

### 3 Coulton Building Characterisation and Analysis



The buildings upon the site of Coulton Mill/Coulton Farm are all of stone, with the exception of a 20thC lean-to of London Brick at the S end of the range of stone stables and barns upon the E of the site. The two-storey cattle byre to the N of the site is of stone, with a later, external brick stair at its S end and brick dressings to quoins and openings, as well as to the eaves course that faces-up the wall-plate. There is a dove-loft opening also primarily of brick. This is possibly the most recently constructed building on the site, the brick lean-to excluded.

All masonry walls are of traditional, solid wall construction.

Except for the lower S wall of the mill-house which abuts the wheel and the tailrace, and the walls of the mill-house above, which are of a mixture of a higher quality and higher bed, hammer-dressed and coursed calcareous sandstone and cornbrash, all of the buildings on the site are constructed of immediately local, undressed cornbrash limestone from the Oxford Corallian series. This is slatty and generally low in the bed with typical angled facing, of a dark honey hue and which creates, in mass

walling, a rich visual texture. Generally, the quoins of the building are formed of the same and reflect the general coursing.

The ashlar blocks of the lower S wall of the mill-house, as well as some of the hammer-dressed rubble of the upper gable and front wall of this are not so immediately local. They are mainly of calcareous sandstone, which may have been sourced in Hovingham, Ampleforth (Wass Bank) or in Appleton-le-Street. Some may be of Hildenley limestone, which is found only in Hildenley itself, between Coneysthorpe and Malton, and which was used almost exclusively by Malton and Kirkham Priors upon their own buildings and upon parish churches within their orbit before the Dissolution and almost as exclusively by the Strickland family, who purchased the quarries, along with Hildenley itself in 1545. Malton Priory owned one bovate of land in Coulton from at least 1285, and probably from the time of their foundation around 1150, so that the presence of probably recycled Hildenley limestone in Coulton should be no surprise.



*high status ashlar of lower mill-house wall (left), much frost-damaged. Higher status sandstone to right of doorway of mill-house (below).*



The general walling stone of the built environment at Coulton Mill will have been sourced within Coulton itself and the 1856 OS Map shows limestone quarries NNW of the Mill in Coulton, as well as three due E of the site in Scackleton, the other side of Soulby Wood. At one of these there is a limekiln, a likely source for quicklime used in both earth and lime mortars of construction to be found within the buildings here.

The stone of inner and outer wythes of the walls is the same, except in the case of the millhouse, where the outer wythe is of hammer dressed ashlar, the inner of coursed slatty rubble. The former is a source of strength, leading to very similar behaviour throughout the wall and to each side of it.

This, and the multiple crossings of thin stones within the wall, has allowed the walls of particularly the single storey outbuildings to lean without undue misadventure at this time.



*the millhouse*

The stonework of the mill-house might be reasonably said to be of higher status and specification than that of most other buildings on the site – the local stone has been more carefully dressed and squared along with the stone that has been brought from further afield, and is of slightly greater bed-height than typically. This may be seen as a response not only to the importance of the mill-workings themselves, but to the regular vibration that will have been ever-present during their operation. This stonework was limewashed without, as may be seen in remnants of the same upon the building and is evidenced by photographs from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries (see below), and lime plastered and limewashed within.

The house itself, by contrast, appears in the same photographs as lime rendered and remains so today, with the same render as may be seen upon the photographs. A thick one-coat of lime plaster has been dashed with larger aggregate, though one would hesitate to characterise it as ‘pebble-dash’. This render has detached in places, to the rear elevation and to the S end. It has almost entirely disappeared from the NE elevation, though clearly this, too, was lime rendered in the past. It may be reasonably assumed that the house was always so rendered, and that this was the expectation and intention of its builders, so that the use of slatty local stone was seen as no compromise in the perception of its status. The mill house seems never to have been lime-rendered, only limewashed. The lime render to the front elevation may conceal evidence of evolution and extension of a smaller, older core building immediately adjacent to the mill-house. Such evidence would not be evident to the rear elevation since the rear extension of the house will have been likely contemporary with any lateral (and perhaps vertical) extension of the earlier dwelling on the site.

The bedding mortars of the buildings are variously of earth or of lime and sand. The sand is fine, indeed ‘soft’ and may be found heaped outside of badger setts within both Soulby and Mill Wood, at around the contour below which most of the multitude of springs burst out. The sand is of a pale orange hue, and this has lent similar to the lime pointing mortars of the buildings, where these survive, in combination with the locally-made lime, which may be anticipated to have had a creamy hue itself, given the colour (and iron content) of the local stone. Until recent repairs to the single

storey cow shed and loose-boxes, all lime used upon the site will have been of immediately local manufacture, there having been lime kilns associated with most nearby quarries, particularly in Scackleton township.

In the case of the single storey stables and cow-shed across the road from the house, the first two bays, looking N have earth mortars; the last bay has a coarse lime mortar with significant lump lime inclusions. The two-storey cow-byre would seem to have both, as well as an earth and lime mortar. Where the bedding mortar of the mill-house may be seen – to its interior back wall, which may be anticipated to be older than its other walls, perhaps – it is of earth. All of these buildings, whether their bedding mortars were of earth, of lime and sand, or of combinations of all three ingredients, were pointed with lime mortar, with a little animal hair included. On an earth built masonry wall, this tended to be laid over the bedding mortar whilst this was almost full, as struck during construction, and the closeness of the earth mortar to the face of the walls where the lime has eroded or fallen away would suggest that this was the pattern at Coulton also.

The remnant walls of the pig-sties and of the former forge between these and the lost wheelhouse which adjoined the mill-house at the end of the 19thC have an earth mortar which has washed out due to long exposure to rainfall, though the earth mortars used in the past are generally resilient to the weather when exposed on a well-maintained – and still-roofed - building. The visible mortars within the stub walls of the former coach or cart-shed above the house are also of earth, with some quicklime inclusion, though this building, like the two-storey cow-byre, may be considered to be of mid-19thC construction and is certainly shown – as are all extant buildings on the site, bar the brick lean-to, upon the 1891 OS map of Coulton. A small, square building upon the beck and to the E of the two-storey cow-byre has been lost. It may, from the plan, be reasonable to interpret this as having been a dove-cot, and perhaps, therefore, one of the oldest buildings on the site. Another building, between this and the N-most loose box has also disappeared, though it does not appear itself until the early 20thC, being shown first on the 1911 OS map. It will have made access to the end pitching door difficult, with only a small gap between the stone buildings. The two-storey cow-byre had another building at its N end in the past, the shadow of which – as well as the seatings of its gable-roof timbers – may be seen upon the wall.

The two-storey cow-byre faced onto and abutted a dry-stone walled fold yard, within which there was the probable dove-cot, and which was bounded on its lower side by the beck. This fold yard is divided by a fence now and by ownership, but its further boundary is marked by an overgrown hedge-line. The footings and first 12” of the stone wall remain.



*dry-stone wall of the former 'fold-yard'.*

The use of earth bedding mortars – as well as of earth plasters – was almost universal in North East Yorkshire until well into the 18thC – in more rural areas, although not for want of lime, this pattern might extend into the 19thC for farm buildings. It was never a response to an absence of limestone or a scarcity of lime, since most of the buildings in this area are constructed of limestone and most are within ready reach of lime quarries and associated lime kilns. It was a craft tradition based upon the availability, suitability and fitness for purpose of these materials, which were typically sourced in the immediate locality of the build. Buildings were invariably pointed with haired lime at the time of construction and earth (or hot-mixed earth and quicklime) plasters were always finished with a typically 4mm thick finish coat rich in both lime and ox-hair.

*Remnant pig-sties (below) forge and S wall of mill wheel building (right).*





*Pig-sties built perhaps during the 19thC against the much older retaining wall of the head-race, which may – along with the mill-dam itself and the lower levels of the mill-house – be among the earliest (and very early) structures on the site.*

*Earth and quicklime mortar, upper cart-shed wall, built in the second half of the 19thC*



Generally, none of the buildings on this site have been more than locally repointed with damaging, incompatible and inappropriate ordinary Portland cement mortars. Here and there – on the mill-house and the house itself, as well as on sections of the single storey cow-shed – there has been patch-pointing with this as well as some introduction of opc renders, particularly to the mill-side gable of the house. Some heavy-handed repairs to the back wall of the single storey cow-shed have been executed in opc mortared concrete block, but this is the exception, not the rule. There has been some rebuilding of late at the N end of the single storey cow-shed and stables. This used lime but was not executed by a stonemason with sympathy for his stone, it is rather higgledy-piggledy and only randomly presents the proper face of the individual stones to the air, creating the effect of exposed wall-core rather than finished wall face. It has failed to follow the original (and existing) wall-line, particularly within the middle stable, where the inner wythe of stonework has been rebuilt well within the line of the original stonework above, necessitating the removal of the inner lintel, it having lost the wall on which it should have borne, and leaving the masonry above, which it had previously supported, floating in mid-air. This is dangerous as well as incompetent.



*north and south walls of the cow byre*









*lime 'sheeted' roof of cow byre*



*Land-drain ventilation detail, cow byre*



*W wall of cow-shed*



*N wall of same*

The building over the mill wheel reflected that over the mill workings in form and elevation, but was a later addition. Both were limewashed, as shown in later 19thC photographs. That the wheel-house was an addition is demonstrated by George Nicholson's 1823 drawing of the mill, which shows the mill-wheel to be exterior at this time.



*remnant limewash, mill-house*



*Nicholson 1823 (Endemol, York City Art Gallery).*



*A different angle on the same, showing the single storey cow shed beyond. This should not be taken as evidence that the pig-sties did not exist at this time (though quite possibly they did not), since Nicholson has clearly removed the lower revetment of the head-race in an exercise of artistic licence to provide a perspective of the mill wheel which would not otherwise be seen. (image, Nick Burrows, York City Art Gallery).*

The same suggests that parts of the mill-house may have been of partly of timber at this time, or, at least, to have a shutter-boarded gable, as well as a thatched roof. There is also a window or pitching door in the gable wall, evidence for which is lacking in the current structure, though the front elevation openings are exactly as today. The current pitching doorway is to the left of the centrally aligned window or pitching window as illustrated by Nicholson, and this may, of course, be what he shows, but shifted slightly upon the paper. The drawing also confirms that the clasp arm wheel with unusual 'Star of David' framing did not exist in 1823, the wheel illustrated being of more normal pattern, with regular and radiating 'spokes' around a circular hub.



*Circa 1910, a  
waggon loaded  
with flour sacks  
leaving the mill ;*



*this image a little  
later (the climber  
having progressed  
higher up the  
house wall), with a  
large flock of  
chickens which will  
have roosted  
above the cow-  
byre.*



*lime pointing, cow byre*

The internal walls of all of the surviving buildings on the site would seem to have been lime plastered originally, though within the hay/chicken loft of the two-storey cow-byre this treatment may have extended no higher than the level of the eave upon either gable wall, a pattern not untypical in other hay-lofts locally. Some of this lime plaster survives. It is rich in lime, and tends to white because of this. Except in the mill-house, this would seem to have been a one-coat treatment.



*lime plaster (with pencil lists) mill-house*

Lime mortars for pointing and plastering historically were typically much richer in lime than those that tend to be specified today. They were almost universally 'hot-mixed' using quicklime, this being added directly to the sand, so that slaking occurred in contact with this sand. Quicklime expands in volume by up to 2.2 times, depending upon its purity (which in turn depends upon the temperature

at which it is fired, though a consistent burn of at least 875 degrees centigrade is essential for its conversion at all), so that a mix of 1 part quicklime to 3 parts sand or earth would deliver an approximate final proportion of 2:3, and this is fairly typical in historic mortars. Modern lime mortars tend to be specified at 1:3, or, increasingly, at 1: 2.5, but these are very often made using natural hydraulic limes which deliver mortars which are typically stronger, harder and more brittle than historic mortars, locally made the hydraulic potential of which was feeble at best and less than even the 'weakest' of NHLs commercially available today. The lime mortars used at Coulton Mill were soft and were hot-mixed, it may be said with absolute certainty. Notably, in this context, the base coat plaster upon the ceiling within the attic of the house – storage space associated primarily with the mill itself – is unusually lean in lime and much more akin to lime plasters being applied after WWII. This plaster has fallen away from the lath in many places and is structurally very weak. It may indicate a 20thC refurbishment of both the roof and the interior of this space.

The floor of the brick lean-to and adjacent cow-byre (most recently a milking shed, with 20thC pre-cast concrete partitions) is of concrete, whilst the middle bay loose box is currently a mass of composted horse dung and straw bedding to a depth of up to 30". The most recent, end bay of the two-storey cow-byre has a stone cobbled floor, more or less at current exterior ground level, as does the ground floor of the two-storey cow-byre, with drainage channel at the rear of the cow-stalls, parts of two of which survive, one larger, one smaller, a sub-partition of wider, two-cow stalls. These are of softwood and of simple plank and rail construction. A joinery hay-rack runs the length of this bay. The front windows are wide, with limewashed brick reveals that offer no hint of what joinery window frame may have been within – suggesting, indeed, that there were none. To the back wall of the cow-byre, as to the end wall of the smaller loose box, ventilation was provided by the building in of circular section land-drains, in threes, forming a triangle.

The roofs of the outbuildings are all of pantile, which will once more be of relatively local manufacture. There were brick and tile works in Yearsley and Oulston, part of the Newburgh Estate in the 18<sup>th</sup> and 19<sup>th</sup> centuries and will have been others nearby. The 'pantile' of the E slope of the millhouse roof is of much more modern manufacture than that elsewhere. The roof of the brick lean-to, as well as of one side of the millhouse is of corrugated asbestos sheet. The house itself is roofed with Welsh slate, which began to be used locally after the arrival of the railway during the mid-nineteenth century. The listing suggests that the house itself has been raised somewhat and this may be so, the pitch of the roof being relatively shallow. The earlier eave would likely have been only a little above the tops of the 'flat-arch' window lintels. The raising, if not the Welsh slates, may be associated with the need to create more storage space within the attic of the house and/or, perhaps, with the need for more accommodation for staff when the farm acreage was increased to 150 acres. If the latter, then Welsh slate might have been the first roof-covering thereafter and their use have facilitated the lowering of the roof pitch.



*back, cat-slide roof of the house, some remnants of opc render*



The roof of the mill-house and perhaps of the house before its raising would quite likely have been thatch in the past, which remained common locally until well into the 19thC, although pantile was by then becoming dominant. The blue millstone that has been incorporated into the upper level of the mill-house at its SW corner may indicate the raising of this building somewhat and the reduction of its pitch at the time that thatch was removed and pantiles installed. Pantiles began to displace thatch in Malton during the early years of the 18thC but many houses in Thornton Dale, for example,



remained thatched at the time of a survey in 1808 carried out by the lords of the manor, the Dean and Canons of St George's Chapel, Windsor Castle. Pantile will have been the first and original roof-cover of all of the 19thC buildings on the site, including of the two-storey cow-byre. Nicholson's drawing of the mill-house and wheel from above appears to show the former to have been thatched, but seems to show slates upon the house roof. These will not be the Welsh slates currently installed – Nicholson was here in 1823, some time before the arrival of the railway. In the earlier 19thC in Malton, Westmorland slates were not uncommon, being carried upon the Derwent Navigation, though the journey from Malton by road would have been expensive. It is possible that the slates were Brandsby Slate – a calcareous sandstone roofing slate sourced locally and which was common in the area as early as the medieval period, though these were fairly thick. Whether Westmorland or Brandsby slate, such a roof covering in the early 19thC would indicate high status, as well as a mill that was generating significant surplus income during the 18thC. The single storey cow-house and stables – or, at least, its earlier phases, may well have been thatched over a much steeper earlier roof, the current pantile roof being probably contemporary with the more recent – and probably mid-19thC king-post trusses and it is possible that Nicholson's second image shows such a roof on the buildings across the road. There is no sheet-lath within this building and likely never was to maximise ventilation, though it is not unusual locally for the pantile roofs of cow sheds to be lath and sheeted on the colder side of the roof, and left without such cover on the warmer side.

The pig-sties and adjoining forge appear as pantiled in late 19thC photographs, though these, too were likely thatched in earlier times and the pig-houses, at the rear of each bay (with yard in front) will almost certainly have been sheeted with lime over lath beneath the pantiles, to reduce draught. Their roof line, which may be seen in several photographs, as well as in the angle of several of the surviving side walls, will have terminated only some 36" from ground level and have had no wall to the front of the roofed shelters, though there may have been joinery front walls.

The pantile roof of the two-storey cow-byre is underlaid with riven lath nailed to the rafters and which was overlaid with a single coat of haired lime plaster, upon which the pantiles would have been bedded immediately. This was known locally as 'sheeting'; the lath as 'sheet lath'. It provided draught-proofing, some insulation and some defence against localised leaks in the pantile cover. The water from small leaks would be absorbed into the lime mortar during rainfall and evaporate away when this ceased. It was typical in particularly single storey animal sheds for the sheeting to be upon the cold side of the roof only, and this pattern is evident in the milking shed, though the roofs of the adjoining loose boxes were fully sheeted in the past, as is common within stables. This pattern of roofing was not limited to animal sheds, it must be stressed and was the norm upon domestic buildings also. It has been largely displaced by the expedient use of bitumen roofing felt (after WWII) and more recently by 'breathable' roofing felt of probably dubious chemical composition and longevity. A sheeted roof was, of course, eminently breathable and long-lasting. It is also of some cultural significance, especially in the context of its accelerating loss during contemporary re-roofing works generally. The under-side of the mill-house roof is lined with bitumen felt, but will have been sheeted in the traditional manner previously.

The joinery of the site is of either oak or of softwood, which latter is predominantly, if not entirely, of larch. Both timbers will have been locally sourced, and those of the later buildings, or for replacement of elements of any of the buildings will also have been converted on site. Thomas Harrison ran a saw-mill, powered by the mill, during the later 19thC and he may not have been the

first farmer at Coulton to do so. The wood across the road, which climbs Scackleton Bank is called Mill Wood and this may denote ownership as well as proximity. The millwheel and the lay-shaft and wheels of the mill itself are all of oak, as may be expected. The shafts are of considerable dimension and would – as would some elements of the wheel itself – have of necessity been made from oak trees of considerable size and age, and of dimensions rare in any age other than the early medieval period. Less structural, and more recently renewed elements of the mill, such as those of the hurst and of the storage floor above are of larch, as are the floorboards, and larch is the primary material of all of the roofs on site. Currently iron cogs within the mill will have replaced earlier ones of oak or even, perhaps, of yew. There are both square and round fixing holes upon the wheels themselves.

Windows and door-frames, as well as most lintels over door and window openings are of oak and of pegged mortice and tenon construction. The first floor windows of the cow-byre are slatted, a detail more commonly encountered at groundfloor level and serving stables, suggesting that the loft was primarily intended for use as a chicken-loft. Plank doors and shutters upon the site are typically of softwood, probably larch.

The single storey cow-shed and stables has 3 king-post trusses of relatively slender section softwood, and one of more 'rustic' construction within the most recently added bay. The king-post trusses are of relatively humble design. The more slender, sawn king-post trusses are very likely to be more recent replacements, dating probably from the mid to late 19thC. They may have been converted on site by Thomas Harrison himself, and he may well have framed them also.

This cow-shed may have originally been made for horses, or even oxen, before becoming a cow-shed in the 19<sup>th</sup> and 20<sup>th</sup> centuries. These may be among the older farm buildings on the site, though the earliest map – of 1856 – is not sufficiently detailed to allow certainty in this area.

The trusses within the two-storey cow byre are also of larch, with some bark remaining in situ, and are simple collared trusses with two sets of tusk-tenon purlins to each slope of each bay. There are two trusses within the first bay, then a stone cross wall, beyond which the second bay has a simple purlin and rafter roof over.

The structure of the mill-house is a simple purlin roof, using modern sawn softwood. The back slope is covered with corrugated asbestos, the front with clay tile over bitumen felt. Above the mill hurst, and beneath this modern roof there is a remnant truss framed to horizontal timbers which are bedded into the end wall, as if purlins, which they likely were. This is a remnant of the earlier roof structure; it probably doubled up as a sack-hoist, hence its survival during re-roofing and is closer to the gable wall than might be expected for this same reason. It is in a poor condition, and is sagging, dragging the purlins downwards, though they remain seated in the wall. The upper levels of its major rafters were sawn off during re-roofing, as were their ends, suggesting strongly that the height of the wall was also raised somewhat at this time.



The first floor of the two-storey cow-byre is of sawn larch boards over larch joists and with two lateral beams of the same material. The joists at the N end pass through the stone cross wall and project within the smaller end bay, carrying a beam at right-angles which in turn carries the joists of the first floor of this space, another chicken loft in which roosting poles survive. A similar beam carries the other end of the joists of this floor, so that none of the joist ends of this floor are embedded in the masonry walls. They have decayed only beneath long-standing leaks in the roof.

Over the two loose boxes across the road, there were first floors in the past, part of one of which survives. The joists were bedded in masonry walls at one end and seated upon the top of the earlier external wall between the two loose boxes which has had its gable taken down above eaves level, its supporting role of the roof taken now by the simple king-post truss. The joists are of halved larch poles, left in the round and probably harvested before any heartwood had developed. They have proved highly appetising to boring insects, therefore, and are – or have been – riddled with worm, as have been the sawn larch boards which survive. These floors will have been hay-lofts and two pitching doors, one of them into the bigger (and older) cow-shed, survive, though the latter has been bricked up.



*the cart-shed, then garage, opposite the mill house, circa 1936-8; Thomas Harrison, son of John Thomas, last miller at Coulton and who last repaired the mill wheel. The same below as it is today.*



All iron door furniture, such as strap hinges, pintles and latches, on the site is blacksmith made and hand-forged, and includes an exquisite knocker to the mill-house door. Some, at least, may have been fashioned on site.



Original rainwater goods are of cast iron, but gutters are typically supported by modern adjustable gutter brackets.



Joinery Figures



*roof of the cow byre during emergency repair*







*truss over single storey loose-boxes*



*simple king-post trusses, single storey cow-shed*

The Mill:



*stone wall of the head-race as it turns to feed the pentrough (left) and tail-race (below).*



*beginning of the 'myll bridge' under the road. This is of some age, and existed when the beck was forded and at least as early as 1604 when Davyll was fined for not maintaining the flow of water beneath it*



*to the roadside of the arch, flat slabs of local cornbrash which formed a 'bridge' and the level of which probably indicate an earlier ground level.*



*the trough and wheel, with remnant penstock at left of picture*



*part of the mill dam. The buttress of this is battered, not leaning; the retaining wall of the tail-race is at left and returned along the line of the back wall of the pig-sheds and forge, they being part of the same retaining wall.*



*junction of mill-dam and forge walls (below),  
the former returning S as part of the rear wall  
the pig sties (left).*



*of*



*trough and plank penstock*



*door into attic of house from within millhouse*



*ladder  
to the above. This doorway and the one within the two-bay attic  
are wide, indicating their storage purpose*



*blocked windows, N end*

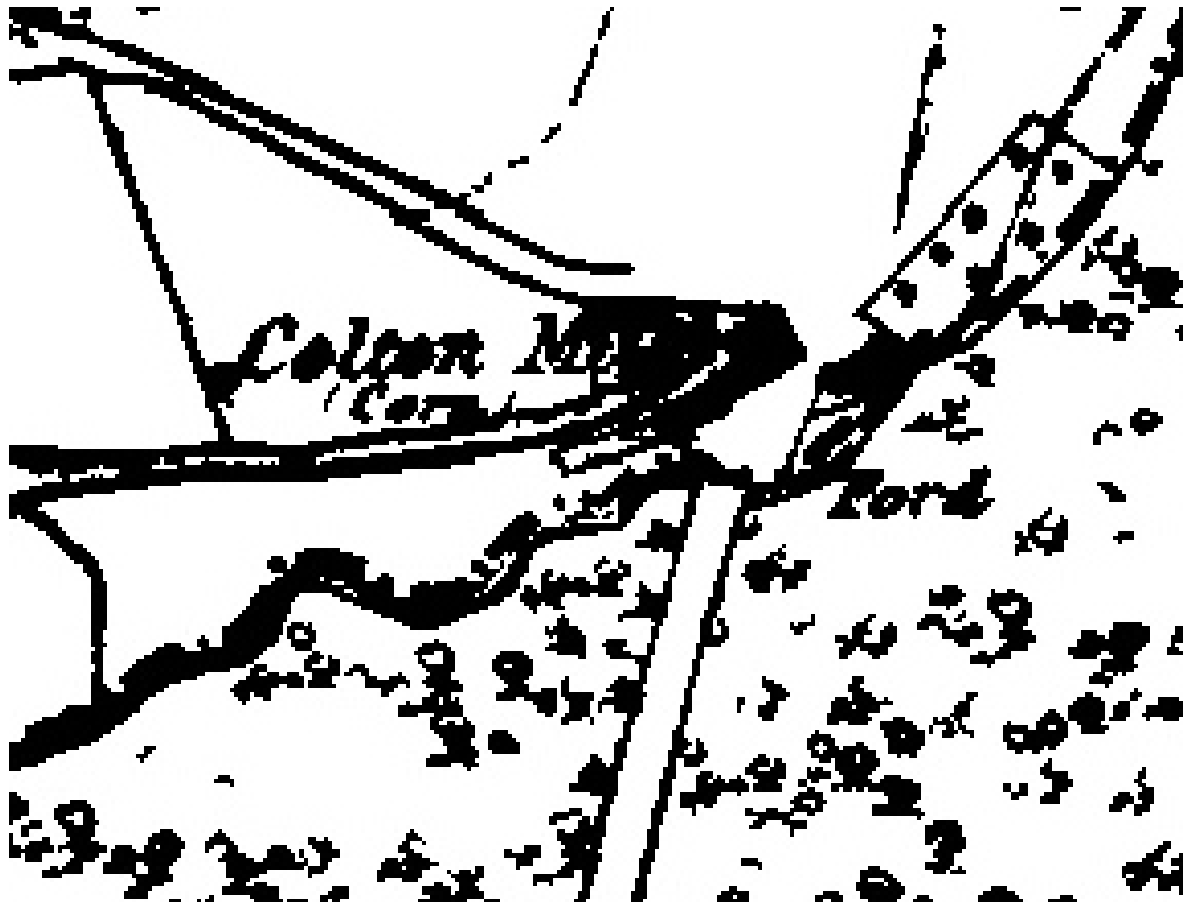


*one of double doors between house and mill-house attics*

Map evidence for the evolution of the site of Coulton Mill and associated farm is relatively sparse.

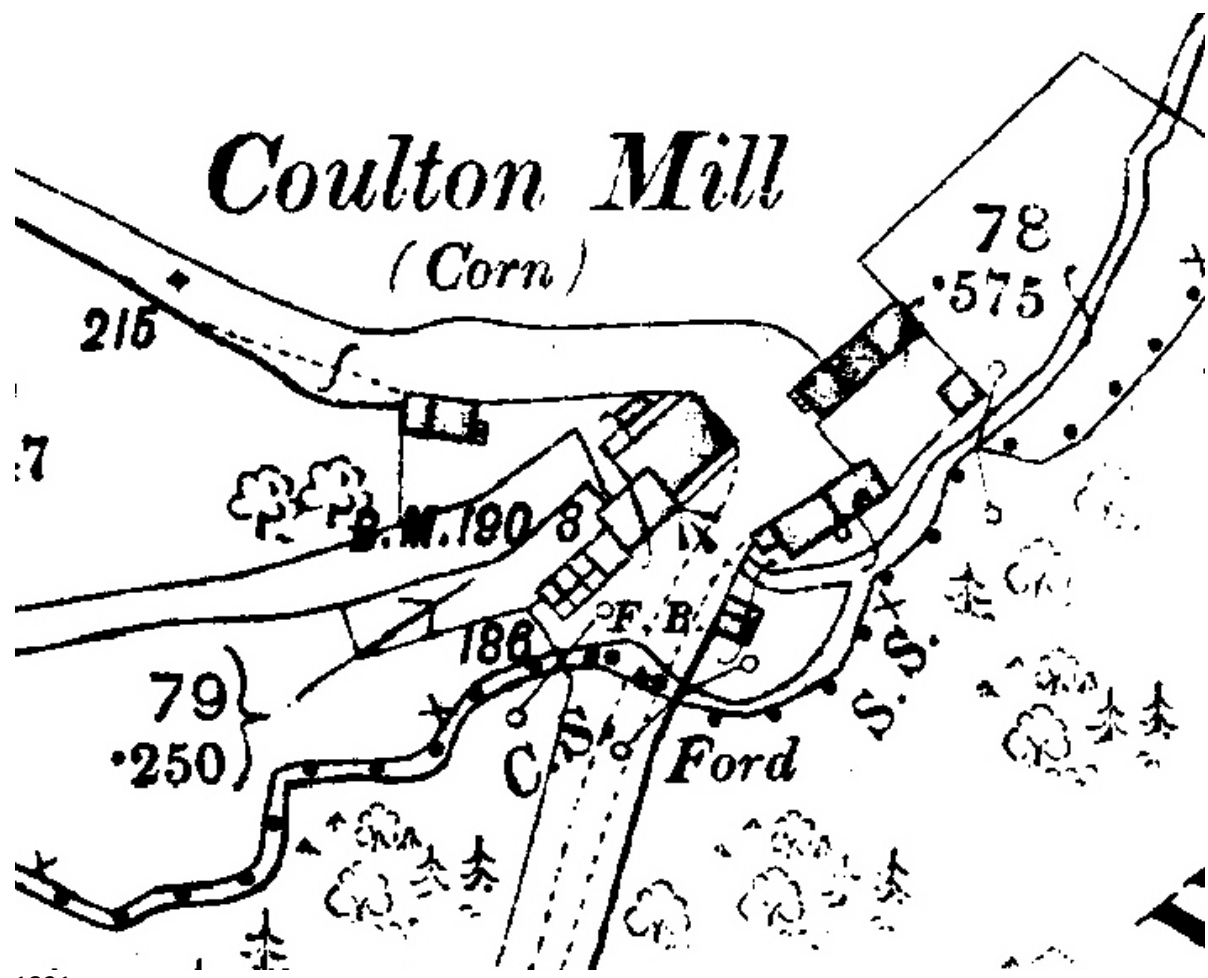
The mill race and mill-house and house are the constant in all of these maps.

The first OS map of 1856 is not easy to read, but shows the house and mill-house upon their current plans, as well as the pig-sties. It shows field interpreted above as a fold-yard associated with the two storey cow byre, but not the cow-byre itself. Within this defined close, there are small 'buildings' evenly spread which may be pig-houses, and there are rectangular solids upon the beck bank within and beyond this fenced area. These may represent trees, and this may, therefore, be interpreted as an orchard. There are buildings on the site of the single storey sheds but these seem to be further NW than today and in the location of the square building that may be seen in 1891 (and which has now gone), though they are not square. There are smaller buildings, perhaps, upon the beck where the cowshed is now, but these are narrower than the current buildings.



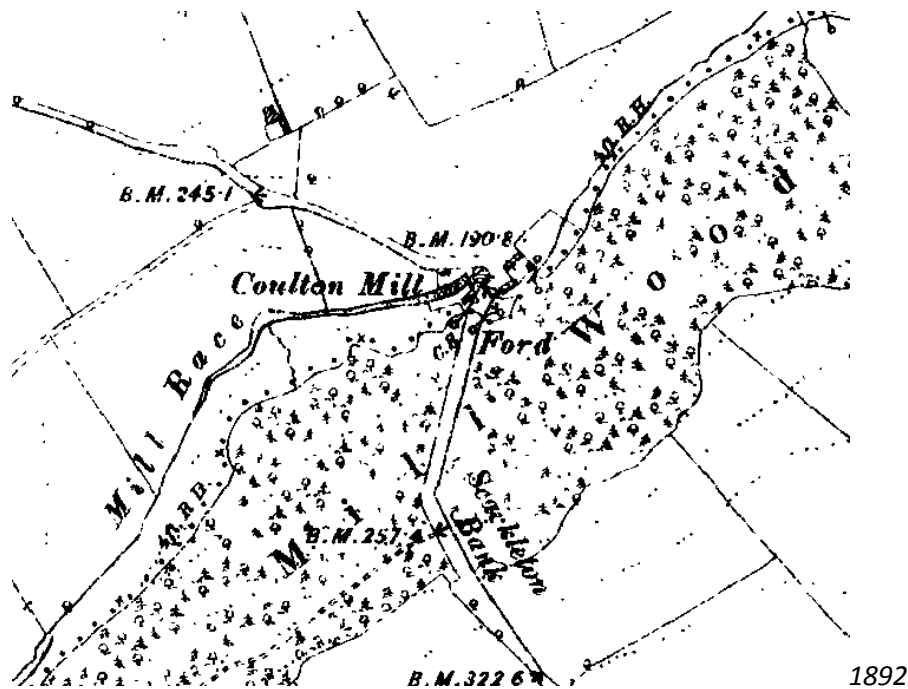
1856

The 1891 OS map is very much more legible and shows the site largely as it remains today, with some subtraction and for all that some of the buildings shown are currently ruinous or remnant walls. The mill wheel retains its covering structure; the forge to the SE of this is shown, along with the pig-sties. The single storey cow shed and added stables are in place. The square, possible dovecot is shown and the two-storey cow byre, as well as its NW-ward extension, now gone, also. The two-storey cow-byre may be seen as a direct response to the dramatic expansion in the acreage of the farm (to 170 acres), and perhaps a move into more intensive dairy farming after the arrival of the railway at Gilling during the mid-19thC, therefore and the construction – or expansion – of the single storey cow shed and stables across the lane from the house may be similarly interpreted. Two cart-sheds have also been built since 1856 – opposite the mill-house and higher up the bank, behind the house and upon the lane to Coulton. Notably, this latter is not shown as being symmetrically divided, but has a large and a small space within – this may suggest a gig-house with stable alongside. There is a stair to a hay-loft over. The coal-house and laundry behind the house are clearly shown.



1891

This lay-out is unsurprisingly confirmed by the 1892 revised OS map.

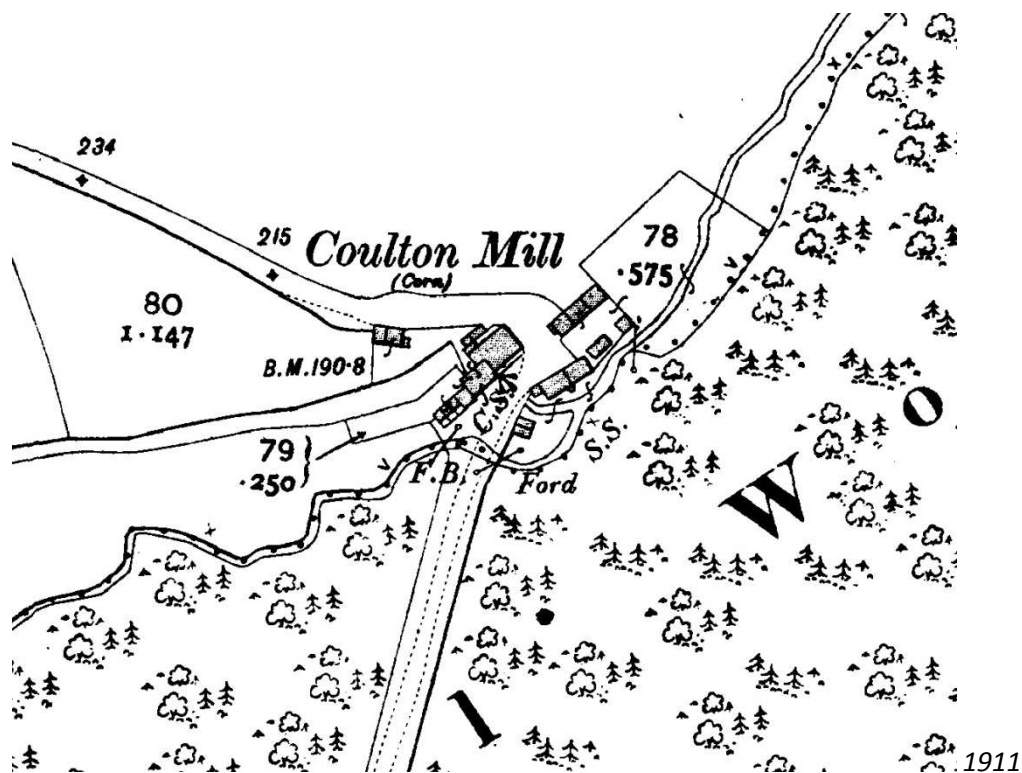


The picture remains substantially the same in 1911, although a small building has been added to the SE of the two-storey cow byre and to the NE of the single storey cow-shed and stables, separated from the latter by a small passage. The square building against the 'fold-yard' also remains, as well as the add-on to the two-storey cow byre which would seem to have been built very soon after the cow-byre itself.

These maps cannot, of course, offer insight to any raising of the buildings and show a period somewhat later than the likely increase in the footprint of the house itself. The lime plaster to the riven lath of the ceiling in the house attic, clearly designed to be storage associated with the mill and without even a stair access from within the house itself, to maximise floor space, is unusually lean in lime, suggesting relatively recent introduction. It may not indicate a late raising of the roof, however, which may have been open to the rafters originally, but is likely contemporary with the later 19thC introduction of Welsh slates. Rafters that may be seen are of late 19thC character also. There are probably more than several phases of the house – a N-ward extension of the earlier house adjacent to the mill-house, which may have doubled its size and which extension will be contemporary with the extension beneath the cat-slide roof at the back of the house, probably a dairy (which had



occurred by 1856) and the introduction of the current window openings, with a further upward extension to increase the storage capacity and utility of the attic. The raising of the building would seem not to have taken place when Nicholson sketched the site in 1823, though this may be a deception.



### Milling and Coulton Mill.

A regular, reliable, or at least a manageable water supply was, of course, the prerequisite of a successful watermill.

At Coulton, the mill is set against the natural bank of a valley side, just N of a point when Marr Beck, which otherwise meanders with a steady flow along the contour of the same bank, gathering water from numerous springs that fall into it along the way, falls steeply to the E, before landing in a gently falling valley floor, whereupon its meandering flow resumes. At the point when it falls suddenly and steeply eastwards, down the bank, there is the remnant of a stone built dam, above which there is a scoured depression which would seem to have held a pond. To the N of this feature, the wide head-race of the Mill begins, continuing along the contour of the bank the beck itself has abandoned. Even allowing for the accretion of debris and compost, the head-race, currently overgrown with trees, is at a somewhat higher level than the beck itself. It runs between quite high and wide earthworks before turning against stone-faced banks to fall into the pentrough of the overshot water wheel.

Further upstream of the dam above-mentioned, there is another, with a remnant sluice-gate built across the stream itself, and the E bank of what seems today to be the beck, carries further earthworks that suggest the existence in the past of another pond associated, it must be assumed, with the management of water flow to the wheel of Coulton Mill. As OS maps from 1856, 1891 and 1911 make clear, these earthworks are indeed part of the system of water management for the mill and mark the onset of the mill leat, with the original course of the beck a little to the E across a boggy water meadow and appearing now as a shallow ditch. The terms of the 13thC exchange between Byland Abbey and Walter de Colton would seem to make clear that this diversion of the



original stream had already occurred by this time and that the leat is in consequence of great antiquity and a significant example of medieval water management.

Marr Beck is a narrow water course, the main drain for a multitude of springs that emanate from the rising ground to either side; it is unlikely to vary tremendously in water volume according to season.

The siting of the mill upon such a watercourse will have meant that Coulton Mill will have avoided attracting most of the common grievances or complaints associated with water mills (Brown 2011 42-43): there could be no navigation of this water course to be disrupted; irrigation of fields could not be compromised when so many springs still today keep the fields to either bank on the verge of bog. Nor would fishing have been a major use of the beck to be disrupted.

There has been an oft-repeated assumption that Coulton Mill was altered from being an undershot to an overshot wheel in response to growing demand generally and for fine flour in particular, and the availability and use of two sets of blue-stones. Overshot wheels harnessed more power than undershot, with breast shot wheels less and more than each respectively.

The source for this assumption seems to be *The Ryedale Story*, by John Rushton. In a very short entry for Coulton, he states that “the Fairfaxes gained the manor in the 16<sup>th</sup> century, installing an overfall wheel at their corn-mill before 1721” (Rushton 1976). His source for this is clearly the Inquisition of Papists Estates of 1720. There seems to be no evidence in the documentary record that the Fairfaxes necessarily acquired the mill at Coulton in the 16thC; nor is there any found by ourselves that they installed the mill. Rushton seems unaware of the medieval precedent on this site, which is no offence, but enhances with clear assumptions the fact that an overshot mill existed on the site in 1720. The book was intended as a brief summary anyway and offers no references and there is no disrespect intended in the above deconstruction, of course. He may have had access to material we have been unable to find.

It is difficult to see why the overshot wheel should be seen as an inevitable evolution, rather than the original pattern – the head-race as it exists today would seem entirely consistent along its whole length with it having been made to service an overshot wheel; it utilises the contour of the hill itself, and this must have informed the siting of the mill against the natural bank, whereas to have sited it thus and to then have excavated huge volumes of the bank away to facilitate the provision of an undershot mill would seem entirely wasteful of time, energy and expense. The relatively narrow beck would presumably have persuaded the earliest builders of the mill of the advantage, if not the necessity of the additional energy delivered by an overshot wheel.

Whilst it would seem quite likely that the mill was substantially rebuilt – and the possibility that the early, medieval mill building had been of timber-frame construction over the still surviving ashlar stone footing that rises from the tailrace of the wheel should not be ruled out – this may have been in the earlier 17thC, rather than in the later 18thC when very many mills were rebuilt to become more adaptive to greater production. Typically, those mills were significantly enlarged by this process, and there is no evidence that Coulton Mill – already one of the larger early mills in the region – was increased in size beyond its earlier footprint. One essential aspect of rebuilding was to provide more storage space – extensive storage space to allow for the supply of growing markets is something that might be seen to be lacking at Coulton Mill, for all that the attic of the adjoining house itself is likely to have been used as much for storage as for anything else, and designed in its current form, at least, for precisely this purpose, and the need for this may date the aggrandisement of a smaller house on the site around 1750, with a possible raising of the attic storey somewhat later again.

Which expanding market would Coulton Mill have been likely to supply? It is not close to any early waterway, and even the arrival of the railway in Gilling might be seen to have been unlikely to have represented any great opportunity for its miller to increase production. Coulton Mill would seem likely to have always been a local mill servicing local farmers and the impulse to rebuild may have been early, in the 17thC, in the cause of starting to mill again at a site that may have fallen into disuse during the 16thC.

The pattern of the structure at Coulton is reflective of Brown's summary that:

"repairs were regularly needed...and this is something that contributed to the paucity of surviving mill buildings from (the medieval period). There have been periods of major rebuildings, first, from the 16<sup>th</sup> to the early 17<sup>th</sup> centuries, when larger buildings replaced many medieval mills. Almost all followed vernacular building traditions, using the materials of the locality" (Brown 2011 49).

It is notable that Coulton Mill would seem always to have been a farm as well as a mill – that the income it delivered was never sufficient in itself. In the 18thC record, the associated farm was 24 acres; by 1851 its acreage had increased to 170, suggesting that by this time, the water mill was the least of the farmer's income sources. By the late 18thC, Joseph Harrison used the mill to power a saw-mill as well as to mill grain and it may very well be the case that in the earlier 19thC, and still in 1851, it was used to power a threshing machine as well. Many farms at this time installed water-wheels, where possible, to drive threshing machines where previously there had been none, and these endured even after the arrival of steam-powered threshing machines (Brown 2011 136).

The wheel itself is likely to have been oft-replaced. The unusual clasp-arm construction need not be as modern, however, as has been generally assumed. Though clasp-arm construction is generally considered to have been first developed in the mid-16thC, Villard de Honnecourt illustrated a design for such a wheel in the mid-13thC, one that bears some resemblance to the 'star of david' design at Coulton (Hewett 1985 196). This is in no way to suggest that the wheel design at Coulton, let alone the wheel itself, is especially ancient, simply to suggest that its pattern need not be so modern. George Nicholson's sketch of the mill-wheel – from two angles – in 1823 shows clearly, however, that the current wheel design is later and that the wheel in 1823 was of more conventional design with 'spokes' radiating from a circular hub. The wheel at Coulton was substantially repaired by Thomas Harrison in the 20thC. It incorporates many iron bolts and straps and braces. However, these need not be so modern themselves.

"Not until the second half of the 19thC, when parts could be bought from firms of engineering millwrights, that cast iron became at all widespread in rural watermills" (Brown 2011 133). The ironwork of the Coulton wheel is likely to have been custom-made by a local blacksmith, therefore, and some of the bolts, at least, may have displaced earlier oak pegs.

The replacement of wooden with iron gearing would have made economic and practical sense as soon as this was possible and affordable, of course.

That major repair and rebuilding will have been necessary at Coulton cannot be doubted, of course, and these will have been associated with technological evolution and particularly with the use of german blue stones and pennine sandstones, which allowed the production of fine, white flour. Previously, millstones at Coulton, as elsewhere in North Yorkshire, will have been of harder beds of North York Moors sandstone, which was coarse and relatively soft and meant that millstones frequently – and expensively – required replacement. These new stones, first records of which appear in the late 17thC, and which were common by the early 18thC, required changes to the gearing of the mill, and these certainly – and demonstrably – have occurred at Coulton. "Two-stage

gearing was now needed for both oatmeal and flour milling”, as the blue stones were smaller and faster-rotating (Harrison 2008 73). Crucially, blue stones were lighter and more efficient than earlier moorstones and allowed for the introduction of more than one set of stones. Previously, one wheel per set of stones had been the limit – another set of stones required another wheel. At Coulton, there are two sets of stones upon a single lay-shaft. Along with the blue stones imported into Hull, there came ‘grey’ stones of Millstone Grit from the Pennines. Pateley Bridge was a notable producer of these, but a mill repair contract for Old Malton Windmill in 1808 specifies Derbyshire grey stones.

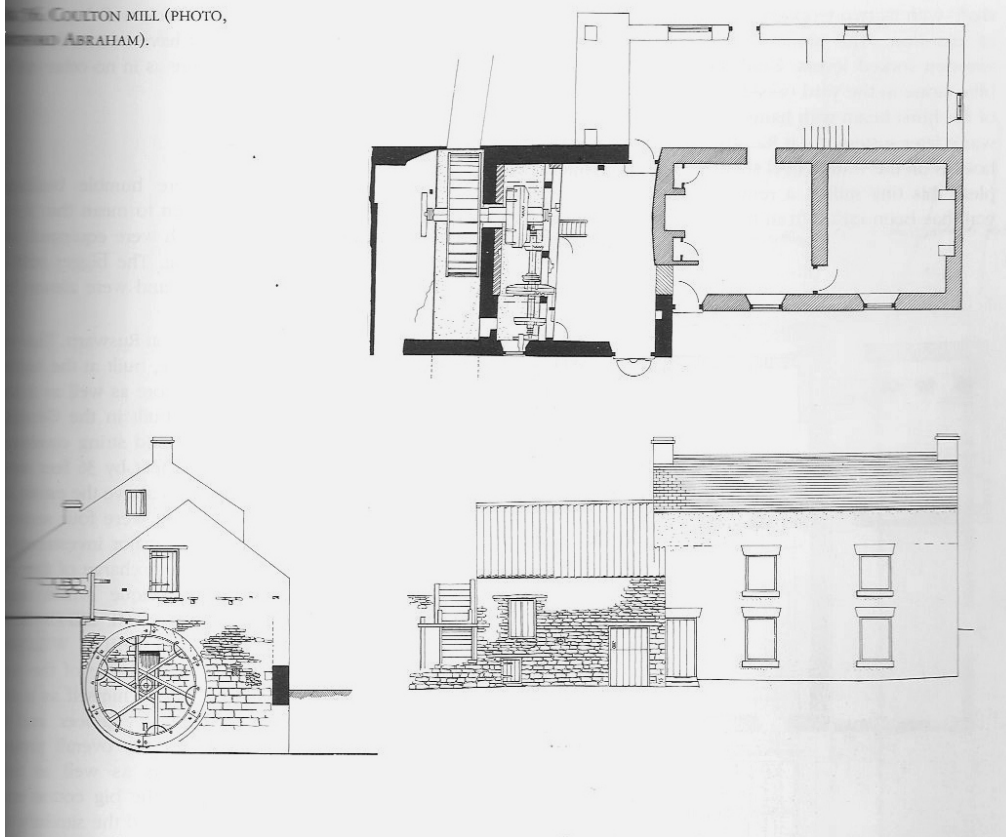
It is in 1725, when these changes were occurring throughout the region, that Rushton suggests Coulton was changed from an under to an overshot mill (Harrison 2008 74), the rationale being the need for increased power. As discussed above, there is no real reason to assume that this power did not already exist and it is most certainly the case that Coulton mill had an overshot wheel in 1720 when the mill is listed in the Inquisition of Papist’s Estates of this year: “thereunto belonging with the overfall corn milne let by the said Lord Fairfax from year to year to William Rood/Reed?? for the yearly rent of £7” (NYCRO see above).

Harrison draws attention to the significance of mill lanes, by which the mill was accessed by those bringing their grain and carrying off their flour or oatmeal. It would seem clear that the lane from Scackleton and from Coulton, and passing the mill is such a lane – and that communication between these settlements may well have taken another, and less precipitous course, had it not been for the existence and location of the mill which, in all likelihood, served both communities, if not before, then subsequent to the Dissolution.

Harrison (2008) includes a summary description of the mill at Coulton, as well as drawings on plan and elevation:

“In 1725 (Coulton Mill) was in the hands of the Fairfax family of Gilling and was, apparently, changed from an undershot to an overshot mill (J Rushton nd 74). This would have entailed digging a new water leat with a new dam. The work may have become necessary because more power was needed to drive a second pair of stones. Surviving eighteenth century features at Coulton include the massively constructed clasp-arm pit wheel, the downstream lying shaft and pieces of the blue stones in the threshold of the mill and in the wall above the pen stock. Again, there have been modifications. For instance, the waterwheel is of nineteenth century design (but rebuilt in the twentieth century). The roof and its main timbers have been replaced this century (C20) so the sack hoist is lost **[or is this the collapsing frame above?]**. A new hurst frame has been installed in front of the old so that the original is hidden away from all but the most persistent searchers. The upstream lying shaft is missing and one gear wheel is missing from the downstream ‘countershaft’. A wooden pulley for a flat belt was added to the downstream shaft to drive a flour dresser which hung from joists of the first floor. But many original features have survived, including the very large hurst pit running the full width of the mill and the two sets of counter-rotating stones on the downstream shaft. The dimensions of the lying shafts are almost identical with those at Rievaulx. One variation is that the wooden rope pulley for the hoist drum is on the downstream lying shaft and not on the waterwheel shaft, the advantage being a quicker hoisting action.”

COULTON MILL (PHOTO,  
BY ABRAHAM).



(Harrison 2008)

MARTIN WATTS PRELIMINARY THOUGHTS.

### *Waterwheel*

The waterwheel, which is built of timber with iron straps and fastenings, is of unusual and exceptional construction. It appears to be of local design, with only two other comparable documented examples, at Raindale Mill (now rebuilt at York Castle Museum) and Hold Cauldron Mill (Harrison 2008, 99). The wheel has 2 sets of 6 tangential clasp arms, timber rings, shrouds, buckets and sole boards. Although now very decayed, enough remains for an accurate set of drawings to be made, from which a new wheel could be constructed. The oak wheelshaft has totally decayed and is collapsing at its outer (wheel) end, although the inner end, on which the pitwheel is mounted, is sound.

### *Machinery*

In general terms, the machinery within the mill building represents a remarkable survival, with substantial remains of a timber hurst and a layshaft parallel with waterwheel, with iron and timber gears, chain drive and belt drive wheels. The lower part of the massive timber clasp-arm pitwheel is buried in debris and silt in the cog pit and the bottom section of the former stone-drive bevel gear, also a timber clasp-arm gear with (formerly) segmental iron

teeth bolted on, has rotted away. There are likely to be remains and/or evidence of the drive system within the debris in the cog pit.

The basic structure of the hurst frame survives, although the two pairs of millstones and the flooring around them have been removed. There are likely to be some problems with decay and possibly the stability of some of the vertical posts that form part of the hurst structure, the extent of which cannot be determined until the cog pit has been cleared. There are also remains of a later, lighter timber structure, including door panels, along the face of the hurst.



*Inside of mill-house*



*window, with lapped panes of glass*

*part of the sluice at the onset of the mill leat*



*the second 'pond' along the leat and where the head-race begins*

*the dam and sluice to feed or relieve the head-race; the watercourse below feeds the overflow back into the beck*





*within- note the liberal use of coach-bolts, which may be interpreted as having been introduced during 20thC repairs.*









millstone seat



probable – elevated – site of medieval Scackleton Mill(left) and leat of the same (below).



## Condition Survey and Recommendations for Repair.

### The Mill House.

The condition of the mill workings will be assessed by Martin Watts, millwright, and final scheduling of masonry repairs will need to be finally drafted in the light of this. All works to the mill will be executed as a separate contract, therefore.

The condition of the masonry of most of the mill-house is good. The ashlar stonework of the lower tail-race wall has suffered extensive frost damage, with faces spalled away to some depth. Some introduction of new facing stone, dressed as originally, will be necessary. A section of wall behind the mill-wheel has fallen out entirely and will require like for like reinstatement. The inner wythe of masonry within the lay-shaft pit is of brick and may represent repairwork at this level in the past. The single skin of brick is all that currently supports the masonry above the hole in the wall. All repair mortar at this level will be Natural Hydraulic Lime 3.5 due to the inherent wetness of the location. The same will be used for some localised mortar repairs of less deeply eroded blocks.

Two new quoins are required to the drive-shaft opening.

Two new stones of the SE quoin require replacement.

There are a number of holes in the end wall which were retrospectively fashioned sockets for roof timbers associated with the building over the mill-wheel. These should be filled with clay tiles and quick-lime mortar, as an honest repair.

An S-bend that carried water from the front gutter into a down-pipe on the side of the mill-house is damaged, but may be re-used. A new section of down-pipe, which drained directly into the tail-race is required.

The pitching door in the end wall requires replacement, but holes currently allow swallows to access the barn, as well as the attic space of the house itself, and this access will be necessary before works may commence. Replacement of this door will be delayed until September 2012, therefore. This door should be of larch and match the design of the current door, re-using the existing ironwork, which will require some refurbishment. The lintel over is a little decayed, but should not need replacement. The threshold, which should be of oak requires renewal.

The verge of the roof is made up of a deep fillet of cement mortar which will conceal a conglomeration of making up consequent upon the removal of the thatch and then the pantile roof. This should be removed and made good with stone as necessary.

The retaining wall behind the mill-wheel and which holds the penstock is somewhat deflected, but this is of no structural concern. Its masonry is bound with lime mortar. Approximately half a metre square is loose at low level and needs to be removed and re-bedded. Five stones are missing at high level and require reinstatement. Approx. 50% of the wall requires re pointing and deep-packing with lime mortar.

The front wall of the mill-house is in a generally good condition. The existing cast iron gutter requires refurbishment only.

The roof is in a good condition, but the rear slope is of corrugated asbestos and consideration should be given to its replacement with pantile.

Whilst the joinery is in a good condition, the jambs of the door surround have received splice repairs to their feet in the past. The S jamb splice joint requires strengthening.

Internally.

The internal walls were fully plastered in the past and most of this treatment survives upon all but the rear wall, which is inherently damp, and to the brick facing to the inside of the end wall, behind the lay-shaft. The lay shaft pit is choked with debris and with earth. Localised excavation of this has revealed no evidence of a stone or brick floor to the pit. The floor of the main mill building is of concrete, which will overlay either an earth, stone flag or cobbled floor, it may be hoped.

To the back wall, not only lime plaster, but lime pointing has been lost, revealing the earth mortar. This should be repointed with an NHL mortar and replastered with similar – a high calcium lime would be unable to carbonate in the context of such inherent dampness.

Around ½ m square of masonry at low level requires consolidation. The brick pilaster which has been installed beneath and above the joinery of the hurst to support the beam the end of which has rotted in the damp wall, should be removed and replaced with a timber version of the same, as per the adjacent floor beam.

There are several cracks to the E and S wall plaster and these should be filled. Approx 2 metres squared of replastering is required to the N wall. There are a number of pencil-written notes upon the surface of the limewashed plaster of this wall and it will be essential that this is preserved.

There is a hole above the lower window of the E, front wall and another next to the saws hanging on this wall, these should be filled and replastered. The edges of the upper window reveal are chipped and abraded and these should be made good with soft lime plaster.

Over the lay-shaft and hurst, there has been opc patching of the plaster which should be carefully chipped out. Around 2m square of new plaster is required. The stone threshold of the pitching doorway requires consolidation and plastering.

The N gable wall, above the first floor retains its lime plaster; the doorway into the attic requires minor refurbishment.

Repairs to the joinery floor will be specified by the millwright after analysis of its evolution. Many of the sawn lath floorboards are in a weak condition due to beetle attack. The deflecting former hoist frame, which is collapsing, will also be subject to survey and its repair specified by the mill-wright. Joist ends are generally sound, however and approx 4m sq of floorboards will be required.

The interior should be limewashed (pencil-written areas excluded), three coats.

Ideally, the concrete floor of the building will be lifted. If no earlier floor survives, this should be remade in cobbles, stone flags or rammed earth. Some cobbles are visible at the E end, closer to the door.

### Pig-sties and forge

Although the pig-sties appear quite ruinous, and are indeed in a poor structural condition, their form remains legible and may be confirmed by reference to old photographs and OS maps, which show each bay composed of a small shelter at the rear, with low eaves to their roofs and a small yard in front. Gateways allowed passage between the pig-sties from N to S and via the forge building. The rear, retaining walls are generally sound, but require localised consolidation, dismantlement and rebuilding. The front walls (of the pens) have been removed, or have fallen, and have been partly rebuilt in dry-stone. The end and side walls of the sties and pens, as well as the back walls were built with earth mortar, and although most remain partly standing, restoration of these building would require their general dismantlement to a sound footing before rebuilding.

The forge building similarly, with its rear and N walls being particularly disrupted. Photographs of this building show its pattern.

The roofs of the sties should be restored using sawn larch timbers and should be fully sheeted with lath and lime mortar beneath new pantiles. The likely pattern of these roofs was of a beam/wallplate across the front, with simple purlin and rafter roofs over, with a shallow pitch, as may be seen in old photographs. There seem to have been no walls to the fronts of the covered shelters. The forge had a pitched roof and front gable wall, but a probable purlin roof within and a pantile roof.

### Single storey cow-shed and loose boxes.

Internally.

The cow-shed was a milking parlour in the more recent past and has a concrete floor, with drainage channel, as well as pre-cast concrete stall partitions and concrete render to approx four feet up the wall. It has a roof of three king-post trusses which are somewhat green with algae, as are the purlins, although the roof cover is generally intact. It has no sheet lath cover. The pantiles of the rear slope are a little disrupted and the whole might benefit from being stripped and relaid to the same pattern, with tile battens replaced as necessary. The purlins sit over and do not pass through the king-post trusses.

The trusses should be cleaned down to remove algae and new applied collar boards should be installed like for like, replacing the existing boards.

The E end of the S has decayed in the wall, due to a long-standing leak above and a steel flitch plate should be installed, or else a scarfed timber repair executed.

The concrete render should be removed and should be replaced with an NHL mortar render.

The back wall in the SE corner has been rebuilt with concrete block (and more extensively on the exterior wythe) and this should be removed and rebuilt using similar stone to the rest of the building.

Some 5 metres sq of repointing is required before the application of 3 coats of limewash.

Walls within were routinely limewashed, but have no evidence of having been plastered in the past, though the concrete render may disguise a lime plastering at similar level.

The former loose boxes were lime plastered in the past and should be once more, after repointing of the masonry. The hay-lofts over each should be regained to their original pattern. The inner wythe of stonework of the middle bay should be carefully dismantled and rebuilt after the excavation of the floor to its original level and the consolidation of the walls currently buried. The improvised timber prop to the N door reveal should be removed and stone installed and a new inner lintol is necessary, with new stone above.

The joint between the E wall and the S gable against which this was added is open and should be deep-packed and consolidated.

There is an earth floor some 30" below current floor level in the middle stable and this should be retained, depending upon intended use. It may be necessary to cobble this floor.

A loading door in the N wall has been blocked with brick. This may be re-opened, otherwise lime plastered. The bricks are London Brick and are bedded in opc mortar. There would be virtue in reopening.

The W truss end is decayed and will require a steel flitch repair. The truss is currently propped off of the wall-top. There are numerous beetle holes in the timber of the truss and it may be necessary to replace the truss as a whole, like for like, dependent upon the amount of heart-wood. It carries the purlins of both stables which overlap one another, sitting in notches within the major rafters. The end of one purlin in the central stable is decayed and will require a scarf or flitch-plate repair.

The surviving purlin over the N loose box is currently damp, the roof missing. However, it will probably prove to sound when it has dried out, though one end may be decayed. This section of the roof will require complete dismantlement and reconstruction, re-using all surviving rafters, which appear relatively sound, as possible.

Significant repointing will be necessary within both loose boxes prior to replastering.

The N loose box has a cobbled floor which should be retained and repaired as necessary.

Masonry at the top of the wall, within the wall plate requires consolidation and some reinstatement.

### Exterior

Externally, the walls are generally well-bound but the side walls display significant outward lean, especially on the back-side. This will be associated with roof thrust, which was probably greater before the relatively recent introduction of king-post trusses. This movement is reflected at the N end in a vertical fissure through the centre of the wall. This requires deep-packing and some stitching across with helical ties and/or stone and clay tile.

The N wall requires repointing as a whole with a haired hot-mixed quicklime mortar. One small hole needs filling with stone. There is a pitching door in the gable, with oak surround and lintel, which requires a new plank shutter door. This has dropped as a result of decay of its cill. The frame should be taken out, repaired and re-set with a new cill over consolidated masonry threshold.

The verge will require consolidation prior to re-roofing.

The East walls of the loose boxes have a significant outward deflection. Both require repointing approx 80%. The upper 12" of stonework around the wallplate need to be taken down and rebuilt as the wall plate is repaired or replaced.

There is approx 1 metre square of severely deflected stonework at high level and the N end of the larger cow-shed – the stone facing is being levered outwards by the roots of an elder tree.



To the W elevation, a new oak frame and new oak door is required for the N stable, to match neighbouring doorway.

The E wall of the cow-shed is somewhat disrupted and has been repaired in several areas using concrete blocks which have then been opc rendered. There are areas of loose and disrupted masonry and an elder tree is growing in the wall top at the N end, its roots pushing at the stonework. All concrete block work should be taken down and these sections rebuilt in stone.

There is a stone buttress which remains well-attached. It has been rendered in opc and this should be removed before repointing.

The junction between the cow-shed and the first addition is awkward, with the stonework of the addition projecting forwards of the earlier wall and without an especially formed quoin of its own. The lean of both walls is significant and it is to be recommended that another buttress is added at this junction, covering it, after deep-packing of the open junction between the two building phases. This will extend almost to the beck bank which will need masonry reinforcement at the same time. The cow shed wall requires repointing 100%.

There is a short section of stone wall exposed at the SE corner before the London Brick lean-to. This has been pointed with opc mortar, which should be removed before repointing with lime mortar. The stone gable above the asbestos roof of the lean to should be repointed 100%.

The brick lean-to might be lime rendered, one coat. Consideration should be given to replacing its asbestos roof with pantile.

The W wall of the cow-shed is deficient in lime mortar and should be repointed with haired lime mortar laid directly on to the earth without this being raked back. There has been some localised repointing with opc and this should be removed and repointed. Repointing is required 100%.

The N reveal of the N doorway should be taken down and rebuilt at the same time as the inner wythe of stonework in this area.

The S doorway requires some attention. The foot of the l/h jamb has decayed and allowed the frame to drop as a result, though there is a remnant iron strap repair. The frame should be removed, refurbished and a new foot spliced into the left hand jamb before re-setting. The lintel over is oak and has suffered surface decay only.

The N door requires replacement, reusing existing iron. Two new jamb feet need to be spliced on. The lintel is sound.

New cast iron guttering will be required to both elevations, as well as two hoppers and two down-pipes per elevation. Gutter brackets will be traditional and hand-forged to the pattern of those originally found on the house.

## Cow Byre

### Internal

The loose box at the N end was limewashed historically but there is no evidence of lime plaster.

Some 60% of the masonry requires re-pointing, but is generally sound.

There is a hay-loft or chicken loft over, with roost poles lodged in the walls, as well as from wall-plate to wall-plate. This loft is carried by joists which rest upon beams at N and S ends which themselves are carried by projecting main byre joist ends at the S side and by joinery corbels at the N. This is unusual but avoids the bedding of joist ends into the masonry wall, mitigating decay. The S beam, as well as three joists and three joist ends (part of joists within the main byre, which also require replacement) have decayed due to long-standing leaks in the roof; the N is sound. Floorboards beneath these leaks have also decayed. There is an old door laid across what may have been a hatch into the loft, but access more recently has been from outside the building, on the W side. At ground floor level, almost the whole of the W wall is now open and is composed of two openings, one large, another consistent with an earlier hatch opening for chickens to access the loft, though both are likely retrospectively made. The larger opening is framed by a long chamfer and stopped lintol, but is recycled from elsewhere, its jambs projecting beyond the stops. There were robust jambs to either side, but the N one is largely missing and the cill upon the structural stability of this opening relied has been lost, allowing deflection of the S jamb which has precipitated progressive collapse of the lintol and masonry that was retrospectively rebuilt over this when the opening was introduced. This jamb is shared with the smaller hatch opening, high in the wall. Parts, but not all of the reveals of the large opening incorporate bricks of the like which typically form the inner and outer quoins of reveals throughout the building, but also stone – this indicates the re-use of bricks from the original opening in this area, which almost certainly reflected those elsewhere at first floor level of this elevation, the ground floor being beneath ground for the most part, with only land-drain ventilation of the lower interior of the main cow byre.

The large opening represents an inherent weakness at this point in the building and it is to be recommended that it is removed. The hatch which was probably an earlier evolution to the main opening (which is also cut across by the floor) should probably be retained – offering exterior access to the chicken loft, but the large opening should be re-filled with stone, all joinery removed. This will strengthen the W wall and especially the connection of this to the N gable wall. The hatch doorway requires a new oak frame and shutter door, as well as new iron door furniture, which should be hand-forged in sympathy with similar elsewhere on the building.

The wall immediately beneath the large opening is in a very poor and absent condition and should be rebuilt.



Floorboards of the loft are much riddled with worm, where they survive and may require full like for like replacement.

The ground floor may be assumed to be cobbled.

The gables of N and S crosswall require 100% repointing. Two holes need to be filled in the N gable; one in the S.

The roof is a simple purlin roof, with two purlins to each slope and multiple, 3-4" larch rafters with riven lath and lime sheeting over the E slope only, which is a probably original detail. The lath is flimsy where it is not decayed and will require wholesale replacement. The tile battens of the E slope are in a poor condition and six rafters, as well as one purlin will require like-for-like replacement in untreated larch. The E wallplate also will likely require replacement.

The ground floor of the main cow byre:

The floor is cobbled with drainage/slurry channel. This would appear to be in good condition, but is covered with debris such that a full assessment is not possible at this time. There were two larger stall partitions, with two smaller partitions – one of each survives, though both require some repair, particularly at low level, where new post feet will be required as well as partial replacement of boards. Two new partitions should be made to match the existing and installed to the S of the cow byre.

A section of interior wythe is missing at the N end where there would appear to have been a window before the addition of the exterior stair, for all that this would seem to be an original feature. It may be that the opening was a storage space. Its reveals are disrupted; its lintel is a thin slab of stone – perhaps also part of one of the treads of the exterior stair. This lintel is currently unsupported at the



E end; the brick reveal survives at the W end of the opening. This recess should be made good and infilled only if it is considered structurally essential upon full investigation. If infilled with stone, the surviving brick reveal should be left in situ.

The W wall should be cleaned down and repointed 70%. The E wall should be cleaned down and locally repointed; the N wall is damp and algae'd and should be thoroughly cleaned down before being repointed 20%. There are 3 small square alcoves/recesses, storage. These are original and framed in brick.

All internal walls should be limewashed five coats.

There are two beams across the width of the building, of larch, with bark in places, though hewn roughly square. These and most joists are in a sound condition. The floorboards have some worm but may be sound enough – their upper surface is covered in chicken guano and their condition is difficult to assess, therefore. Allowance for general replacement should be made at this stage. Around 5 metres squared have decayed as a result of roof leaks. Three joists at the SW, which pass through the crosswall require replacement, as well as the joist in contact with the W wall.

The joinery hay-rack remains and should be repaired in situ. Ten staves are missing and should be installed.

First floor:

The S truss has been recently repaired and rafters replaced. Several new rafters (or part-rafters) are still required. The pigeon loft has been stripped of rotten boards during this repair and the original joists, which are of unconverted larch, reinstated. New floorboards, wall planks and door frame and shutter door are required.

The pantiles have been stripped and set aside from the S half of the roof; the N half requires similar. The roof over the main cow byre was fully lath and sheeted and this will be re-instated like for like, using riven softwood or sweet chestnut lath and haired hot mixed lime mortar.

At the level of the window cills on the W side, a 1" plank which formed the cills continued the whole length of the wall. This has substantially decayed. Decayed parts of this should be chopped out to full depth (in short sections) and be replaced with clay plain tiles bedded in soft lime mortar; two courses of plain tile. The cills of the windows, however, should be renewed in oak.

The W wall requires repointing 80%. The top of the E wall and stone cills of openings require consolidation and repointing 50%.

The N gable wall requires 100% repointing above the level of adjacent eaves after consolidation (prior to re-roofing) of the wall top.

To the NE corner there is disruption of the E wall adjacent to the N gable wall, which later has been partly pulled away, leaving a crack. The stonework of the E wall (approx 1 m sq) should be dismantled and rebuilt; the crack should be stitched with helical steel bar and deep-packed.

The E and W walls should be replastered, one coat, with lime plaster. The gable walls also, but only to the level of the eaves.

The whole should then be limewashed five coats.

### Externally

The doors and frames at each end should be removed and repaired and refurbished. The N door has a joinery rimlock. Its pintel has failed, leading to distortion of the door. The lintel over the S door has decayed at one end and has slipped therefore, and a peg has decayed which held the joint of the E jamb and lintel of the door frame, allowing the jamb to drop slightly.

The mainly brick exterior stair with local cornbrash treads, at the S end of the cow byre has subsided and its treads are in a poor condition, much delaminated by frost action. Some have collapsed within the storage space beneath, the door of which has been lost. The stair requires wholesale dismantlement and reconstruction, re-using all bricks and walling stone. It may require a new NHL concrete footing and will require new treads. These should be of sandstone, matched for colour to the originals. New stone of the exact local geology is unavailable. The lintel of the N ground floor doorway into the cow byre should be renewed at the time the stair is taken down. Bricks immediately beneath the decayed end require re-bedding. A new oak frame and larch plank door, with hand-forged iron fixings should be installed over the storage area as originally, reusing existing pintels.

E elevation.

The cast iron gutter is missing, though a hopper and part of the down-pipe survives. The hopper should be refurbished; the down-pipe cut to a clean end and an additional section added at lower level, as well as a shoe. New cast iron guttering should be installed supported by hand-forged iron or mild steel gutter brackets to traditional pattern. An original gutter bracket remains upon a section of renewed fascia board from the house and this should be the model. The gutter should be half-round, matching surviving cast iron guttering to the mill-house.

The windows of the cow byre have no frames within the brick reveals. New windows, framed and of oak of similar pattern to those above – suitably adjusted to allow for their greater overall dimension and with slats and small windows in the upper third of the frame will be required (see example images attached). The oak plank cill should be re-instated. The lintels over are good.

The S first floor window is generally good, but the lintel requires replacement. The N window should be taken out, dismantled and a new N jamb installed along with new slats before re-installation. A new lintel is required over the opening itself.

The S door should be renewed in larch, re-using existing iron. Two new feet need to be spliced to the jambs of the frame; the lintel over is in good condition. Likewise the N door.

The brick eaves course will require re-bedding at the same time as re-roofing is carried out. Some 10 bricks are missing.

Some lime pointing has been lost due to defective rainwater goods inducing saturation and frost damage. The bedding mortars are of earth, sand and quicklime. This is especially so adjacent the down pipe and over the doorways. Approx 50% repointing is required.

At the NE corner, some 7 bricks of the original quoin are missing and should be re-instated.

At the N end, the gable requires repointing 100%, as well as filling in of made sockets for roof timbers of a now lost add-on structure, within the former boundaries of which original pointing is generally sound, requiring repointing over 15% of its area.

The W wall requires approx 50% repointing. Repair of retrospective openings at its N end have been discussed above.

The lintel over the middle window should be replaced, as well as its sub-cill. Both original windows require refurbishment only.

There is no gutter to this elevation, nor evidence of there ever having been one. There should be, as well, Perhaps, as a French or similar drain against the wall itself to reduce moisture content within the masonry. The lie of the land would allow this to drain into the road.

The brick eave course should be re-bedded along the length of this wall as the roof is repaired.

The wall-plate is contained within brick to either side of the wall and a blocking of stone and lime is then built up over the wall-plate and between the lower end of the rafters, tying the two courses of brick together. This detail may necessarily be lost in the course of roof repairs, but should be re-instated afterwards.

### Electrics

There has been rudimentary electrical supply to the cow byre and cow shed in the past. There are old, not to say antique switches in the first floor of the cow byre suggesting that such supply has been of long-standing, although currently arrives via a more modern cable slung from the roof of the single storey loose boxes. This cable passed through the upper gable of the cow byre and remains live. All existing wiring should be stripped out and replaced to modern specification, with the provision of lighting throughout and some plug sockets. All such services provision must be executed with sensitivity to the historic fabric but should be honest and straightforward.

### Groundworks

The specification of groundworks associated with the head and tail-races of the mill will be the responsibility of Martin Watts, millwright.

The provision of a French drain or similar against the W wall of the two storey cow byre has been mentioned above.

To the other side of this building, the ground falls away to the beck and may contain a cobbled surface. The floor levels within the loose boxes are lower than current ground level to the W side and would be vulnerable to the ingress of surface water running down the lane without some consideration of the management of this. There is a land drain which exits into the beck to the N of the loose boxes and this may be fed from the road and an earlier response to the inherent problem. An enhancement of this system, plus the introduction of a higher verge which might direct running water into the tail-race would be the least intrusive option and less visually intrusive than more conventional civil engineering options.

## 4 Specification and Schedule of Works

### Section 1

#### 1.1 PROJECT PARTICULARS

- 1.1.1 PROJECT: Repair and conservation of two-storey cow byre, single storey cow shed and stables, mill-house, pig-sties and historic corn-mill, Coulton Mill, Coulton, Hovingham, YO62 4ND
- 1.1.2 CLIENT: Nick and Heather Burrows
- 1.1.3 CONTRACT ADMINISTRATOR: Nigel Copsey, The Earth, Stone and Lime Company, Hall Farm, Maltongate, Thornton Dale, Pickering, YO18 7SA Telephone: 07845 739 594 email: [nigelcopsey@hotmail.com](mailto:nigelcopsey@hotmail.com) web-site: [www.nigelcopsey.com](http://www.nigelcopsey.com).

1.2 TENDER DOCUMENTS. Drawings; Condition Survey; Schedule of Works.

#### 1.3 THE SITE

- 1.3.1 THE SITE: Coulton Mill and farm buildings which are separated by a public highway between Scackleton and Coulton villages.
- 1.3.2 EXISTING BUILDINGS ON THE SITE: the building and site all around it is part of a working farm; this must be considered and respected at all times.
- 1.3.3 SCAFFOLDING: all scaffolding and staging necessary shall be provided by the contractor and allowed as a separate item.
- 1.3.4 PROPPING AND SHORING: both will be necessary during the contract and all proposed methods shall be subject to a detailed method statement, discussed with and approved by the CA. Allow for 10 # accrow props and 4 # strongboys as a minimum.
- 1.3.5 EXISTING MAINS AND SERVICES: Electricity and water will be available on site. Allow a sum of £300 for this.
- 1.3.6 SITE ACCESS: the site is accessed via a single track road from either Scackleton or Coulton villages
- 1.3.7 SITE SECURITY: Subject to discussion with client, the site will be generally secure and safe from penetration by livestock throughout the project. The cow byre and cowsheds will not be used during the project and storage of materials and tools will be possible within by agreement. The area must be kept clean and tidy at all times and fully protected from leaks and spills associated with the storage of materials. The Burrows live on site, but security of plant, other tools and materials will be the responsibility of the contractor.
- 1.3.8 HEALTH AND SAFETY AND WELFARE: the contractor must allow for the provision of legal minimum of health and safety and welfare facilities.
- 1.3.9 CDM: due to the nature of the works, CDM regulations will apply. The contractor should allow for costs associated with compliance of these regulations.
- 1.3.10 PARKING: except for deliveries, parking will be to the north west of the site, upon the footing of an old gig-house, or in a lay-by a little way up Scackleton Bank, to the SE of the site or by agreement with the client. Vehicle parking arrangements will be flexible according to the working schedules of the farm and contractors must co-operate at all times with the client in ensuring a minimum of inconvenience to ensure the smooth running of the farm.

- 1.3.11 SURROUNDING LAND AND ITS USES: the site is isolated from other buildings or dwellings; the land around the site is pasture and woodland. Animals may be grazing the pasture to east, west and south of the site. Every care must be taken to keep grazing sheep from the site and ZERO litter or other debris should be left anywhere on site or in the surrounding landscape.
- 1.3.12 WILDLIFE MITIGATION: all trades on site must allow for liaison with an ecologist before any works begin. All sensitive areas will be identified and will be marked by the ecologist, who will advise upon mitigation and retention of habitat as part of the works. Bats frequent the site in the summer months. Barn owls may have used the barn in the past. Swallows nest within the buildings and no works which might damage their nests during the nesting season will be permitted, though work in the vicinity of these nests may be possible.
- 1.3.13 WASTE DISPOSAL: all waste materials will be removed from site as soon after their generation as possible. Due to the sensitive nature of the site, open or uncovered skips will not be permitted except for hardcore-like materials. Materials must otherwise be carried away from site by the contractor for disposal elsewhere. Materials will be recycled wherever possible. Skip location will be by agreement with the client.
- 1.3.14 UPON COMPLETION the site and adjoining land must be left clean and tidy and free of damage, disruption or hazard.
- 1.3.15 SITE VISITS: Before tendering, a site inspection will be essential to assess the likely impact of the site conditions and restrictions upon the cost.

## 2.1 MATERIALS AND WORKMANSHIP

- 2.1.1 GENERAL: all replacement or repair materials used will be like-for-like and fully compatible with the original materials
- 2.1.2 STONE: all new or replacement stone will be a good match in geology, colour and character to the original, approved by reference to the CA. New stone will be local calcareous sandstone/sandy limestone which may be sourced as recycled material from Dring Stone, Hartoft. New ashlar should be Sebastapol French Limestone sourced from CWO Ltd Chichester. New stone will be tooled in like fashion to the host material.
- 2.1.3 MORTAR: all new lime mortar for bedding and repointing will be mixed hot, using quicklime and sharp sands. No additives will be permitted; no ordinary Portland cement will be permitted in any mortars or anywhere on site. A typical mix might be 3 parts sharp sand (Travis Perkins) : 2 parts oolitic limestone dust: 1 ½ part quicklime ( Calbux, supplied by Buxton Lime or Womersleys Ltd or Singleton Birch microlime supplied by Ecolime Ltd, Rosewood, Terrington, York YO60 6QB Tel: 01653 648112. [www.ecolime.co.uk](http://www.ecolime.co.uk) ). Ox or goat hair should be added immediately after slaking and/or just prior to use. Pointing mortar for all stonework will include animal hair. Allowance should be made to carry out 5 number mortar samples before final agreement of proportions. Some sieving of aggregates will be required for pointing and bedding mortars for some stone work and for brickwork. Mortar for ridge tiles and pantile fillets will be 2 parts sharp sand : 1 part French NHL 3.5, either St Astier or Castle. Mud mortar for re-bedding of stonework shall be of similar lime mortar to the above or local sub-soil which may be dug by agreement with the client and CA or be otherwise locally sourced. This may require the addition of some sharp sand. Allow for one day to sample and adjust identified sub-soil.

- 2.1.4 WOOD: all new timber will be like-for-like oak or larch, free from defect and not unduly knotted. Oak will be European Oak. Larch should be British Larch. All new timber should be slow-grown and seasoned but untreated. No chemical treatment of new or existing timbers on site will be permitted. All wood will be unpainted, except for doors and windows.
- 2.1.5 PAINT: paint will be linseed oil paint. All new timber will be primed with neat linseed oil prior to application of linseed oil colour coat. Colour to be agreed.
- 2.1.6 IRONWORK: all new or replacement iron work will be hand forged and match the existing. All new iron work to be supplied by Andy Basnett of Espersykes Farm, Malton. Hand-made nails, spikes for hinges: [www.handforged.co.uk](http://www.handforged.co.uk)
- 2.1.7 RAINWATER GOODS: All new or replacement rainwater goods will be of cast iron, supplied by J & JW Longbottom Ltd.
- 2.1.8 ROOFING: for all re-roofing works, the presumption should be in favour of re-use of existing pantiles. Roofers should be conversant with the traditional lath and lime 'sheeted' pattern of pantile roofing locally and experienced in its repair and installation. Roofing felt of any kind will very rarely be acceptable. New pantiles will be William Blythe handmade pantiles. All roofing timbers, including battens, will be of untreated timber and of larch.
- 2.1.9 SITE PREPARATION: Allow to clear interiors of all standing buildings of accumulated straw and dung and debris and to regain hard-standing within each prior to works commencing. Liaise with client regarding disposal of same.
- 2.1.10 RECORDING: A site diary and a full photographic record of all stages of repair works must be kept. Allow for the provision of a photographic and descriptive record of all repair works to be submitted at the end of the project.

Any variation of the above will not be permitted without prior consultation with and written instruction from the contract administrator.

## WORKMANSHIP

All contractors working on the site will demonstrate appropriate experience and/or accreditation to ply their trade upon the fabric the historic buildings; all will enjoy demonstrable facility in the use and repair of traditional materials. CSCS Heritage Skills Cards would be an advantage, but insufficient in themselves without demonstrable experience also.

The principle of minimum intervention will apply throughout the contract. No works beyond the scope of the schedule of works will be permitted without prior consultation with and written instruction from the contract administrator.

## APPROVED OR RECOMMENDED SPECIALIST SUPPLIERS:

New Bricks: the York Handmade Brick Company, Alne, York

Buxton Calbux quicklime: Womersleys Ltd, Heckmondwike

Singleton Birch quicklime: Ecolime Ltd, Rosewood, Terrington, York, YO60 6QB Tel: 01653 648112.  
[www.ecolime.co.uk](http://www.ecolime.co.uk) .

Riven lath, Ox-hair and goat-hair available from Womersleys Ltd or from Mike Wye Associates.

St Astier Natural Hydraulic Lime: Womersleys Ltd

Castle Cement NHL 3.5: Travis Perkins, Malton

Sharp sand : Travis Perkins, Malton. This sand is available from Malton Branch only and must be that supplied by Yarrows Aggregates, Beverley. Yarrow Aggregates will supply direct.

[info@yarrowsaggregates.co.uk](mailto:info@yarrowsaggregates.co.uk)

Limestone dust, 5mm down: Whitewall Quarry, Norton, Clifford Watts owners.

Pantiles: William Blyth, Hoe Hill, Barton upon Humber, North Lincolnshire, DN18 5RB. 01652 632175.

[www.williamblyth.co.uk](http://www.williamblyth.co.uk) or Sandtoft Roof Tiles Ltd, Belton Road, Sandtoft, Doncaster, DN8 5SY **0844 9395900** [www.sandtoft.co.uk](http://www.sandtoft.co.uk)

Blacksmithing & Ironwork: Andy Basnett, Espersykes Farm, Malton 01653 694001

Hand-forged nails and hinges: [www.handforged.co.uk](http://www.handforged.co.uk)

Rainwater Goods, J & JW Longbottom Ltd, Bridge Foundry, Holmfirth, Huddersfield. HD9 7AW. 01484 682141

Timber: MJ Wall & Sons, The Sawmill Westwood Lane Ampleforth York YO62 4DU. 01439 788 554

Paint: Linseed oil paints are available from Holkham Linseed Paints  
[www.holkhamlinseedpaints.co.uk](http://www.holkhamlinseedpaints.co.uk) or [www.linseedpaintcompany.co.uk](http://www.linseedpaintcompany.co.uk)

Roofing: Jordan Heritage Roofing: The Genesis Business Centre 36-42 King Street, Alferton, Derbyshire DE55 7DQ 01773 522413 [www.jordanheritageroofing.co.uk](http://www.jordanheritageroofing.co.uk)

Nominated Subcontractors.

Martin Watts, millwright. The specification and repair of the mill workings and associated managed watercourses will be the responsibility of the mill-wright and will form a separate item. Masonry repairs will need to be finally scheduled in liaison with the millwright and will necessarily form part of the separate mill building works. These will be tendered for once the main contract is underway.

Timber Framer: Wayne Kirby, J & W Kirby 47, Slack Lane, Crofton, Wakefield, West Yorkshire WF4 1HH. 01924 862567 [www.jwkyrby.co.uk](http://www.jwkyrby.co.uk)

Structural Engineer, if deemed necessary: Gez Pegram, Alan Wood and Partners, 341 Beverley Road Hull, North Humberside HU5 1LD 01482 442138. [www.alanwood.co.uk](http://www.alanwood.co.uk)

### 3.0 Schedule of Works

#### **3.1 Two-storey cow byre**

**Drawings D2,3,4.**

Exterior:

Masonry:

3.1.1 Allow to repoint E (front) elevation 50%

3.1.2 Allow to re-bed brick eaves course and to liaise with roofer. Allow for 10 new bricks. Allow to reinstate stone and lime detail over wall-plate and between rafter ends

3.1.3 NE quoin. Allow to reinstate 7 number new bricks and to point same

3.1.4 N wall: allow to repoint gable above eaves level 100% and to make good wall top before re-roofing

3.1.5 N wall: allow to repoint 15% below this level

3.1.6 N wall, allow to reinstate missing stonework where holes made for now lost building roof timbers – 6 number.

3.1.7 NW quoin of same, replace 1 number brick

3.1.8 W wall: repoint 50%

3.1.9 W wall: allow to remove lintel over large opening and masonry above. Allow to block this opening with stone, full thickness, using lime mortar, leaving one window opening to match others in this wall in size and character. Allow to point both sides of new stonework.

3.1.10 W wall: allow to consolidate hatch doorway, making new masonry quoin for this to the N side as blocking of larger opening proceeds.

3.1.11 W wall: allow to re-bed brick eaves course; allow for 10 new bricks.

3.1.12 S wall: allow to dismantle existing brick and stone stair, setting bricks and sound stone aside for re-use. Allow to rebuild stair on a new lime concrete footing, like for like.

3.1.13 S wall: allow to install new West Yorkshire sandstone steps to the same, like for like in size and including a single slab at head of stair.

3.1.14 S wall: allow to all loose or dislodged bricks to the W jamb of the groundfloor doorway and to the first floor doorway jambs.

3.1.15 S wall: allow to make good wall top in liaison with roofers

3.1.16 S wall: allow for 10% repointing.

Internal, main cow byre, ground floor

3.1.17 S wall: allow to make good recess, reinstating missing brick reveal. Allow to reinstate stone lintel, which may also be part of a tread on exterior stair.



3.1.18 S wall: allow to repoint 20%

3.1.19 W wall: allow to clean down with stiff bristle brushes and to repoint 70%

3.1.20 E wall, allow to clean down and to repoint locally as necessary

3.1.21 N (cross) wall: allow to clean down with bristle brushes and water with fungicide. Allow to repoint 20%.

3.1.22 All walls: allow to limewash, 4 coats.

Internal, loose box, groundfloor:

3.1.23 allow to clear all debris and accumulated waste from floor to reveal original cobbled surface. Allow provisional sum of £1200 for floor repairs.

3.1.24 Allow to repoint 60%

3.1.25 Allow to limewash three coats throughout

3.1.26 Allow to dig out floor to expose surface. Allow provisional sum of £600 for repairs to cobble floor, if present.

Cow byre internal, first floor masonry:

3.1.27 allow to remove all chicken guano placing in location agreed with client

3.1.28 allow to chop out decayed built in board at cill level of W wall and to replace with clay plain tile bedded in lime mortar, two courses, flush with wall-line

3.1.29 W wall: allow to repoint 80% and to clean and consolidate stone cills of windows

3.1.30 E wall allow to consolidate loose wall top and to re-bed bricks

3.1.31 E wall, allow to repoint 50%, and consolidate stone cills of windows

3.1.32 E wall, allow to take down 1 metre sq of masonry to full width of the wall at the N end and against the cross wall and to rebuild in line with adjacent masonry

3.1.33 N gable: allow to repoint 100% above eaves level

3.1.34 N gable, allow to consolidate wall top

3.1.35 N gable, allow to consolidate crack at W end and to install 5 # helical ties across this crack

3.1.36 allow to lime plaster, as necessary, one coat, throughout to eaves level.

3.1.37 allow to limewash throughout, 4 coats.

Loose box of two storey cow-byre, first floor masonry:

3.1.38 N gable, fill 2 # holes with stone and lime mortar and repoint 100%

3.1.39 S gable, fill 1# hole, repoint 100%

3.1.40 W wall, all to be rebuilt at this level – see above

3.1.41 E wall, allow to repoint and to rebed bricks at wall-top.

3.1.42 allow to liaise with roofer and to make good after introduction of new purlin and other joinery.

Cow byre joinery:

3.1.43 E wall, windows, groundfloor: allow to make 2 # windows to match those above in pattern and style, as per **Drawings 9 & 10** attached, renewing oak cill

3.1.44 E wall first floor windows, S window: allow to lintel over in oak and to refurbish window in situ.

3.1.45 ditto, N window: allow to remove window and frame, renewing N jamb and cill, reslating and re-setting in place. Allow for new lintel over.

3.1.46 E wall, S doorway, allow to splice two new jamb feet in oak and to make new door like for like reusing existing iron and to fix

3.1.47 allow to install new oak frame and larch door between cow byre and loose box.

3.1.48 E wall, N doorway, ditto the above.

3.1.49 S wall, lower doorway: allow to take out and to re-peg E jamb. Allow for new door reusing as much as possible of existing door and reusing existing ironwork. Allow for new oak lintel over and to reinstate all

3.1.50 allow to repair lower boards of surviving stall partitions

3.1.51 allow to make three new stall partitions, two small and one large, to match existing in materials and style and to fix the same, the large one beneath the S beam.

3.1.52 allow to refurbish existing hay-rack in situ, renewing 10 # slats like for like

3.1.53 S wall, hay-loft door. Allow to take out and to repair as necessary as above. The pintle has failed and this has allowed deformation of door. Allow for new lower pintle. Retain iron repairs to jamb feet if practicable.

3.1.54 W walls, windows allow to remove, refurbish and to provide new oak sub-cills to both frames and to re-fix.

3.1.55 first floor joinery, main cow byre: allow to replace 3 # joists at NW end, like for like and passing through the cross wall to receive timber beam at other side. Allow to replace 3 # joists against E wall.

3.1.56 allow to replace floorboards 100%, like for like in sawn larch

Loose-box of cow byre:

3.1.57 allow to replace S beam that sits on projecting joist ends and supports joists above 100%

3.1.58 allow to replace 3 # joists

3.1.59 allow to replace floorboards 100%, sawn larch

3.1.60 allow to make and install a new and simple access hatch where there is currently an old door, to allow passage from ground to first floor. Allow to make and fix a simple ladder stair also.

Roof

3.1.61 allow to strip and set aside pantiles from N half of the roof

3.1.62 allow to strip off existing riven lath from same, setting aside all sound material for re-use

3.1.63 allow to replace one tusk tenon purlin, S end and between trusses, currently coach-bolted.

3.1.64 allow to replace 50% of rafters of roof to N of recently repaired S truss, renewing ridge plate 100%

3.1.65 allow to replace 50% of wallplate to W side and 100% to square east

3.1.66 allow to replace 1 # purlin, E slope of roof over loose box

3.1.67 allow to replace tile battens 100% in untreated larch, 1 ¼" x 1 ¼"

3.1.68 allow to apply riven chestnut lath across whole roof and to 'sheet' with one coat of haired hot-mixed quicklime mortar between tile battens.

3.1.69 allow to liaise with roofers, as sheeting and pantiling will need to proceed at the same time, the tiles bedded onto moist lime mortar.

## **3.2 Single storey cow-shed and loose boxes**

### **Drawing 5**

Interior, main cow shed

Masonry:

3.2.1 allow to remove opc render to lower walls throughout

3.2.2 allow to repoint walls behind 100%

3.2.3 allow to apply two coat NH lime render

3.2.4 W wall allow to repoint 3m sq.

3.2.5 NW corner: allow to repoint 2m sq

3.2.6 allow to take out concrete block (and to rebuild at same time as outer wall of same)

3.2.7 allow to limewash throughout, 3 coats

#### Roof

3.2.8 allow to strip all pantiles and stone ridge tiles, setting aside for re-use

3.2.9 allow to clean down trusses by dry-brushing

3.2.10 allow for each of the following repair options for E end of S truss: a) 1 new flitch plate and shoe; b) traditional scarfed repair

2.2.11 allow for new face-plates at apexes of trusses

3.2.12 allow for replacement of 10 # rafters

3.2.13 allow for 100% replacement of tile battens

3.2.14 allow for re-laying of pantiles without felt or sheeting

#### Middle stable

##### Interior

##### Masonry

3.2.15 allow to dig out accumulated dung and straw to establish condition of lower walls

3.2.16 allow to take down inner skin of front, W wall and quoin of doorway and to rebuild to original line, installing new inner lintel over doorway

3.2.17 allow to remove brick blocking of pitching door, S gable wall

3.2.18 allow to consolidate loose masonry and make good gable wall top, S wall

3.2.19 allow to repoint 50%

3.2.20 E wall: allow to deep pack junction with S wall with lime mortar and clay tile

3.2.21 E wall: allow to repoint 30%

3.2.22 N wall: allow to repoint un-rebuilt section, approx 3 m sq

3.2.23 all walls, allow to repoint currently below ground section 100% to 24" below current grade

3.2.14 allow to lay lime concrete floor to specification.

3.2.25 allow to plaster throughout to full height, 2 coats lime plaster (some original plaster survives and should be retained)

3.2.26 allow to consolidate E wall-top

#### Roof

3.2.27 allow to strip roof of pantiles and clay ridge tiles, setting aside for re-use

3.2.28 allow to replace 1 # purlin like-for-like

3.2.29 allow to dismantle roof, setting aside for re-use

3.2.30 allow to a) introduce flitch plate to W end of truss, in situ; allow for all necessary propping; b) to renew truss 100% like for like

3.2.31 allow to reinstate roof structure as per originally, renewing ridge plate

3.2.32 allow to apply lime mortar sheeted riven lath covering over rafters, both sides

3.2.33 allow to relay original pantiles to W slope of roof; new handmade pantiles to E slope, reusing clay ridge tiles

N (end) stable,

Interior masonry:

3.2.34 allow to clean floor, exposing original cobbles

3.2.35 allow PS of £500 for replacing missing sections of cobble and repointing of cobbled floor

3.2.36 E wall: repoint 100%

3.2.37 S wall, repoint 40%

3.2.38 N wall, repoint 100%, refilling 4 # holes

Roof

3.2.39 allow to take down surviving parts of roof structure, setting aside for re-use

3.2.40 allow to scarf in 1 metre new wall-plate

3.2.41 allow to re-use 6 ½ original rafters, 1 purlin

3.2.42 allow to supply and fix 7 ½ new rafters, new purlin, ridgeplate and wallplate, W slope

3.2.43 allow to apply lime mortar sheeted riven lath covering over rafters, both sides

3.2.44 allow to re-lay original pantiles to W slope (won from roof over middle stable); new handmade pantiles to E slope and to rebed clay ridge tiles

Interior joinery, both stables:

3.2.45 allow to reinstate both first floors to pattern of surviving section of first floor inside middle stable, using larch lumber converted as per original material and sawn larch boards.

3.2.46 allow to make new door frame and door as per patterns elsewhere on the site (oak surround; larch door) with hand-forged iron hinges and door furniture, S gable wall, middle stable.

## **Cow-shed and Stables, exterior:**

### **Drawing 5**

Brick lean-to, S end:

3.2.47 allow to remove asbestos sheet roof

3.2.48 allow to install simple rafter roof of sufficient performance to receive pantiles

3.2.49 allow to pantile roof using new, handmade pantiles

3.2.50 allow to lime render exterior brickwork, 2 coats.

3.2.51 main cow-shed, E wall: allow to repoint 100%, over laying existing earth mortar without raking this back and removing 2m sq of opc repointing

3.2.52 middle stable, E wall, allow to repoint wall between doors 100%

Doorways

3.2.53 S door, allow to splice new foot to N jamb, taking out and refurbishing frame. Allow for new door, reusing existing ironwork

3.2.54 middle door: make and fit new oak frame and make new door as above

3.2.55 N door remove frame and splice two new jamb feet

3.2.56 S wall over lean to: repoint gable 100%

3.2.57 S wall, E of lean to: remove opc and repoint 80%

3.2.58 E wall: take out 2 # concrete block sections (beneath opc render) and remake wall with stone to match adjacent walling to full depth

3.2.59 E wall: rebuild upper section of stone wall between these sections

3.2.60 E wall: take down loose stonework adjacent N gable, removing tree and tree roots before rebuilding

3.2.61 E wall buttress: remove opc render. Allow PS £400 for repointing of stonework with NHL mortar

3.2.62 E wall: allow to rebuild or consolidate upper 12" of wall around wall-plate

3.2.63 allow to deep-pack junction of middle stable wall with main cow-shed wall

3.2.64 allow to build new buttress across junction of main cow-shed and middle stable, 1 m wide and with 2m maximum projection. Allow to consolidate and face stream bank to E of proposed buttress to receive (and be part of) the footing of the same.

3.2.65 repoint E wall as a whole 100%

North wall

3.2.66 deep-fill and locally stitch the vertical separation crack in the centre of the wall below door opening. Allow for 5# stainless steel helical ties

3.2.67 allow to repoint 100%, re-filling 1# hole

3.2.68 allow to consolidate gable wall-top for re-roofing

3.2.69 allow to consolidate stone cill of pitching doorway

3.2.70 allow to remove and refurbish repair (new threshold) and reset pitching door frame and to make new plank door to pattern of others on site

Rainwater goods

3.2.71 allow to supply and fix cast iron gutters to length of E and W walls, to fall to down-pipes at N end, one per elevation, with octagonal hoppers over.

### **3.3 Pig-sties**

#### **Drawing 8**

3.3.1 allow to remove all debris and fallen stone from within all former sties and forge building, setting the stone from each bay aside separately for re-use

3.3.2 allow to take down the front and side perimeter walls to a sound footing, again setting aside according to location

3.3.3 allow to take down side walls within perimeter to a sound footing

3.3.4 allow to repair and consolidate back wall of sties, rebuilding upper sections

3.3.5 allow to take down and rebuild upper half of back wall of forge

3.3.6 allow to repoint and deep-pack open joints of back wall with NHL mortar

3.3.7 allow to investigate concrete floor. Allow PS of £2000 to lay in lime concrete floor.

3.3.8 allow to rebuild all walls of the pig-sties using hot mixed quicklime lime mortar in their original location and to their original pattern

3.3.9 allow to rebuild walls of forge a) to 46" high, with coping of new sandstone, once-weathered, 4" maximum bed-height; b) allow to rebuild walls of forge to full original height, including gables, using stone available on site

3.3.10 allow to supply and fix new roofs over the pig-sties to drawing #=====, fully lath and sheeted with riven lath and pantiled with new hand-made pantiles.

3.3.11 allow to supply and fix new purlin roof over forge building, a) lath and sheeted; b) without lath or underfelt; new hand-made pantiles and clay ridge tiles

3.3.12 allow to supply and fix once-weathered sandstone copings to sit over back wall and lap over upper pantiles of roofs of pig-sties, 4" maximum bed-height, minimum 24" wide.

3.3.13 allow to research, design and install historically appropriate feeding bays to the front walls of the sties – PS £2000

3.3.14 allow for plank door gates between forge and all sties with oak posts to either side for access as historically against E wall.

### **3.4 Mill-house**

#### **Drawings 6 & 7**

South elevation, exterior

3.4.1 allow to replace 12 # ashlar blocks, dressing back original blocks in situ to allow introduction of new facing stones to original face dimension. New stones should be a minimum of 6" deep.

3.4.2 allow to mortar repair 4 # less severely delaminated ashlar blocks above

3.4.3 allow to reinstate approx 2 m sq of ashlar where there is currently a hole, behind the mill wheel. Typical ashlar sizes to match existing adjacent. Blocks to be a minimum of 8" deep. Allow for fully mortared rubble core.

3.4.4 allow for 2 # quoin stones to drive-shaft opening, 8" deep

3.4.5 allow for mortar repair to 5 # blocks of same, as well as to oak lintel.

3.4.6 allow to remove concrete pad over pathway adjacent to tail-race

3.4.7 allow to repave this area with random York stone flags on a rubble base, subject to discovery of surface beneath concrete.

3.4.8 allow to consolidate and make good S wall of tail-race to level of concrete pathway, using like stone and NHL mortar.

3.4.9 allow to repoint approx 2 m sq of wall (other than repaired or rebuilt sections), removing all opc mortar

3.4.10 allow to carefully break out opc fillet beneath roof verge and to replace with stone, matching adjacent masonry

3.4.11 allow to refurbish cast iron S-bend and to install new cast iron down-pipe which will dispense into the tail-race

3.4.12 allow to supply and fix new larch door to match existing, re-using all ironwork



3.4.13 allow for new oak threshold and to splice new feet to jambs of door frame

#### **Mill Dam**

3.4.14 allow to take out and rebuild approx ½ m sq at low level

3.4.15 allow to replace 5# missing stones at high level

3.4.16 allow to deep-pack open joints and to repoint 50%

3.4.17 allow to consolidate wall top adjoining forge wall

#### **Mill-house, East elevation, exterior**

3.4.18 allow to remove patch pointing with opc over doorway and to repoint with lime

3.4.19 allow to deep pack repoint the slight crack above and in line with S jamb of doorway (after lifting lintel and strengthening S jamb foot)

3.4.20 allow to break out concrete path around mill-stone threshold and to lay in cobbles set in dry-mixed NHL mortar

3.4.21 allow to strengthen connection between splice repair of S jamb and main jamb and to lift frame lintel and main lintel back into place

3.4.22 allow to remove half-round cast iron gutter, refurbish and re-fix over new hand-forged gutter brackets

3.4.23 allow to remove asbestos sheet roof to W slope and to lay on new rafters of untreated larch over purlins adjusted or redesigned as necessary.

3.4.24 allow to lath and lime sheet the same

3.4.25 allow to supply and lay new handmade pantiles, reusing existing stone ridge.

#### **Mill-house interior**

##### **Ground floor**

3.4.26 allow to investigate floor, 3 # small excavations

3.4.27 allow to break and lift concrete to expose earlier floor surface

3.4.28 allow to lay a) York stone flags upon a lime concrete base throughout; b) allow to lay cobbles throughout

3.4.29 allow to consolidate masonry at low level, within mill-pit W wall

3.4.30 allow to remove awkward brick pillar against W wall and beneath floor beam, first propping this beam

3.4.31 allow to install oak pillar in place of brick pillar, beneath hurst frame and between this and the floor beam, the end of which has decayed in the wall. Oak to be of same dimension as the floor beam and suitably jointed (Wayne Kirby).

3.4.32 allow to point/dub-out W wall and to plaster 100% in two coat NHL mortar

3.4.33 allow to replaster 2 m sq, N wall; crack fill same

3.4.34 allow to replaster over filled holes, E wall

3.4.35 allow to deep-pack crack at high level SE corner

3.4.36 allow to chop out patches of opc repair, S gable wall, allowing for 2 m sq of new plaster

3.4.37 allow to point and consolidate stone and brickwork below threshold of pitching door and to plaster the same

3.4.38 allow to limewash throughout, 3 coats but avoiding pencil-written notes

3.4.39 allow to carefully remove all debris and soil from within the mill-pit, propping and wedging any decayed feet of the hurst frame as this proceeds. Excavation to proceed to 6" below wheel diameters, and depth will vary.

First floor – all repairs at this level subject to the conclusions of millwrights report

3.4.40 allow to re-establish stability and surviving form of earlier truss, which may require the addition of steel plates

3.4.41 allow to reinstate 10 m sq new floor boards to match existing.

3.4.42 allow to make new ladder stair to match existing, re-using as much of original as possible.

3.4.43 allow to refurbish and repair door and door frame of access into attic.

3.4.44 allow to patch repair plaster of walls, window reveals, house attic.

3.4.45 allow to remove all loose or defective plaster to lath ceiling within attic

3.4.46 allow to replaster ceiling of house attic 100%

3.4.47 allow to re-open windows at N end of attic and to install 2 # sash windows to match existing in the house (subject to listed building consent).

### **3.5 Groundworks**

#### **Drawing 1**

3.5.1 allow to investigate earlier surface beneath fold yard to E of two storey cow byre, 4 trial pits

3.5.2 allow to remove overburden from same to a depth of 12".

3.5.3 allow PS of £5000 for repair of existing or provision of new hard-standing in same

3.5.4 allow PS of £5000 for design and introduction of drainage scheme to carry run off from road away from buildings to E of road and into the tail-race.