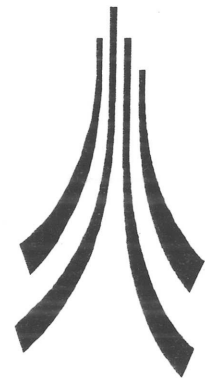


LANCASTER
UNIVERSITY
ARCHAEOLOGICAL
UNIT



April 1995

THE HOWK BOBBIN MILL, CALDBECK

Cumbria

Archaeological Survey

Commissioned and funded by:

Lake District National Park Authority

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ACKNOWLEDGEMENTS

This report was compiled by Nick Hair and Michael Trueman. The survey team was led by Jamie Quatermaine, with assistance from Nick Hair, Peter Redmayne Ken Browell and Jonathan Smith. Interim elevation drawings were produced by Richard Danks and final plans and elevation drawings were completed in CAD by Nick Hair and **XXXXX**.. Dennis Thompson was commissioned by the Unit to undertake all rectified photographic work on the site. Overall project management and report editing was undertaken by Jason Wood.

Thanks are due to the staff of the Lake District National Park Authority who removed much of the undergrowth from the study area, and provided the survey team with ladders.

EXECUTIVE SUMMARY

Field survey of the Howk Bobbin Mill has been undertaken to satisfy the Lake District National Park Authority's project brief, dated May 1994. Surveyed features include remains of the Bobbin mill, a stone coppice barn, miscellaneous buildings identified as a drying kiln and workshops/offices, together with remains of a water supply system. The end product of the survey is an accurate topographical survey accompanied by gazetteer and photographs. Detailed recording of the mill building and coppice barn was also carried out in the form of elevation drawings, based on rectified photography, with appropriate fabric analysis.

An historical chronology for the site has been set out, based on selected primary records together with published and manuscript secondary sources, and this has been compared to stratigraphic information gleaned from the survey. This has established a working model for the development for the site. The mill and associated structures were probably constructed from limestone quarried from the ravine in which they sit (together with imported sandstone for quoins). The mill itself was purpose-built for bobbin manufacture in 1857 and was operated until closure in 1924. The surviving structure largely dates from 1857, although significant modifications have occurred in the west part of the mill. The original 40' water-wheel is documented as having been replaced in 1859 by a 42' 5" wheel. It is apparent from examination of the surviving wheel pit and adjacent mill wall, that both wheels would have been accommodated within this pit and that the first wheel would probably have been operated as the second, which is clear from documents was a high breastshot wheel with power take off via a rim gear wheel fixed to the spokes. Such an arrangement was common amongst Lakeland bobbin mills. It is also clear from documents and the surviving structure that the launder support at the north end of the pit is the last of at least three structures constructed and used during the mill's lifetime. Archaeological evidence also strongly suggests that a previously undocumented water turbine was installed and used at the mill to augment the water-wheel. Of the other structures on site, features which probably date to the original construction of the mill include the stone coppice barn, water supply system (reservoir, weir, leat), retaining walls, drying kiln and privy. Other structures were added by the time of the OS 1889 map. These include wooden coppice barns (identified on an early photograph); workshops/offices adjacent to the mill; a possible extension to the drying kiln, and a lean-to against the north side of the mill, almost certainly for a saw bench.

Conservation aspects of the site were also examined. It is apparent that remains have not yet reached an equilibrium in their state of survival, and there is continued slow deterioration of all stone structures. This decay is resulting in loss of archaeologically recoverable data about the site's history. In addition the mill building floor must be considered an area of particular archaeological sensitivity. The benefits of further archaeological investigation have therefore been set out.

1. METHODOLOGY

The archaeological survey of the Howk Bobbin Mill was carried out for Mr John Hodgson (Archaeologist) of the Lake District National Park Authority in fulfilment of his brief (Appendix 4) dated 26th May 1994. The elements required in the project brief were:

- 1:500 scale base survey of entire study area
- 1:100 scale plan of mill building, coppice shed, and associated remains
- 1:20 scale phased elevation drawings of elements of the mill and coppice store (based on rectified photography)
- Site photography
- Structured gazetteer of site components
- Analytical report

Field survey was undertaken in August 1994. Archaeological and topographic detail was surveyed by EDM tacheometry using an electronic total station and data logger facility. This instrument was used to transform the raw data into national grid co-ordinates and output to a portable plotter. Detail was drawn in by hand. Inked and CAD drawings were then produced. Analysis, site photography and the commissioned report were completed in March 1995.

The description of the operation and development of the different parts of the site are put forward as a working model, based on assessment of the evidence that was available at the time of writing. It is designed to be modified and improved as further evidence comes to light.

Documentary research was outside the brief supplied to LUAU. However, in order to complete a basic level of analysis it was necessary to access early map and photographic evidence. Reference has also been made to a Lake District National Park commissioned report by Davies-Shiel (1994) and other published and manuscript works.

2. INTRODUCTION TO THE SITE

2.1 Location

The Howk Bobbin Mill lies just west of the village of Caldbeck which is situated amongst the gently rounded Caldbeck Fells of North Lakeland (NGR NY 3193 3975). The area of study defined by the project brief encompassed the entire mill complex, including the bobbin mill, coppice store, and associated buildings, together with the weir, situated c150m upstream from the mill, and the leat.

2.2 Geology and Topography

The mill is located within the east end of a limestone gorge known as 'The Howk', at a height of c180m above ordnance datum. The ravine was created by the action of the Whelpo Beck which descends in a series of picturesque waterfalls through the gorge. According to Davies-Shiel (1994, 1), the name 'Howk' derives from an Old Norse word 'haak' (pronounced 'hark'), meaning notch or cleft. The mill buildings are surrounded by ash and elm woodland, which was coppiced when the mill was in production (see **Appendix 4**).

2.3 Site Significance

The bobbin mills of the Lake District developed as a result of the growth of the cotton industry from the late eighteenth century onwards. It has been suggested that by the mid-nineteenth century they accounted for about 50% of bobbin production in Britain (Marshall and Davies-Shiel 1977) and that there were around 129 bobbin mills within Cumbria (Davies-Shiel 1994, 1). By the end of the nineteenth century they had declined in the face of automated machinery and cheap imports. The Howk mill lies at the north end of the main concentration of Lakeland bobbin mills. It was purpose-built and started producing bobbins in 1857, during the industry's peak period, staying in production for some 67 years, eventually closing in 1924 (Davies-Shiel 1994, 8).

3. DOCUMENTARY EVIDENCE

3.1 The Cumbrian Bobbin Industry

The broad history and significance of the so-called Lakeland bobbin mills has been described by Marshall and Davies-Shiel (1977) and (White 1977) from which the following summary is drawn.

Bobbin mills were part of a broader Cumbrian woodworking industry, and produced a wide variety of wood-turned items, the staple products being, 'bobbins and later reels, spools and handles' (White 1977, 335). The mills emerged in the late eighteenth century in response to demand from the South Lancashire cotton industry. The 1830s saw a rapid expansion due to growth of the Lancashire textile trade, peaking in the period 1847-70. Marshall and Davies-Shiel (1977, 63) describe the Lakelands as having the highest concentration of bobbin manufacture producing perhaps 50% of textile mill requirements in Great Britain at this time. From the end of this period a series of factors, including dropping demand as a result of the 'cotton famine', increased automatic bobbin turning by the spinners, Scandinavian competition, and the introduction of metal spindles and paper cops.

White (1977, 335) has remarked on the distinctive character of the Lakeland industry in that in most regions of textile production bobbins were made close by (in special shops or in the textile mills). In addition, Cumbria contrasts with the wood-turning trade of the Chilterns where furniture-making was based on individuals rather than mills.

Two dominant factors lay behind the siting of Lakeland mills: the availability of water power and the existence of a well-wooded landscaped that had been coppiced for centuries (with ash, alder, birch) to produce for charcoal for the iron industry. Marshall and Davies-Shiel (1977, 62) claimed a total of 69 bobbin mills in Lakeland and The Lune valley (with 49 working in the region in the peak period of 1847-70), although Davies-Shiel (1994, 1) now gives a number of 129 mills. These mills could employ from 10 to 240 people, although a typical number was about 40. According to Marshall and Davies-Shiel (1977, 62) the lathes were operated by men; the sawing and boring machines by apprentices, and sanding, painting, polishing, counting and packing by women (see table of processes below). Production of bobbins was measured by the gross (144 bobbins), and Marshall and Davies-Shiel (1977, 63) suggest a production rate of one gross of simple bobbins every half hour and one gross per hour for a more complex design.

Marshall and Davies-Shiel (1977, 64-73) paint a picture of a 'typical' mill site and its operation. The components would include the mill itself, coppice barns, a variety of other structures including perhaps a drying kiln, weirs, and leats. Coppice barns were very distinctive features, with their generally pillared construction. Marshall and Davies-Shiel give a broad rule that pre-1860 barns had round pillars, where post-1860 generally had rectangular cross-section pillars. In addition there was generally a wooden first floor and a wooden or stone ground floor. The Stott Park coppice barn seems to have had a wooden framework rather than solid floors for holding coppice poles.

Marshall and Davies-Shiel (1977, 66) also describe the use of a steam chest and drying kiln to avoid lengthy seasoning periods. This does not appear to have been done at Stott Park, where timber was stored and seasoned for 12 months. This process would utilize a separate drying kiln, housing a boiler fired by the cast quantity of wood waste.

The mills themselves were a mixture of purpose-built and converted buildings. Purpose-built mills were generally two-storey, small and rectangular in plan. There was usually a water-wheel in a large pit built into one end of the mill. This indirectly drove line shafting from which belt-driven lathes were operated in well-lit rooms. Early lathes were mounted on pairs of heavy timbers fixed to walls. Later iron lathes (such as those installed at Stott Park in the 1870s) were fixed to the floor). Other machinery driven from the same line shafts would be housed in the same rooms and elsewhere. The processes and equipment involved are described in Ayris and White (1983), Marshall and Davies-Shiel (1977) and White (1977) and are listed below. Bobbins were moved around on site between these processes in baskets or 'swills'.

Process	Equipment	Description
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Coppicing	Horse and cart	To convey materials in and out
Bark peeling and storage	Coppice barn	Coppice stored in stackyard and coppice barns. Bark peeled for re-sale
Sawing	Bench saw	To cut coppice into either 'cakes' from the base of thicker wood, or required lengths of the narrower 'tops'
Blocking wood cut into 'cakes'	Blocking saw	Tubular saw with 'parrot nose' bit to cut 'blocking' wood from 'cakes'
Tops wood cut to length and 'bored'	Bench drills and boring machines	To bore central hole through lengths of tops wood
Tops wood 'roughing'	'Roughing' Lathes	To obtain the rough shape of bobbins from tops wood
Drying	Drying rooms	Cutting and roughing often done with wet timber. This was dried before finishing work
Rincing or reemering	Manual drills	Central hole enlarged and cleaned
Finishing	Finishing Lathes	Final shape and size produced
Dying	Dying vats	If required bobbins were dyed or painted colours to suit the customer
Polishing	Polishing barrels	With a barrel, many bobbins loaded with pieces of wax. Rotated for about half an hour. Shellac could be applied to bobbin still held on a lathe, using a brush
Sorting and packing		Packed into sacks or hampers, ready for transport by horse and cart

Steam power could be installed, but more commonly water turbines were added, particularly after 1880. Water turbines for motive power were perfected by Fourneyron in 1827. Numerous other designs followed (Trinder 1992, 781). Stott Park Bobbin Mill had installed a Williamson-type turbine in 1858, a Gilkes-type in c1890 and an Armfield-type in 1931 (Marshall and Davies-Shiel 1977, 73; White 1977, 346 - who does not mention the first turbine).

3.2 Bobbin Mills in Caldbeck

The village of Caldbeck is at the northern extreme of the geographical spread of the bobbin industry in Lakeland. It had a thriving water-power based industry with 24 watermills with fulling mills, corn mills, flax mills, woollen mills, paper mill, brewery, smelting mills, barytes crushing works and four wood-turning mills including the Howk (Davies-Shiel 1994, 1).

The three other wood-turning mills were: Low or Priests Mill (NY 326 399, survives), the 'Old Paper Mill' (NY 327 399, demolished) and a new bobbin mill at 'Old Paper Mill' (NY 327 399, demolished). Davies-Shiel (1994, 2-4) has summarised the history of these mills, which have some bearing on the history of Howk mill. The following chronologies are based entirely on his work.

3.2.1 Low Mill

Date	Events
1702	Built or rebuilt as Corn mill
1702-1832	Series of millers held lease under incumbent priest)
1832-c1897	Helms or Helmes family acquired lease. Ground floor remained for corn. 1st floor converted to bobbin production. Probably built exterior workrooms. Invented and sold 'fire-lights'
by 1847	William Helme was manager
by 1900	Mill sold to John Greenup, joiner
1968	Greenup's son (also a joiner) retired

3.2.2 Old Paper Mill

Date	Events
c1735	Converted from fulling to paper mill

1837	Owner William Jeffrey converted two floors to bobbin production under William Walker and Son
1842	Paper making ceased and whole mill used for bobbin manufacture
1840s	New lease to Mr Sinkinson
by 1860	Ceased working
1860-70	Used as village dance hall and by Temperance Society. Ground floor had brushstocks work
1870-96	Gradually demolished

3.2.3 New Bobbin Mill at Old Paper Mill

Date	Events
1837/38	Built as Bobbin mill by John Jennings adjoining and upstream of Old Paper Mill. two storeys. Leased to Thomas and William Helme
1847	William Helme left
1901	John Jennings I died. Ownership passed to son John
1908	John Jennings II died. Instructed in will that all records be burnt (duly carried out by his daughter). Ownership passed to son Charles. Mill closed shortly after
1909	Sold water-wheel to Overwater house. Mill soon demolished

As the Jennings family also owned Howk mill, it is possible the destruction of records relating to the New Bobbin Mill included business records relating to the Howk.

3.3 Howk Mill Chronology

The following chronology, with accompanying notes, is based on information drawn from direct consultation of the first and second OS map editions at 1:2500, the early photographs listed in the bibliography, and secondary sources in the form of Allen (1994), Davies-Shiel (1994), Marshall and Davies-Shiel (1977) and Peter (1994). It is intended on the one hand to set out the historical context to the site and on the other to provide a starting point for defining the historical periods at which the various remains originated. Further documentary work may allow alteration or expansion of this information.

Marshall and Davies-Shiel (1977, 230) state that the mill was built c1847 and rebuilt in 1857. Davies-Shiel (1994, 4) contradicts this giving 1856-7 as the date of construction, 'on previously unused ground'. In either case the existing structure dates to 1857 (as identified by the date stone on the main facade). The more recent reference has been assumed to be adopted for the historic periods model used in this report.

Date	Events
1817	A natural limestone bridge within the Gorge blown up by Mr Harrison of Todcrofts in connection with rights of way dispute (Allen 1994)
1856/57	Construction of mill by Wigton firm for John Jennings, owner. 40' diameter water-wheel acquired second hand from Carrock Tungsten mine leaseholder. Wheel designed and built by Harrison Scott of Keswick, aided by John Wilkinson of Hesket Newmarket (Allen 1994; Carlisle Journal 25 July 1856; Davies-Shiel 1994, 4)
1857	Mill began operating. Leasee and manager: W Helme (Davies-Shiel 1994, 5)
1859	Major fire destroyed water-wheel and much machinery. New water-wheel of 42' 5" installed (Davies-Shiel 1994, 5-6; Westmorland Gazette, 2 Apr 1859; Cumberland Paquet, 5 Apr 1859)
1859-62	Second fire - in drying kiln (Davies-Shiel 1994, 7)
1862	Third fire - in drying kiln (Davies-Shiel 1994, 7; Cumberland Paquet, 12 Aug 1862)

1863	W Helme still manager (Carlisle Journal, 5 June 1863)
1863	Layout of site included: mill building [7] with wheel pit [18], main coppice shed [8], drying kiln [12], privy [14], reservoir [1], weir [2], leat [3], path [6], track [11] (OS 1st edition 25" map)
1863	A bad accident occurred at the mill involving a boy named Cooper (Allen 1994)
1870	Photograph 2 shows solid walled stone launder support topped by short pillars and wooden launder (from east)
c1880	Photograph 3 shows same arrangement (from west)
1880s	Asbridge family replaced Helmes as leasees/managers (Davies-Shiel 1994, 8)
c1880s	Photograph 3 shows solid walled stone launder support topped by short pillars and wooden launder
1881	1881 Census states that at the 'bobbin manufactory, there were 21 men, 4 boys, 2 carters and 2 woodcutters, to which of the two mills then operating this refers is not stated. However manager is given as Thomas Ashbridge, so this may be the Howk (Peter 1994, 16)
c1894	Photograph 5 shows wooden launder support topped by wooden launder and walkway
?post-1894	Photograph 11 shows launder support as survives today, stone base, with tall stone pillars above. Wooden launder and walkway is also visible
1897	a 'great frost', during which the wheel was kept turning by the efforts of men chipping ice away every day (Allen 1994)
1899	Layout of site as 1863, plus: second [23] and third [24] coppice sheds (identified as such from photograph 1), a building [25] adjacent to the drying shed, the stables [13] and two small buildings west of the mill [22] (OS 2nd edition 25" map)
1908	John Jennings II died. Ownership passed to son Charles. John Wilkinson became manager of mill (Davies-Shiel 1994, 8)
1912	John Wilkinson still manager (Report of Whitehaven and District Boy Scout Camp at Caldbeck, 1912)
1914-18	Howk mill was kept working. Tom Wilkinson joined father John (Davies-Shiel 1994, 8). Employed several turners and carters (Denton 1972)
c1924	Mill stopped working. Subsequently may have been used by cloggers for a short time (Davies-Shiel 1994, 9)
1940	Water-wheel dismantled and removed by Messrs Stalker of Penrith (Davies-Shiel 1994, 9)
1956	Roof fell in following fire (Davies-Shiel 1994, 9)

3.4 Howk Mill Historic Periods

The chronology given above suggests that the physical remains of the Howk mill site relate to the following historic periods.

Period	Dates	Description
I	pre-1857	Pre-mill use of site included presence of footpath, with stone bridge over the Cald beck
II	1857-59	Early mill, prior to fire in 1859. Components at original construction consisted of mill, main coppice shed, drying shed, privy, weir, leat
III	1859-post-1863/ pre-1899	Mill underwent significant repairs and alteration following fire of 1859, including replacement of wheel. At least two further fires occurred up to 1862 (in the drying kiln)
IV	post-1863 -1924 pre-1899	Several buildings added to the site: stables, small buildings west of mill, additional coppice sheds, building adjacent to drying room. In addition photographs 2, 3, 5, 11 show that the launder support was remodelled from a stone to a wooden and back to a stone structure during this period
V	1924 -56	Empty mill may have been used by cloggers for a short while. Structure remained intact to 1956, but machinery gradually removed, including removal of wheel in 1940
VI	1956 - present	Roof fell in 1956 following fire. Subsequently mill a ruin

3.5 Howk Mill Components

The functions of the mill building and coppice barn are evident from the form of these structures as well as documentary evidence (for example the early photographs). Anecdotal information from several local people who visited the site during survey work named building [13] as stables and [14] as toilet. These functions are also given by Peter (1994, fig 3) who, in addition, names [12] as a drying shed (argued from site evidence), and [22] as an office/tool shed (inspired guess based on photograph 13). A drying kiln is named in newspaper articles (*eg* Cumberland Paquet 12 Aug 1862) as having caught fire twice. Early photographs (see Bibliography) give considerable information about these and other components of the site. This is described under the relevant gazetteer entries and in the discussion section.

3.6 Howk Mill Products

Davies-Shiel (1994, 7-8) lists the following items as produced at Howk mill:

- Brushstocks (heads)
- Butter moulds
- Cartwheel naves
- Childrens dolls
- Clog soles (by 1908)
- Egg stands
- Helme's patent fire-lights
- Helves for picks and hammers (for mines)
- Mole traps
- Nutcrackers (each made from single piece of wood)
- Sewing cotton reels
- Spinning and threading bobbins
- Thivels (porridge sticks)
- Washing dollies

Allen (1994) lists the following additional items

- Bread boards
- Matchboxes (round) for the patent fire-lights
- Potato mashers
- Rolling pins

3.7 Other Information

A miscellany of additional information regarding the use and operation of Howk mill is scattered amongst the sources consulted. These are as follows.

- Wood was seasoned for twelve months in the stackyard (Davies-Shiel 1994, 8).
- A lot of alder and birch was used (Davies-Shiel 1994, 8).
- The second water-wheel was known as 'Auld Red Rover' due to its being painted with red haematite paint. It also bore an (unknown) inscription (Davies-Shiel 1994, 8).
- At the height of operation it is suggested that the mill employed 60 men and some boys, although the source of this figure is not identified (Allen 1994; Peter 1994, 16).
- Transport of materials was by horse and cart to Wigton railway station, 8 miles away (Allen 1994; Davies-Shiel 1994, 8).
- Markets included Ireland and Calcutta (Allen 1994).
- 'During very frosty weather steam pipes were in operation day and night to keep it clear of ice' (Cumberland and Westmorland Herald, 3 Aug 1940).

4. FIELD SURVEY

4.1 Survey

A topographical survey was undertaken of all landscape features identified within the study area, and the results plotted at a scale of 1:500. In addition, a core area, centred on the bobbin mill and its associated structures, was planned at a scale of 1:100. Identified sites have been numbered, described and interpreted in a gazetteer (Appendix 1), where an indication of their current condition has also been given. A summary of these results is also given here. Elevation drawings at a scale of 1:20 were made of selected walls of the bobbin mill and coppice store. Context-based analysis was made of these elevations (Appendix 2), resulting in an assessment of structural phasing (Appendix 3). The results are summarised below.

The archaeological remains within the study area fall into the following categories: mill, other structures, water supply and transport.

4.2 Mill

This includes gazetteer entries as follows: mill [07], wheel pit [18], machine bases [19], rectangular pit [20], and lean-to structure [21].

The mill building [07] survives as an unroofed, two-storey, stone structure with L-shaped plan. Photographs 2-6, 11-12 show it had a slate roof (a few slates remain on wall tops and within mill building). A date stone of 1857 is in the east wall. The wheel pit [18] forms a continuous build with the west end of the mill, where several later alterations are identifiable. The site of a lean-to structure ([21], identifiable from photographs) lies within the L-shape, north of the mill building and adjacent to a set of steps rising to a first floor doorway (context (7)). Major features within the mill building are machine bases [19], and a pit [20], within the west end of the building.

It is difficult to give a clear sequence of structural phases for the mill complex. However on the basis of the context analysis it is possible to give fairly confident statement of the original form of the mill, together with a list of distinct, if stratigraphically separate, alterations to the fabric.

4.3 The 1857 Mill

Surviving physical evidence suggests that the bulk of the mill building remains are of a single phase and that this phase of construction equates to Period II, the 1857 construction.

The L-shaped plan, and two-storey height belong to this period. Beam sockets for the lost first floor are visible in all wall interiors. The south wall (25)/(41), overlooking the river, incorporated two rows of five windows each. The north wall (1)/(16) of the main mill block had three upper floor windows, but only a single ground floor window (at this stage probably looking to the outside). The east wall (55)/(91) was built with a pair of fine, arched, ground-floor doorways (93). These had sliding doors, evidenced by fragments of wooden runners (52) and slots (21), (36) in adjacent wall interiors.

The north block of the mill had a first-floor entrance (7), via stone steps (122) (butted to the wall but probably original). A part of a wooden door (date uncertain) to opening (7) is *in situ* bearing the very faded letters 'OFFICE'. The fireplace (79) in this upper room is probably original. Although there appears to be a butt join between the chimney breast (80) and the wall (76), there is no evidence that this was produced by chopping into the main wall. However, the room also has an opening (108), high in the south wall, presumably for a small line shaft. There was a single window whose light would have been largely blocked by the main mill range. All these features might imply a dual function. Perhaps drying room with polishing barrels. The office function could be secondary. The lower room in this block contains part of the machine base [19] and features a fireplace and a single-barred window. Again it may have functioned as a drying room.

Internal features include slots (57), (58), (65), (68) which from their location and size probably held the ends of long wooden lathe benches. A series of slots (24), (38), (39), through the long walls of the mill, some with metal fixtures in place, are suitably located to have provided additional fastenings for these benches. All these features, combined with the siting of the windows is consistent with lathes being located along both sides of the upper floor and along the river side of the ground floor. Slot (23) may have been a cupboard.

Sockets (63), (64), (56), (59) are consistent with an arrangement for line shafting of the form still present at Stott Park (Ayriss and White 1983). The metal handle (56) may have related to this. This line shaft could have served both floors. However, socket (67) appears to be original and contains a metal bracket for a line shaft, presumably served the ground-floor lathes. Opening (108) has no accompanying sockets but its location high in wall (16) implies a use for holding line shafting for the north mill block.

The south wall of the mill building terminates at the wheel pit [18], and is clearly of a single phase with well-defined, symmetrical quoin stones delimiting both its east and west corners. The stonework of the west wall of the mill is continuous with this and with the stonework of the north wall of the pit. Later alterations are restricted to the launder tower and possible rebuilding of some of the stonework upon which it sits. Hence the original form of the launder support as seen in the archaeological record is unknown. The earliest form identifiable from documentary evidence was the stone tower seen in photographs 2 (dated c1870) and 3 (c1880) and this could represent the original launder support. The recorded 40' wheel would have fitted comfortably within this wheel pit. Its axle would have rested on the central buttress (117) of the pit's west wall and the sill of opening (70/89). A similar opening (73) is original to the mill/wheel pit fabric and is located such that its centre is 11' away from the centre of the axle sill. It also lies directly below the point where a launder would have fed water onto a high breastshot wheel. This standard arrangement for the use of rim gears for power take off was a practice established in the early nineteenth century (Cossons 1987, 50) and which was certainly used for the second wheel at Howk mill. This evidence strongly suggests a rim gear was also used for the first wheel.

Given this likely use of a rim gear, there is no reason to suppose that the machine base [19] does not date from original mill also (stratigraphic evidence may become evident if controlled clearance of this area is carried out). The arrangement of pulleys from here to the line shafts has not been determined with certainty (analysis with the aid of three dimensional modelling would be helpful here). However, it is possible that power was transferred to a pulley wheel housed in socket (72), where grease stains are present, and from there to upper and ground floor line shafts of the main building. Power could also have been transferred through a right angle on the northern part of the machine block and thence to the line shaft (108) directly above serving the upper room of the north mill block.

4.4 Alterations to Mill

Davies-Shiel (1994, 5-6) suggests that the earlier wheel was housed in a smaller wheel pit which, following the 1859 fire, was substantially rebuilt for the new, slightly larger wheel. There is no evidence to support this suggestion. Indeed stratigraphic evidence shows the basic size and form of the existing wheel pit to be unaltered and contemporary with the construction of the 1857 mill. Early photographs do seem to show rebuilding of the launder tower such that three distinct towers are identifiable in the period 1870-1894. It seems likely, given the height of the leat, that the 1857 wheel was operated as a high breastshot wheel and that the 1870 stone launder tower was either built for the original mill or replaced an earlier tower. Periods II/III saw this tower remodelled to a wooden (1880s) and back to a stone structure (by 1894).

The pit [20] does not appear in any documentary evidence. However, archaeological evidence in the form of the cutting away (115) of an original buttress of wall (62), suggests it is an insertion. The inserted opening (113) and concrete recess (114) are interpreted as a water outlet. The concrete tower (74) is also inserted and its robust construction would be consistent with an interpretation as the support for a water tank. The angled groove (112) cut into buttress (123) would, furthermore, be consistent with an angled pipe having been fitted between such a water tank and the pit. (Possible rebuilding (111) of a section of the north block partition wall (16), adjacent to opening (70), may also relate to this).

These features are the basis for suggesting that a water turbine was housed in the pit. The depth of the pit and height of the tower would ensure as big a head of water as possible within the confines of the mill's interior and would place the turbine below ground floor level, allowing continued operation of lathes in front of window (42). The location of the pit in the south-west corner of the mill also aligns with the line shafting housing (in (67)). Such a turbine would then have been operated separately from the water-wheel. It could also have been coupled to provide additional power to the whole system. One might speculate that the insertion of a turbine coincided with the acquisition of new floor bolted lathes, for which some of the fixing bolts visible in the ground floor of the main range might have been used. Davis-Shiel's (1994, fig 3) suggestion that this pit provided an access to the wheel pit seems unlikely given the absence of any observed opening within the wheel pit.

The original mill presumably did not have any structure in area [21], as this would have obstructed window (5)/(17). It may be that the open rectangle shown on the 1863 OS map represents an unroofed enclosure. However, a lean-to was certainly in place by the date of photograph 2 (c1870). Two pillars supported the east side of this lean-to at that time. By the date of photograph 3 (1880s), there were three pillars. Photograph 11 reveals what appears to be a bench beneath the lean-to and the area today contains a series of stone blocks with iron bolts. In addition, window (5) has circular grooves incised in its outer face that are consistent with a pulley wheel having been located here. All this evidence would be consistent with Peter's (1994, fig 3) suggestion that this area housed a saw bench, suitably located close to the mill.

4.5 Other Structures

The following sites fall into this category: buildings [13] and [22]; coppice barns [08]/[23]/[24]; building [12], toilet block [14], building [15] and pond [16].

Buildings [13] and [22] stood immediately north of the mill. These are described in detail under the gazetteer entries. The function of both buildings is uncertain. The only visual record of two buildings shown on the 1899 OS map at area [22] is a single, one-storey stone structure in photograph 13. With its glazed window, roof light and chimney, this could have been an office, a store, or small workshop, perhaps a blacksmiths. Building [13] was south facing, and its two ground-floor windows presumably made this floor well-lit, so again a workshop function would seem possible. The pillared construction of the upper floor is reminiscent of the coppice barn and perhaps it was used for this initially. The wood panel infill may represent conversion to either an office or warehouse.

The coppice barn [08] is of open construction and survives relatively intact. Its roof structure, with surviving slate covering, is supported by ten substantial dressed stone pillars of square cross-section rising from two separate foundation walls. The southern foundation wall is the retaining wall [4] made up of a single context (95) which is butted to the east side of the bobbin mill. These pillars and the foundation stonework appear to be of a single phase. The barn must therefore have been built subsequent to the construction of the mill. The existing barn is visible on photograph 3 (dated c1880s) and a building is shown at this location on the 1863 OS map. Given the nature of the stonework, matching that of the mill, and the fact that coppice storage would have been required from the site's earliest use, it would seem likely that the barn dates from 1857, the butt against the mill representing simply the order of build.

Photograph 1 (dated c1870) shows two additional coppice barns of wooden construction with corrugated (? iron) roofs. Comparison of this photograph with the 1899 OS map identifies the location of these structures as areas [23] and [24]. No physical remains of either structure are apparent on the site today, although the continuation of retaining wall [4] implies a use was intended for area [23]. The long narrow form of the shed in area [24] shown on the 1899 map suggests this area was always very restricted. Its use for a coppice barn presumably reflects a need for greater quantities of raw material for processing in the mill.

Building [12], the toilet block [14], building [15] and the pond [16] form a distinct group separate from the mill and coppice barns. The identification of building [12] as a drying kiln is based on the remnant of an iron roof, the distance of the building from the mill and barns, and the presence of what appears to be a small pond above it, perhaps a water supply for a boiler. There is, however, no direct evidence of a boiler on site. Building [15] only appears on the 1899 OS map and remains are in the form of a partially rubble filled, sunken area, but this could have been an extension to

the drying kiln. Steps at the north-east corner of building [12] presumably gave access to it. Oral information has identified building [14] as a toilet block. The structure is ruinous, but this interpretation is consistent with the remains: a single doorway opposite a low trough against the rear wall within which is set two small openings.

4.6 Water Supply

The following sites fall into this category, reservoir [01] weir [02], leat [03], water pipe [09], and ledge [17].

Water used to supply the wheel was drawn from reservoir [01], situated c150m upstream from the mill, the reservoir was dammed using a simple concrete, wood, and iron weir [02]. A stone-lined channel [03] was formed as the intake to the mill leat. The line of the leat between this channel and an emerging water pipe [09] is not traceable (nor is it shown on maps suggesting it was below ground). However, two sunken areas interpreted as inspection hatches are visible. (These were identified during a winter visit subsequent to the main survey and as such do not appear on the survey plan).

East of the pipe [09], the leat was formed as a straight narrow ledge excavated out of the cliff face [17], and recorded on the 1863 and 1899 OS maps. This probably carried a wooden launder whose east end is visible on photographs 2-5 and 11-12, delivering water to the water-wheel. No remains of the wooden launder were identified.

A water supply to the mill wheel must have existed from its original operation, and there is no evidence to suggest that the system described above was not built at that date. The only evidence for structural phases is in the form of changes to the wooden launder and walkway between the east of ledge [17] and the top of the launder tower between c1870 and 1894 (as seen in photographs 2-5, 11-12). These changes relate to rebuilds of the launder tower (see above and gazetteer entry [18]).

4.7 Transport

A track is located in the base of the ravine and linked the bobbin mill and the village of Caldbeck. It is shown on the 1863 and 1899 OS maps and is the only vehicular route in and out of the ravine.

5. DISCUSSION

5.1 General

The survey has established the extent, form and nature of the remains within the study area, and set out a broad framework of historical periods within which these remains may be viewed. In addition, detailed recording has allowed limited analysis of certain parts of the site.

5.2 Site Summary

Field survey of the site, informed by documentary evidence, has identified 24 components, described in the gazetteer. These appear to relate to the defined historic periods as follows:

Period	Dates	Description
I	pre 1857	Pathway 06
II	1857-59	Basic layout of site with construction of reservoir [1]; weir [2]; leat [3]/[9]/[17]; retaining walls [4], [5] and [10]; mill and wheel pit [7]/[18] with machine base [19]; coppice barn [8]; track [11]; drying kiln [12]; privy [14]; ?pond [16]. Probable quarrying on site to obtain stone for the new buildings, producing crags to north
III	1859 -post 1863/ pre-1899	Possible construction of, or alteration to, launder tower. Early enclosure or lean-to [21], against north side of mill. Pit [20] for turbine (with associated water tank in north corner of mill) may have been inserted in this or subsequent period
IV	post-1863/ -1924 pre-1899	Buildings added to the site: stables [13]; small buildings west of mill [22]; additional coppice sheds [23]/[24]; building adjacent to drying room [15]. Launder support was remodelled from a stone to a wooden and back to a stone structure during this period. Rebuilt lean-to [21] against north side of mill
V	1924-56	Empty mill may have been used by cloggers for a short while. Structure remained intact to 1956, but machinery gradually removed, including wheel in 1940
VI	1956-present	Roof fell in 1956 following fire. Subsequently mill a ruin

5.3 Conservation Aspects

It is clear that all structures on the site are undergoing varying degrees of decay caused by the weather, stream erosion and visitors. The main mill building and coppice store remain relatively intact, although there is some evidence of localised decay within the fabric and two of the columns in the store are leaning towards the stream. Retaining wall [04] is in danger of collapsing in places due to water erosion. The ancillary buildings are in a ruinous state.

5.4 Further Work

This survey has provided a base record and initial understanding of the site. However, it is clear that continued deterioration of the surviving structures is resulting in the loss of archaeologically retrievable information which would supplement and modify the interpretations made so far. Further work on the site falls under three main headings: documentary work, fabric recording and analysis, and excavation. Archaeological analysis of the site would be enhanced by the use of accurate three dimensional computer modelling, particularly of the bobbin mill. This would allow a more detailed analysis of on-site processes, for example the detailed means of power transferral from water wheel to machinery. It would also provide a useful aid in presenting the site to a wider

audience. Other useful work would include a detailed study of the woodland environment to determine the character and extent of past coppicing.

5.4 1 Documentary Work

A working archive of the site would benefit from collation of all primary records. Of particular value to further archaeological analysis would be the location original copies of the early photographs and their reproduction as high quality, large scale prints. A check for additional material may also be productive.

5.4 2 Fabric Recording and Analysis

Not all elevations of the mill have been recorded due to access problems. In the event of consolidation works being carried out, it is recommended that further archaeological recording be carried out, taking advantage of the need to scaffold the structure. Such examination should be designed to record those areas which were inaccessible during the survey (for example the wheel pit interior) and to answer specific questions raised by the survey. In addition, the opportunity should be taken to add the leat inspection hatches to the 1:500 site survey.

5.4 3 Excavation

If any clearance work is to be carried out in the mill interior (including area [21]), it is recommended that this is carried out under archaeological supervision with due provision for archaeological recording. If any removal of material is required, it is recommended this be carried out as part of a controlled archaeological excavation.

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Primary Sources relating to the Howk

The following primary sources are identified from Davies-Shiel's report (1994), from the other secondary sources listed above and from consultation with the Cumbria Record Office at Carlisle and John Hodgson at the Lake District National Park. Davies-Shiel (1994, 1) indicates that in compiling his report for all four mills in Caldbeck he consulted a miscellany of primary records including: 'maps and estate plans, trade directories, the parish registers, tithe and corn-rent schedules, tax lists, newspaper gleanings since c1770, all in the county library and Carlisle Record Office, also many private sources of manuscript material and photographs made available in the last 27 years'. It would therefore seem likely that many further sources relating to the Howk could be collated and listed.

Maps

Ordnance Survey 1863	1st edition, 1:2500 map, Cumberland Sheet 37.12, surveyed 1863
Ordnance Survey 1863	1st edition, 1:2500 map, Cumberland Sheet 37.17, surveyed 1863
Ordnance Survey 1899	2nd edition, 1:2500 map, Cumberland Sheet 37.12, surveyed 1899
Ordnance Survey 1899	2nd edition, 1:2500 map, Cumberland Sheet 37.17, surveyed 1899

Newspaper articles

Date	Newspaper	Item
1856 (25 Jul)	Carlisle Journal	Sale notice for first water-wheel
1859 (2 Apr)	Westmorland Gazette	Report on fire of 1859
1859 (5 Apr)	Cumberland Paquet	Report on fire of 1859
1862 (12 Aug)	Cumberland Paquet	Report of fire in drying kiln
1863 1 (5 Jun)	Carlisle Journal	Prospectus for Maryport, Caldbeck and Hesketh-Newmarket railway
1940 (3 Aug 1940)	Cumberland and Westmorland Herald	Article relating to history of the mill
1954 (Nov)	Cumberland News	Article relating to mill and its fires

Photographs

Sources given are as seen by or supplied to LUAU, rather than the original sources of the photographs.

No	Date	Description	Items visible	Source
1	c1870	Coppice stores and work-force	23, 24	Allen 1994
2	c1870	View of mill and stables from east, with work-force.	7, 13, 18, 21	LDNP
3	c1880	View of mill and wheel from west	7, 8, 18	LDNP
4	c1880s	View of mill and stables from east	7, 13, 18, 21	LDNP
5	1894	View of mill and stables from east	7, 8, 13, 18, 21	LDNP
6	1920	View of mill and wheel from west ('1083')	7, 18	Allen 1994 & LDNP
7	1940	View of wheel on 3 Aug 1940	7, 18	LDNP
8	1987	View of 'drying kiln' building (12)	7, 8, 12	LDNP
9	?	View of mill and wheel from west, with men standing on wheel-pit wall	7, 18	Allen 1994
10	?	View of wheel from west in winter ('RHL')	7, 8, 18	LDNP
11	?	View of mill and stables from east ('4320')	7, 8, 13, 18, 21	Allen 1994
12	?	View of mill and stable from east ('45095')	7, 8, 13, 18, 21	LDNP
13	?	View of building to west of wheel (22)	22	LDNP

APPENDIX 1 GAZETTEER OF SITE REMAINS

Site number	01
Site type	Reservoir
Description	Small reservoir (widening of the Cald Beck) formed by weir [02]. Located c150m upstream of bobbin mill [07].
Documentary	Depicted on 1863 and 1899 OS maps
Date of origin	c1857
Interpretation	Small mill pond designed to store water for bobbin mill [07].
Form	Feature
Condition	Partially intact

Number	02
Site type	Weir
Description	Simple dam of concrete, wood, and iron construction, which extends across the width of the Cald Beck, c150m upstream of bobbin mill [07].
Documentary	Depicted on 1863 and 1899 OS maps
Date of origin	c1857
Interpretation	Deliberate damming of the Cald Beck to produce a small reservoir to feed mill leat [03].
Form	Structure
Condition	Partially intact

Number	03
Site type	Leat
Description	A stone-lined water channel, orientated roughly east-west, at its take off point within the north side of reservoir [01], where iron intake grill is <i>in situ</i> . To the east a large diameter pipe [9] was identified on the same line as the channel. Between these two extremes, the land is higher than the visible features.
Documentary	On the 1863 and 1899 OS maps, a slight kink in the reservoir indicates the location of the stone channel.
Date of origin	c1857
Interpretation	Upper line of the mill leat, transported water from the dam to the wheel. Davis-Shiel (1994, 4) describes it as an 'open and underground leat on the north bank of the gorge for some 400 feet'. The line of the leat could not be traced during the (summer) survey. During a second (winter) visit two rectangular depressions were identified, which were probably inspection hatches.
Form	Linear feature
Condition	Stone channel entrance appears intact, although masked by vegetation.

Number	04
Site type	Wall
Description	Substantial stone wall extending along the north bank of the Cald Beck for a distance of 42m. The wall is 3.50m high and at one point forms the foundation course for coppice store [08]. It butts against the south and east elevations of the mill [07]. At south end, wall curves to the north.
Documentary	OS 1863 map shows the coppice barn and the line of the wall.
Date of origin	Probably 1857.
Interpretation	Stone retaining wall used to channel the Cald Beck around the south side of the ravine floor.
Form	Linear structure
Condition	Mostly intact, although some localised areas of collapse as a result of water action.

Number	05
Site type	Wall
Description	Stone built wall, aligned roughly east-west, located west of bobbin mill. The wall is 25m long and c1m high, although areas of it are badly collapsed. Divides Cald Beck from path [06]. May originally have extended eastwards up to the external face of wheel pit [18].
Documentary	OS 1863 map shows the line of a wall at this location.
Date of origin	Probably 1857
Interpretation	Stone built retaining wall almost certainly designed to channel the north bank of the Cald Beck away from path [06], and bobbin mill [07].
Form	Structure
Condition	Partially collapsed

Number	06
Site type	Path
Description	Narrow trackway originating from the west end of track [11], skirts around the north side of the bobbin mill [07], and continues in a westerly direction up the ravine to mill pond [01] and beyond.
Documentary	A path is shown in this location on the 1863 map. Allen (1994) documents that a natural limestone bridge passed over the Cald Beck prior to 1817, but was blown up by Mr Harrison of Todcrofts who was involved in a dispute over rights of way in the gorge
Date of origin	Pre-1817
Interpretation	Footpath linking track [11], bobbin mill [07], and reservoir [01] during lifetime of mill, probably following line of earlier path.
Form	Earthwork
Condition	Intact

Number	07
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Site type	Bobbin mill
Description	Large, stone-built mill located in the east of the ravine north of the Cald Beck. The mill is L-shaped in plan and has its long axis orientated parallel to the beck. It measures 17.50m east-west by 13m north-south. The mill is two storeys high, with walls and gables surviving to roof height, although no elements of the roof or first floor remain <i>in situ</i> . A large wheel pit [18], is sited parallel to and alongside the west gable of the mill. Entry to the ground floor of the mill is via two arched doors located within the centre of the east gable. These doors were constructed out of neatly-faced red sandstone quoins and key stones. Access to the first floor of the mill is obtained from a small external staircase located in the eastern facing wall of the structure. A large date stone inscribed '1857' is set above the double doors in the east gable. The south wall of the mill is more substantial than the others, as it extends up from the level of the stream bed, and therefore its lower courses act as an earth retaining wall. This wall contains five identical window openings on each floor. Several large stone blocks [19], some of which contain iron bolts, are located within the interior of the building.
Documentary	There are clear references to the construction of the mill in 1857, in agreement with the datestone on the entrance facade and to its subsequent owners and managers and operation (see main text). The 1863 and 1899 OS maps show an unchanged layout to the structure. The mill is visible on photographs 2-6, 9, 11-12 at dates between c1870 and 1920, where it is essentially unchanged. Windows were glazed, the roof was of slate and incorporated a roof light near the inner corner of the L-shape.
Date of origin	1857
Interpretation	Bobbin mill. External appearance largely unchanged during lifetime (1857-1924). Detailed analysis indicates phases of alteration in west end of mill, mainly concerned with power supply (see [18] and [20], and main text).
Form	Structure
Condition	The mill walls stand relatively intact up to the roof line, although they are clearly decaying slowly. The roof and first floor are no longer <i>in situ</i> .
Number	08
Site type	Coppice barn
Description	Large (13m x 6m), tall, roofed, rectangular structure, comprising two stone retaining walls and ten substantial columns, which are buttressed internally. The ground level inside the building is substantially lower than outside, hence the need for retaining walls on the north and south sides of the structure. The east and west sides of the structure and the gables are now entirely open. The columns appear to be bonded into the retaining walls and are of fine dressed stonework. Their internal sides are stepped near ground level and contain slots above and below.
Documentary	OS 1863 map depicts the building. Visible on photographs 5, 11, 12.
Date of origin	Probably 1857
Interpretation	Coppice barn used to store and season wood prior to its use in the manufacture of bobbins within the mill. Map evidence and nature of stonework of the barn suggest a date of construction contemporary with the mill building. Photographs 5, 11 and 12 show horizontal timber partitioning within the building coinciding with the upper slots in the stone pillars. By comparison with Stott Park Bobbin Mill, it would seem likely this was open wooden frame rather than a floor and that the framing extended to the column steps and the lower slots.
Form	Structure
Condition	Largely intact although the two easternmost columns now lean towards the beck. Slate roof survives relatively intact.
Number	09
Site type	Water pipe
Description	Narrow stone-built wall with length of 15 inch diameter pipe projecting at base. The piping lies at west end of ledge [17].
Documentary	OS 1863 map shows line of ledge [17].

Date of origin	1857
Interpretation	Water pipe which originally formed part of the mill leat.
Form	Linear feature
Condition	Survives intact
Number	10
Site type	Wall
Description	Low, c1m high, stone-built earth-retaining wall, aligned roughly east-west, its east end is attached to rectangular structure [11]. Parts of the wall survive relatively intact, whilst other areas have collapsed.
Documentary	OS 1863 map shows the line of a wall at this location.
Date of origin	Probably 1857.
Interpretation	Stone retaining wall, presumably designed to separate the flat valley floor from the steeply sloping ground located to the north. Photographs of the mill in operation show that the flat area of land between wall [10] and the Cald Beck to the south was used to store items such as timber required in the manufacturing process.
Form	Structure
Condition	Partially collapsed
Number	11
Site type	Track
Description	Track located within valley base, leading from bobbin mill [07] to the village of Caldbeck.
Date of origin	1857
Interpretation	Track allowing vehicular access between bobbin mill [07] and the village of Caldbeck. Used to import raw materials to the site and export manufactured bobbins.
Form	Earthwork
Condition	Intact
Number	12
Site type	Building
Description	Rectangular structure measuring 6m north-south by 5m east-west, whose north, east, and west sides appear to have been partially set into the north side of the valley. Stone walls survive up to c2m high, although several areas of collapse also exist. An entrance was visible within the centre of the south wall of the structure. Remnants of an iron sheet roof with a roof truss of iron bars are located within the structure. Stone steps lead away from north-east corner.
Documentary	Structure shown on OS 1863 map. South-west corner is just visible on photograph 5. Photograph 8 shows that building stood as a ruin to two storeys in 1987 and had a small rectangular window above the door in its south wall. Several visitors to the site named this as the drying kiln.
Date of origin	Probably 1857.
Interpretation	The iron roof and the separation of this building from the mill, support the suggested identification as a drying kiln. There are no physical remains of a boiler or of an appropriate housing for one, although the banked area [16] could have formed a small pond for a boiler.
Form	Structure
Condition	Ruined
Number	13
Site type	Wall
Description	Low L-shaped stone wall, on average 0.40m high, located north of bobbin mill [7]. Butted against the crag at north-west end. Dense vegetation prohibited defining its north-east extent. A number of large iron bolts together with an iron ring were visible within the overhang of the crag face.

Documentary	Not shown on the 1863 map, but is on the 1899 map. Also depicted on photograph 2 (dated c1870) with ground floor of conventional stone walls with door and two glazed windows, and the upper floor of stone pillars with wood panelling infill. Visitors to the site identified the building as a stable. Peter (1994, fig 3) identifies the building as stable/office/store.
Date of origin	Post-1863, pre-1870
Interpretation	The iron bolts within the overhang of the crag were probably used to secure the roof to the rock face. The precise function of the building is not clear. The suggestion of a stable might be supported by the surviving iron ring. However the fact that it had two large glazed windows on its ground floor, implies a workshop or offices. The upper floor may originally have been open and functioned as a coppice store, perhaps being infilled with panelling later offices (as at Stott Park Bobbin Mill).
Form	Structure
Condition	Ruined, survives only at foundation level.

Number	14
Site type	Building
Description	Small rectangular stone building, measuring 3m x 3m, located to the east of building [12]. Walls survive to a maximum height of 1m. Single entrance within its west side. A large stone trough was visible on its eastern side together with two low openings.
Documentary	Shown on the 1863 map. Identified by (Peter 1994, fig 3) and by visitors to the site, as a privy.
Date of origin	Probably 1857
Interpretation	Form of the building with the trough and adjacent openings fits well with the suggestion of use as a privy.
Form	Structure
Condition	Ruined

Number	15
Site type	Platform
Description	Slightly sunken area with slope, partially filled with stone rubble.
Documentary	Building shown here on the 1899 OS map.
Date of origin	Post-1863, pre-1899
Interpretation	Building of unknown function. Possibly an extension to the drying kiln [12].
Form	Structure
Condition	Ruined

Number	16
Site type	Bank
Description	Deliberately constructed curvilinear bank located around an area of relatively flat ground south of the ravine crags, north of the toilet block [14] and drying kiln [12]. The bank was 1.50m wide, 0.30m high, and its east and west extents butt against the crag.
Documentary	None
Date of origin	Unknown

Interpretation	Form of this feature suggest it formed a small pond, although there is no evidence for inlet or outlet. It may have supplied water to the toilet block [14] and/or to a boiler for the drying kiln [12].
Form	Earthwork
Condition	Intact

Number	17
Site type	Ledge
Description	Ledge located on the north side of the ravine, to the immediate west of the bobbin mill, and running from the water pipe [09] towards the north-west corner of the wheel pit [18].
Documentary	Narrow, linear feature shown on 1863 and 1899 maps. Photographs 2-5, 11- [12] show a wooden launder and walkway emerging from the east end of this feature and extending over the launder tower. The photographs show a differing form to the launder and walkway in line with changes to the launder tower (see entry [18]).
Date of origin	1857
Interpretation	Step in crag quarried out in order to accommodate wooden launder which allowed water to pass from water pipe [09] to wheel pit [18].
Form	Feature
Condition	Ledge intact, although no trace of wooden launder.

Number	18
Site type	Wheel pit
Description	Large stone-built wheel pit, rectangular in plan, measuring 13.4m (44') long by 1.3m (4' 3") wide internally, and in long section. The pit is located at the west end of the mill [07]. The west wall of the mill building forms the east side of the pit. Stonework continuous with this wall forms the north and west sides of the pit, with the south side open (towards the river). The top of the west wall is capped with flagstones and is level with a large central opening in the mill wall (context 70/89). At this point the west wall has a large built-in buttress. The flagstone over this is larger than the others and contains several carved rectangular depressions and iron bolt holes. Two narrower buttresses flank the central area and survive to differing heights. At the north end of the pit, and, above the main level of the west wall, is a three-sided 'tower' formed of distinct masonry with 'rock-cut' stone laid in courses (there is also some evidence of rebuilding and/or repointing of parts of the earlier walling at this end of the pit). This tower in turn is topped by four pillars, of similar construction, which carry a pair of decayed wooden beams.
Documentary	Shown on 1863 and 1899 OS maps apparently of plan as seen today. Photographs 2-5 show a clear progression of the launder tower from a solid-walled stone tower (pre-1870), a wooden tower (1880s) and the surviving stone tower base with stone pillars (by 1894). Written sources indicate that a water-wheel '40 feet in diameter, 3ft breast' was installed at the mill in 1857 (Carlisle Journal, 24 Jul, 1856). A fire in 1859 presumably caused considerable damage to this, as a second wheel of 42' 5" diameter and 3' width was installed following the fire. Photographs 2-7, 9-12 show the later wheel <i>in situ</i>. It is evident from photograph 3 that the boxed wheel had 16 pairs of spokes with eight buckets between neighbouring spokes, making a total of 128 buckets. Photograph 7 clearly shows it would have operated as a high breastshot wheel and that the power take-off was via an iron segmental gear wheel attached to the wheel spokes. This wheel was 22' in diameter according to the Cumberland and Westmorland Herald, 3 Aug 1940, 6; photograph 7 shows the teeth on the outer part of the ring. Allen (1994) states that the water-wheel contained 17 tons of metal and had turned at a speed of about three revolutions per minute (although no source is given for this information). The wheel was apparently painted with red haematite ore paint and hence known locally as 'Auld Red Rover' (Davies-Shiel 1994, 8).
Date of origin	1857
Interpretation	Wheel pit that housed the two water-wheels documented on this site. Both water-wheels would have fitted within the length of the pit as it stands today and the continuous run of the stone of the pit walls strongly suggests that its internal dimensions are as originally built. The only changes were concerned with the launder tower at the north end. The wooden lintels and stone pillars identified within this area of the pit supported a wooden launder described under entry [17]. It is evident from photographs that the main wheel bearing was carried on the central buttress and sill of window (70/89). The gear wheel radius of 11' equates to the distance from the centre of this sill to the middle of window (73) in the mill's west wall, where the power take-off would clearly have been situated (see entry [7]).
Form	Structure
Condition	Largely still intact. However, the west wall of the pit has several major cracks and is in danger of collapse.

Number	19
Site type	Machine bases

Description	Five substantial stone piers located within the west end of the mill building. The upper surface of the piers contain several small cut grooves and rectangular slots together with iron bolts. The north end of the piers lies opposite window (73).
Documentary	None
Date of origin	Possibly 1857
Interpretation	Substantial stone support piers used to anchor the main mill drive mechanism. The power take-off shaft was presumably anchored to the northernmost pier, and the remainder supported a system of cogs, belts and pulleys which transferred the power to line shafting.
Form	Structure
Condition	Intact
Number	20
Site type	Rectangular pit
Description	A rectangular pit measuring at least 4m by 1.20m, and at least 0.80m deep, situated within the south-west corner of the mill building. Infill made measurement of precise dimensions impossible. The west side of the pit is formed by the west gable of the mill (where a built-in shallow buttress has been cut back), the south and east sides by a stone walling. The north side is masked by infill. At the south-west corner of the pit, a length of timber is supported on an inserted concrete ledge. Adjacent to this, a narrow recess formed of concrete has been inserted against the south wall of the mill. This aligns with a small rectangular opening, which appears to be inserted.
Documentary	None
Date of origin	Unknown (secondary to original construction of mill)
Interpretation	Inserted pit, perhaps to house a turbine fed by pipe running diagonally from a water tank on the concrete buttress at the north corner of the mill.
Form	Structure
Condition	Intact, although infilled with rubble.
Number	21
Site type	Structure
Description	Sunken area on north side of mill building containing several worked stone fragments; some have iron fixtures. Within the adjacent face of the mill's north wall, window (5) has circular score marks in the window jambs.
Documentary	The 1863 OS map depicts an open rectangular here. 1893 OS map shows an enlarged building that equates to a stone-pillared lean-to shown on photographs 2, 4, 5, 11 and 12. Photograph 2 (dated c1870) appears to have only two stone pillars supporting the east end of the lean-to, compared to three in all the later photographs. In photograph 11, a bench is visible under the lean-to.
Date of origin	Post-1863, pre-1870 structure replaced pre-1863 structure.
Interpretation	Site of stone-pillared lean-to. Peter (1994, fig 3) suggests this as possible site of saw bench. The presence of the stone blocks with iron bolts would be consistent with such a function, which would be best situated close to the mill. The circular grooves in window (5) would be consistent with a pulley wheel placed on a drive through this window to power such a saw.
Form	Structure
Condition	Ruined
Number	22
Site type	Building
Description	Line of stones set within line of pathway [6] (identified in winter visit to site, not surveyed).

Documentary	Two small buildings shown on 1899 OS map. Photograph 13 shows small, single-storey, stone building with chimney, west facing window and roof light, in approximate location of line of stones on site.
Date of origin	Pre-1899
Interpretation	The evidence of photograph 13 and the topography of the site suggest that the location of these buildings is incorrectly plotted on the OS map - they should be slightly south of that shown. In addition photograph 13 is probably of the eastern building, implying that the western building did not exist at the time of the (undated) photograph. Peter (1994, 20) suggests this building may have been an office or tool shed. This suggestion would not be inconsistent with the size, form and location of the buildings.
Form	Buried
Condition	No above-ground remains.
Number	23
Site type	Building
Description	Level area north of retaining wall [04]. No physical remains of structure.
Documentary	Building shown on 1899 OS map. Equates to wooden structure and corrugated (? iron) at extreme right in photograph 13 (dated c1870).
Date of origin	Post-1863, pre-1870
Interpretation	Wooden coppice barn. Structure apparently of similar size to stone coppice barn [08].
Form	Buried
Condition	No above ground remains
Number	24
Site type	Building
Description	Mainly sloping area immediately south of track [11]. No physical remains of structure.
Documentary	Long , narrow building shown on 1899 OS map. Equates to wooden structure and corrugated (iron?) in centre of photograph 13 (dated c1870).
Date of origin	post 1863, pre 1870
Interpretation	Wooden coppice barn. Long thin structure erected between track and river. Eroding action of river may have cut into the site of this structure.
Form	Buried
Condition	No above ground remains

APPENDIX 2 CONTEXT SUMMARY

No	Same as	Elevation	Description
1	16	M13	Bobbin Mill, north wall, external face, formed of unevenly coursed stone blocks, bonded into walls 6 and 91. Its east corner is faced with dressed quoin stones.
2	18	M13	Bobbin Mill, east 1st floor rectangular window in wall 1, formed of dressed stone sill, lintel and jambs.
3	19	M13	Bobbin Mill, central 1st floor rectangular window in wall 1, only dressed stone sill survives.
4	20	M13	Bobbin Mill, west 1st floor rectangular window in wall 1, only dressed stone sill survives.
5	17	M13	Bobbin Mill, central ground floor rectangular window in wall 1, formed of dressed stone sill, lintel and jambs. Cut by circular groove in outer face.
6		M4	Bobbin Mill, east wall external face, formed of unevenly coursed stone blocks, bonded into walls 1 and 10.
7		M4	Bobbin Mill, 1st floor doorway in wall 6, formed of dressed quoins, and lintel. A wooden door still in place with letters 'OFFICE'.
8		M4	Bobbin Mill, 1st floor rectangular window in wall 6, formed of dressed stone sill, lintel and jambs.
9		M4	Bobbin Mill, ground floor rectangular window in wall 6, formed of dressed stone sill, lintel and jambs. Each jamb incorporates three iron rods which perhaps originally functioned as window bars.
10	76	M1	Bobbin Mill, north gable external face, formed of unevenly coursed stone blocks, bonded into wall 6. East side faced with quoin stones.
11		M1	Bobbin Mill, part of north gable external face, formed of evenly coursed blocks, later repair to wall 10 (same phase as wall 12).
12		M2	Bobbin Mill, east wall of wheel pit, formed of roughly dressed coursed blocks. Butted to wall 10. Bonded into wall 14.
13		M2 M3	Bobbin Mill, north east supporting pillar for launder, formed of partially dressed, coursed, blocks, on top of walls 12 and 14.
14		M3	Bobbin Mill, north wall of wheel pit external face, formed of partially dressed, coursed blocks, (bonded into wall 12).
15		M3 M7	Bobbin Mill, north west supporting tower for mill leat, formed of partially dressed, coursed, blocks, above walls 14 and 83.
16	1	M14	Bobbin Mill, north wall internal face, formed of unevenly coursed stone blocks, bonded into adjacent walls.
17	2	M14	Bobbin Mill, ground floor rectangular window in wall 16, formed of dressed stone sill, wooden lintel and chamfered stone block jambs.
18	2	M14	Bobbin Mill, east 1st floor rectangular window in wall 16, formed of stone sill, wooden lintel and chamfered stone block jambs.
19	3	M14	Bobbin Mill, central 1st floor rectangular window in wall 16, only stone sill and east chamfered block jamb survive.
20	3	M14	Bobbin Mill, position of west 1st floor rectangular window in wall 16, only part of east chamfered block jamb survives.
21		M14	Bobbin Mill, long thin vertical slot for sliding doors in wall 16 at ground floor level.
22		M14	Bobbin Mill, four rectangular joist slots in wall 16. The easternmost slot is set into a large wooden lintel and contains an iron fitting.
23		M14	Bobbin Mill, , small rectangular recess in wall 16 at ground floor level, with partially dressed stone lintel and sill.
No	Same as	Elevation	Description
24		M13M14	Bobbin Mill, three small rectangular slots in walls 1 and 16 at 1st floor level, the slots extend right through the wall.

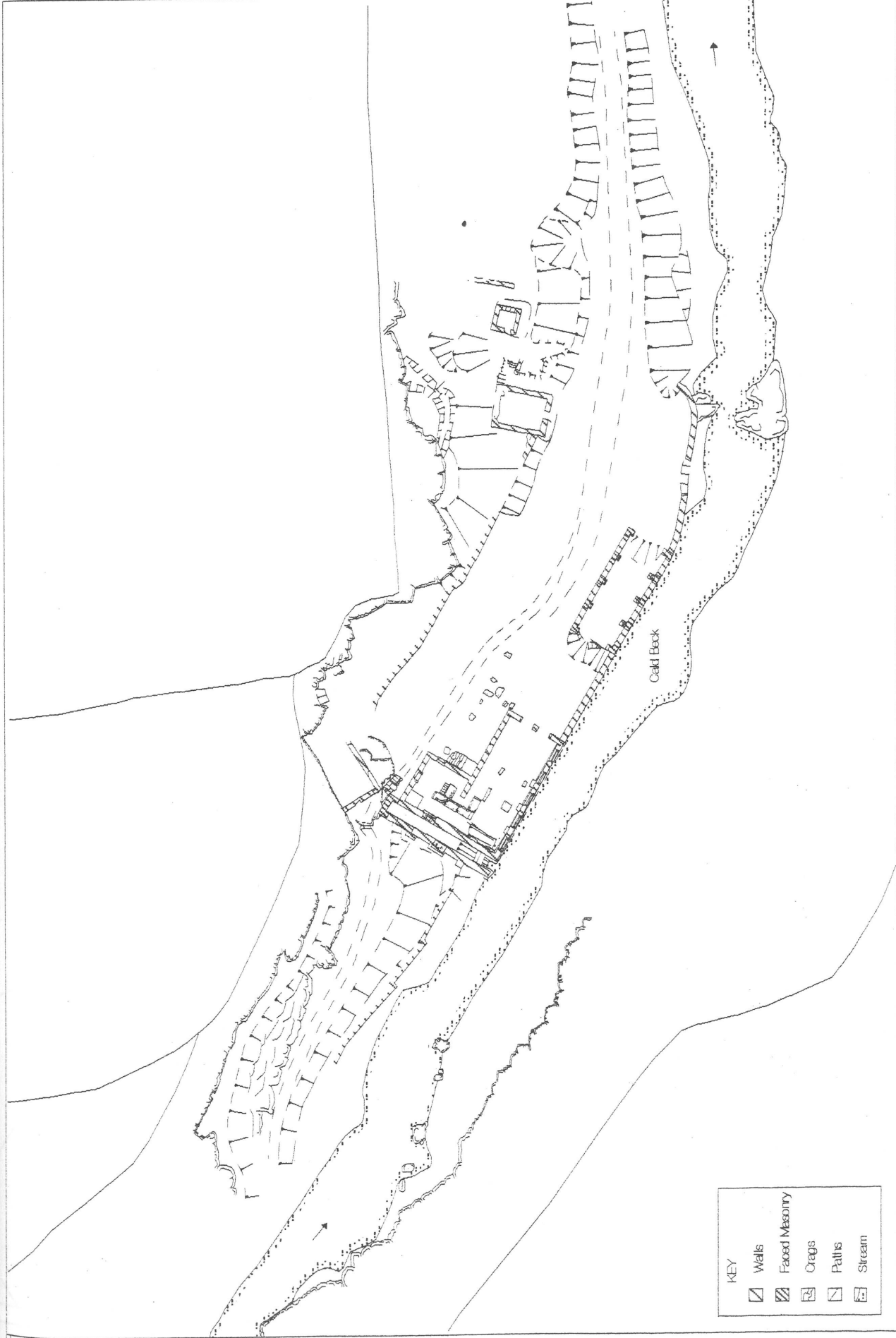
25		M9	Bobbin Mill, south wall internal face, formed of irregular sized, unevenly coursed blocks, bonded into walls 55 and 62.
26	46	M9	Bobbin Mill, ground floor rectangular window in east of wall 25, formed of dressed stone sill, wooden lintel and chamfered block jambs.
27	45	M9	Bobbin Mill, ground floor rectangular window in wall 25, formed of dressed stone sill, wooden lintel and chamfered block jambs.
28	44	M9	Bobbin Mill, ground floor rectangular window in wall 25, formed of wooden lintel and chamfered block jambs, sill missing.
29	43	M9	Bobbin Mill, ground floor rectangular window in wall 25, formed of dressed stone sill, wooden lintel and chamfered block jambs.
30	42	M9	Bobbin Mill, ground floor rectangular window in west of wall 25, formed of dressed stone sill, wooden lintel and chamfered block jambs.
31	51	M9	Bobbin Mill, 1st floor rectangular window in east of wall 25, formed of stone sill, very decayed wooden lintel and chamfered block jambs.
32	50	M9	Bobbin Mill, 1st floor rectangular window in wall 25, formed of stone sill, wooden lintel and chamfered block jambs.
33	49	M9	Bobbin Mill, 1st floor rectangular window in wall 25, formed of stone sill, wooden lintel and chamfered block jambs.
34	48	M9	Bobbin Mill, 1st floor rectangular window in wall 25, formed of stone sill, wooden lintel and chamfered block jambs.
35	47	M9	Bobbin Mill, 1st floor rectangular window in west of wall 25, formed of stone sill, wooden lintel and chamfered block jambs.
36		M9	Bobbin Mill, long thin vertical slot for sliding doors in wall 25 at ground floor level.
37		M9	Bobbin Mill, four rectangular joist slots in wall 25, the eastern most slot is badly decayed.
38		M9 M6	Bobbin Mill, five small rectangular slots in wall 25 and 41 at ground floor level, which extend through the wall. The westernmost slot contains an iron bolt fitting.
39		M9 M6	Bobbin Mill, five small rectangular slots in wall 25 and 41 at 1st floor level. One of the slots still contains an iron bolt fitting.
40		M9	Bobbin Mill, wall foundation course, stepped out slightly from wall 25.
41		M6	Bobbin Mill, south wall external face, formed of irregular sized, unevenly coursed blocks, bonded into walls 87 and 91. Foundation level characterised by smaller blocks and absence of quoin stones at corners, although no obvious break in construction.
42	30	M6	Bobbin Mill, ground floor rectangular window in west of wall 41, formed of dressed stone sill, lintel and jambs.
43	29	M6	Bobbin Mill, ground floor rectangular window in wall 41, formed of dressed stone sill, lintel and jambs.
44	28	M6	Bobbin Mill, ground floor rectangular window in wall 41, formed of dressed stone sill, lintel and jambs.
45	27	M6	Bobbin Mill, ground floor rectangular window in wall 41, formed of dressed stone sill, lintel and jambs.
46	26	M6	Bobbin Mill, ground floor rectangular window in east of wall 41, formed of dressed stone sill, lintel and jambs.
47	35	M6	Bobbin Mill, 1st floor rectangular window in west of wall 41, formed of dressed stone sill, lintel and jambs.
48	34	M6	Bobbin Mill, 1st floor rectangular window in wall 41, formed of dressed stone sill, lintel and jambs.
49	33	M6	Bobbin Mill, 1st floor rectangular window in wall 41, formed of dressed stone sill, lintel and jambs.
50	32	M6	Bobbin Mill, 1st floor rectangular window in wall 41, formed of dressed stone sill, lintel and jambs.
No	Same as	Elevation	Description
51	31	M6	Bobbin Mill, 1st floor rectangular window in east of wall 41, formed of dressed stone sill, lintel and jambs.
52		M10	Line of 5 iron bolts set into wall 55, with length of decayed timber attached to central bolt.

53		M10	Length of iron bar.
54		M6	Bobbin Mill, stepped-out stone roof plate above wall 41.
55	91	M10	Bobbin Mill, east gable internal face, formed of irregular sized, unevenly coursed blocks of masonry, bonded into walls 16 and 25.
56	92	M10	Bobbin Mill, small central rectangular opening in upper portion of wall 55, formed of stone sill, wooden lintel and block jambs.
57		M10	Bobbin Mill, rectangular recess at 1st floor level within north of wall 55, wooden lintel now missing.
58		M10	Bobbin Mill, rectangular recess at 1st floor level within south of wall 55, with wooden lintel.
59		M10	Bobbin Mill, two small rectangular slots flanking opening 56 in wall 55, presumably originally for joists.
60		M10	Bobbin Mill, fifteen rectangular slots at top of ground floor level in wall 55, presumably for floor joists.
61	93	M10	Bobbin Mill, double, dressed, sandstone arches forming entrance into mill through wall 55.
62	87	M8 M12	Bobbin Mill, west gable internal face, formed of irregular sized, unevenly coursed blocks, bonded into adjacent walls. Wall 62 steps back c0.15m, just below joists 69, although the wall is almost certainly of one build.
63		M8	Bobbin Mill, two small rectangular slots flanking opening 64 in wall 62, presumably originally for joists.
64	88	M8	Bobbin Mill, small rectangular opening in upper portion of wall 62, formed of stone sill, wooden lintel and block jambs.
65		M8	Bobbin Mill, rectangular recess at 1st floor level within southern portion of wall 62, with wooden lintel.
66		M8	Bobbin Mill, large iron handle mechanism attached at first floor level to wall 62.
67		M8	Bobbin Mill, iron housing set into rectangular recess in wall 62.
68		M8	Bobbin Mill, rectangular recess at ground floor level within southern portion of wall 62, with stone lintel.
69		M8	Bobbin Mill, joist holes between ground and first floor levels in wall 62, joist holes obscured by vegetation.
70	89	M8	Bobbin Mill, rectangular window in first floor of wall 62, formed of very robust stone sill, lintel and keyed block jambs. This window is of a different character to the other windows in the mill and appears to be set above wall 71, it may date to the same phase as wall 71.
71		M12	Bobbin Mill. Stone buttress, part of wall 62.
72		M12	Bobbin Mill, small rectangular recess at ground floor level within wall 71, formed of stone lintel and sill. Grease stains at back.
73		M12	Bobbin Mill, rectangular window in ground floor of wall 62, formed of robust stone sill, lintel and keyed block jambs. This window was constructed in a similar fashion to window 70.
74		M12	Bobbin Mill, substantial three tiered solid concrete tower situated at the north end of wall 62, to which it butts.
75		M12	Bobbin Mill, twelve small rectangular slots in wall 62, at roof level, presumably for roof joists.
76	10	M11	Bobbin Mill, north gable, internal face, formed of irregular sized, unevenly coursed blocks, bonded into wall 62.
77		M11	Bobbin Mill, rectangular fire place in chimney breast 78, located at ground floor level, formed of dressed stone jambs and lintel.
No	Same as	Elevation	Description
78		M11	Bobbin Mill, ground floor chimney breast, stepped out slightly from wall 76, however bonded in to this wall, identical masonry, almost certainly the same phase.
79		M11	Bobbin Mill, rectangular fire place in chimney breast 80, located at 1st floor level, formed of dressed stone jambs and lintel.

80		M11	Bobbin Mill, 1st floor chimney breast, stepped out slightly from wall 76, however bonded into this wall, identical masonry, almost certainly the same phase.
81		M11	Bobbin Mill, nine rectangular slots at top of ground floor level in wall 76, presumably for floor joists.
82		M7	Wheel Pit, west wall, external face, formed out of unevenly coursed stone blocks. This wall contains three substantial support buttresses, which are bonded into the wall and formed out of identical masonry.
83		M7	Wheel Pit, west wall, external face, formed of partially dressed coursed blocks. Constructed above wall 82. Bonded into wall 14.
84		M7	Wheel Pit, south-west supporting tower for launder, formed of partially dressed, coursed, blocks, constructed above walls 14 and 83.
85		M7	Wheel Pit, large rectangular opening within wall 82. Substantial stone lintel. Opens onto wheel pit.
86		M7	Wheel Pit, substantial capping stones for wall 82. The central stone is more substantial than the others and contains several bolt holes.
87	62	M15	Bobbin Mill, west gable, external face, formed out of unevenly coursed stone blocks, bonded into wall 41.
88	64	M15	Bobbin Mill, small rectangular opening in upper portion of wall 87, formed of stone sill, lintel and block jambs.
89	70	M15	Bobbin Mill, rectangular window in first floor of wall 87, formed of very robust stone sill, lintel and keyed block jambs. This window is of a different character to the other windows in the mill
90		M15	Bobbin Mill, west wall, external face, an area of repair to wall 87, characterised by a different style of stonework. Probably relates to modification of the launder tower.
91	55	M5	Bobbin Mill, east gable, external face, formed out of unevenly coursed stone blocks, quoin stones face the north and south corners of the wall, where it is bonded into walls 1 and 41 respectively.
92	56	M5	Bobbin Mill, small central rectangular opening in upper portion of wall 91 formed of stone sill, lintel and block jambs.
93	61	M5	Bobbin Mill, double, dressed, sandstone arches forming entrance into mill through wall 91.
94		M5	Bobbin Mill, part of east gable, external face. Date stone set into wall 91 displays a date of 1857, located above arches 93.
95		M6	Retaining Wall, south retaining wall, links mill to coppice store, formed out of unevenly coursed stone blocks. Wall 95 butts against south mill wall 45. Wall 95 also forms the foundations for the south side of the coppice store.
96		M6	Retaining Wall, small rectangular opening within wall 95, formed out of a stone lintel, perhaps a drain exit into the Cald Beck.
97		CS2	Coppice Barn, north retaining wall.
98		CS1/2	Coppice Barn, north-west column, formed of neatly coursed, dressed stone blocks, stepped internally (base of wall bonded into wall 97).
99		CS2	Coppice Barn, north column, formed of neatly coursed, dressed stone blocks, stepped internally (base of wall bonded into wall 97).
100		CS2	Coppice Barn, north column, formed of neatly coursed, dressed stone blocks, stepped internally (base of wall bonded into wall 97).
101		CS2	Coppice Barn, north column, formed of neatly coursed, dressed stone blocks, stepped internally (base of wall bonded into wall 97).

No	Same as	Elevation	Description
102		CS2/3	Coppice Barn, north-east column, formed of neatly coursed, dressed stone blocks, stepped internally (base of wall bonded into wall 97).
103		M6ef, CS1	Coppice Barn, south-west column, formed of neatly coursed, dressed stone blocks, stepped internally (base of column bonded into wall 95).
104		M6ef	Coppice Barn, south column, formed of neatly coursed, dressed stone blocks, stepped internally (base of column bonded into wall 95).

105	M6ef	Coppice Barn, south column, formed of neatly coursed, dressed stone blocks, stepped internally (base of column bonded into wall 95).
106	M6ef	Coppice Barn, south column, formed of neatly coursed, dressed stone blocks, stepped internally (base of column bonded into wall 95).
107	M6ef, CS3	Coppice Barn, south-east column, formed of neatly coursed, dressed stone blocks, stepped internally (base of column bonded into wall 95).
108	M14	Bobbin Mill. Small square opening high in wall 16.
109	M14	Bobbin Mill. Doorway at first floor level in wall 16.
110	M14	Bobbin Mill. Opening at first floor level in wall 16
111	M14	Bobbin Mill. Area of possibly rebuilt masonry within wall 16. Edges not defined with certainty.
112	M8/M12	Bobbin Mill. Angled slot roughly cut into buttress, 71. Aligns with top of concrete tower, 74 and south end of pit [20].
113	M6/M8	Bobbin Mill. Opening through south wall of mill. Possibly inserted (difficult access).
114	M8	Bobbin Mill. Recess formed of concrete and added to inner face of wall, 25.
115	M8	Bobbin Mill. Cutting away of buttress of wall 62.
116	M8	Bobbin Mill. Ledge formed of concrete and added to face of wall 62. Carries length of decayed timber.
117	M7	Wheel Pit. Central buttress of west wall.
118	M7	Wheel Pit. North buttress of west wall.
119	M7	Wheel Pit. South buttress of west wall.
120	M5	Bobbin Mill. Slot cut into corner of east wall of mill (wall 91).
121	M5	Bobbin Mill. Tar line running below level context 120.
122	M4/M13	Bobbin Mill. Stone steps.



KEY	
	Walls
	Faced Masonry
	Crags
	Paths
	Stream

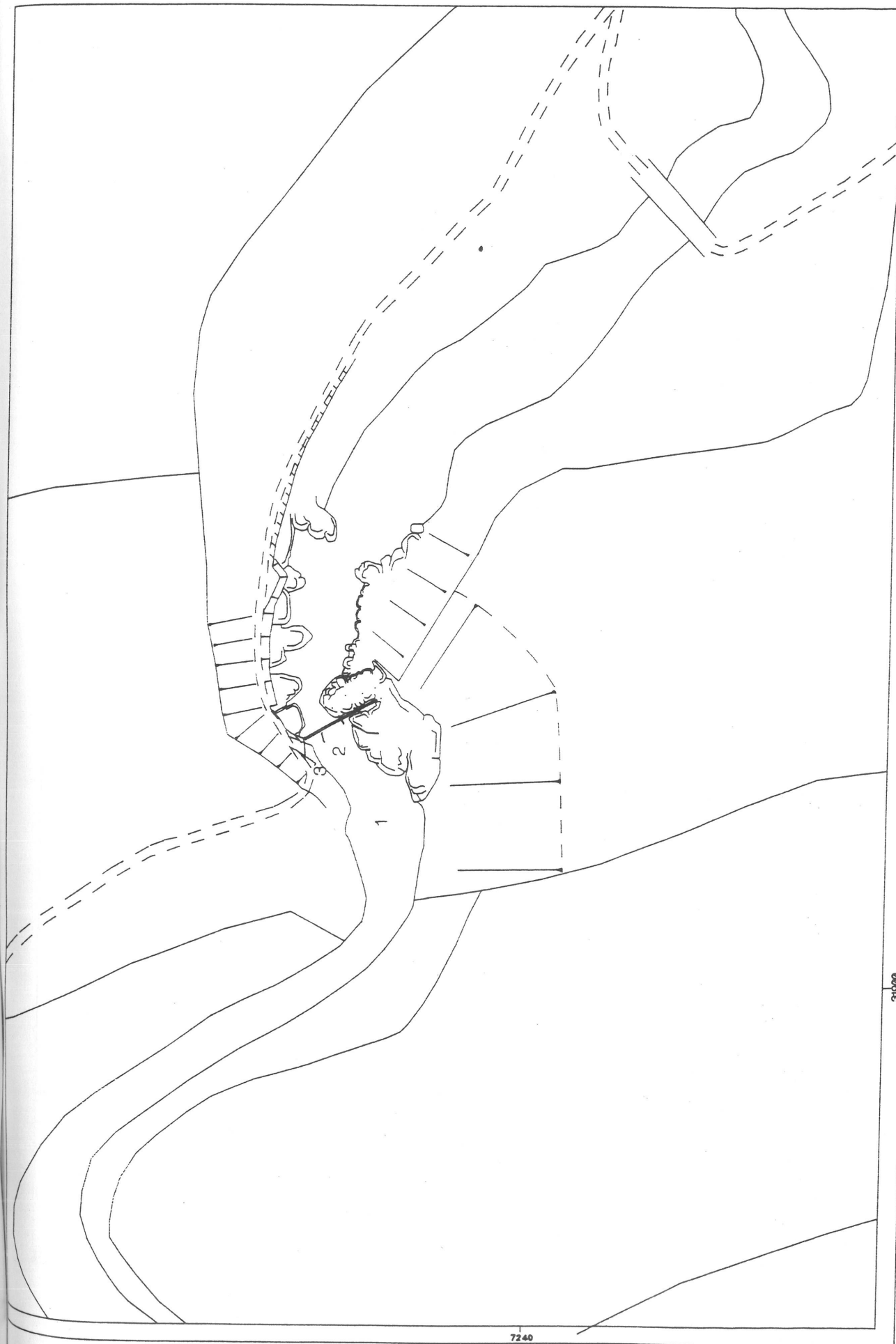
THE HOWK
Bobbin Mill

PLAN NAME
Ground Plan

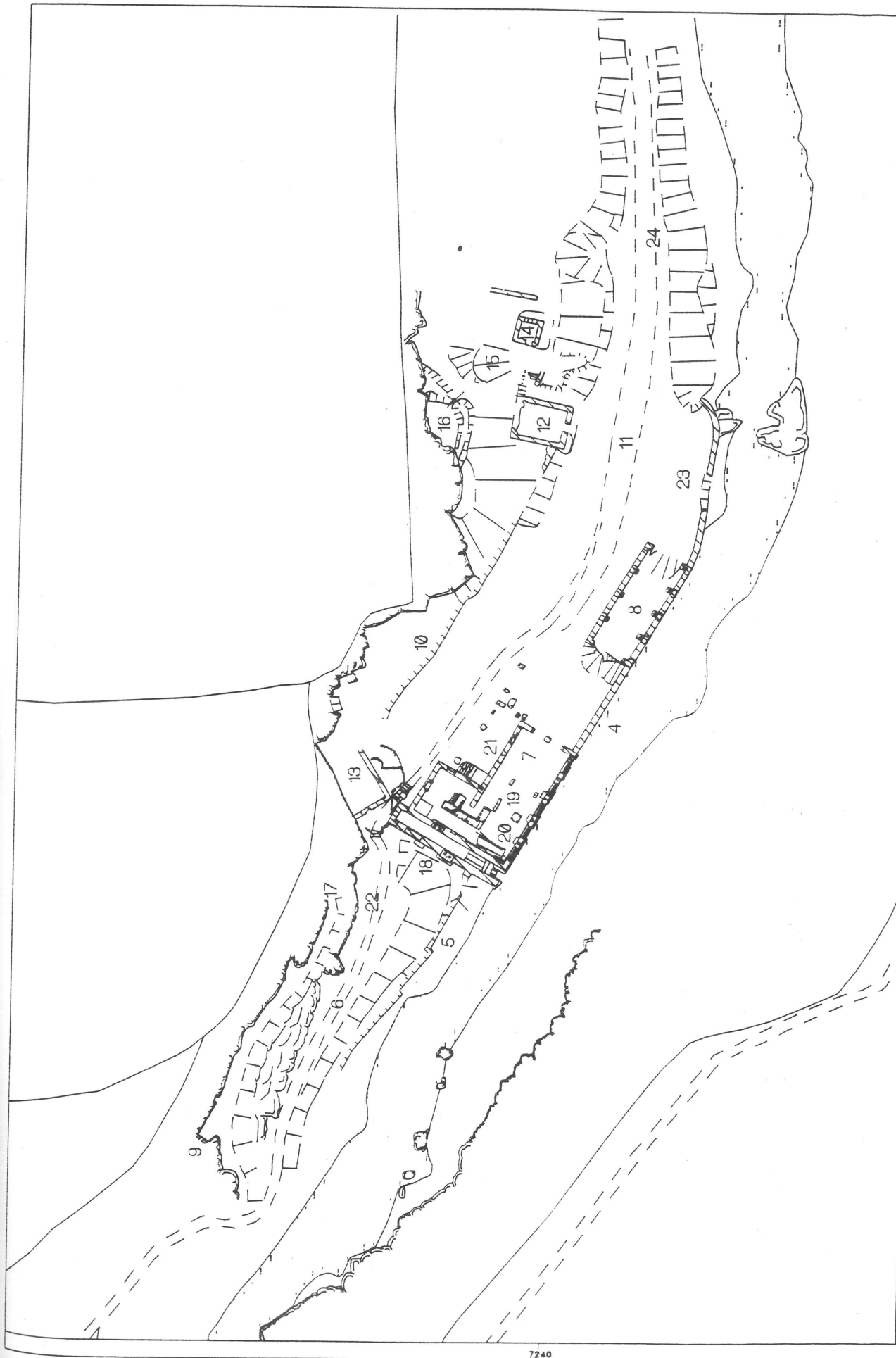
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THE HOWK
Bobbin Mill

PLAN NAME
PLAN OF GAZETTEER SITES

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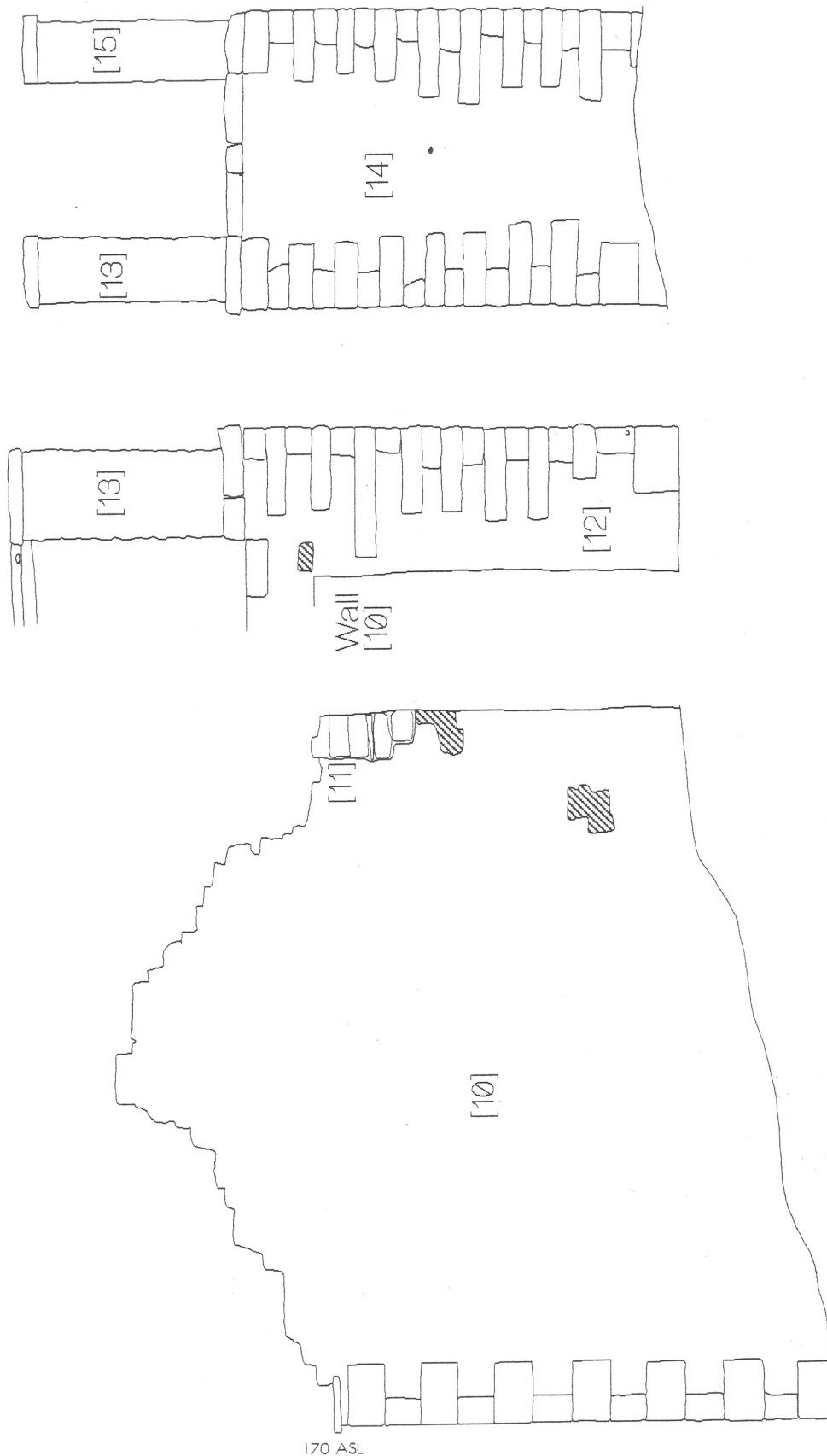


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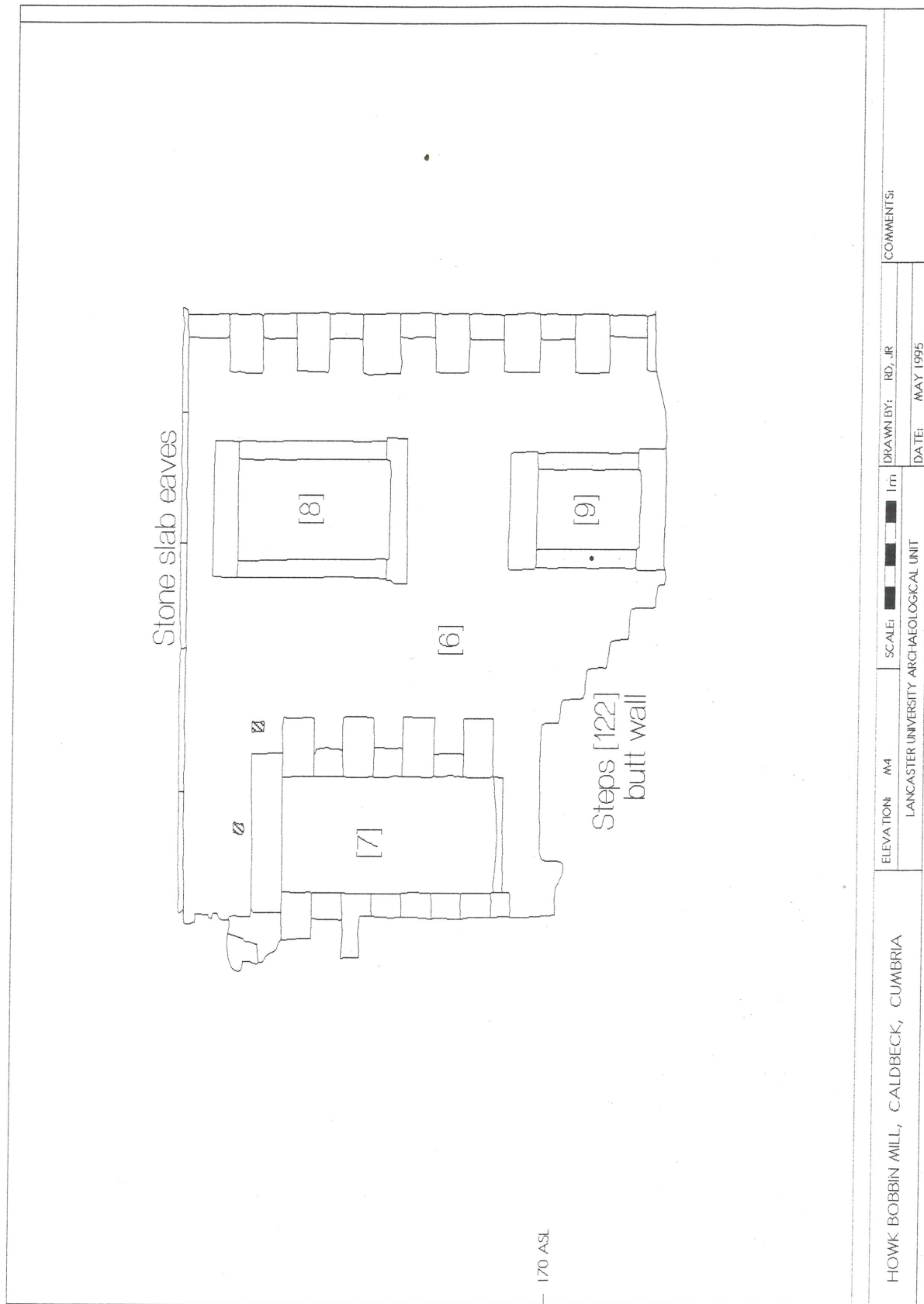
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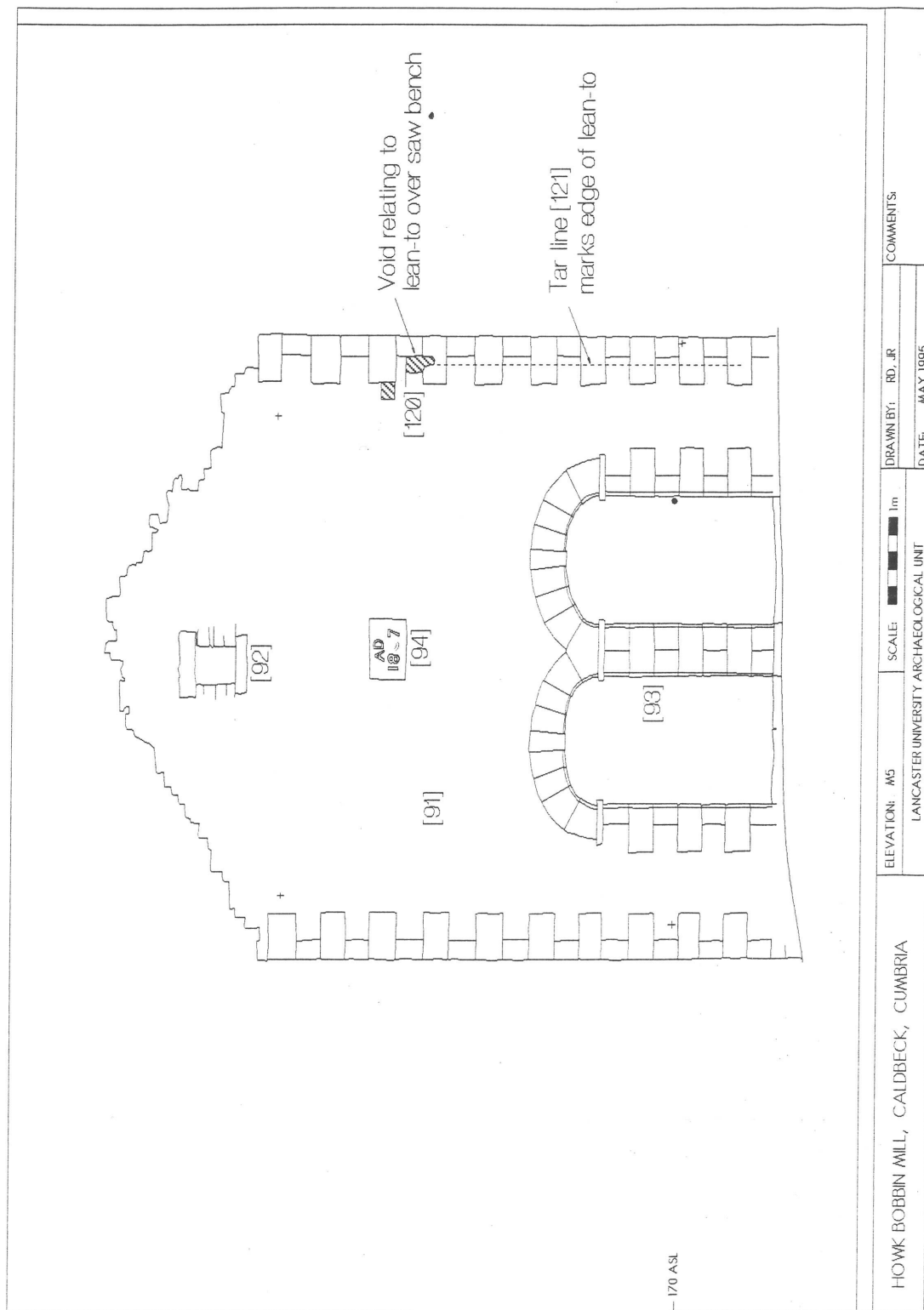
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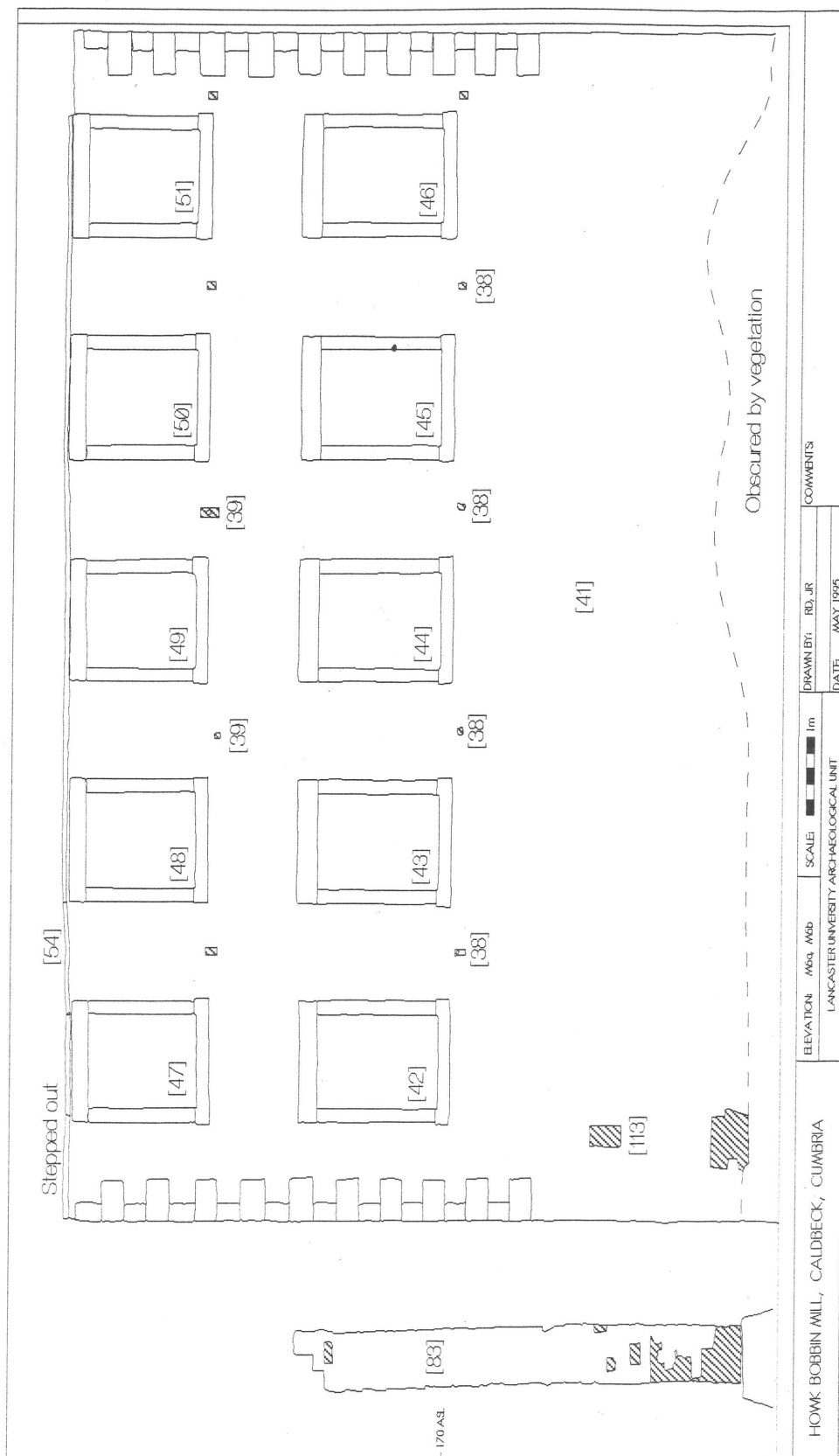
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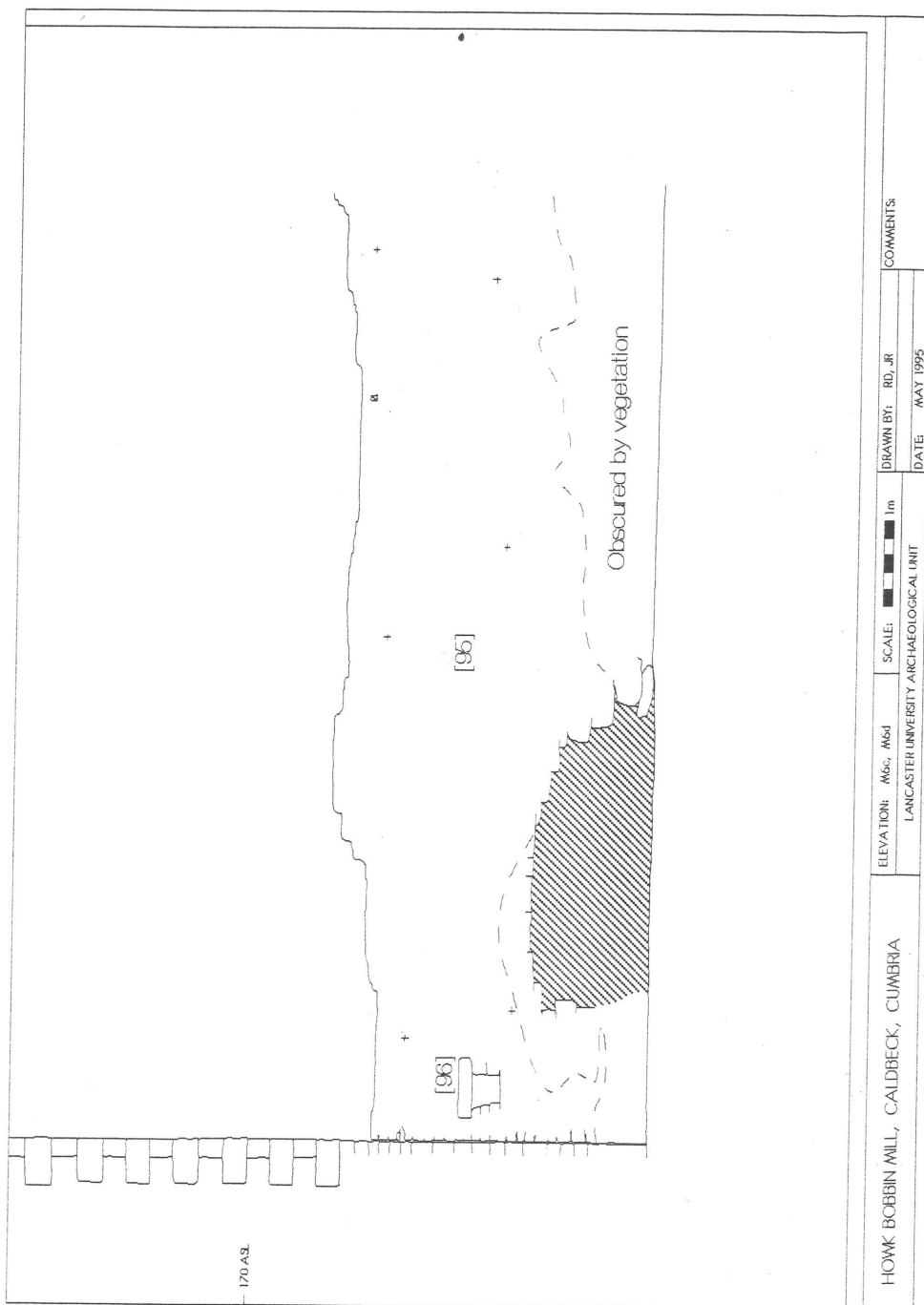
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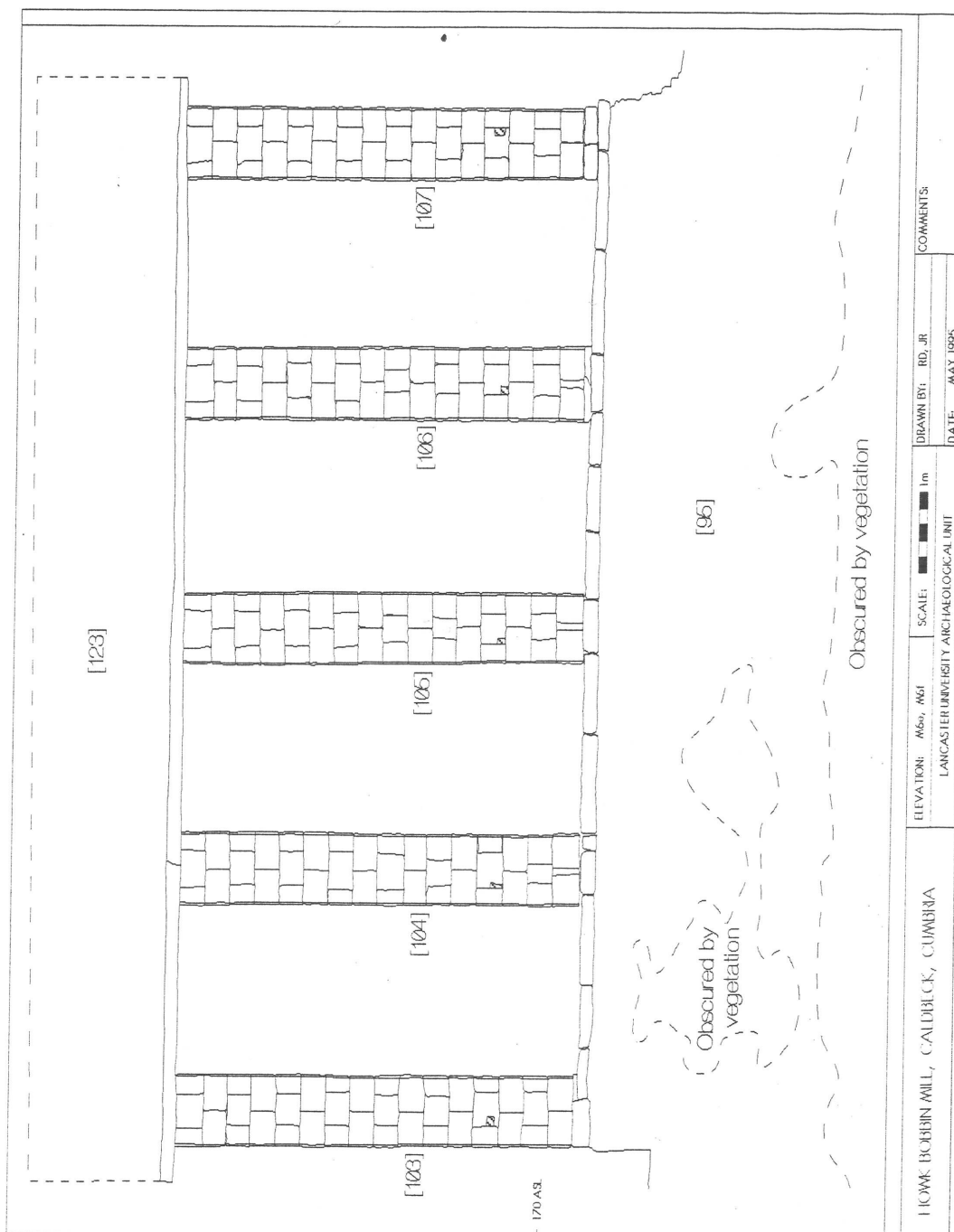
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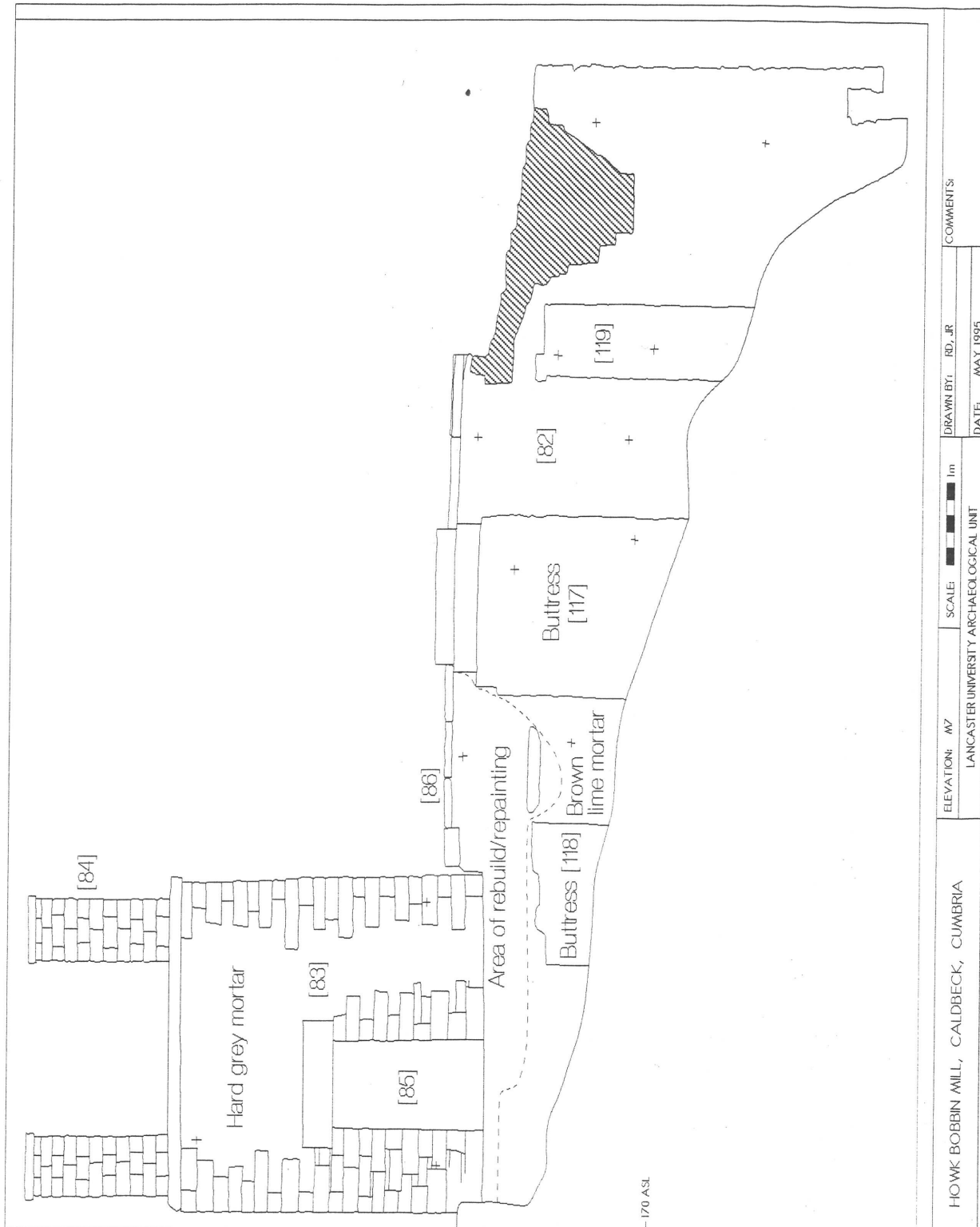












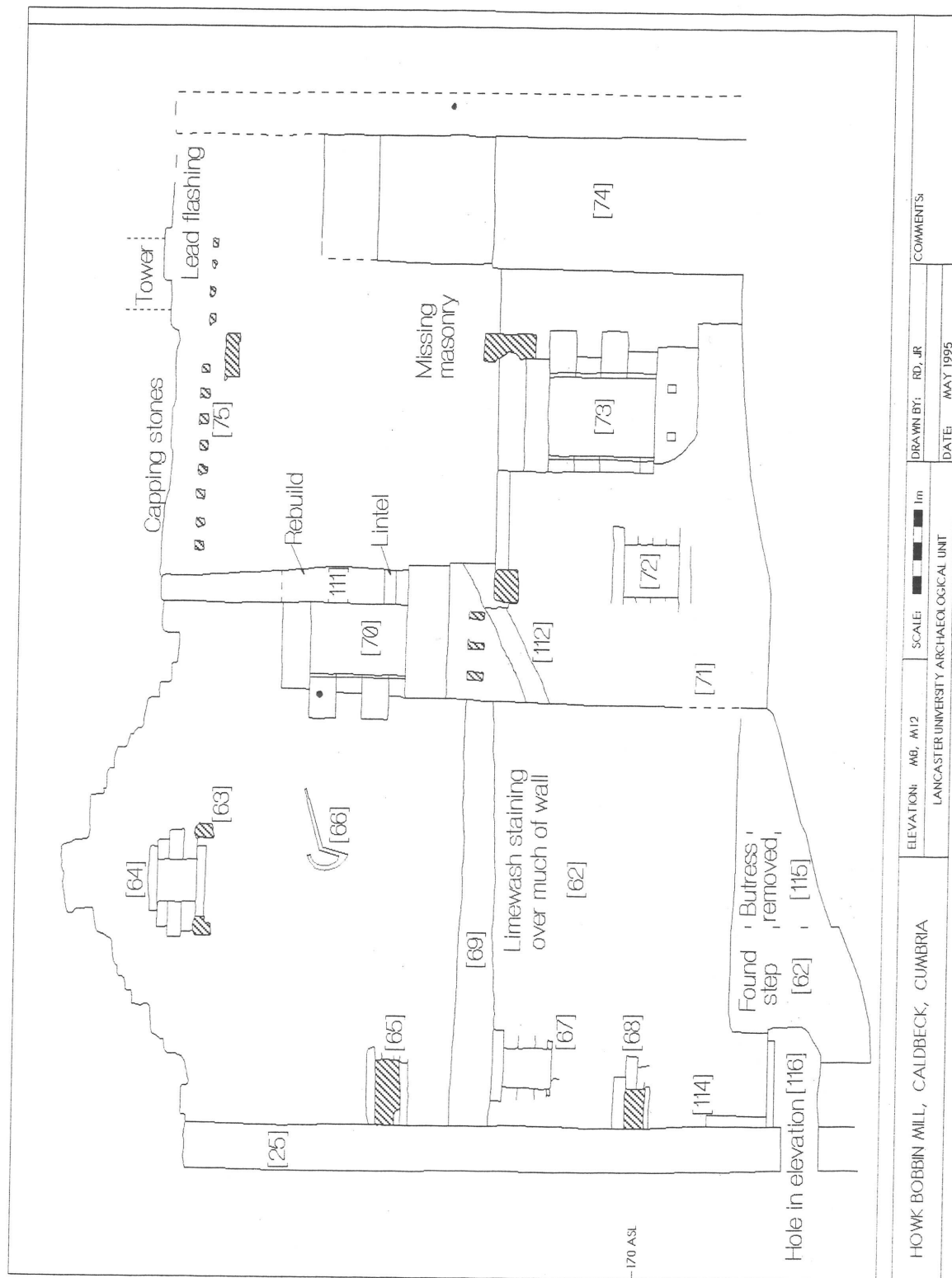
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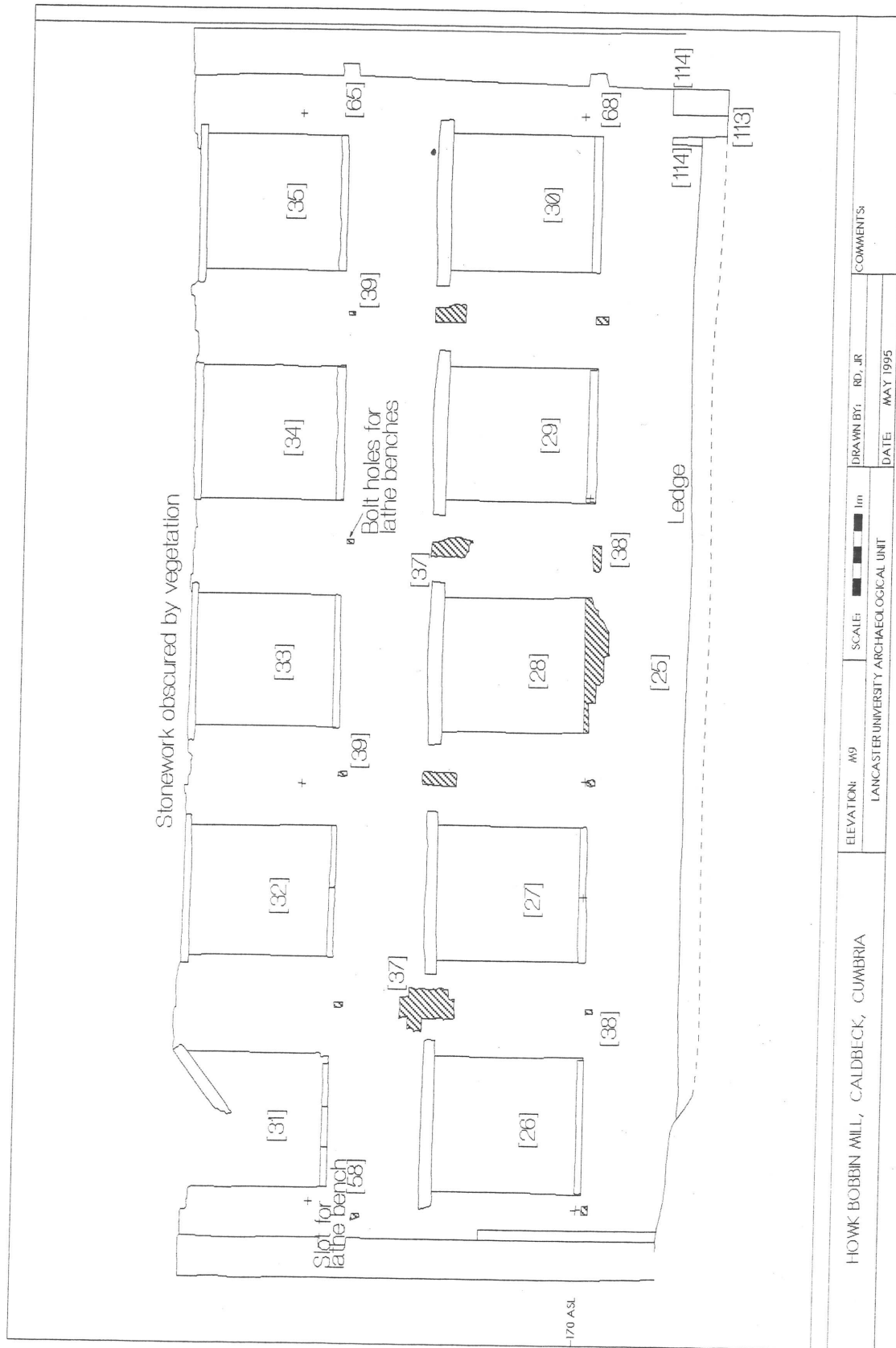
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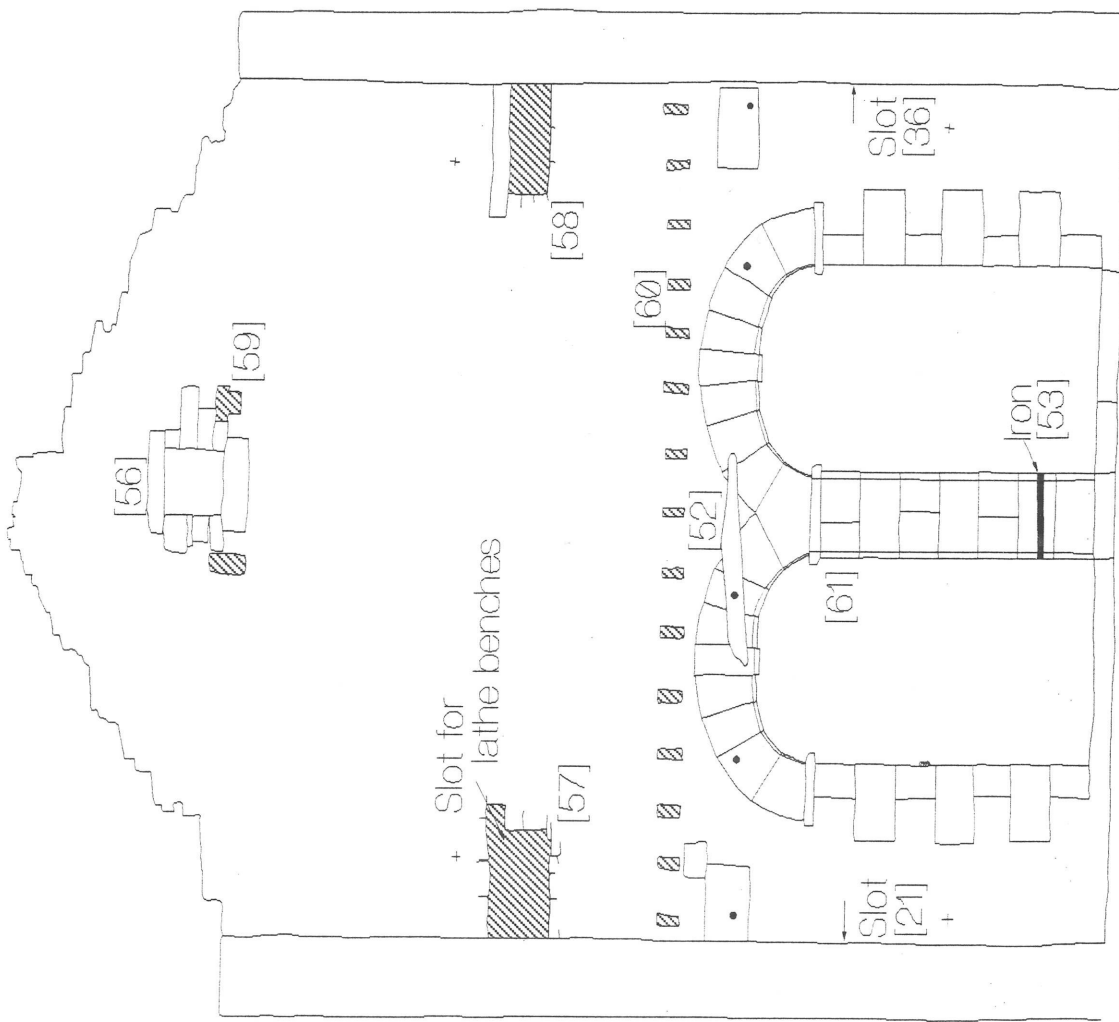
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ELEVATION: M7
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HOWK BOBBIN MILL, CALDBECK, CUMBRIA







170 ASL

HOWK BOBBIN MILL, CALDBECK, CUMBRIA

ELEVATION: M10

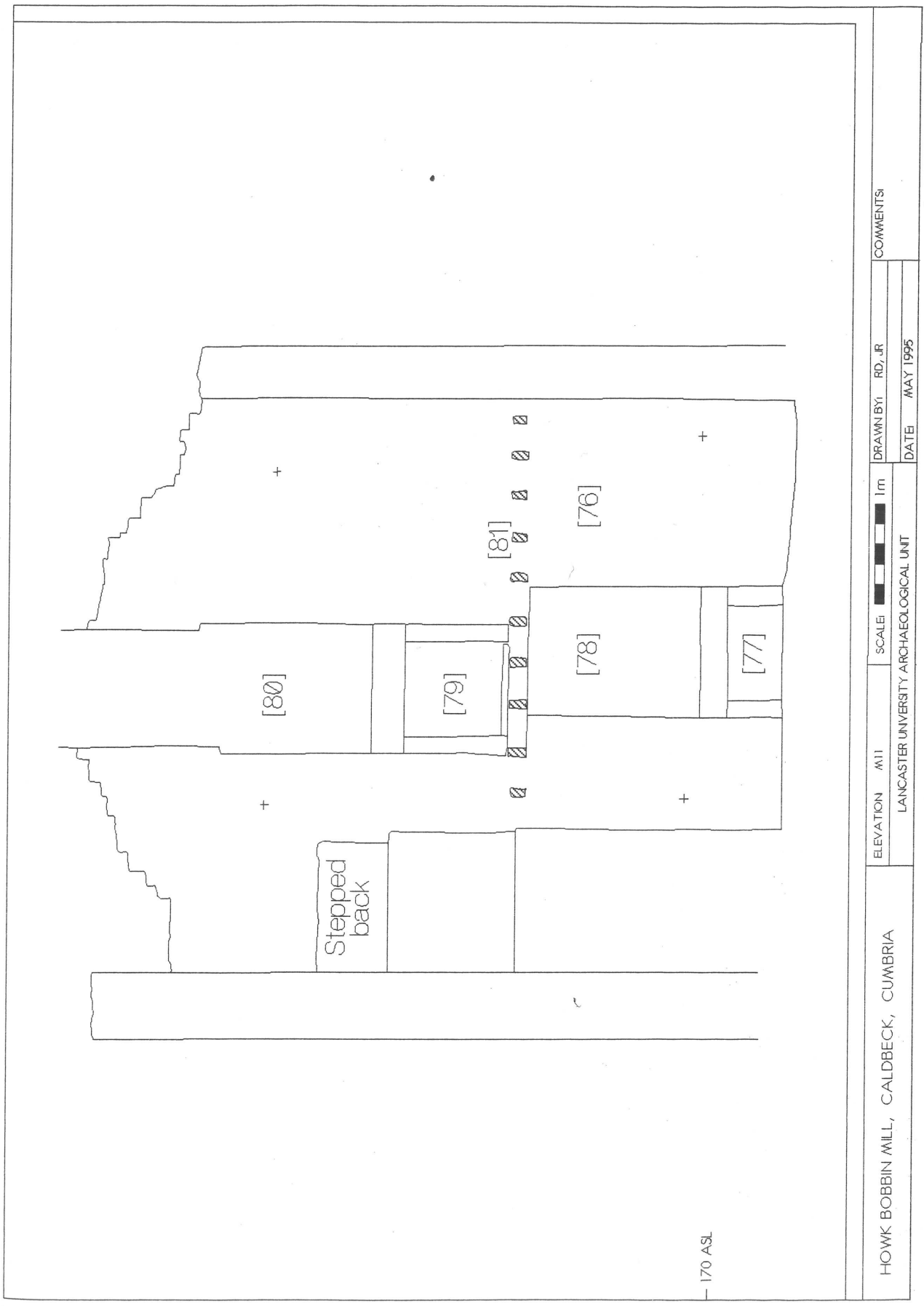
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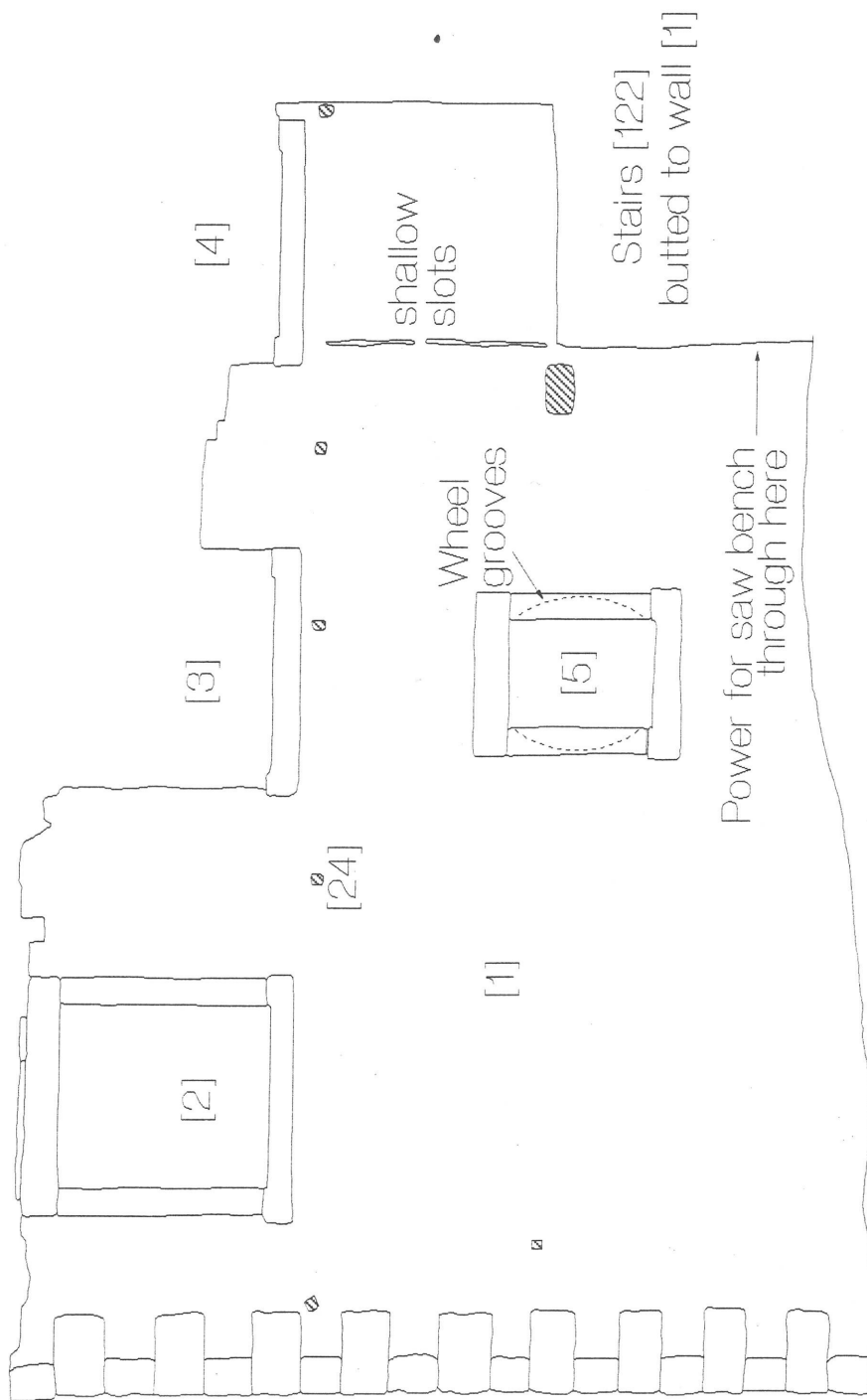
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DRAWN BY: RD, JR

DATE: MAY 1995

COMMENTS:



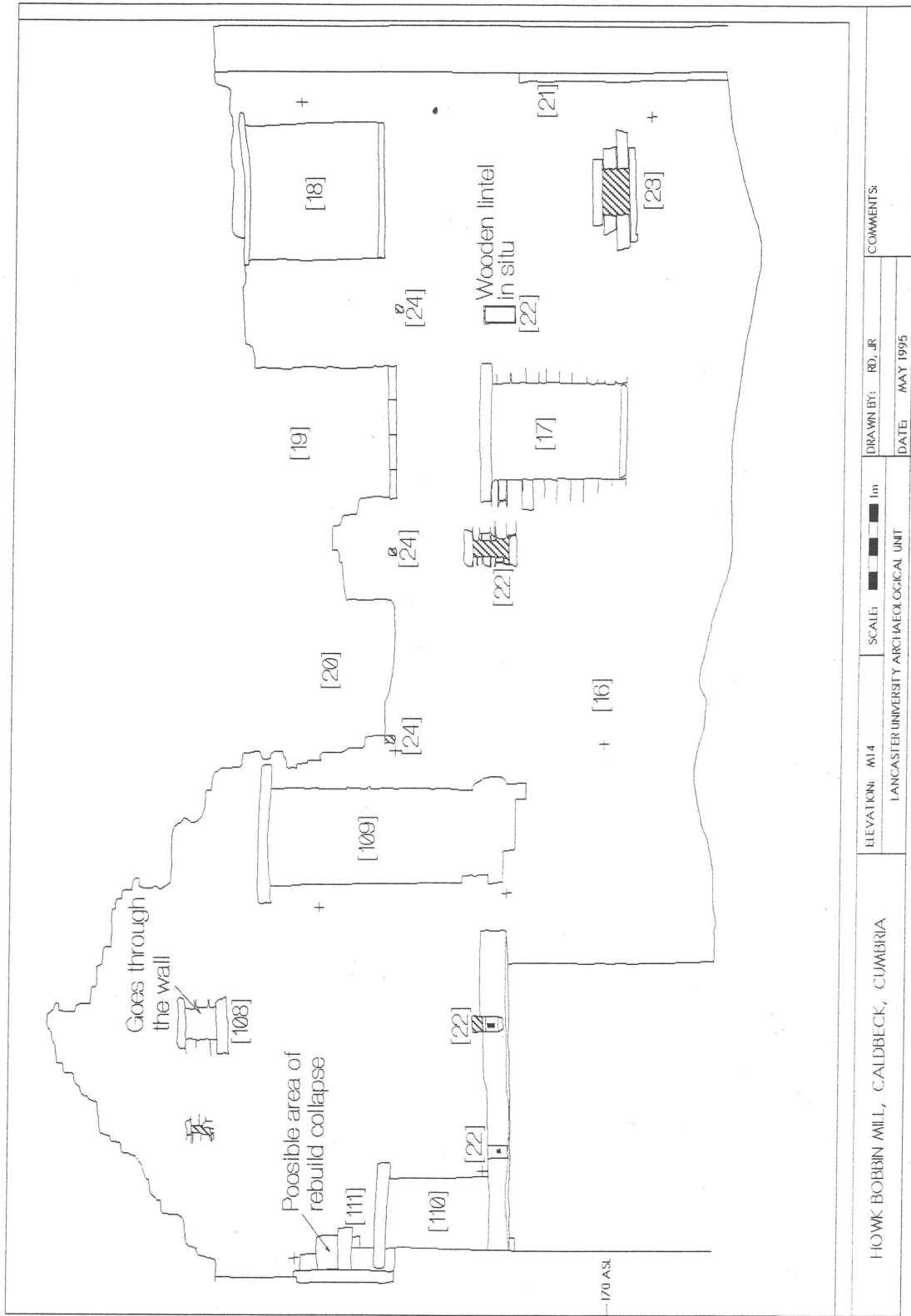


HOWK BOBBIN MILL, CALDBECK, CUMBRIA

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DATE: MAY 1995

COMMENTS:



HOWK BOBBIN MILL, CALDBECK, CUMBRIA

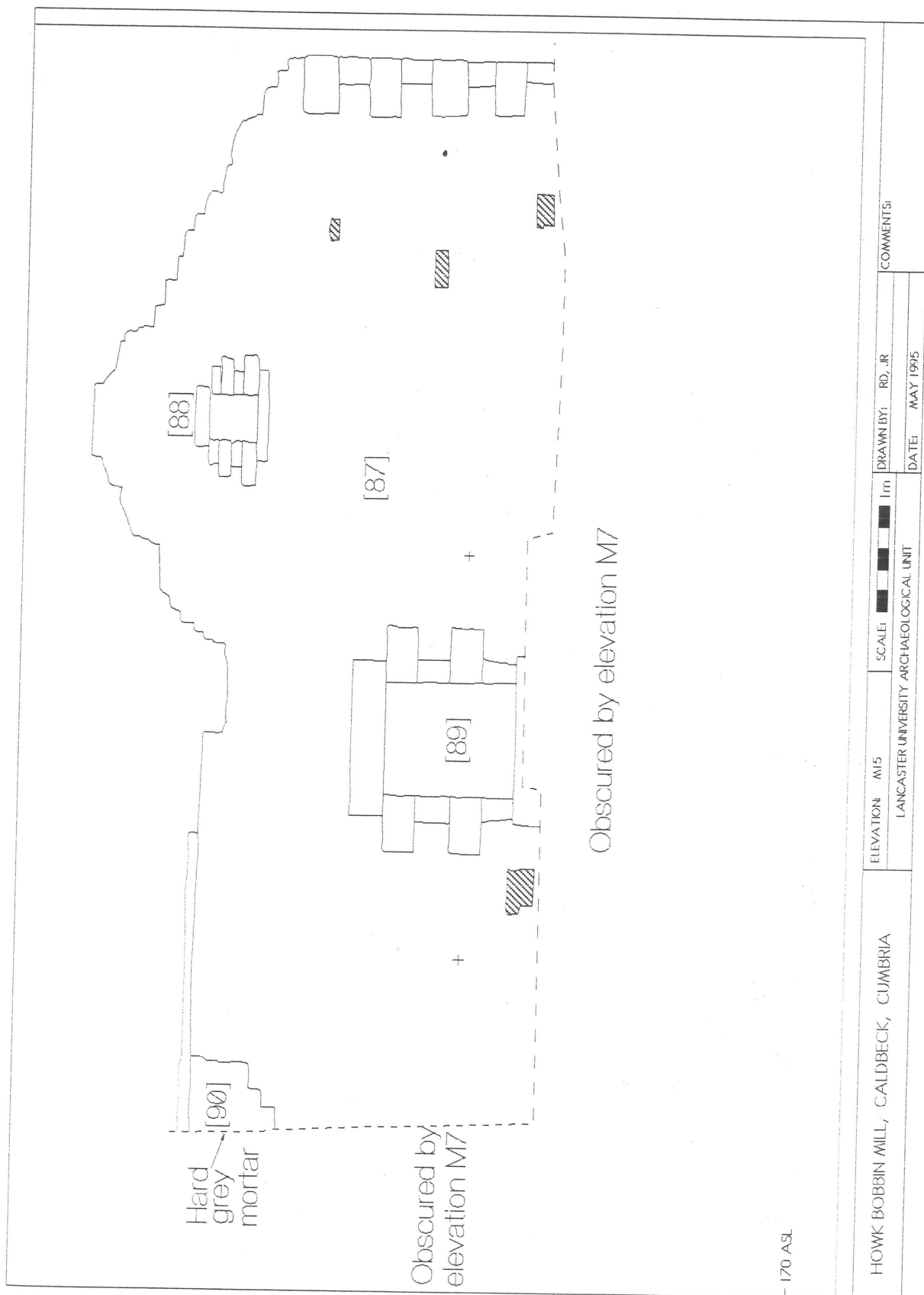
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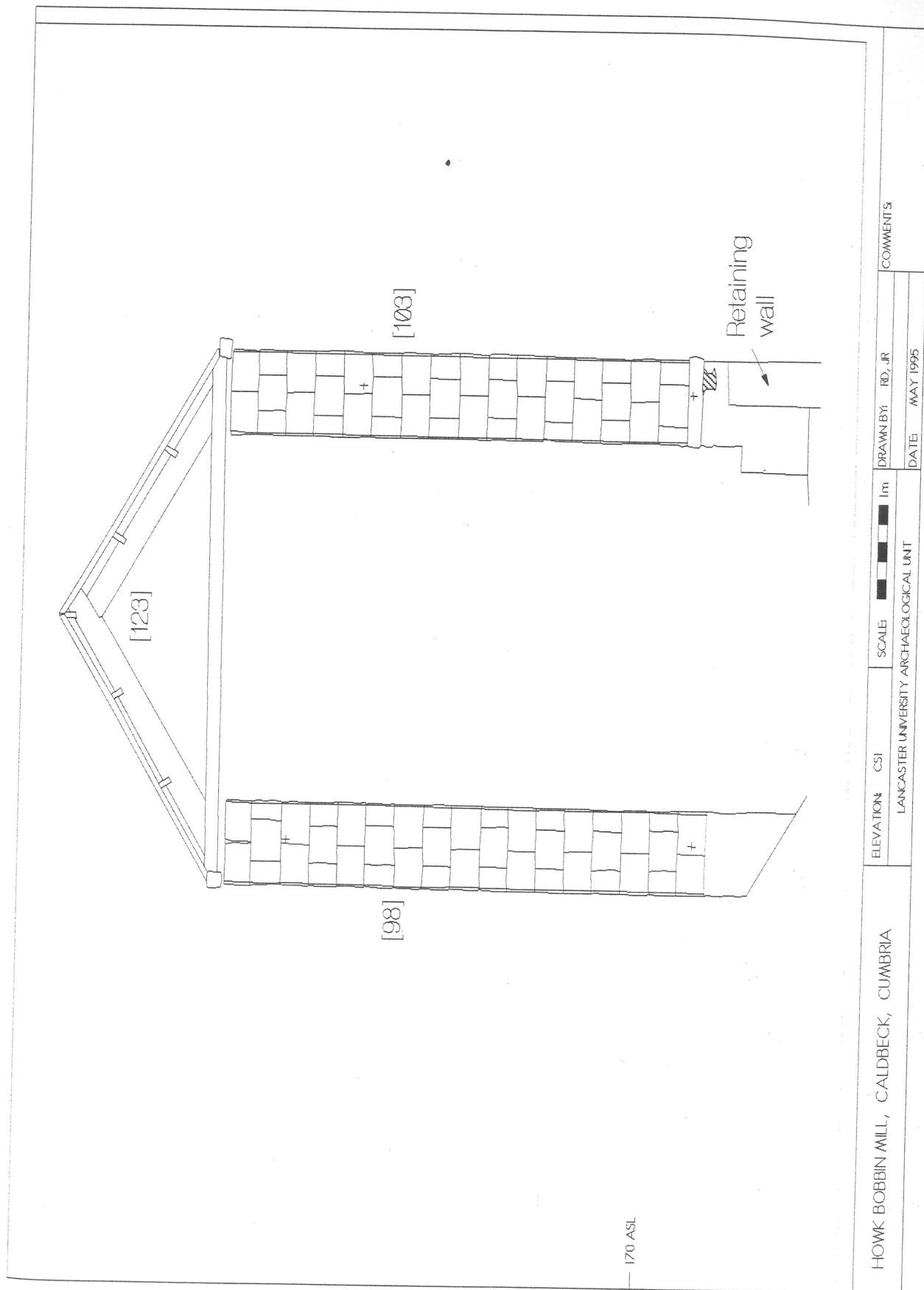
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DRAWN BY: RD, JR

COMMENTS:

DATE: MAY 1995





HOWK BOBBIN MILL, CALDBECK, CUMBRIA		ELEVATION	CSI	SCALE	DRAWN BY: RD, JR	COMMENTS
				1m	DATE MAY 1995	
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