BRYNN MILL
ROCHE
CORNWALL

Desk-Based Assessment &
Historic Building Recording

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Brynn Mill, Roche, Cornwall

Desk-Based Assessment & Historic Building Recording

For

Peter Wonnacott

On behalf of

Kate Mabley

By

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Summary

South West Archaeology Ltd. was instructed by Peter Wonnacott (the Agent) on behalf of Kate Mabley (the Client) to undertake a desk-based assessment and historic building recording at Brynn Mill, Roche, Cornwall.

The cartographic research and the survey of the buildings appear to indicate the mill building and associated leat and mill pond were built in the 18th century, with a small cottage built adjacent, probably in the 19th century. The Mill was extended in the third quarter of the 19th century, when the extant machinery and wheel was installed; this was a double layshaft drive to two pairs of millstones. The Mill and Cottage were intact, and the mill machinery recorded, in 1988. However, the buildings are now both ruinous and most wooden interior fixtures have been lost; only the upstream end of the hurst survives in a parlous state.

Contents

List of Figures

List of Appendices

Acknowledgements

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Kate Mabley, for access
Sue Watts, for her assistance during the survey
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Martin Bodman, for references to the Census, newspapers and information on Oatey & Co.
Dan Ratcliffe of the Cornwall Council Historic Environment Service

1.0 Introduction

Location: Brynn Mill
Parish: Roche
County: Cornwall

1.1 Project Background

South West Archaeology Ltd. (SWARCH) was commissioned by Peter Wonnacott (the Agent) on behalf of Kate Mabley (the Client) to undertake a desk-based assessment and detailed historic building survey at Brynn Mill, Roche, Cornwall, in advance of development at the property. The Written Scheme of Investigation and the schedule of work it proposes were drawn up in consultation with Dan Ratcliffe of Cornwall Council Historic Environment Service (CCHES).

1.2 Topographical and Geological Background

The site is located in the base of valley next to one of the tributaries of the River Camel, at a height of c.80m AOD. The land rises steeply to the west to Belowda Beacon. The soils of this area are the well-drained fine loamy or fine silty soils over rock of the Manod Association (SSEW 1983), overlying the partly metamorphosed slates and sandstones of the Meadfoot Group (BGS 2014).

1.3 Historic Background

The site lies at the extreme northern limit of the parish of Roche. Brynn Mill is surrounded by a series of small and slightly irregular enclosures, but most of the area was enclosed in the 19th century from the open moor. The fields immediately to the north of the Mill are listed as *upland rough ground*, others as *post-medieval* and *recently-enclosed land*, on the Cornwall and Scilly Historic Landscape Characterisation. A building is labelled as *Brynn Mill* on the Ordnance Survey surveyor's draft map in 1808. To the north and south of the site there are extensive areas of medieval and post-medieval tin-streaming (Lestormer MCO42591; Little Brynn MCO42506).

1.4 Methodology

The building assessment was undertaken by Martin Watts on the 3rd April 2014, and was carried out in accordance with English Heritage and IfA guidelines on the recording of standing buildings and structures. It is supplemented by notes and photographs taken by Martin Watts in January and March 1988 (exterior only) and notes of the internal working parts made by Alan Stoyel in April 1988. Historical and background information has been compiled from a variety of sources which are referenced and acknowledged. The desk-based assessment utilised cartographic and documentary sources held by the Cornwall Record Office, as well as the Historic Environment Record maintained by Cornwall Council. Relevant online sources were also consulted, and appropriate Internet databases investigated.

Figure 1: Site location.

2.0 Desk-Based Assessment

2.1 Historical Background

The information on Brynn Mill is rather patchy and all dates to the 19th century. 'Brin Mill' is shown, though not in any detail, on the Ordnance Survey surveyor's draft map of 1808, attributed to Robert Dawson (Sheet OSD 8). The will of William Liddicoat of Belovely (Belowda) Roche, dated 1827 and proved in 1840, refers to a dwelling house, mill, outhouses and fields at Brin Mill and tenement, which he left to his son George (CRO: AP/L/2400).

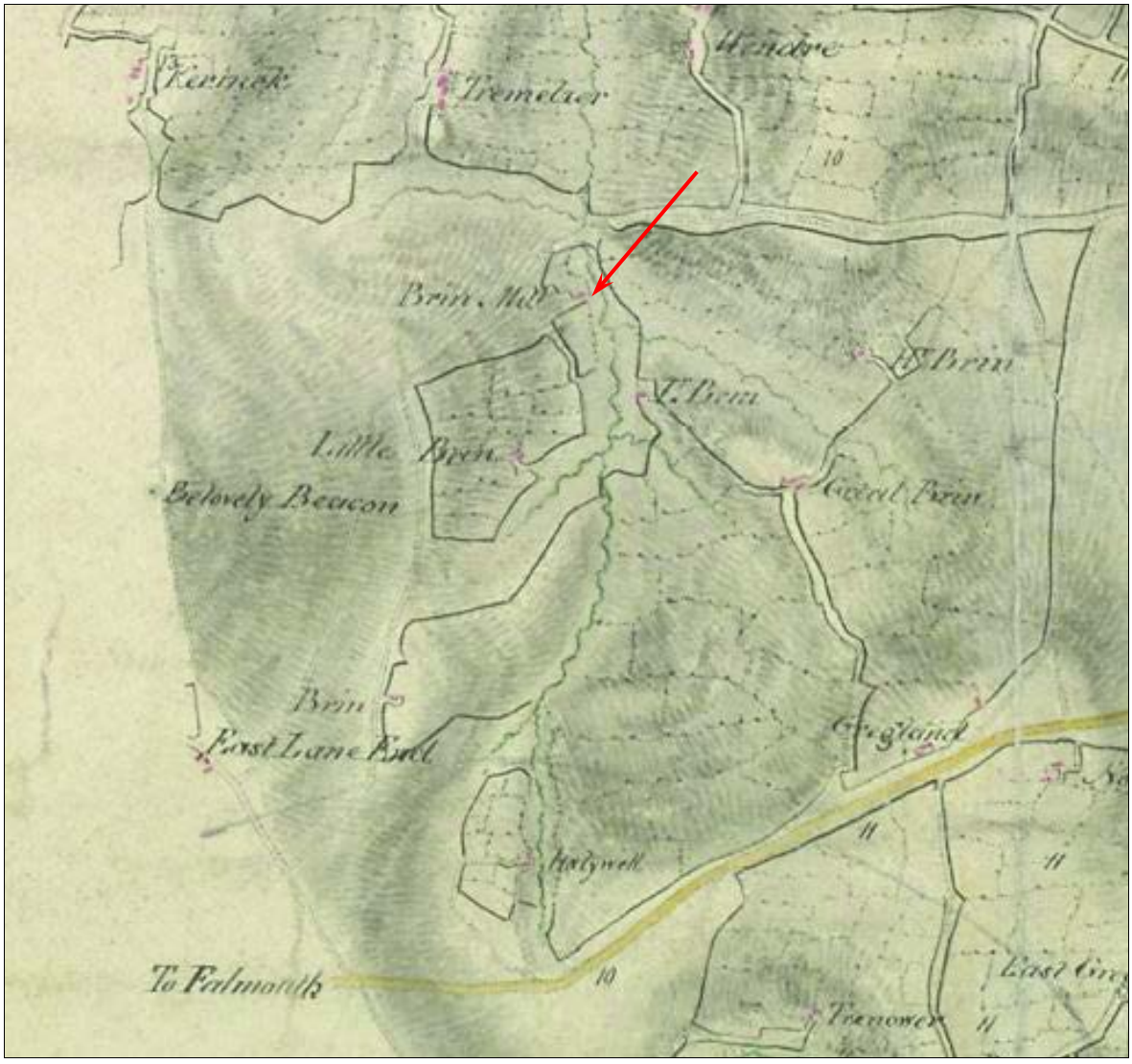


Figure 2: The 1808 Ordnance Survey surveyor's draft map.

In the 1841 Roche Census returns 'Breen Mill' was occupied by Joseph Osborn, miller, aged 55, his wife, son and two servants in 1841. The Roche tithe map (Figure 3) appears to show the layout of buildings, ponds and leats much as it was later in the 19th century, although the quality of the reproduction held by the Cornwall Record Office is very poor. In 1851 the mill was occupied by Joseph Hicks, miller, aged 31, his wife Jane and two male servants. Joseph is recorded as farmer and miller there in 1861, as well as one James Leverton, described as a widower, aged 63, and his

occupation is also given as miller. In 1871 John Common, a widower aged 60, was recorded as miller, occupying Brynn Mill with his unmarried son John, a miner, and his 17 year old daughter, Mary, as housekeeper. In 1881 John Common, then aged 70, is still listed as miller, his grandson living with him. John Common died at Brynn Mill on 30 March 1882, aged 73 (*Royal Cornwall Gazette* 7 April 1882, 5). No miller is specifically listed under Brynn in the 1891 census. However, Hart Hicks is recorded as 'miller (water)' at Brynn Mill in Kelly's *Directory* of 1893, 1902, 1906 and 1914.

Figure 3: Extract from a reproduction of the Roche tithe map of 1839 (CRO).

Benney (1972, 99-100) cites the following (from title deeds to Demelza Mill): “George Hicks [son of John Hicks of Demelza Mill] was a miller in his own right and on the 26th of June 1867 the leasehold interest in neighbouring Little Brynn Mill was assigned to him by William Huddy in consideration of a payment of £500. Originally the property of the Earl of Falmouth, Little Brynn Mill was leased by him to a John Hicks on the 5th of November 1845, such lease to be determinable on the death of James Hicks, George Hicks and Carl Hicks. Eventually both Demelza and Little Brynn Mills came into the possession of a Joseph Hicks on the 5th of July 1882, as he then purchased the freehold interest in Demelza and acquired an assignment of the leasehold interest in Little Brynn for the total payment of £760.”

The First Edition OS 1:2500 map, surveyed in 1880 and published in 1888, shows the plan of the building similar to that which survives today. It is marked simply as Brynn Mill, with no qualification, such as 'Corn' in brackets as at Demelza Mill to the north. From the trade directory entries given above it appears that the mill continued in use until at least the start of World War I.

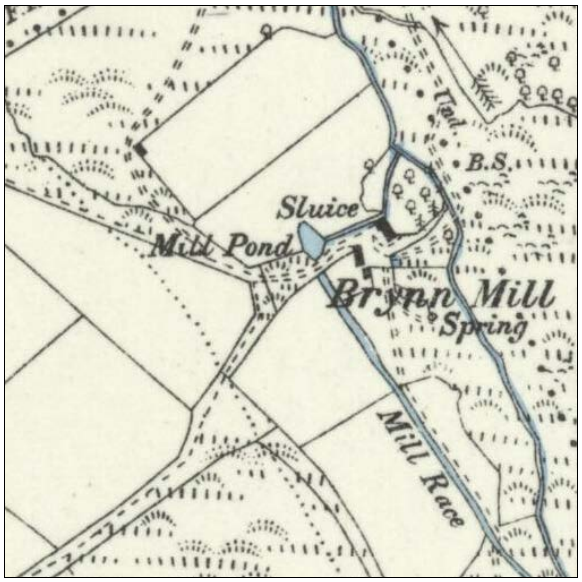


Figure 4: [left] The 1880, published 1888 Ordnance Survey 1st Edition map.
Figure 5: [right] The 1905, published 1907 Ordnance Survey 2nd Edition map.

3.0 Building Recording

3.1 General Description of the Buildings

The author first visited Brynn Mill in January 1988, when the mill and adjoining cottage were unoccupied but relatively intact (see below). No access was gained to the interior of either building at that time. The mill roof was then clad with large slates on both sides; the south-west pitch of the house roof was clad with smaller slates and the rear pitch with corrugated sheet. The Mill and Cottage are currently (2014) in a parlous state – the roofs have gone and the interiors shrouded in vegetation and debris from the roofs/cob walls. Some of the slates found within the debris in the former cottage were from Delabole. Parts of the machinery (see below) remain *in situ*, but most is lost or concealed. The outbuildings are in a similar state of disrepair.

The mill and adjoining dwelling house are orientated roughly south-east to north-west, with the mill at the north-west end. There is a corrugated iron lean-to extension adjoining the south-eastern end of the cottage, and a timber-framed corrugated iron clad shed with gable roof extending from the north-eastern side of the mill. To the south-east end, behind the cottage, is a free-standing concrete-block privy with a timber boarded door on its east side and a monopitch corrugated asbestos sheet roof.

3.2 Water Supply

The water supply for Brynn Mill was provided by a leat and pond system; the intake is located some 500m south of the site, from a weir across the stream. On the late 19th century Ordnance Survey maps the leat is shown feeding a pond a short distance from its intake, then running in a north-north-westerly direction on the west side of the stream. Within the subject property the northern section of the leat is cut into the natural slope, with the upcast forming a hedgebank on its eastern downhill side. To the west of the mill the leat fed a small pond, from which water was taken eastwards to the mill; the leat and small pond still hold water. There is stone walling on the east side of the pond, but the water exit is not visible. Between the pond and the mill the water ran in a trough formed of granite slabs on top of an artificial embankment. The channel is now partly broken down, although the section at the mill end, above the waterwheel pit, survives. At the time of survey water was running below the north side of the embankment and entering the wheelpit and tailrace. Water would have been taken out from the end of the stone channel to the top of the wheel via a timber trough or launder, of which there are now no remains.

The wheelpit is stone built, *c*.0.9m wide at its upstream end. The tailrace, which takes the water away from the wheelpit, is an open channel that runs in a northerly direction to rejoin the stream north of the site.

3.3 Building Descriptions

3.3.1 1986 Listing

House with attached corn mill. Early C19 with few later alterations. House in granite rubble, with upper storey in cob, some brick; slurried slate roof with ridge coping tiles and gable ends, gable end stack to left removed, gable end to right rebuilt with external stack in brick. Rear slope of roof in

corrugated asbestos. The mill is in granite rubble with slate roof, with ridge coping tiles and gable ends.
Plan: the house is of 2-room plan, with central entrance kitchen to right heated by gable end stack and room to left also heated by gable end stack. The mill is attached to the left side, of 2 storeys and one-room plan, with loft at upper level. The leat runs towards the front of the mill, at right angles to it, and drives an overshot wheel, which remains in situ. House of 2 storeys, 2 window range, at first floor has two C19 2-light casements of 2 panes each light; at ground floor a blocked window to left and right, central 4- panelled door with pitched slate hood. The right side of the house has external brick stack and curved oven at the base to front. Single storey corrugated iron lean-to attached to right. The rear of the house has a single 9-pane light at ground floor to right and 9-pane sash under eaves to left. The mill is attached to the left side of the house, and has a higher roof level; it projects beyond the front of the house. Door with granite lintel to right and small window opening under eaves to left. The left side of the mill has the wheel pit, with cast iron wheel; the leat runs away from the mill to the rear. Rear of the mill has attached corrugated iron shed.
Interior: Not accessible at time of survey (July 1986) but is believed to contain the rest of the mill machinery.

3.3.2 The Mill - Exterior

The roof of the mill has collapsed completely; it was formerly slated and some large slates still remain on the wall head at eaves level. From survey drawings made in the 1980s, the pitch of the mill roof was about 30 degrees. The external walls are still standing to eaves level. These walls are of uncoursed rubble stone bedded in lime mortar, with some massive blocks, particularly in the north-west (wheelpit) wall. The stone is a mixture of the local slatestone and sandstone (not granite rubble, as stated in the Listing description). The granite present is mostly used for lintels and quoins.

The south-west elevation is of rubble stonework with two openings: with a wide ground-floor stable door in a timber frame under a granite lintel and a small first-floor window. The door opening has dressed quoins, including a granite stone with a domed back to the right of the door. This appears to be reused and its shape suggests it may have been cut from a millstone blank. The first floor window opening has a slate cill, but the window frame has gone and there is a tree lying through the opening.

The north-west gable end of the mill still stands to its full height. This is the wheelpit wall, and has a rectangular opening at low level for the shaft of the waterwheel to enter the building. The granite lintel over this opening is cracked. There is a secondary massive granite lintel built into the wall a short distance above the shaft opening. Towards the western end of the wheelpit there is some decayed iron strapping, bolted into or through the wall to retain the masonry. Above the shaft opening is a small, square timber-framed four-light window with a slate cill under a timber lintel. To the west of this is a vertical opening through which a lever projected for controlling the flow of water in the launder onto the wheel. There is a vertical joint in the stonework to the right of this slot, which indicates where the mill building has been extended to the west. The stonework of the extension is not as massive as that of the main part of the wheelpit wall and the stone is generally slightly lighter in colour. The upper parts of the wall and verges are obscured by ivy.

The north-east elevation of the mill is largely obscured by ivy and the corrugated iron shed which extends to the east. Within the shed the mill wall can be seen to be of rubble stone with a doorway under a granite lintel and single leaf vertically-planked timber door. This door opened outwards, into the shed, and as the opening has splayed reveals internally; it appears to have been a window opening subsquently enlarged for a door. The 1980s survey drawings show a first floor window in this wall, but this is no longer visible.

Figure 6: South-west elevation of the Cottage and Mill in 1988.

Figure 7: South-west elevation of the Cottage and Mill in 2014.

Figure 8: North-east elevation of the Cottage and Mill in 1988.

Figure 9: North-east elevation of the Cottage and Mill in 2014.

Figure 10: South-east gable elevation of the Cottage in 1988.

Figure 11: South-east gable elevation of the Cottage in 2014.

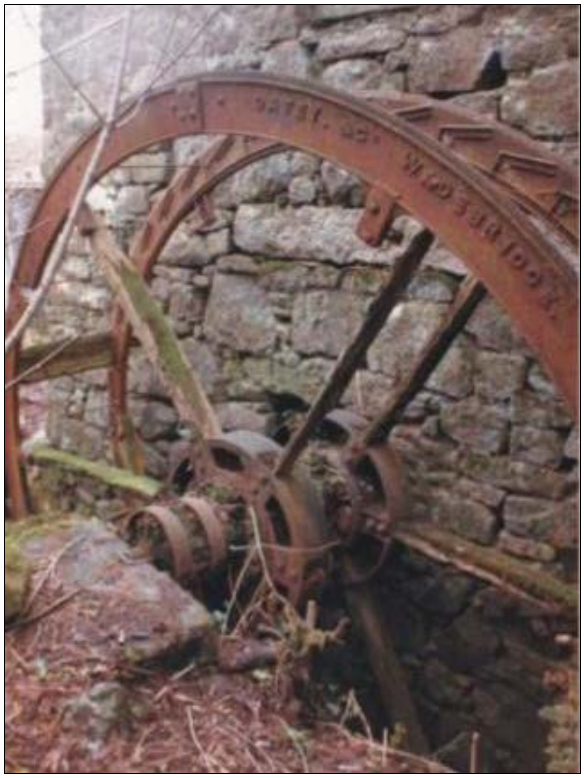



Figure 12: [left] The waterwheel in 1988.
Figure 13: [right] The waterwheel in 2014.

The internal dividing wall between the mill and the cottage is now reduced to a low level. Its base is of rubble stone, which appears to have originally extended up to first floor level with lighter construction above. On the western side the wall stands to eaves level, with dressed stone quoins used in the return at former first floor level. This may have formed one side of a doorway into the mill, or is simply the limit of the extension of the mill building.

3.3.3 The Mill - Interior

Within the mill the timber first floor structure has collapsed and largely rotted away. Some fragments of the west end of the hurst frame (the timber structure that encloses the driving gears and supports the millstones) remain *in situ*, supporting, albeit precariously, one pair of millstones. Other elements of the working parts were partly visible under the rubble, roofing slates and overgrowth within the mill, but no clearance was attempted and not all of the interior of the mill was accessible on safety grounds.

The working parts are concentrated inside the north-west wall (the pit wall), where the hurst frame carried two pairs of millstones at first floor level. Below the hurst is the cog pit, which appears to run the full length of the building. Its size could not be determined due to the presence of rubble/undergrowth. Along the inside of the pit wall there is a cill in the stonework projecting about 0.1m into the mill. This extends from the building break eastwards to the corner of the mill. This was probably to support the rear beam of an earlier phase hurst, which was set at a lower level.

The north-east wall is overgrown with ivy and its upper level was not visible. The rotted remains of the eastern end of the hurst bressummer beam and a joist pocket, a remnant of the former first floor structure, survives *in situ*. The ground floor doorway has splayed reveals, and appears to have originally been a window.

The south-east wall, between the mill and the cottage, is reduced to the height of *c.*1m; where visible, it is built of irregular blocks of rubble stone.

Waterwheel and working parts

The working parts of Brynn Mill were recorded by observation and some measurements taken in April 1988 by Alan Stoyel (see Appendix 2); these notes have been used to help reconstruct the original layout of the machinery (see Figure 13, Figure 14 and Figure 15), as no interior photography was permitted at the time.

The waterwheel was overshot and would have been fed from a timber launder that projected beyond the masonry wall at the upstream end of the wheelpit. Only the cast-iron shrouds of the waterwheel remain, leaning at a precarious angle to the north. The outer shroud ring is broken at one point and has a short section missing, but otherwise the castings appear intact. The shroud castings carry the embossed inscription OATEY. & C^{o} WADEBRIDGE in a bold sans serif face (see above). The wheel was about 3.7m overall diameter by 0.75m overall width. The shrouds, which form the rings of the wheel, are made up of six sections each side, the sections being joined end to end midway between the arm positions with a cover plate and four bolts. The number 6 is cast on the cover plates and shrouds. There would have been two sets of six timber arms, all of which have rotted away, as have the timber buckets and sole boards. The shroud sections having integrally cast flanges to locate the bucket and sole boards and there are three cross-tie rods between each pair of sections. There would have been 42 buckets, each formed of two boards, and sole boards, the ends of which were located between two flanges around the inner circumference of the shrouds. The timber arms were bolted to projecting plates cast integrally with the shrouds and their inner ends were housed and bolted into pockets in heavy cast-iron centres or naves. The naves are about 0.76m in diameter and were wedged onto the timber wheelshaft, of which some decayed vestiges remain. The outer end of the wheelshaft has a cast-iron cross-tail gudgeon and two gudgeon rings. Its journal (bearing) ran in a bronze bearing set in a granite block. This appears to be still in place on the pit wall, but is now obscured by overgrowth.

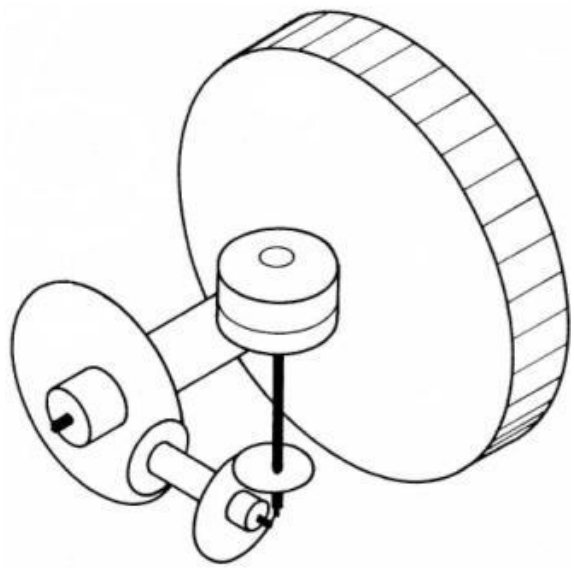
The inner end of the wheelshaft and the pitwheel centre were not visible, although some parts of the timber cog ring of the pitwheel could be seen beneath the rubble and debris now obscuring most of the cog pit area within the mill. It is likely that the remains of the downstream pinion, layshaft and the gear from which the millstones were driven survive beneath the debris, but only the millstones, with the millstone spindle still in place, could be clearly seen. These have collapsed into the mill. They are a pair of granite stones *c.*1.22m in diameter, both stones having domed backs. The runner (top) stone is worn thin, being only 0.07m thick at the periphery. The millstone spindle, which together with the driving irons appears to be seized in place in the bedstone, is 0.065m square iron. Two metal discs that formed the top and bottom plates of the wooden stone nut (see Appendix 3) are all that remain of this gear.

The iron layshaft which was driven off the upstream side of the pitwheel appears relatively intact, although largely buried and obscured. The cast-iron bevel gear from which the drive was taken to the upstream millstones is partly visible. It has six T-section arms and approximately 80 inserted timber cogs, with timber wedges between the shanks to hold them in place. It drove a cast-iron stone nut, a small bevel pinion with 21 teeth, mounted on a 0.065m square iron spindle. The layshaft extends beyond the millstone position, and its outer end projects through the south-west wall of the mill. Inside this wall it carries a second cast-iron bevel gear with timber cogs, from which a 0.04m square vertical iron shaft was driven. This projects through the hurst floor, its head being at about eaves level, where it formerly carried a belt wheel or pulley.

The upstream millstones are precariously balanced on the remains of the hurst, but are in about their original working position. Only a short section of the softwood front beam (bressummer) survives, to which the vertical front bridge post is notched and bolted. This post is of oak, sparingly converted from a small tree, 0.21m wide by 0.12m thick. The bridge tree, which spans horizontally between the front and rear bridge posts, carries the foot bearing of the millstone spindle. It is 0.15m wide by 0.17m deep, with a central tenon at its outer end which projects through a long mortise in the front bridge post, and to which the tentering adjuster is fixed. This is a vertical iron screw with a captive spanner. Alteration of the tentering screw adjusts the elevation of the millstone spindle, and thus the gap between the millstones whilst working, to control the texture of what is being milled. The upstream millstones consist of a worn granite runner stone with a domed back and a bedstone which has been bound with a 0.15m deep iron hoop and has a decayed plaster backing. The face of this stone was not clearly visible, but it appears to be granite. The hoop and backing appear to have been added to a worn stone to increase its working life.

No remains of the millstone furniture noted by Alan Stoyel in 1988 were seen, but both of the wrought iron damsels are still in the mill, that to the downstream stones displaced in the debris under the stones and that to the upstream stones still in position.

Leaning against the south-east wall of the mill, just inside the doorway on the south-west side, is a domed-back granite runner millstone of about 1.1m in diameter. Its milling face is against the wall, but it is dressed for clockwise rotation and has chases cut in around the eye for a four-armed or stiff rynd, which suggests it is from an earlier configuration of machinery.



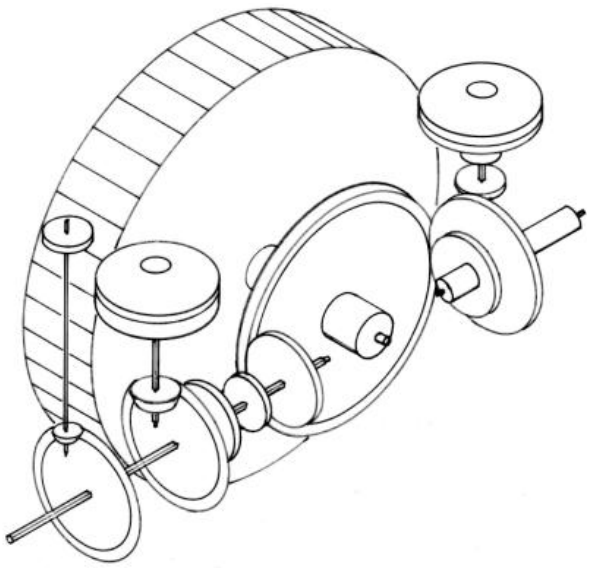


Figure 14: [left] Treble mill gearing layout: drive to a single pair of stones.
Figure 15: [right] Double layshaft drives to two pairs of millstones: diagrammatic reconstruction of the layout at Brynn Mill.

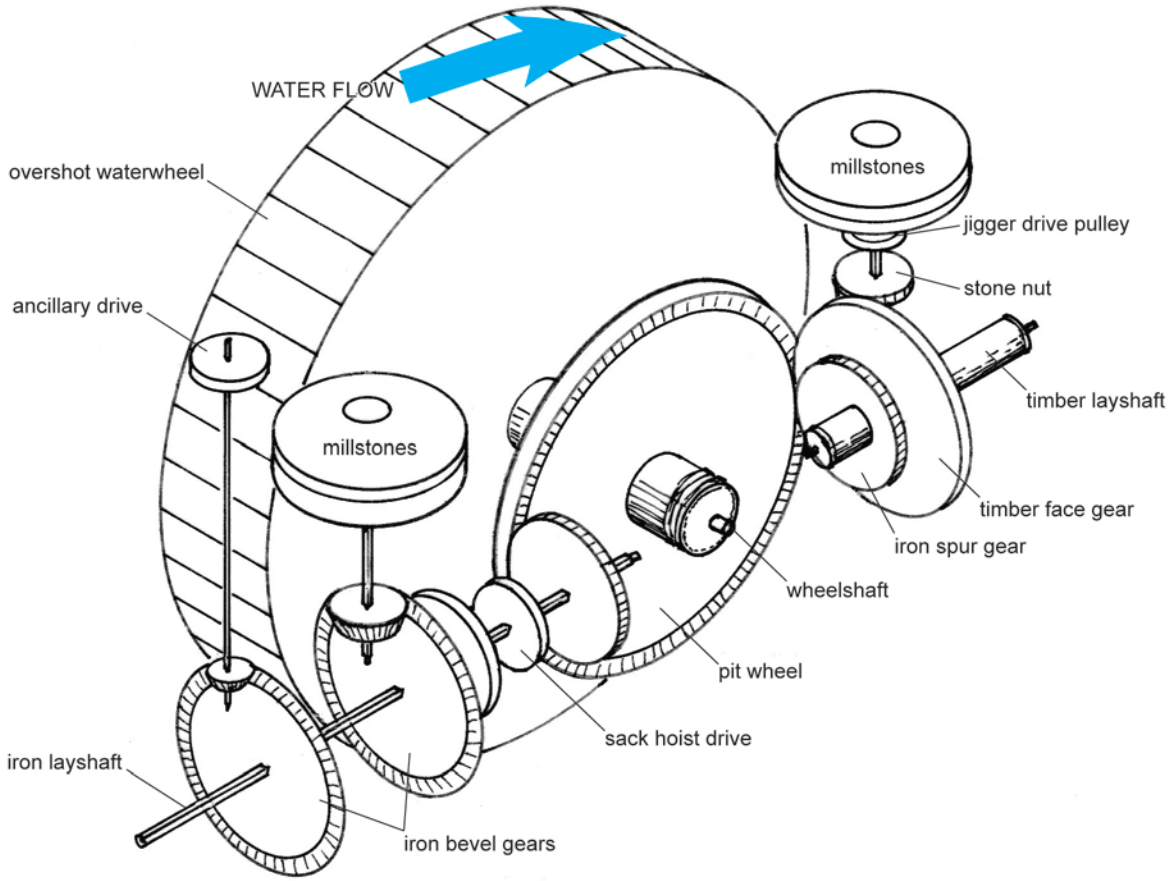


Figure 16: Reconstruction of the working parts of Brynn Mill, based on measurements taken in 1988 and surviving site evidence, with naming of parts.

3.3.4 The Cottage - Exterior

The south-west elevation is of random rubble stonework up to the first-floor window cill level and was formerly of cob above. The cob walling has mostly gone. There were two windows lighting ground floor rooms each side of a central doorway. The window frame on the north side of the door has gone, leaving an opening with some brickwork patching visible on its lower right side. The doorway retains a timber six-panelled door in its frame. The window to the south is modern and this area been repaired with concrete blockwork and a facing of brittle cement render, which extends around the window and over the face of the wall to eaves level. The window cills are made from roofing slates. The upper part of the wall at the south end is two skins of concrete block with a gap between.

On the south-west corner of this elevation is a curved stone projection which enclosed a cloam oven, the remains of which were visible where the stonework has broken away. This projection was roofed with mortared slates. The cement render extends from the south-west elevation around the south-east gable end. This wall stands to full height including a chimney stack; it is of rubble stone up to about 1.4m and cob and brick above, the cob having been faced in brickwork on the outside. It is likely that the bricks were made at the nearby Carbis brickworks. The north-east elevation stands to a height of about 1m, rising to about 2m at the south-east end. The foot of the wall is overgrown and buried under the debris which fills the internal ground floor of the cottage and no details could be seen. This elevation appears to have been mostly built of cob.

Figure 17: Remains of the hurst (left) and fallen millstones, from the west.

Figure 18: Remains of the hurst and upstream millstones.

3.3.5 The Cottage – Interior

Because of the amount of building rubble, debris and overgrowth filling the ground floor area of the cottage, no significant details of the interior could be determined or recorded. Plans made in the 1980s indicated a two-room layout, with ground-floor fireplaces at both ends and a central stair to the first floor. The chimney serving the fireplace at the north-west end had been removed and roofed over before 1988.

3.3.6 The Outbuildings

To the west of the mill and cottage are the overgrown remains of the rubble stone walls of some small outbuildings built into the slope. These were not closely investigated; they appear to have been ancillary buildings, probably for animals, forming an essential part of any smallholding. A photograph taken in 1988 shows some of these buildings in a more intact condition.

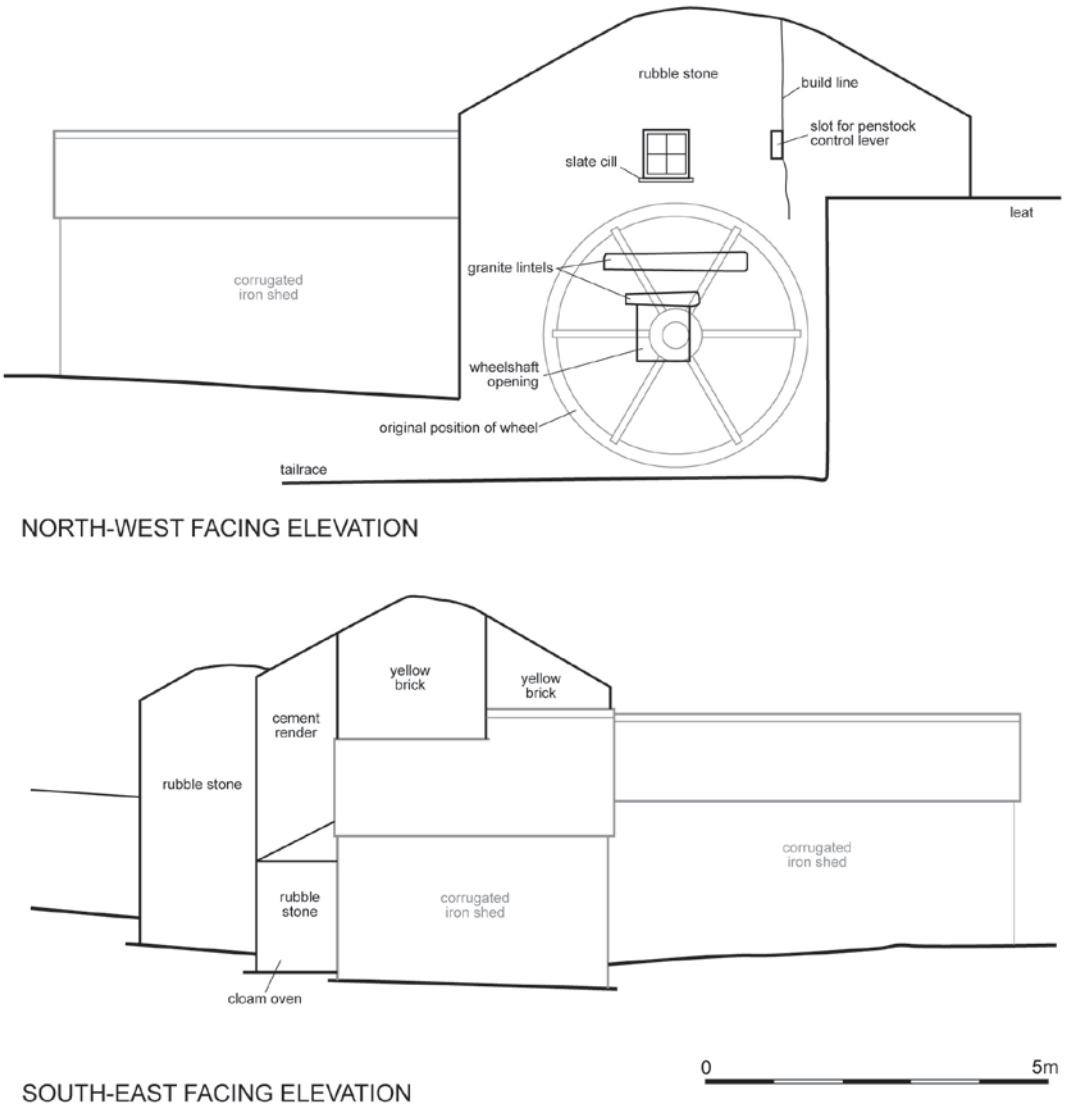


Figure 19: Elevation drawings, based on existing architect's plans.

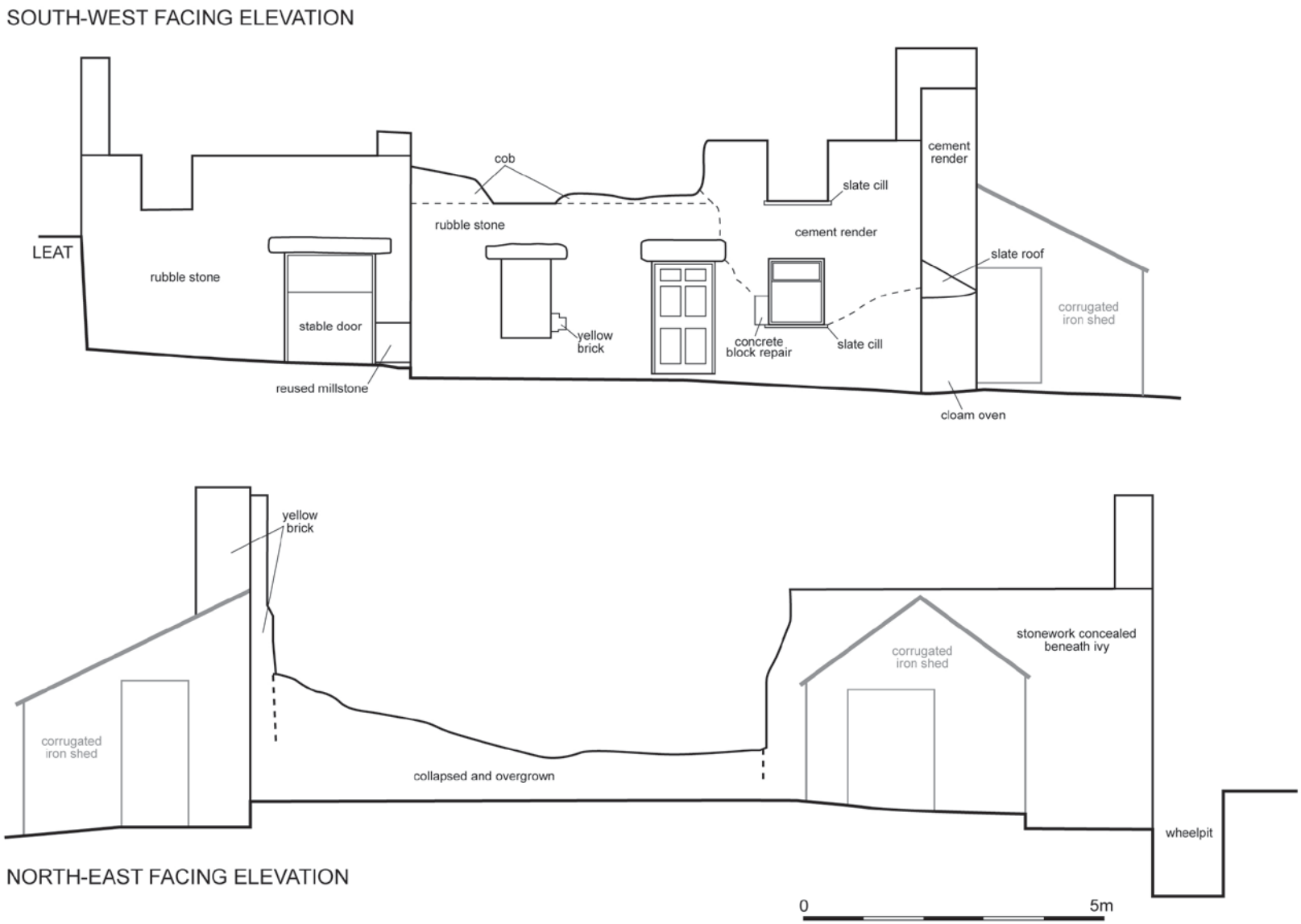


Figure 20: Elevation drawings, based on existing architect's plans.

4.0 Dating and Discussion

From its location and the somewhat elaborate arrangement of its water supply, it is considered that Brynn Mill is a post-medieval foundation, rather than having a medieval or manorial origin. There were several other watermills in the vicinity, so the mill at Brynn is likely to have been established for a local trade, serving the immediate agricultural community and perhaps the tin workers at the nearby streamworks and mine.

The mill was originally a small building, almost square on plan, with a ground-floor area occupying about 18m². Due to the lack of any obvious dating evidence, this phase should probably be dated to the 18th century. The original mechanical layout appears to have been an overshot wheel driving a single pair of millstones, either by direct drive from the pitwheel or more probably by treble gearing (see diagrams, above). This layout is well-documented and examples have been found in Cornwall and Devon which date from the post-medieval period (Watts 2002, 120-1; 135; Unwin calls this 'double gear', 1987, 47). It had an advantage over direct drive as it increased the relatively slow rotation of the waterwheel through two sets of gears, to drive the upper millstone at a higher speed and thus increase throughput. The small granite millstone leaning against the wall inside the mill may be a relic of this phase.

The original mill building appears to have predated the construction of the cottage which, considering the lack of clear dating evidence, probably occurred in the earlier 19th century.

At some time in mid/late 19th century the mill building was extended to the west and an additional layshaft and gearing installed. From present evidence, this would appear to be most likely when the present waterwheel was put in by Oatey & Co during the second half of the 19th century. The iron gearing is likely to be contemporary with this. The hurst bressummer would also have been replaced at this time, a longer timber being required to span the full length of the building. The sack hoist below the hurst floor and the secondary drives noted in 1988 are also considered to date from this phase.

With regard to the dating of the waterwheel and other iron machinery more precisely, William Oatey established an iron foundry at Wadebridge in *c*.1833. The earliest known waterwheels cast by him which have been found in Cornwall are signed W. OATEY WADEBRIDGE and dated to 1839 and 1840. This inscription and a similar one without the initial W is also found on waterwheels dated up to 1849. In Slater's *Directory of Cornwall* of 1852-3 W. Oatey & Sons are listed, although this name does not appear to have been used as an inscription on any of the waterwheels thusfar identified. The inscription OATEY & C^{o} has been recorded on several waterwheels, but these are undated. The name of the company was changed to Oatey & Martyn in October 1872 (Bodman 2009, 7) and William Oatey died in 1874. The foundry continued trading as Oatey & Martyn until 1958 and the premises were subsequently demolished. This evidence suggests that the Oatey & Co period may be bracketed between *c*.1850 and 1872 and that the waterwheel at Brynn Mill is therefore most likely to have been installed during the third quarter of the 19th century.

The millstones that remain in the mill are all of granite and those that were *in situ* in the final working phase are well used, the bedstone of the upstream pair having been hooped and backed with plaster to prolong its working life. Although there were several belt wheels or pulleys for taking power off to drive ancillary machinery, none but the sack hoist remained in the mill in 1988. A further feature noted then was the half loft floor on the upstream (west) side of the mill, where sacks of grain could be stored. This suggests a reasonably active trade in meal and flour and, perhaps latterly, animal feed. The mill appears to have continued in use until at least the start of World War I, Hart Hicks being recorded as water miller there in the county trade directory of 1914.

Figure 21: Phased ground floor plan, based on existing architect's plans, and showing a reconstruction of the mill machinery.

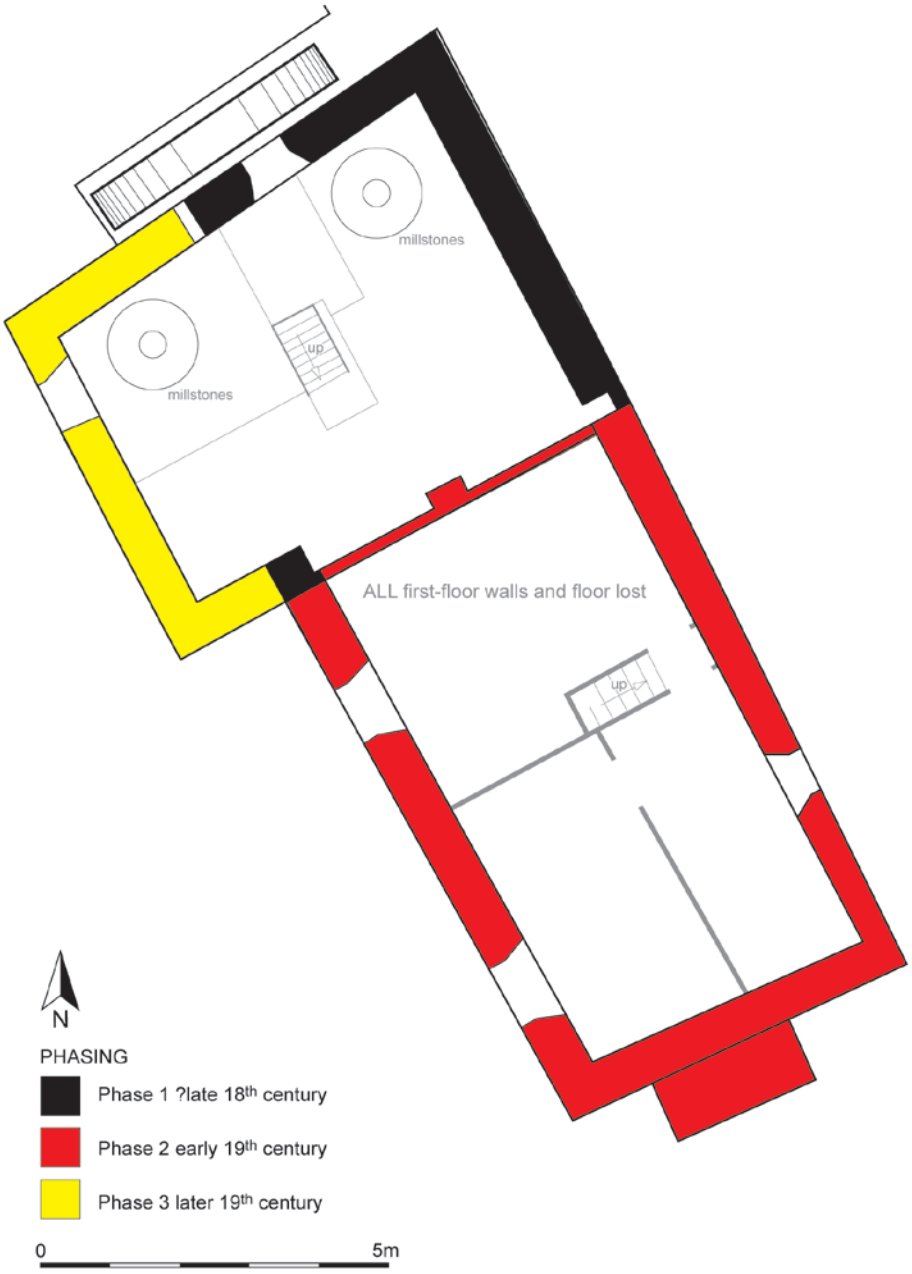


Figure 22: Phased first-floor plan, based on existing architect's plans.

5.0 Conclusion

The heritage value of Brynn Mill has been much diminished by the treatment of the site over the last 25 years or so, with the introduction of a number of large caravans and improvised shelters at the expense of maintaining the original buildings on the site. The loss of the roofs and upper floors of the mill and adjoining cottage has resulted in the almost complete reduction of these buildings to ground floor level. The walls of the mill still stand to eaves level and it would appear feasible to repair, rebuild and re-roof the mill and cottage to their earlier appearance. However, while many of the iron elements of the mill machinery are likely to have survived under the rubble and debris, it is considered that the remains of the working parts of Brynn Mill are now so decayed and fragmented as to be beyond any meaningful historical or economic restoration. The cast-iron shrouds and naves of the waterwheel are basically intact, however, and could be salvaged.

With regard to further recording, there are likely to be remains of ironwork, including gears, and perhaps some worked timber artefacts relating to the working parts and machinery beneath the rubble and debris at present covering much of the former hurst and cog pit areas within the mill. Careful clearance and setting aside of such artefacts is therefore considered important, to add to the record.

The weir and intake from the stream into the leat and pond system that fed the mill were not examined, but the upper section of the leat and the small pond to the west of the mill still retain water. There is therefore the possible potential of a usable water supply being reinstated for power generation purposes, although this would need to be assessed by a hydro-power specialist.

6.0 Bibliography & References

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APPENDIX 1
WRITTEN SCHEME OF INVESTIGATION FOR HISTORIC BUILDING RECORDING, BRYNN MILL, ROCHE, CORNWALL

Location: Brynn Mill, Roche, St. Austell, Cornwall, PL26 8NL
Parish: Roche
County: Cornwall
NGR: SW 98245 63322
Planning Application No: PA13/07736 and PA13/07737
Proposal: Restoration of Brynn Mill together with erection of a dwelling
Date: 28th March 2014

1.0 INTRODUCTION

1.1 This document forms a Written Scheme of Investigation (WSI) which has been produced by South West Archaeology Ltd (SWARCH) at the request of Peter Wonnacott (the Agent) on behalf of Kate Mabley (the Client). It sets out the methodology for historic building recording to be undertaken of the Listed Mill and adjacent house at Brynn Mill, Roche, and for related off-site analysis and reporting, prior to the restoration of the Mill and construction of a dwelling. The WSI and the schedule of work it proposes were drawn up in consultation with Dan Ratcliffe of Cornwall County Historic Environment Service (CCHES). This WSI covers only the building recording aspect of the work, any further monitoring and recording will be covered by a separate document.

1.2 Consent for the development has been granted conditional on a programme of archaeological work. The planning condition (No. 6) states that:

No development shall take place within the site until the applicant has secured and implemented a programme of archaeological work in accordance with a written scheme of investigation to be submitted by the applicant and approved in writing by the Local Planning Authority in consultation with the County Archaeologist.

Reason: In the interests of the historic environment in accordance with the provisions of the NPPF 2012, with particular reference to parts 7 and 12.

2.0 ARCHAEOLOGICAL & HISTORIC BACKGROUND

2.1 Brynn Mill was a corn mill that is 1st recorded on the 1st edition OS one inch map (1810-1813), then later on the c. 1840 tithe map and the c. 1880 1st and c.1907 2nd edition 1:2500 OS maps (below). In 1971 it was recorded as being complete with machinery.

The building was Grade II Listed in 1987 and is described as:

House with attached corn mill. Early C19 with few later alterations. House in granite rubble, with upper storey in cob, some brick; slurried slate roof with ridge coping tiles and gable ends, gable end stack to left removed, gable end to right rebuilt with external stack in brick. Rear slope of roof in corrugated asbestos. The mill is in granite rubble with slate roof, with ridge coping tiles and gable ends. Plan: the house is of 2-room plan, with central entrance kitchen to right heated by gable end stack and room to left also heated by gable end stack. The mill is attached to the left side, of 2 storeys and one-room plan, with loft at upper level. The leat runs towards the front of the mill, at right angles to it, and drives an overshot wheel, which remains in situ. House of 2 storeys, 2 window range, at first floor has two C19 2-light casements of 2 panes each light; at ground floor a blocked window to left and right, central 4- panelled door with pitched slate hood. The right side of the house has external brick stack and curved oven at the base to front. Single storey corrugated iron lean-to attached to right. The rear of the house has a single 9-pane light at ground floor to right and 9-pane sash under eaves to left. The mill is attached to the left side of the house, and has a higher roof level; it projects beyond the front of the house. Door with granite lintel to right and small window opening under eaves to left. The left side of the mill has the wheel pit, with cast iron wheel; the leat runs away from the mill to the rear. Rear of the mill has attached corrugated iron shed.

Interior: Not accessible at time of survey (July 1986) but is believed to contain the rest of the mill machinery.

The mill was powered by a waterwheel fed via a millrace from a small millpond to the west, a second larger millpond also exists further to the south. The mill races are still extant. The mill race from the large pond to the smaller pond crosses under the access lane immediately to the south of the smaller pond. This area is framed by several large mature oak trees. The mill race from the smaller pond fed an overshot waterwheel on the north side of the mill. The water then discharged back into a stream to the east of the site.

Behind the mill building and cottage a historic orchard survives. Between the mill and small millpond, to the south of the mill race there was an L-shaped range of outbuildings and small detached outbuilding, there was also a small pond fed by a spring. It is not known to what extent the remains of these features survive, this part of the site is rather obscured by vegetation, caravans and block structures.

The mill and cottage are roofless and overgrown, the rear wall has suffered the most loss. The front mill stable door survives and inside there are collapsed timbers and 2 granite mill stones. The front 6-panel door to the cottage survives and to the right of this a modern top hung window. All other windows have been lost. Some of the collapsed cob is probably inside and to the rear of the cottage. There are some very large slates hanging off the eaves of mill which could be rags, or could be the eaves courses of a former scantle slate roof. The waterwheel survives with few timbers surviving and is broken.

The mill and cottage with its mill races, ponds, orchard, oak trees and outbuildings would have comprised a very picturesque rural setting.

3.0 AIMS

3.1 To make a record of the historic buildings prior to the commencement of the restoration and construction works;

3.2 To analyse and report on the results of the project as appropriate.

4.0 PROGRAMME OF ARCHAEOLOGICAL WORKS

4.1 Desk-based appraisal:

The programme of work shall include a desk-based *appraisal* of the site to place the development area into its historic and archaeological context. This will include examination of cartographic sources; *Ordnance Survey maps and the Tithe Map(s) and Apportionments and information held by the Cornwall and Scilly Historic Environment record (HER), the Cornwall Records Office at Truro and the Cornwall Centre at Redruth as appropriate.*

This information will be presented as part of the final report along with the results of the fieldwork.

4.2 Historic building recording:

A record shall be made of the historic fabric of the buildings affected by the development. This work shall conform to an appropriate level (Level 3/4) of recording as set in Understanding Historic Buildings: A guide to good recording practice - English Heritage 2006 (available on-line at the English Heritage website). Previously prepared architect's plans will be used as the basis of any historic building fabric recording, provided they are of adequate scale and accuracy.

4.3 A photographic record of the historic buildings recording work will be prepared. This will include photographs illustrating the principal architectural features and any finds discovered, in detail and in context. The photographic record will also include working shots to illustrate more generally the nature of the archaeological operation mounted. All photographs of archaeological detail will feature an appropriately-sized scale. The drawn and written record will be on an appropriately archivable medium.

4.4 Health and Safety requirements will be observed at all times by any archaeological staff working on site, particularly when working with machinery. As a minimum: high-visibility jackets, safety helmets and protective footwear will be worn.

4.4.1 Appropriate PPE will be employed at all times.

4.4.2 The site archaeologist will undertake any site safety induction course provided by the Client.

5.0 REPORTING

5.1 A report will be produced, including the following elements:

5.1.1 A report number, date and the OASIS record number;

5.1.2 A copy of this WSI;

5.1.3 A summary of the project's background;

5.1.4 A description and illustration of the buildings location;

5.1.5 A methodology of the works undertaken;

5.1.6 Plans and reports of all documentary and other research undertaken;

5.1.7 A summary of the project's results;

5.1.8 An interpretation of the results in the appropriate context;

5.1.9 A summary of the contents of the project archive and its location (including summary catalogues of finds and samples);

5.1.10 A site location plan at an appropriate scale on an Ordnance Survey, or equivalent, base-map;

5.1.11 A plan showing the layout of the building subject to this programme of work in relation to identifiable landscape features and other buildings;

5.1.12 The results of the historic building recording that shall include a written description and analysis of the historic fabric of the building and associated mill machinery, appropriately;

5.1.13 Photographs showing the general site layout and exposed significant features of historic or architectural significance that are referred to in the text. All photographs will contain appropriate scales, the size of which will be noted in the illustration's caption;

5.1.14 A consideration of evidence within its wider context;

5.1.15 Any specialist assessment or analysis reports that where undertaken;

5.2 CCHES will receive the report within three months of completion of fieldwork, dependant on the provision of specialist reports, radiocarbon dating results etc, the production of which may exceed this period. If a substantial delay is anticipated then an interim report will be produced and a revised submission date for the final report agreed with the HES.

5.3 On completion of the final report, in addition to copies required by the Client, hard copies of the report shall be supplied to the HES on the understanding that one of these copies will be deposited for public reference in the HER. In addition to the hard copies of the report, one copy shall be provided to the County Historic Environment Service in digital format - in a format to be agreed in advance with the HES - on the understanding that it may in future be made available to researchers via a web-based version of the Historic Environment Record.

5.4 A copy of the report detailing the results of these investigations will be submitted to the OASIS (*Online AccesS to the Index of archaeological investigations*) database under reference southwes1-176019 within 6 months of completion of fieldwork.

6.0 PUBLICATION

Where the exposure of architectural or historic building fabric is limited or of little significance reporting will follow on directly from the field work - see section 5 above. Should particularly significant architectural, archaeological or palaeoenvironmental remains, finds and/or deposits be encountered, then these, because of their importance, are likely to merit wider publication in line with government planning guidance (paragraph 141 of the *National Planning Policy Framework* (2012). If such remains are encountered, the publication requirements – including any further analysis that may be necessary – will be confirmed with the HES.

7.0 MONITORING

7.1.1 SWARCH shall agree monitoring arrangements with the HES and give two weeks notice, unless a shorter period is agreed, of commencement of the fieldwork. Details will be agreed of any monitoring points where decisions on options within the programme are to be made.

7.1.2 Monitoring will continue until the deposition of the site archive and finds, and the satisfactory completion of an OASIS report - see 8.0 below.

7.1.3 SWARCH will notify the HES upon completion of the fieldwork stage of these works.

8.0 ARCHIVE

8.1 On completion of the project an ordered and integrated site archive will be prepared in accordance with section 9 of the Brief prepared by the Cornwall County Historic Environment Service and Management of Research Projects in the Historic Environment (MoRPHE) (http://www.english-heritage.org.uk/publications/morphe-project-managers-guide/). The digital element of the archive will be transferred to the Archaeology Data Service (ADS) for long-term curation.

8.2 The archive will consist of two elements, the digital archive and the material archive.

8.2.1 The digital archive, including digital copies of all relevant written and drawn records and photographs, will be deposited with the Archaeology Data Service (ADS) and in compliance with their standards and requirements.

8.2.2 The material archive, comprising the retained artefacts/samples and the hardcopy paper record (if requested) will be cleaned (or otherwise treated), ordered, recorded, packed and boxed in accordance with the deposition standards of the Royal Cornwall Museum (RCM)/Cornwall records Office, and in a timely fashion.

8.2.3 If the RCM wishes to retain the hardcopy paper archive, it will be deposited with the rest of the material archive under an accession number. Should the RCM decline the hardcopy paper archive, that archive will be offered to other appropriate museum bodies or the Devon Heritage Centre. If a suitable third party cannot be found, the hardcopy paper archive will be retained by SWARCH for 3 years and then destroyed.

8.3 SWARCH will, on behalf of the RCM, obtain a written agreement from the landowner to transfer title to all items in the material archive to the receiving museum.

8.4 If ownership of all or any of the finds is to remain with the landowner, provision and agreement must be made for the time-limited retention of the material and its full analysis and recording, by appropriate specialists.

8.5 SWARCH will notify the HES upon the completion of:
i) deposition of the digital archive with the ADS, and
ii) deposition of the material (finds) archive with the museum.

8.6 The condition placed upon this development will not be regarded as discharged until the report has been produced and submitted to the HES and the LPA, the site archive deposited and the OASIS form completed.

8.7 The archive will be completed within 6 months of the completion of the final report.

9.0 CONFLICT WITH OTHER CONDITIONS AND STATUTORY PROTECTED SPECIES

9.1 Even where groundworks are being undertaken under the direct control and supervision of SWARCH personnel, it remains the responsibility of the Client - in consultation with SWARCH, the applicant or agent - to ensure that the required archaeological works do not conflict with any other conditions that have been imposed upon the consent granted and should also consider any biodiversity issues as covered by the NERC Act 2006. In particular, such conflicts may arise where archaeological investigations/excavations have the potential to have an impact upon protected species and/or natural habitats e.g. SSSIs, National Nature Reserves, Special Protection Areas, Special Areas of Conservation, Ramsar sites, County Wildlife Sites etc.

10.0 PERSONNEL & MONITORING

10.1 The project will be managed by Colin Humphreys; the archaeological monitoring and building recording will be undertaken by SWARCH personnel with appropriate expertise and experience. Where necessary, appropriate specialist advice will be sought (see list of consultant specialists in Appendix 1 below).

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List of specialists

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Palaeoenvironmental/Organic

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Plant macro-fossils Julie Jones juliedjones@blueyonder.co.uk
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Pottery

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APPENDIX 2
Survey notes of Brynn Mill made by Alan Stoyel, April 1988

Waterwheel: Exterior overshot wheel. The buckets and sole-boards are all missing, as is the trough which fed the wheel. One shroud has a break in it. Overall size of waterwheel 12'0" × 2'5"; width between shrouds 2'4". Two sets of 6 wooden arms, 5⅛" wide × 2¾" radiating from circular cast-iron naves, *c*.30" diameter × 6½" wide. Overall width at naves 2'5½". Each cast-iron shroud is in 6 segments, joined by rectangular cast-iron plates, each of which is carrying a "6" inscription and is fixed with 4 bolts – round-headed on the outside, and with square nuts on the inside. Shroud is 8" wide, including sole-boards, and is inscribed "OATEY & Co. WADEBRIDGE". 42 wooden buckets, the bucket [outer board] of 1" timber; the riser was held by only one flange, so its timber thickness cannot be measured. Captive sole of 1" timber. Wooden wheelshaft has a cross-tailed gudgeon with a pintle of 2¾" diameter × 3" long, resting in an open brass bearing set in a stone block of 34" × 22" × 8+". The two gudgeon rings on the outer end of the wheelshaft are 14" diameter.

Pitwheel: Wooden compass-armed, contrate wheel,[1] approximately 6'0" diameter. The oak wheelshaft is octagonal, approximately 11½" across the flats. Mounted on the shaft is a cast-iron nave, 28" diameter × 8½" wide, carrying 6 radial wooden arms. The wheel has a width of 5½" and a face of c.7¼". Approximately 54 wooden cogs of 4" pitch, 3" face and 2¼" projection.

Downstream layshaft: Crudely circular, *c*.9" diameter, wooden. Driven from pitwheel by a cast-iron spur pinion, *c*.24" diameter × 4" wide, cast as unit with 4 arms. Mounted on shaft is a wooden, compass-armed, contrate wheel of approximately 54" diameter × 5" wide, with a 6" face. There are 4 arms. Cogs have 3½" pitch and 3" face. This wheel engages a wooden, spur-geared stone nut with iron plates, top and bottom; mounted on a 2½" square spindle. There are 12 cogs of 2" projection and 3¼" face. Each cog is held by a pin with a loop, for easy disengagement. The whole layshaft can be disengaged by sliding the upstream end so the pinion is not meshing with the pitwheel. Above the stone nut is a wooden beltwheel of 12" diameter × 4" wide plus a wooden flange at bottom. A vertical iron rod, c.⅞" square is on waterwheel side of, and slightly downstream from, the spindle and is belt-driven from the spindle. It carries a wooden belt pulley of 4¾" length × 4" diameter and, at the lower end, is a 4" throw produced by a crank – presumably to drive a jog scry[2] below the meal spout. Tentering[3] is by a captive square spanner onto a threaded rod above the end of the bridge-tree. Granite bedstone.

Upstream layshaft: A 3" square iron layshaft is driven off the upstream side of the pitwheel through a cast-iron spur pinion, 30" diameter × 4" wide, with 8 arms and 23 teeth of 4" pitch. The shaft extends through the upstream wall of the mill, emerging just above ground level. The next wheel on the shaft is a wooden beltwheel, 16" diameter × 7" wide. This drove the sackhoist, and the 2" belt is still in place. The sackhoist is tucked beneath the stone floor, inside the hurst. The windlass is wooden, 18" long × 4¼" diameter, with a wooden pulley of 13" diameter × 6½" wide at the downstream end. The next wheel on the shaft is a second wooden beltwheel, 29" diameter × 5" wide. The next is a cast-iron bevelled mortice wheel of approximately 4'3" overall diameter, cast as a unit, with 8 arms and a 4⅜" bevelled face. There are about 80 wooden cogs of 1¾" pitch and 3½" face, with wedged shanks. This mortice wheel engages a bevelled, cast-iron stone nut with 4 arms, of 13" overall diameter, with 3⅜" face and 21 teeth. The spindle is of wrought-iron, and it does not carry a beltwheel. The bedstone is ?French burr[4] with a wooden eye. The tentering arrangement is the same as for the other pair of stones. On the upstream side of the mortice wheel, between it and the upstream wall of the mill, is another bevelled cast-iron mortice wheel of 4'6" diameter, cast as a unit, with 6 arms. Approximately 84 wooden cogs of 2" pitch with wedged shanks. This engages a small cast-iron bevel pinion with 14 teeth on a 1½" square shaft running up to the stone floor close to the mill wall.

Stone floor: At the upstream end is the top of the light iron upright shaft, carrying a 4-armed wooden horizontal beltwheel, 26" diameter × 5" wide. Two octagonal wooden tuns are complete and in place, with wooden horses, hoppers and shoes. Nut-ended damsels.[5]

Loft: Half loft on upstream side of mill. No bins, but low vertical boards fixed along edges of loft with wooden roller along one edge – for ease of raising sacks of corn. All timber, including structural timbers and floorboards, appear to be of hand-sawn softwood – including the bressummer beam of the hurst frame. The bressummer beam, however, is a replacement, running the full length of the present mill.

[1] Contrate = unbevelled; in other words a right-angle gear drive.
[2] A jog scry is a reciprocating sieve used to remove coarse parts from the meal produced by the millstones; sometimes referred to as a jigger in Cornwall (Unwin 2002).
[3] Tentering is the action of raising/lowering the upper millstone whilst working, to alter and control the texture of what is being milled.
[4] The bedstone appears to be granite, backed with plaster to prolong its working life - see main text.
[5] Damsels are metal raps for feeding grain evenly into the millstones.

APPENDIX 3
Additional Jpegs

South-west elevation of the Mill in 1988.

South-west elevation of Mill in 2014.

Detail of the doorway into the Mill.

Detail of the possible re-used millstone used as a quoin.

Leat embankment, with front of Mill to right.

North-west corner of the Mill, upper part of pit wall, with granite trough in foreground.

Detail of the granite trough leading to the (vanished) timber launder.

[left] The wheelpit, from above.
[right] The wheel in relation to the window and lever slot used to control the flow of water over the wheel.

North-west gable end of Mill, wheelpit and waterwheel.

Waterwheel shrouds showing maker's name inscription.

Detail of the opening and shaft through the wall into the Mill.

As above, detail of the cast-iron nave and spoke sockets.

The waterwheel and wheelpit, viewed from the tailrace.

The north-east (rear) elevation of the Mill.

North-east doorway into Mill, from inside the adjoining corrugated iron shed.

Interior face of the north-west elevation of the Mill.

As above, showing the *in situ* upstream millstones.

As above, showing the brick reveals to the first-floor window.

Remains of the hurst and upstream millstones.

Remains of the hurst, showing the collapsed downstream millstones.

The top of the surviving hurst.

The four-light window in the gable wall of the Mill.

Detail of the internal face of the south-east elevation, showing the doorway.

Detail of tentering control and front bridge post.

Drive to upstream millstones.

Granite millstone against south-east wall, Mill ground floor

Wrought iron damsel, from downstream millstones

The (now collapsed) partition between the Mill and the Cottage, viewed from the south-east. Note the Cottage walls abut the Mill, and the probable presence of a door between the two at first-floor level.

The collapsed wall between the Mill and the Cottage, viewed from the south-east.

South-west elevation of Cottage.

[left] Cloam oven extension, south-western corner of the Cottage.
[right] Inside the corrugated iron shed adjacent.

View from south-east, showing the lean-to shed and free-standing concrete block privy.

The collapsed north-east (rear) wall of the Cottage.

South-eastern gable end of the Cottage, interior view.

Detail of the front door of the Cottage.

Leat, looking east from slope towards hedgebank.

Mill pond to west of mill, looking south-east

Tailrace (right) rejoining stream below mill

The out-buildings in 1988.

The remains of the outbuildings in 2014.

One of the collapsed outbuildings, from the south.

Caravans to south of mill and cottage.

Site from west, with caravans and shelter.

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