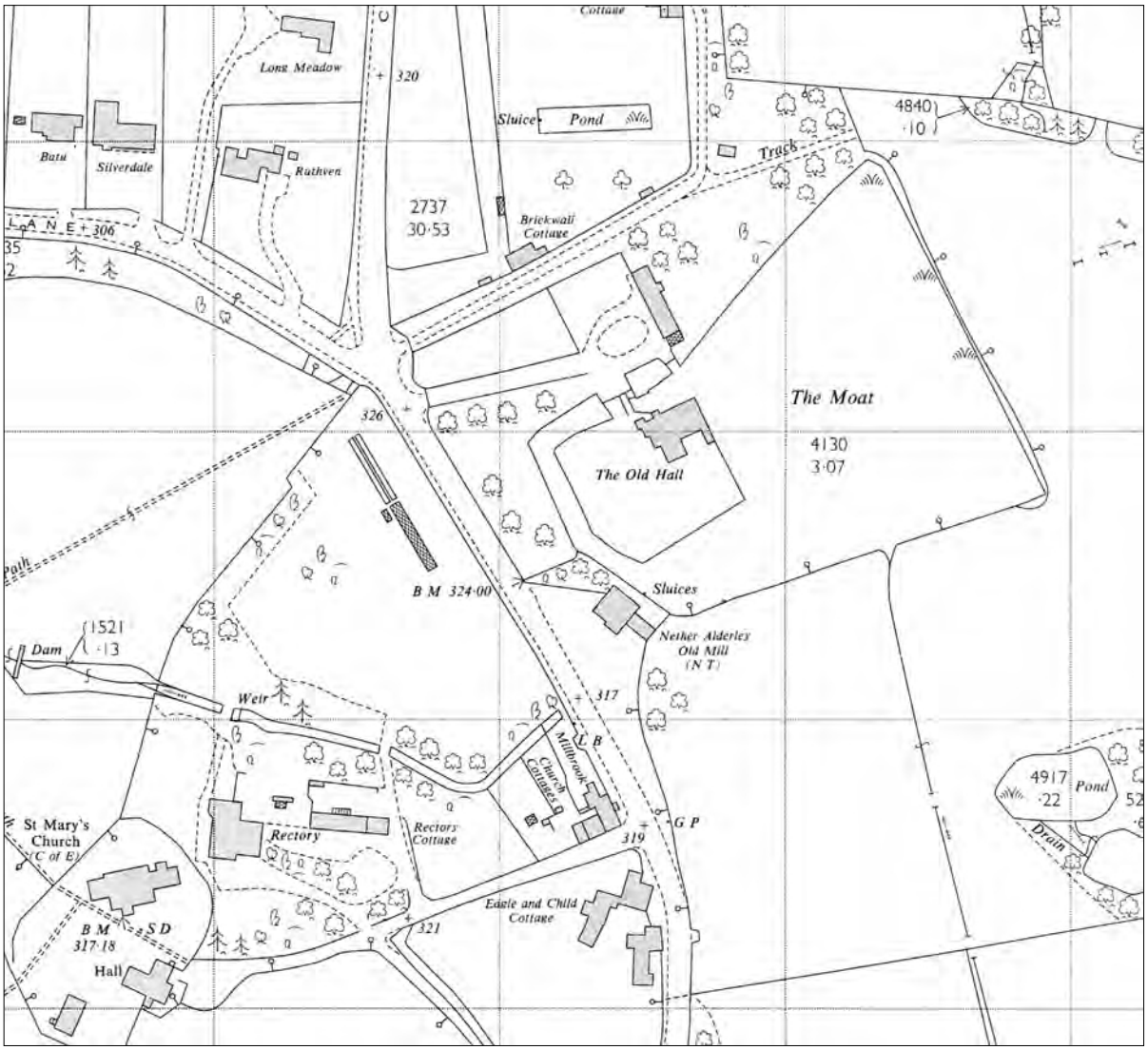


Figure 6: Nether Alderley Mill, centre, on OS 1:2500 sheets SJ 8476 & 8576, revised 1968, published 1969. Scale 1:2500. Crown copyright, O.S. Licence No.AL100032621.

Figure 7: Nether Alderley Mill, a watercolour of 1888 in the possession of the National Trust (photograph courtesy of Mike Redfern).

Figure 8: Nether Alderley Mill, *c* 1880s (The National Trust).

Figure 9: Nether Alderley Mill, *c* 1903 (Moss 1903).

Figure 10: Nether Alderley Mill, postcard post marked 1910 (courtesy of Mike Redfern).

Figure 11: Nether Alderley Mill, postcard, early 20th century (Cheshire Record Office D 4744/4).

Figure 12: Nether Alderley Mill, postcard, early 20th century (courtesy of Mike Redfern).

Figure 13: Nether Alderley Mill, *c* 1946 (Cheshire Record Office D 4744/14).

Figure 14: Nether Alderley Mill, a National Trust postcard *c* 1963 (Cheshire Record Office D 4744/4).

Figure 15: Nether Alderley Mill, from a slide show by Cyril Boucher *c* 1968-9 (courtesy of Mike Redfern).

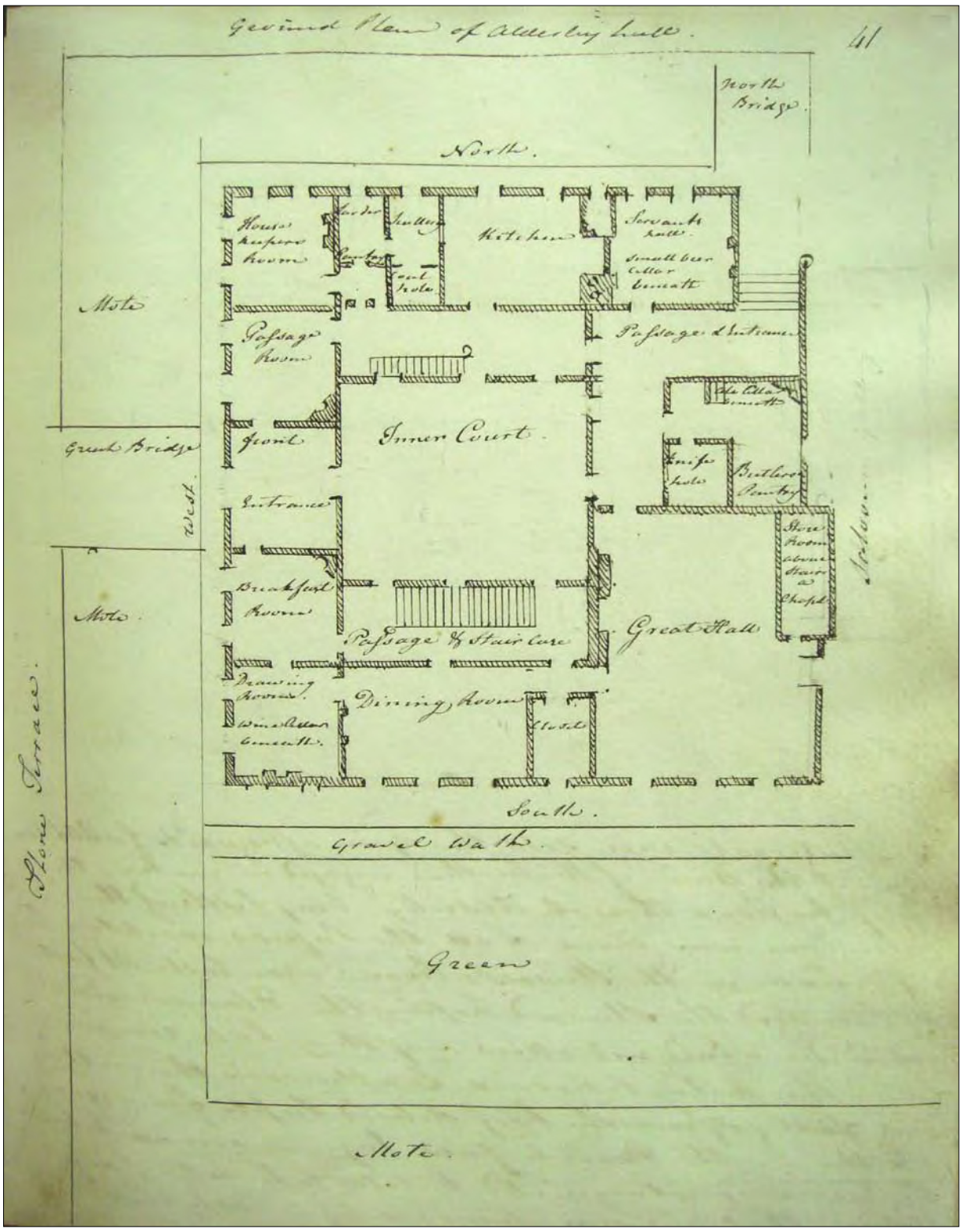


Figure 16: Early 19th century plan showing Alderley Hall prior to the fire of 1779 (Cheshire Record Office DSA 5/10).

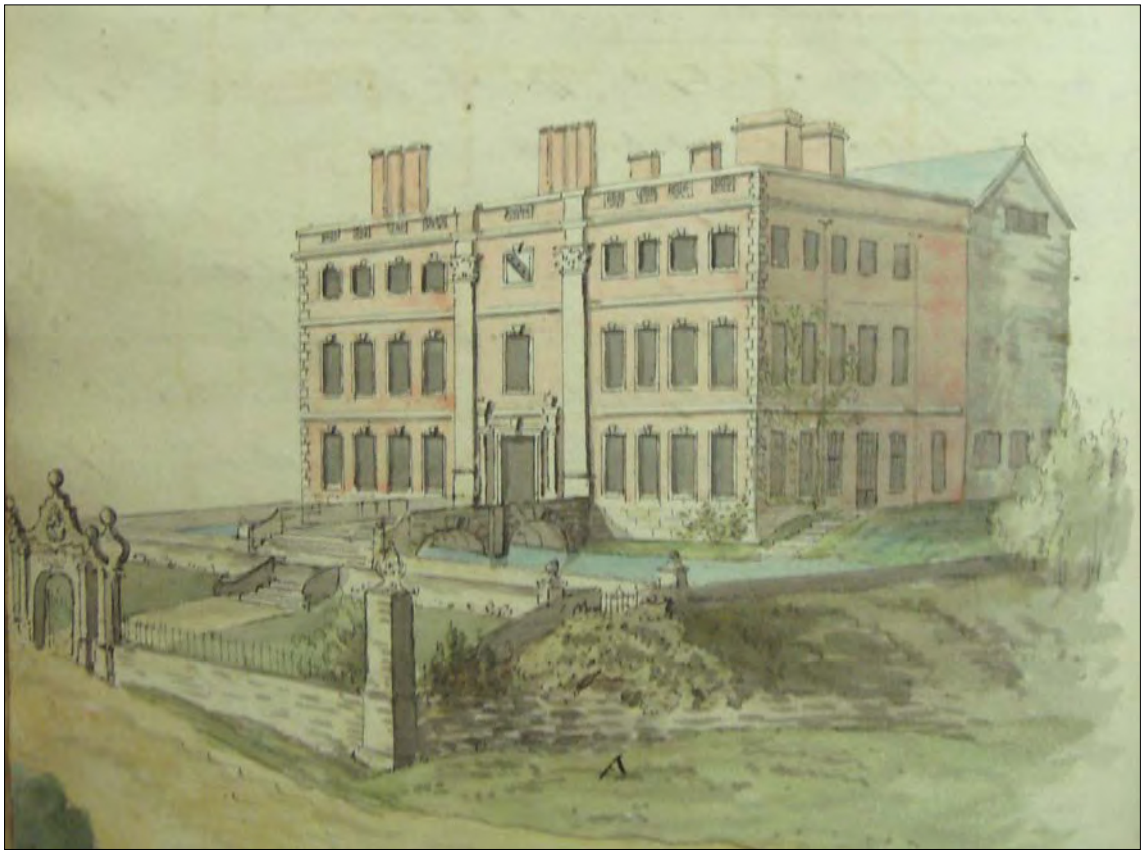


Figure 17: Early 19th century watercolour showing Alderley Hall prior to the fire of 1779 (Cheshire Record Office DSA 5/10).

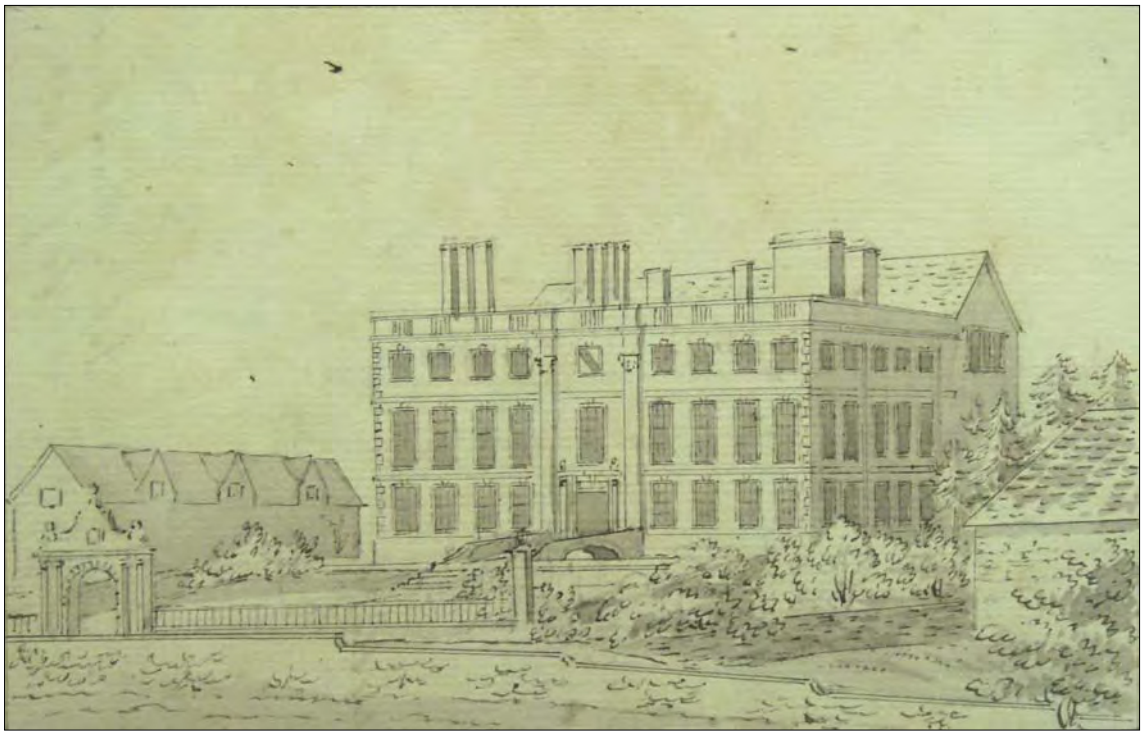


Figure 18: Drawing showing Alderley Hall prior to the fire of 1779, from an estate account book of 1798-1800 (Cheshire Record Office DSA 241/1A).

Figure 19: Oil painting in the possession of Lord Stanley, showing Nether Alderley Mill and the hall prior to the fire of 1779 (image courtesy of Mike Redfern).

Figure 20: ‘Drive from lower wheel’, 1964 (Cheshire Record Office D 4744/4).

Figure 21: ‘Interconnecting drive from wheels’, 1964 (Cheshire Record Office D 4744/4).

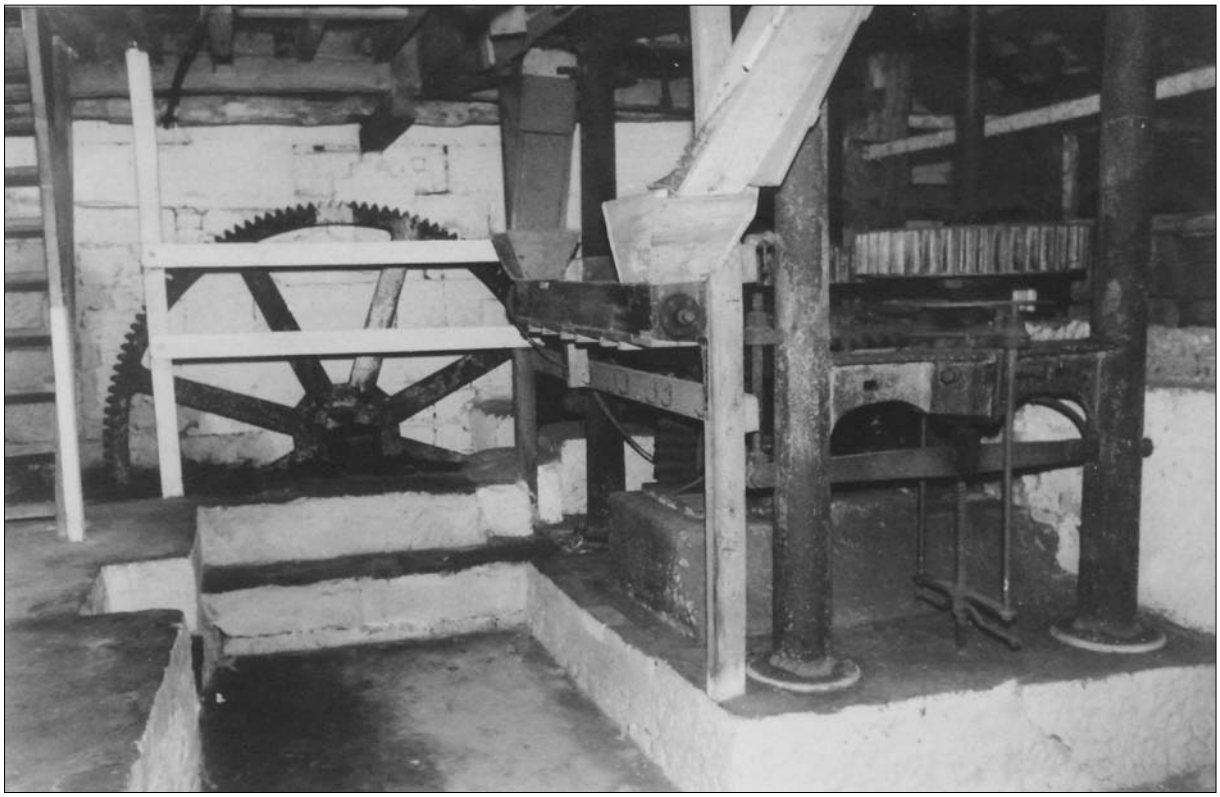


Figure 22: ‘Drive to stones’, 1964 (Cheshire Record Office D 4744/4).

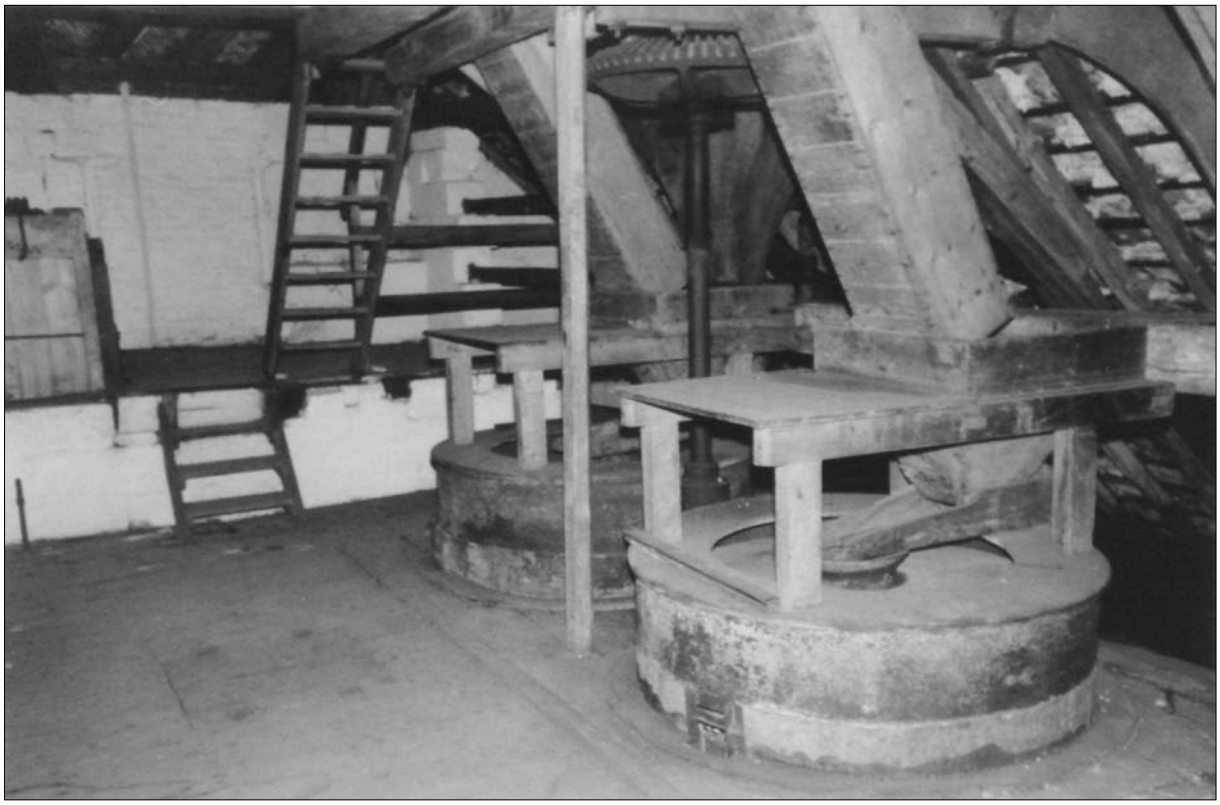


Figure 23: The millstones, 1964 (Cheshire Record Office D 4744/4).

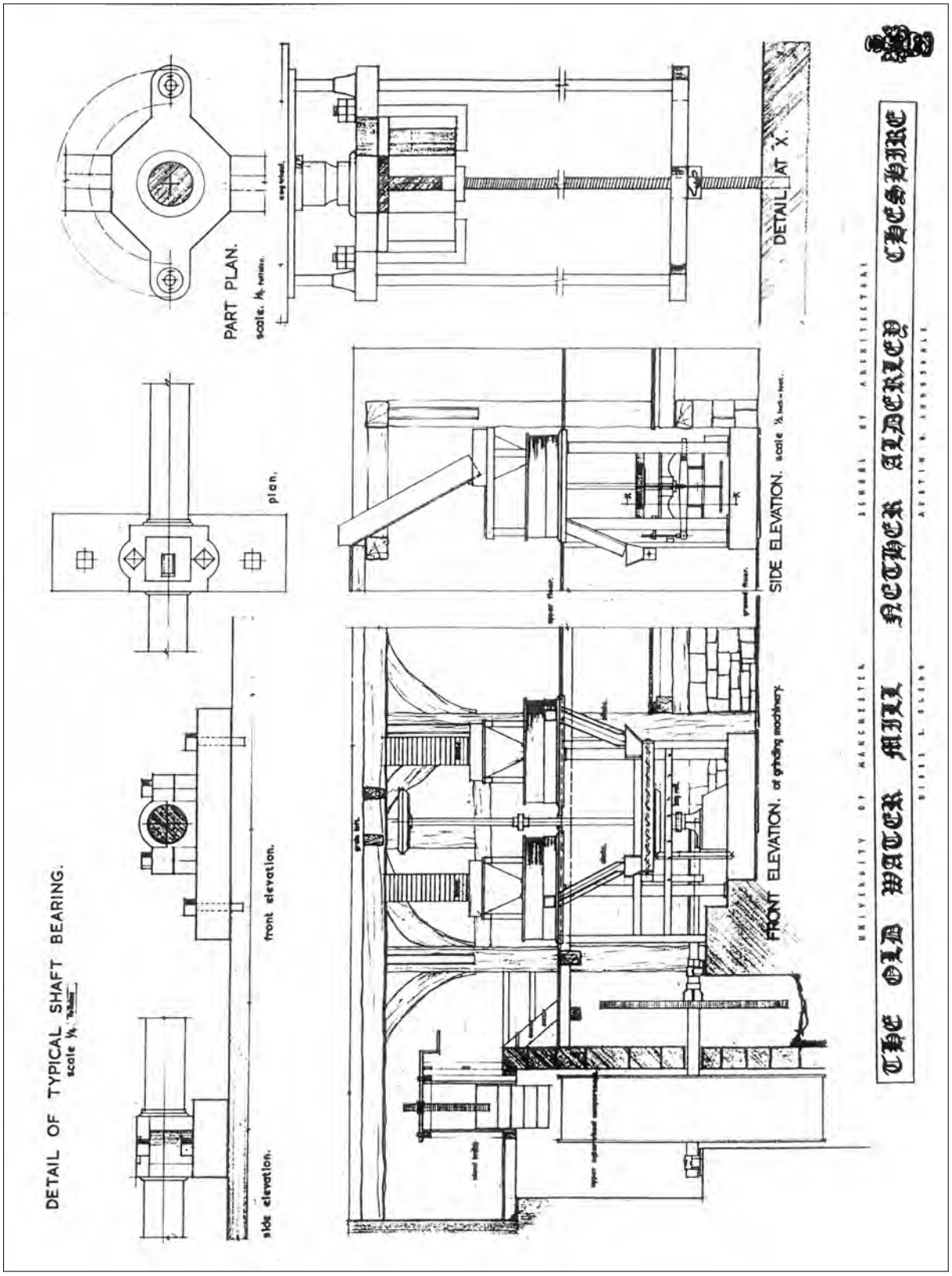


Figure 24: Drawings of the mill machinery from the survey by Nigel Clegg and Austin Longsdale of University of Manchester's Department of Architecture, 1960s.

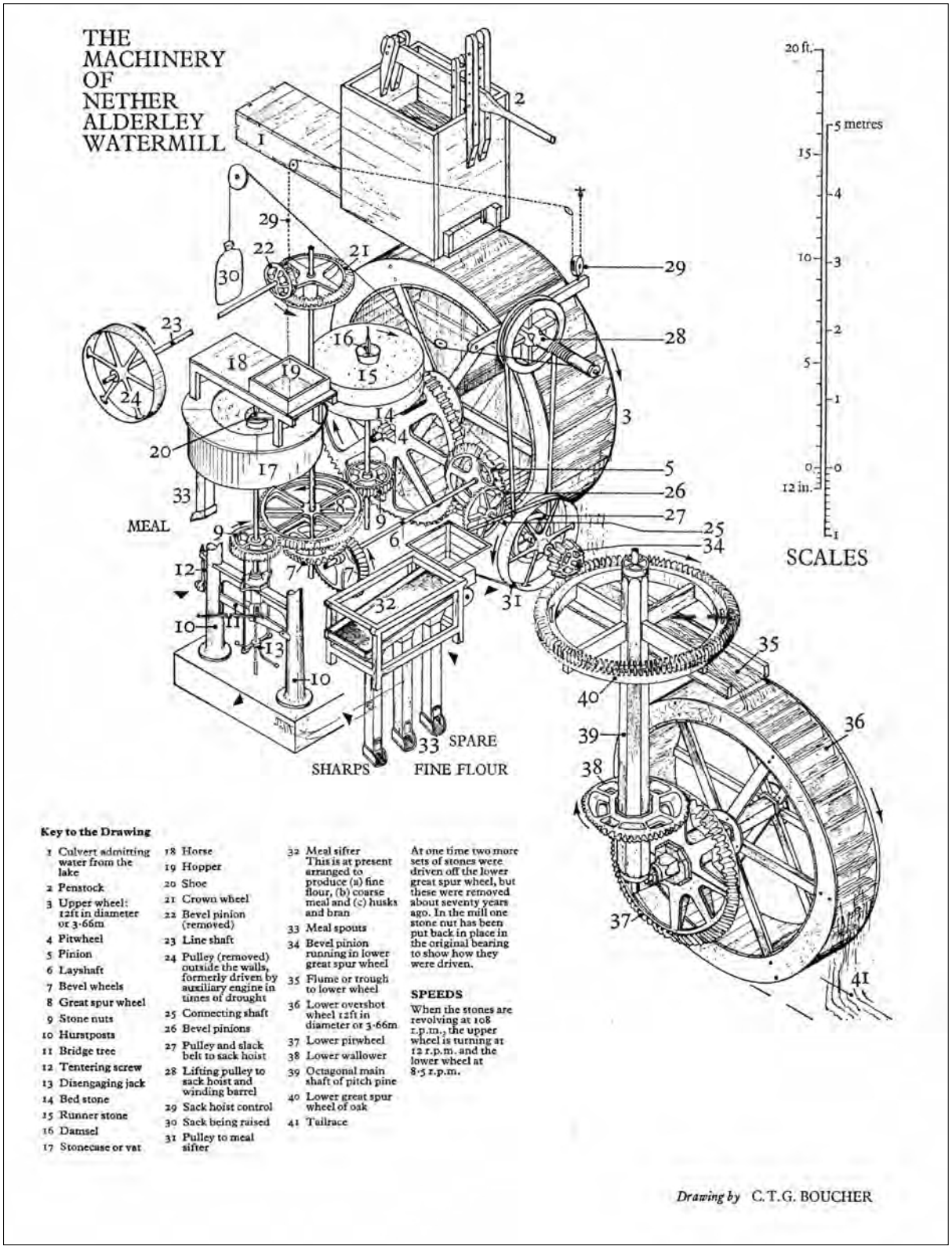


Figure 25: The mill machinery as drawn by Cyril Boucher (Boucher 1974, revised 1978).

MOATED ISLAND

0 30 Metres

PRIVATE GARDEN

MILLPOND / MOAT

376250m N

MILL DAM

SLUICE

BYEWASH WEIR

SITE OF ENGINE HOUSE

MILL

SLUICE

KILN

CONGLETON ROAD (A34)

CAR PARK

BYEWASH CHANNEL?

QUARRY FACE

PROJECTED

SITE OF STEPS

MILLPOND DRAIN

FORMER TAILRACE

BYEWASH TUNNEL

TAILRACE TUNNEL

A

B

C

D

E

F

N

SITE NORTH

55 Deg.

376225m N

376200m N

384325m E

384350m E

384375m E

NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Topographic Site Plan

M. F.

Figure 26

A1

UPPER MILL OVER

KILN OVER

B1

B

PASSAGE OVER

SJ

12

13

65

50

101

100

07

112

11

96

111

108

52

106

109

117

107

102

BD

04

05

56

103

113

104

51

59

TP2

TP1

SITE OF PITWHEEL?

SITE OF WATERWHEEL

116

54

61

23

BW

115

BA

25

26

53

TAILRACE

BLOCKED TAILRACE

A

N

PHASE 1 - c.1598?

PHASE 2 - 18th C.

PHASE 4 - 20th C.

BLOCKING

TIMBER

IRON/STEEL

0 10 Metres

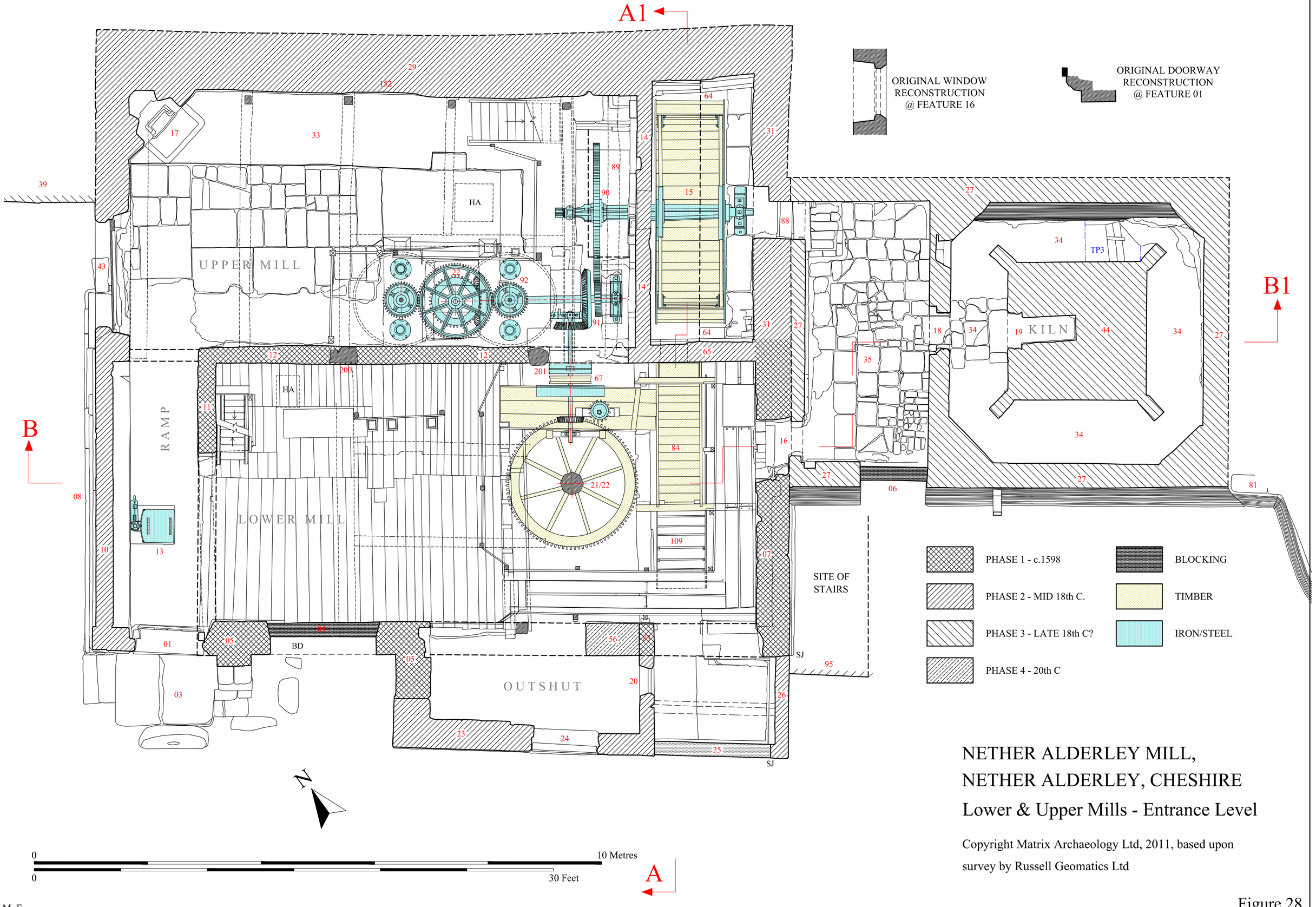
0 30 Feet

NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Lower Mill - Basement Level

M. F.

Figure 27

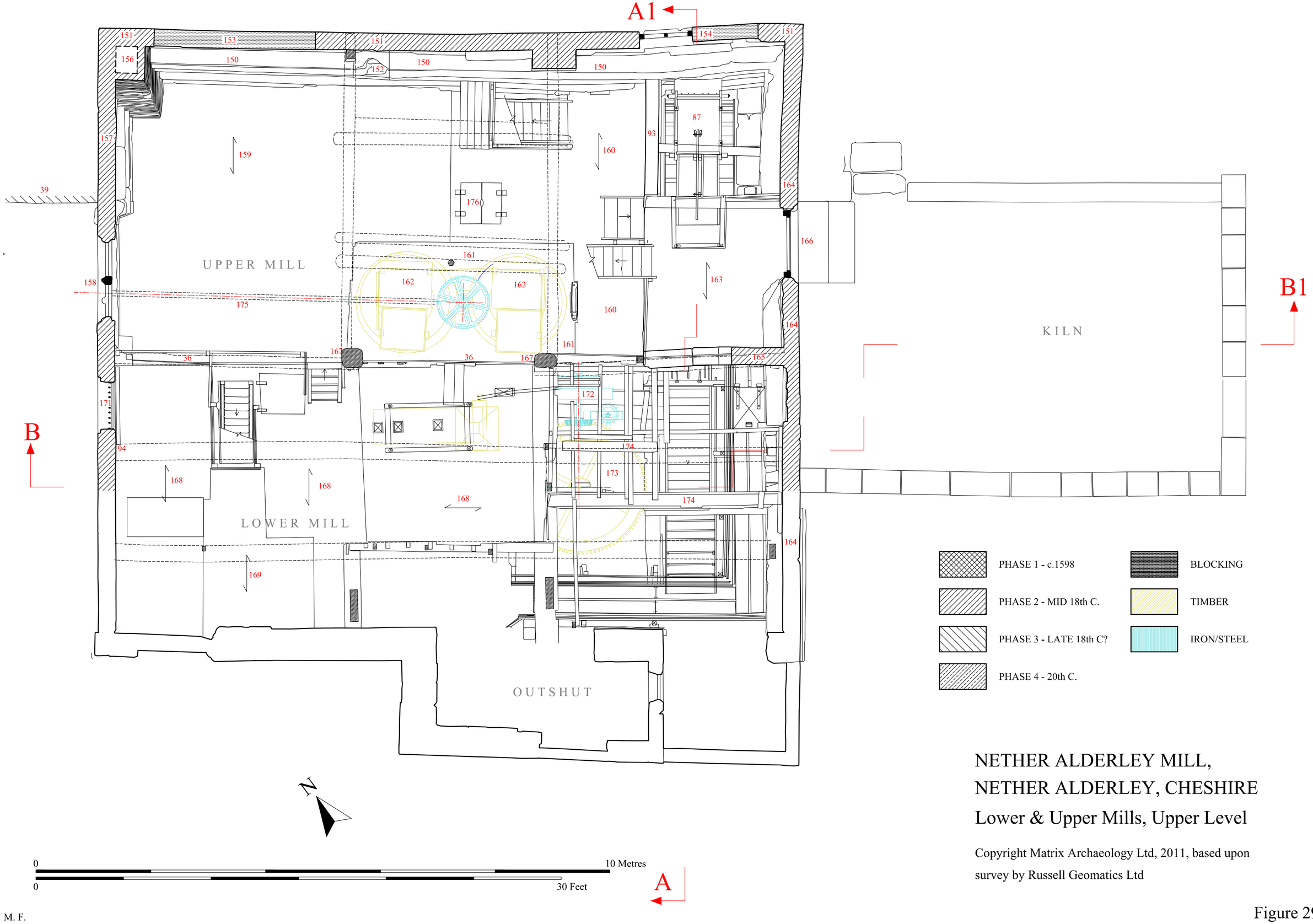


NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Lower & Upper Mills - Entrance Level

M. F.

Figure 28

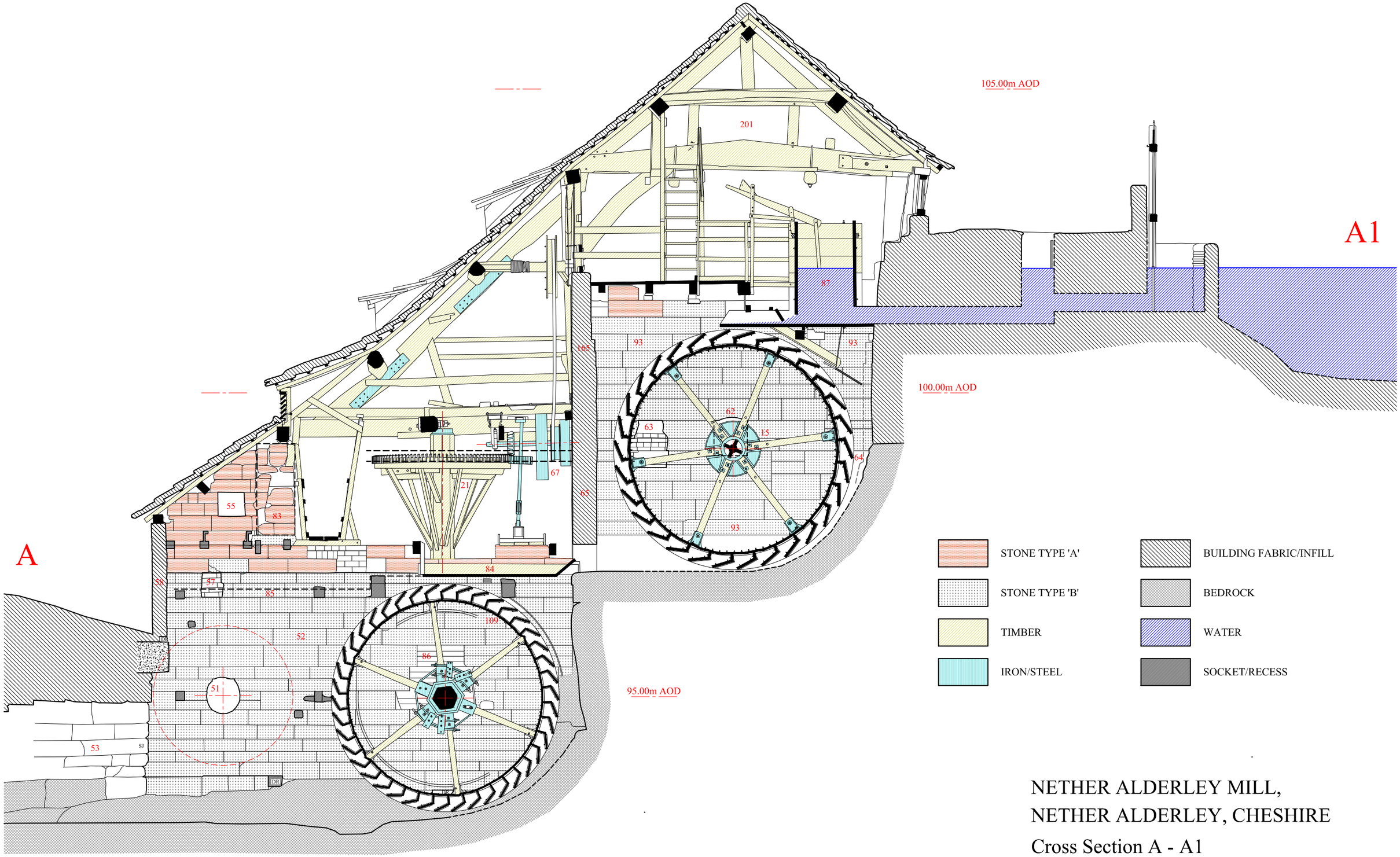


NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Lower & Upper Mills, Upper Level

M. F.

Figure 29



NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Cross Section A - A1

M. F.

Figure 30

STONE TYPE 'A'
STONE TYPE 'B'
TIMBER
IRON/STEEL
BUILDING FABRIC/INFILL
BEDROCK
SOCKET/RECESS

B

B1

105.00m AOD

200
201
165
40
EARLIER FLOOR LEVEL?
41
10
39
08
69
12
11
67
21
66
65
68
SJ
52
110
101
102
96
95.00m AOD

MILLPOND LEVEL
42
71
165
37
70
07
27
KILN
35
44
18
34
19
16
CUT OF
BYEWASH CHANNEL?
100.00m AOD
DRAIN

0 10 Metres
0 30 Feet

NETHER ALDERLEY MILL
NETHER ALDERLEY, CHESHIRE
Cross Section B - B1

M. F.

Figure 31

STONE TYPE 'A'

STONE TYPE 'B'

STONE TYPE 'D'

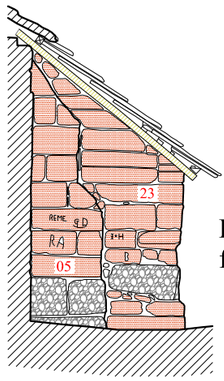
TIMBER

BUILDING FABRIC/INFILL

BLOCKING

C

98.00m AOD

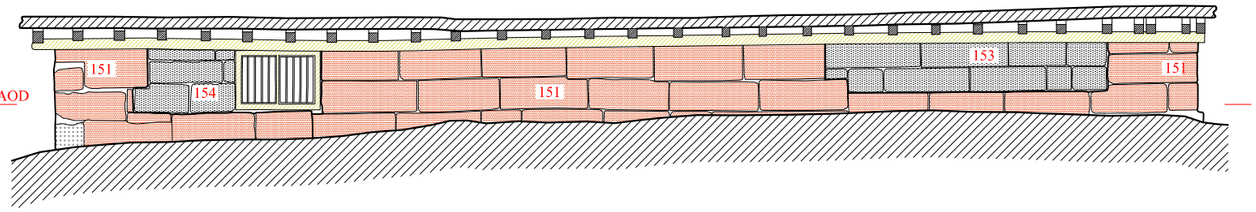


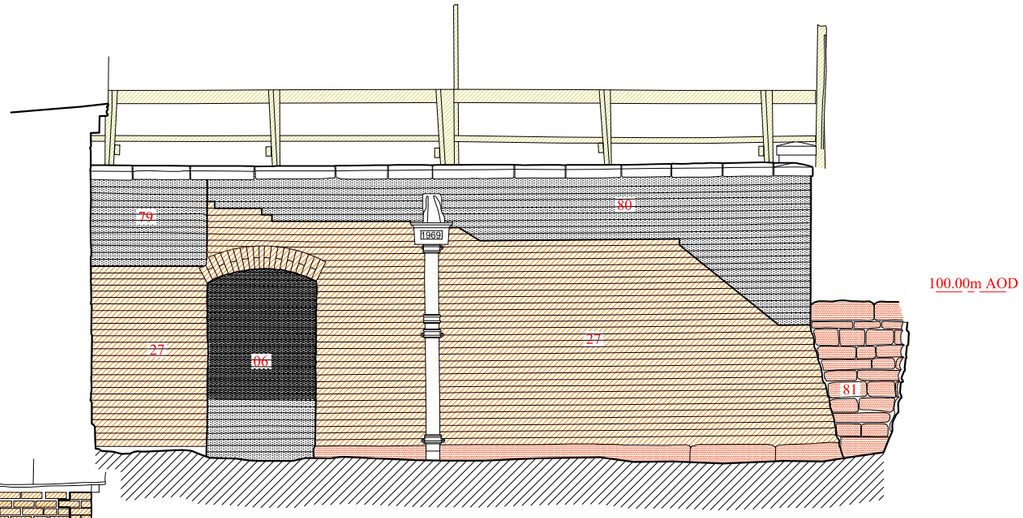
C1

Return Elevation
facing north, C - C1

East External Elevation

103.00m AOD

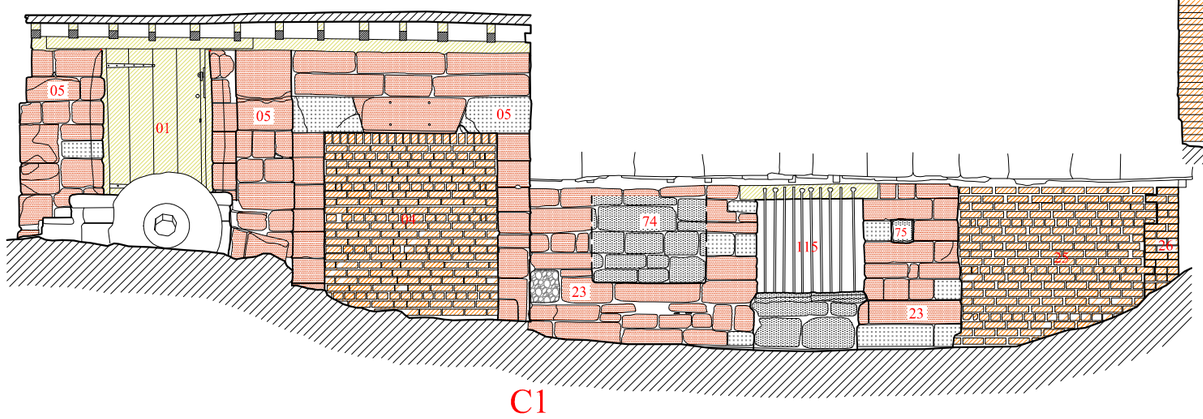




Composite West External Elevation

100.00m AOD

C



C1

100.00m AOD

0 10 Metres

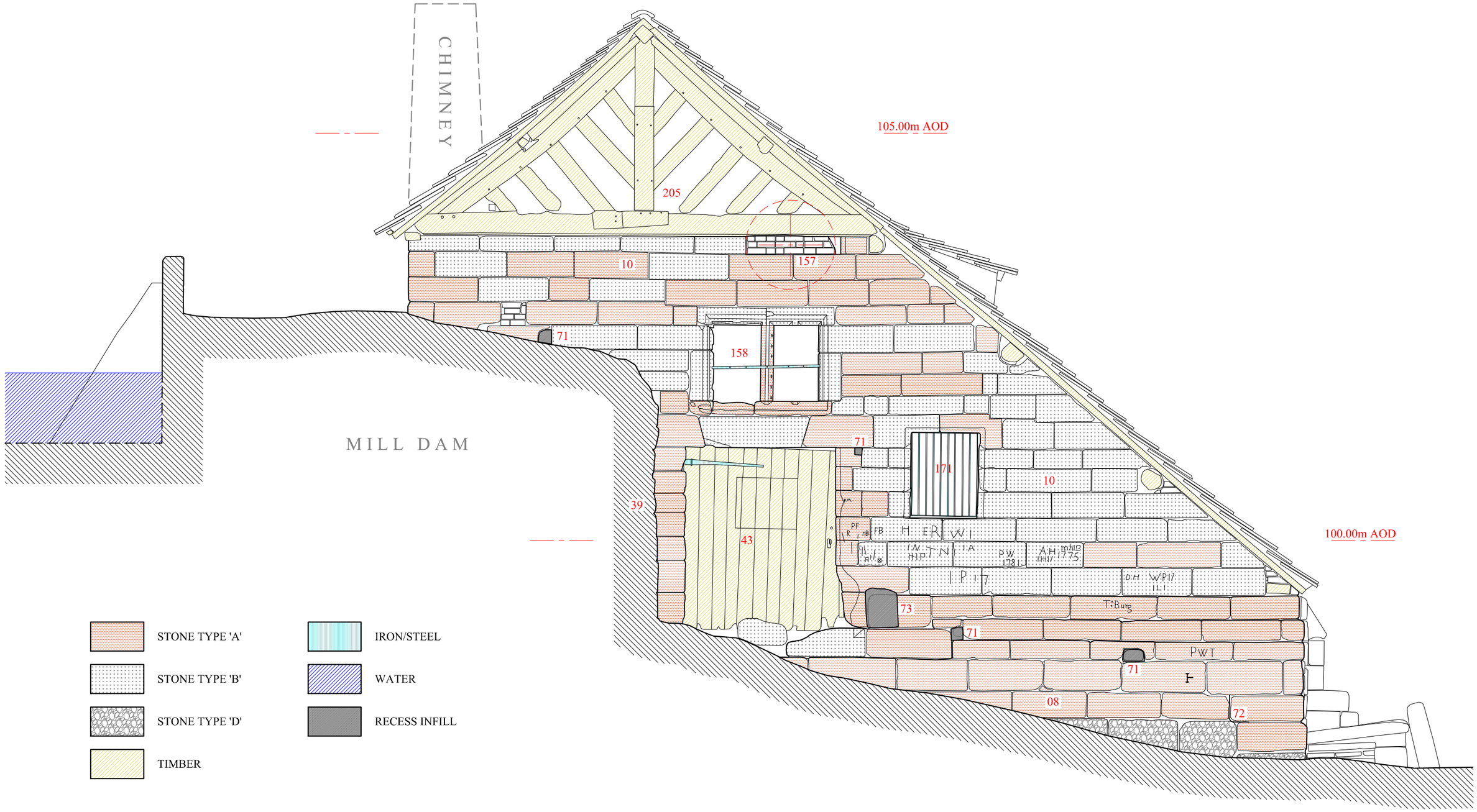
0 30 Feet

NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

East and Composite West External Elevations

M. F.

Figure 32

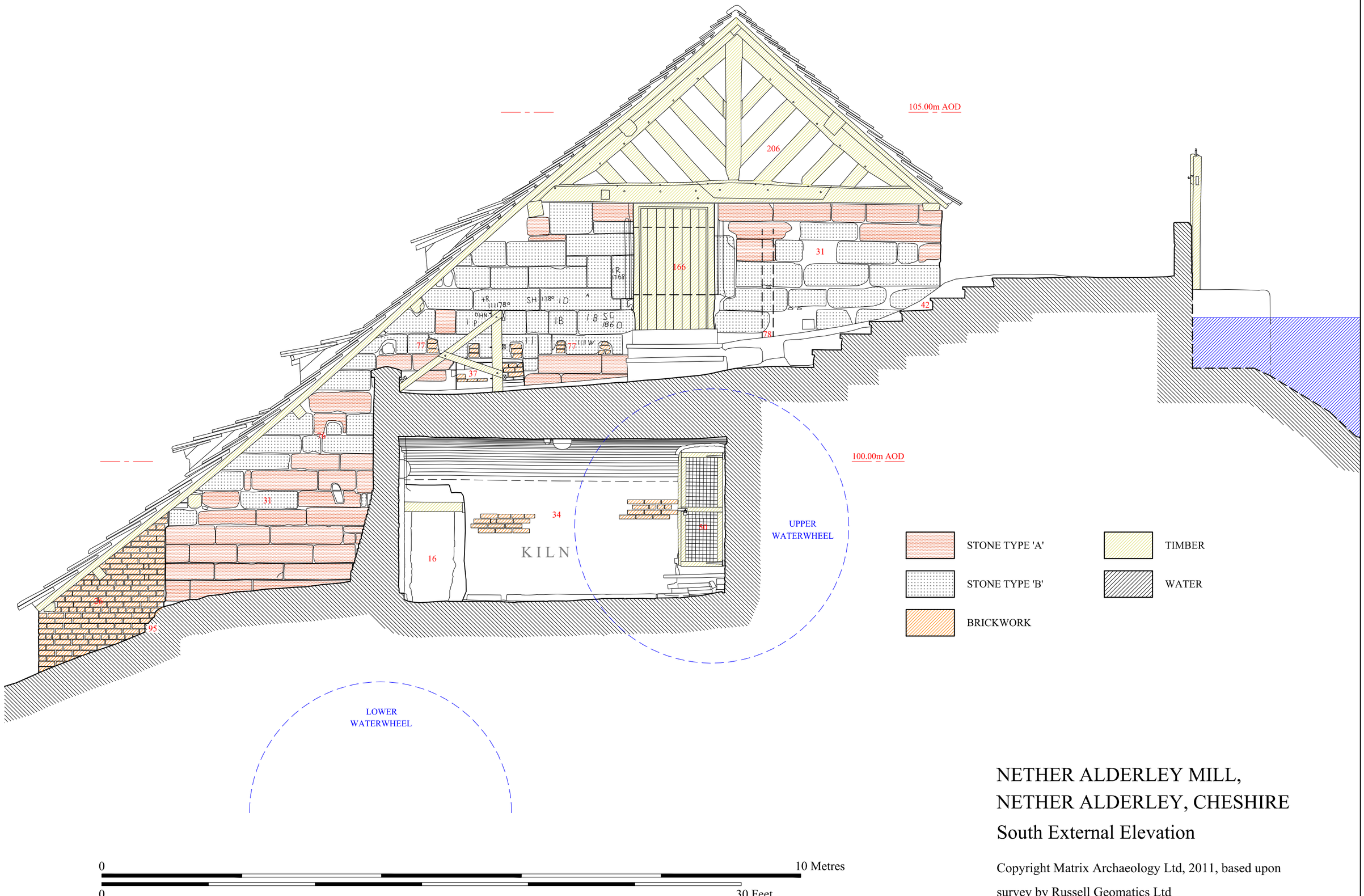


NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

North External Elevation

M. F.

Figure 33



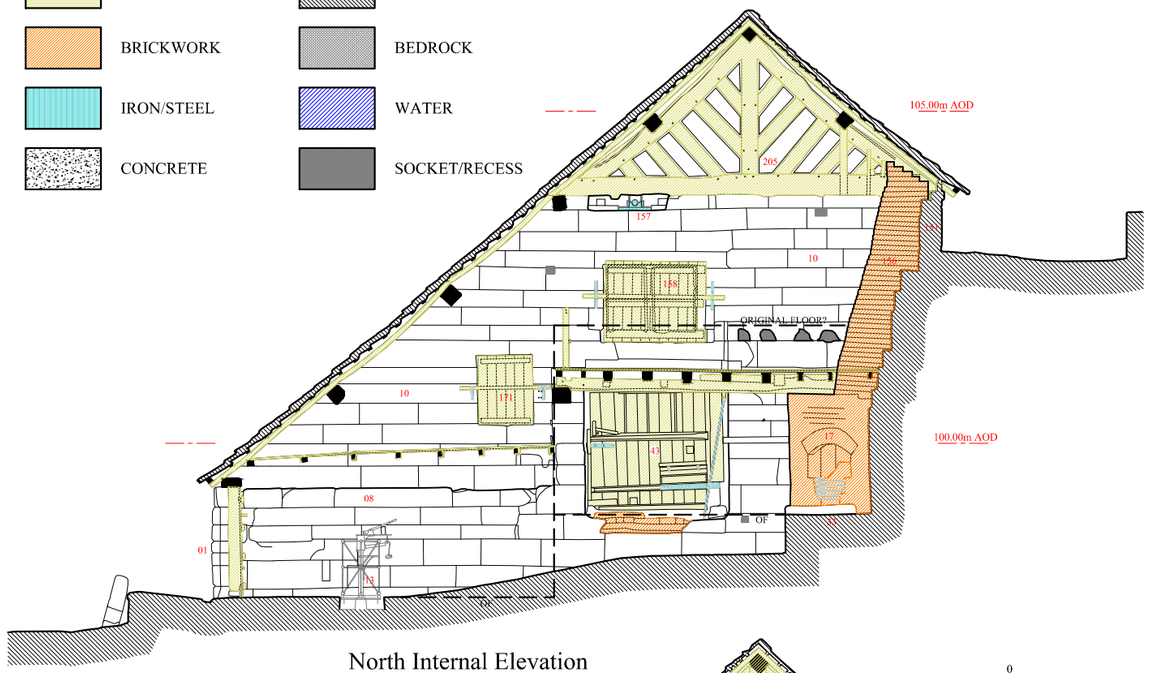
NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

South External Elevation

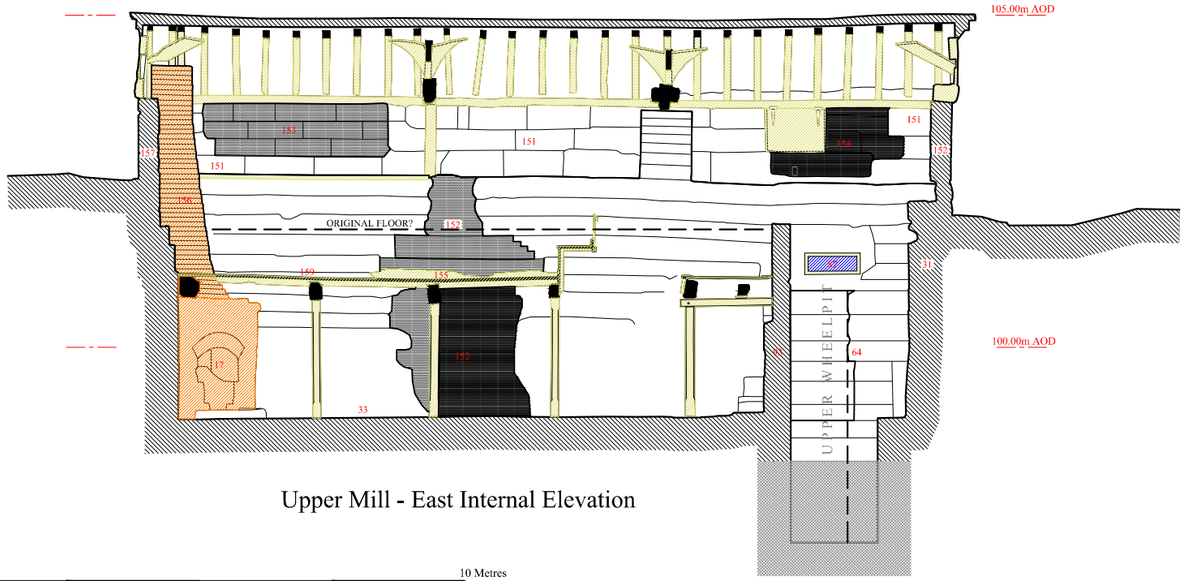
M. F.

Figure 34

TIMBER
BRICKWORK
IRON/STEEL
CONCRETE
BUILDING FABRIC/INFILL
BEDROCK
WATER
SOCKET/RECESS

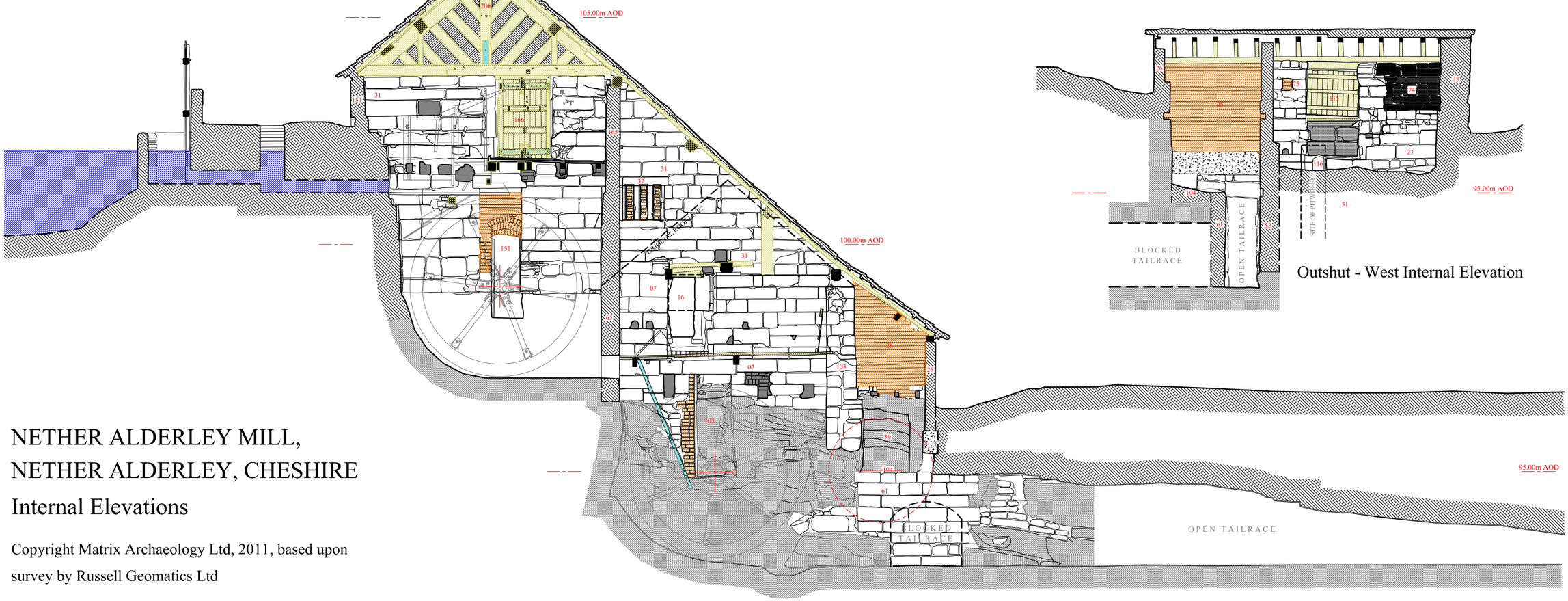


North Internal Elevation



Upper Mill - East Internal Elevation

0 10 Metres
0 30 Feet



South Internal Elevation & Tailrace

Outshut - West Internal Elevation

NETHER ALDERLEY MILL, NETHER ALDERLEY, CHESHIRE

Internal Elevations

T. M. & M. F.

Figure 35