



**RED ROSE
DEVELOPMENTS**

METHOD STATEMENT FOR REPAIR WORK TO BUILDINGS AT

ASHRIDGE FARM, WOKINGHAM

Report by William Harrison

RED ROSE DEVELOPMENTS MARCH 2021

Construction Method Statement
For Ashridge Farm Development in Wokingham

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Revision sheet

Revision	Date	Changes
A	30/04/21	First issue
B	30/08/21	Conservation officer comments
C	16/03/21	New planning submission

1. Introduction

Following planning and listed building permission being granted to convert the five existing farm buildings at Ashridge Farm into residential properties in 2018 this new application seeks to update and clarify the previous information as well as making design changes mainly to the internal layouts of the properties.

This report has been commissioned following a review of the reports submitted when granted planning permission, to convert the agricultural buildings to domestic dwellings, as well as structural considerations and buildability considered when converting historic buildings of this nature. This method statement is required to ensure that the special historic environment is retained in accordance with the local Development Planning Policy. A visual structural integrity report has been compiled by MLM consulting engineers, report ref NA/667422/RP 2017 and then developed by Hockley and Dawson structural engineers in producing structural designs in October 2021, a timber frame repair schedule has been completed for Unit 5 (The Grade 2 Listed Barn) by Green Oak Carpentry, dated April 2021.

The existing site comprises of five units of which extensive repairs are required to all of the buildings to address structural instability and to comply with current building regulations. The brick built barns forming Units 1 and 2 require structural repairs to a lesser extent than the other buildings, aside from the 20th century timber extension to the West of Unit 1 which was in poor condition. Unit 3 comprising of a 20th century timber shed with modern roman tiled roof is of no significant age according to the BJHC Historic building report 2016 and is in 'perilous condition' close to collapse. Unit 4 is a partially brick built workshop in fair condition with what was an open sided cart style timber frame to the courtyard side that is now rotten and infilled using modern construction methods. The timber frame barn building forming Unit 5, following long-term neglect is in a structurally poor condition but the timber is able to be repaired, as noted in the MLM structural report. All five buildings will be repaired, replaced in areas and part extended following conversion for domestic use and this report will examine the proposed methods of conversion and repair as well as bringing the buildings up to current building regulations and acceptable structural integrity.



Figure 1: Aerial view of Ashridge Farm from the South, Units 1-3, 2021.

Red Rose Developments has previously completed works to numerous similar Grade 2 listed barns in the area and similar outbuildings of this age to a commendable standard and using best practice conservation techniques from predominantly the Special Protection of Ancient Buildings (SPAB) and also English Heritage guidance. Predominantly local skilled craftsmen will be used, and best practice methods used in order to maintain and enhance the historic fabric of the buildings whilst renewing the buildings usage and ultimately saving the historic buildings for the future.

Noted in this method statement is a brief description of how each building is constructed and its present condition – this is required as a background understanding of the historical feature being explained for repair. A full description of the historical features has been completed in a separate historic report by BJHC recording services, 2016. A photographic record was also completed, in September 2021, to meet the requirements of Level 3 of Historic England Guide to Understanding Historic Buildings - A Guide to Good Recording Practice and was submitted with the local Historic Environment Record which included the current photos, analytical BJHC report and existing plan and elevation drawings.

As far as reasonably practical 'The conversion of traditional farm buildings: A guide to good practice' a document produced by English Heritage has been followed in developing this method statement. Elements of the method statement also refer to guidance from The Society for Protection of Ancient Buildings (SPAB).

2. Heritage significance of buildings

The Farmhouse which is of separate ownership and does not form part of this report is believed to be C17th and is Grade 2* listed. The Timber framed Barn is Grade 2 listed and was likely assembled circa. late C16th with the eastern extension added C17th. The other barns are considered within the curtilage of these listed buildings and are mainly of C19th and the timber clad buildings 20th century construction.

The Grade 2 listed timber framed barn was originally erected with five unequal bays and an offset porch on the north side which would have been used as a threshing barn at a time when it was realised that the stored harvest needed more room than the gleaned grain. The Brick Barn and Brick Stables were built as a unit between 1838 and 1877 and the quality of the brickwork and the machine sawn softwood timbers indicates a date late in that range. In the same time bracket the Timber-framed Barn was extended, adding a bay to the western end and a two storey extension using a second-hand C17th frame at the other end. Between 1875 and 1899 the Workshop and Processing Shed were built as a combination of a new brick building and a reused timber-framed one, most likely moved from the middle of the site. In the same period the Timber Stables were added to the western end of the Brick Stable. This concluded the expansion of the farmyard until the late C20th when cow byres and a bull pen were added.

Ashridge Farm has been unused and unoccupied for a considerable number of years. All five of the buildings described above are in poor condition and require repairs to mitigate the damage already caused to the original structures. The buildings have in relatively recent times all received minor alterations and patch repairs to try and limit the damage but are in need of significant repairs and maintenance to ensure their long-term future.

3. Structural condition

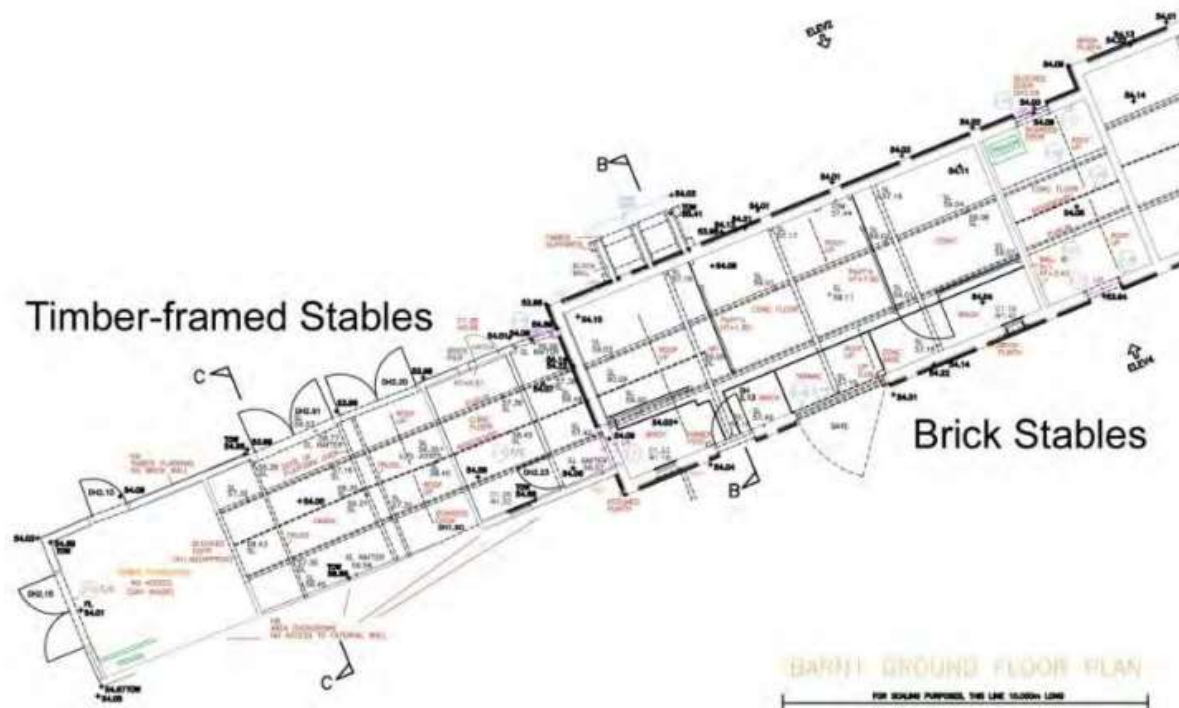
In this section of the statement each building has been reviewed individually with the overall construction and visual condition explained with extracts from MLM's structural report drawn upon. The repair methods are explained in the next section of this report. The visual structural survey was completed by MLM consultancy in a separate report.

Unit 1



Figure 2: C19th Century South East elevation of Unit 1 Figure 3: C20th North West elevation of Unit 1

To the West lower section of Unit 1 there is a rough, partially broken up, concrete ground floor slab, previously used as timber framed stables and a garage. There is no sign of a visible damp proof membrane. The slab will have to be removed and replaced. The timber clad frame is sited on a small perimeter brick plinth that is partially collapsed in areas. It is unlikely that the structure has a much of a foundation due to the condition of the plinth. Tree roots around the building have destabilised much of the wall. Within the brick stables there is also a rough concrete slab which requires removing and replacing.



Existing walls

There are numerous spalled bricks that would need to be replaced locally, but in general the brickwork is in fair condition to the stables. All the brickwork will require repointing which will be completed in lime mortar, of matched colour and texture to the existing. There is structural cracking appearing where the external southern wall meets the eastern internal wall, likely due to the roof spreading. This will be repaired once the roof is repaired. The steel lintel over the main opening from the courtyard is not up to building regulations and has crudely been added in across two original windows, see image below, it has also been knocked causing a instability. The steel beam will be removed and replaced with a hidden lintel and brickwork made good above.

To the western elevation the walls and structure is constructed from softwood timber, partially sat on a brick plinth. The weatherboarding and timber structure is full of rot and in poor condition and requires total replacement. Like any modern shed once the roof tiles and cladding are removed what is left is an insubstantial softwood timber frame of no structural integrity.



Figure 5: Brickwork collapsing and steel beam over entrance to unit 1

Existing roof structure

The existing structural joinery is, overall, in need of a number of repairs but is in reasonable condition and can be sympathetically restored. Some original elements have been removed and replaced with softwood more recently which will be replaced as originally intended. The Queen post truss and purlins will be retained withing the brick stables and left in situ with the rafters and battens replaced to incorporate insulation. The roof tiles will be removed and reused where they are in good condition, and it is thought 75% should be able to be reused. There is some woodworm infestation, and all the softwood timber work will require woodworm treatment. The roof structure over the western timber framed elevation has partially collapsed and modern fluted clay tiles have been used, these will be replaced to match the remainder of the roof covering, tile sample subject to the council's approval.

Unit 2



Figure 6: Exterior south elevation of unit 2

The brick barn forming Unit 1 is of the similar age and construction and Unit 1, a concrete ground slab had no sign of a damp proof membrane and was not level which will be replaced. There were a number of spalled bricks and some cracking to the brickwork visible over a number of the roof trusses, possibly from machine collisions. The external walls were overall in good condition, plumb and showed no evidence of subsidence although the roof is spreading over the northern and southern main openings which is pushing the wall outwards considerably and unrepaired would lead to collapse of the wall and roof. The external walls require repointing in some areas where the mortar has leached out. There was no damp-proof course in the wall.

The roof structure has received many patch repairs over time using unsuitable materials and a felt underlay has been added to areas. The large queen post trusses will be retained in situ and reused but the rafters and battens will need to be replaced. The roof tiles look to be in sound condition so will be reused.

The current porch doors and surrounding cladding are in poor condition and have decayed beyond repair.

Unit 3

The former workshop forming Unit 3 has timber-framed walls with softwood studs clad with C20th weather-boards. The doors and window glass are missing. The roof is clad with modern double roman tiles, but the roof structure is C19th in design and fabric. A thin concrete slurry partially covers the floor. The building is held up using several acrow props on all sides due to all of the structure being in a state of decay. Most of the structural timber posts are rotten or missing. Metal sheeting has been added internally which is tying some of the timber together. Undergrowth,

particularly ivy, is currently holding much of the structure together. Overall, there is no fabric of this building that can be retained.



Figure 7: Courtyard view of unit 3 in state of collapse and temporarily propped



Figure 8: Internal view of Unit 3 showing decay and overgrowth

Unit 4



Figure 9: Courtyard view of unit 4

The thin concrete ground slab is cracked in areas and had no sign of a damp proof membrane and was not level, which will be replaced. To the southern elevation and gable ends the solid brick wall is in fair condition and can be repaired. To the North courtyard elevation that was open until post 1966, according to historical plans, there were a number of spalled bricks and modern cement repairs that infilled the rotting timber sections. It is proposed that this section is removed in order to replace it, matching it with the original brickwork on the other sides of the building. The roof structure and roman tiles are of modern construction and will be replaced.

Unit 5 – The timber framed Barn



Figure 10: External East elevation of unit 5

A full repairs schedule to the timber frame has been completed separately, report by Green Oak carpentry 2021. The oak timber frame is thought to date back to the late 16th century with the eastern end bay added in the 17th century and is made up of seven uneven bays with a central porch.

Existing floor slab

The concrete ground slab that was visible is uneven and there was no sign of a damp proof membrane. This will need to be removed and replaced with a ground bearing slab, to engineer's details, inside of the timber frame. A particularly small brick plinth wall could be seen under the sole plate which runs around the perimeter. This wall has settled drastically in areas, likely to having no foundation, which has broken many of the timber joints and now some of the timber is almost at ground level which has caused the timber to further decay after getting damp. The plinth wall will need to be reinstated level and at the correct height where it has settled with bricks replaced and bonded in lime mortar. Following Green Oak Carpentry's recommendations, when sections of the timber frame of bays 1-6 is removed, in order to repair, it this will allow the brick plinth will be repaired and replaced.

Existing walls

Due to the long-term damage caused by water ingress the full extent of the repairs to the timber structure will only be fully realised once it has been exposed in removing the cladding. Any further repairs will be completed in a traditional like-for-like basis. The main post to the west of the southern elevation barn door has been moved, following a lorry crash into the building and has been

repaired comparatively recently following damage from the collision. Due to both factors the frame is severely damaged in this area.

The structural condition of the building overall is poor due to racking and movement, although the timber looks to be mainly free from decay. The timber itself is in fair condition and the vast majority can be repaired but due to all the movement many of the joints holding the structure together have snapped leaving it structurally unsecure. The roof has also racked over badly from its original position.

The external cladding to the main barn is black horizontal timber boarding onto timber uprights. Areas of the cladding have been replaced over the years and it will be removed to allow the repairs to be completed then replaced with larch, stained black, in keeping with the original fabric. The main barn doors have been replaced with softwood and are too large for the original opening. These will be replaced with a hardwood door of the same style and pinned open.

To the eastern elevation of the barn, the later extended bay 7, the wattle and daub panels have been infilled with brickwork and render. There is a high brick plinth where most of the original bricks have been repointed in cement have now blown. Subsidence has also left the South East corner structurally unsound, a range of modern bricks have been used to patch repair this corner of the barn. Cement render has also been used on the higher panels. Removing this render now would damage the timber wattle it is bonded to so it is sought to leave this in situ. All the modern bricks, cement and bricks in poor condition will need to be removed and replaced locally with a reclaimed match for the original handmade brick and pointed in lime mortar.

Internally in Bay 7, the hay loft, there are a number of wattle and daub plastered walls between the timber frame. The intent is to leave this bay in situ in its entirety in order to preserve these original panels. Where the lime in a panel is in poor condition it will be repaired using a traditional lime mix and techniques to stop further damage. In order to preserve this further, once repaired, any of the wall up to head height will have a new stud wall built in front of it to that when the building is in domestic use it cannot be damaged or disturbed. The majority of the historic fabric in this area will be left undisturbed, minor repairs completed to prevent further decay and then the new structure built in front to protect it and ensure structural stability.

There are two windows (W14 and W7) which have been selected to be repaired and refurbished. These will carefully be removed and repaired in a workshop before being reinstated.

Existing roof structure

The roof is tiled in a mix of old and new clay tiles due to being re roofed with under felt added in the 90's. Due to the structural movement underneath it is in need of major repair works, although mainly water tight there are some missing tiles causing water damage internally. Some of the internal roof timbers have deflected excessively or broken. The tiles of modern manufacture will all be replaced with a tile to match the older style. The guttering and downpipes are in poor condition and will need to be replaced as water is currently draining onto the original timber frame causing significant damage, especially seen on the south east corner, photo below.



Figure 11: South eastern corner of unit 5

4. Proposed methods of structural repairs

Unit 1, 2 and 4

Each element of the build methods proposed to repair the structure has been explained in the sections below.

Foundations and ground floor slabs

The existing concrete slabs to all the buildings will be removed using a small breaker and excavator. In Unit 5 the concrete slab will be cut up and folded back on itself to break it up in order to minimise vibration. The build-up material, likely sand and gravel will be reduced approximately 200mm down from current floor level. Ground bearing slabs, 150mm thick, will be installed to the engineer's details to all of the units. This will allow the existing brick walls to remain in situ whilst allowing insulation and a damp proof course to be added in. A low-pressure underfloor heating is proposed to be installed on top of each slab in a layer of 75mm screed to keep the properties at a constant ambient temperature, helping with thermal efficiency and will omit the requirement for modern radiators on show.

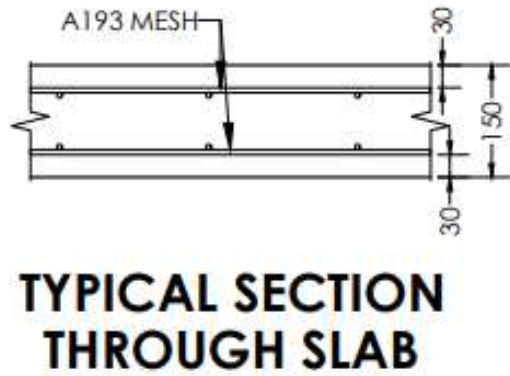


Figure 12: Ground bearing slab detail

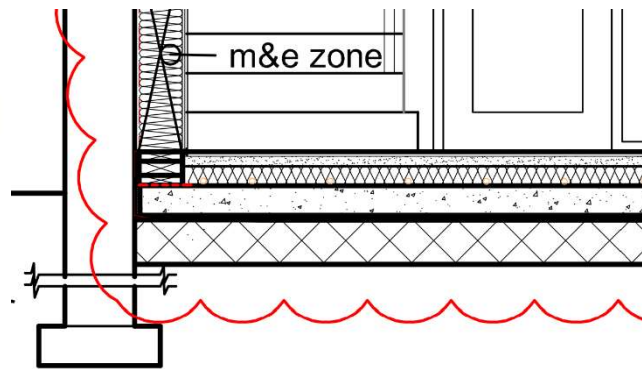


Figure 13: New slab, insulation, UFH and screed within existing walls

The only exception to the ground bearing slabs will be the western section of Unit 1 which will be completed in block and beam flooring, subject to the engineer's design. This is due to the proximity of two trees and a risk of clay heave.

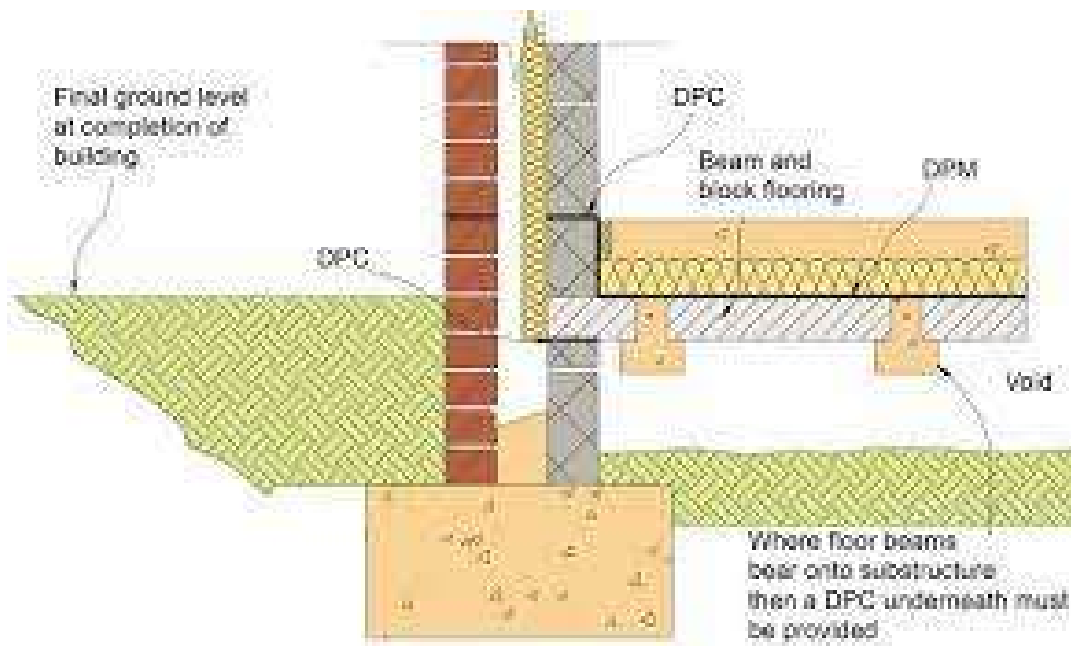
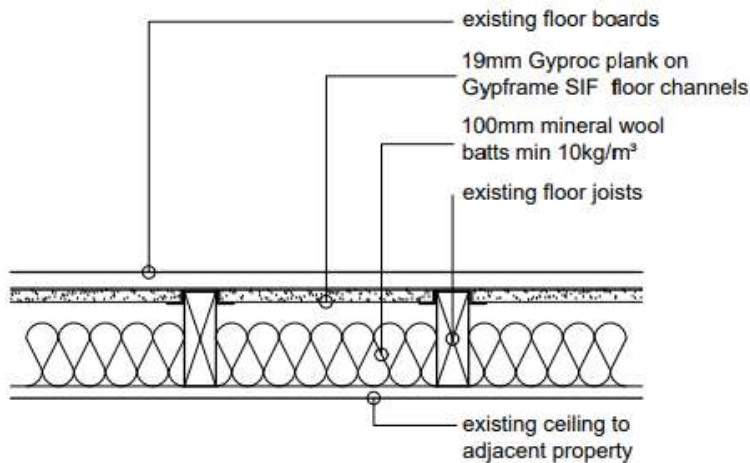


Figure 14: typical block and beam detail proposed for Unit 1 West

The first floor to Unit 1 mezzanine, unit 2 and unit 5 is to be constructed from timber joists on hangers from the new structural studwork, set inside the existing brickwork with new floor boards, sound insulation and underlay between with plasterboard fixed underneath and a plaster skim finish. Using this no loads are imposed on any of the existing structure.



First floor detail scale 1:10 @ A1

Figure 15: Typical first floor section detail

External Walls

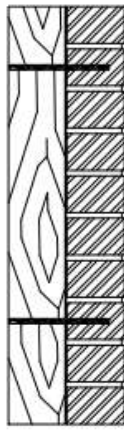
Externally, all repairs to the existing fabric will be in like-for-like repairs. The exception might be if we find that work has been previously carried out in inappropriate materials such as cement repointing, in which case new work will be done in lime mortar, and an assessment of whether it is possible to un-pick previous inappropriate work. All new work will be carried out in accordance with S.P.A.B. 'alterations and extensions to listed buildings' good practice guidelines. The replacement sections of wall will be built from a matching brick. Much of the brickwork requires repointing, this will be done by first chiselling out by hand and then repointing undertaken in matching lime mortar.

All the structural brick walls are to be left in-situ. Unsound brickwork is to be replaced locally in lime mortar as existing and re-pointed where required. Following SPAB guidelines the brickwork will not be chemically treated and will just be washed with water and a brush.

Internally a Structural stud walls in 220mmx 50mm treated timber, to engineers detail below, will line the existing brick walls which as well as stabilising the brickwork also allows insulation between the studs and plasterboard to be installed.

CONNECTING NEW BUILD TIMBER STUDS TO AN EXISTING WALL USING RETROTIES

METHOD STATEMENT:



1. MARK THE POINTS FOR RETROTIE INSERTION AT THE MIDDLE OF THE TIMBER STUD.
2. DRILL THE APPROPRIATE PILOT HOLE ALL THE WAY THROUGH THE TIMBER STUD AND 80MM INTO THE FAR LEAF. THE PILOT HOLE WILL NOT BE REQUIRED IF THE BACK-UP MATERIAL IS AIRCRETE.
3. WIDEN THE PILOT HOLE IN THE STUD USING A TIMBER DRILL BIT TO CREATE THE APPROPRIATE CLEARANCE HOLE.
4. THOROUGHLY BLOW THE DUST OUT OF THE TIMBER STUD HOLE WITH AN AIRJET.
5. LOAD THE RETROTIE INTO THE SUPPORT TOOL, INSERT THROUGH THE TIMBER STUD AND DRIVE HOME INTO THE FAR LEAF. THE 'O' RING MARKER ALLOWS THE CAVITY WIDTH TO BE MEASURED AND AVOIDS OVER-DRIVING.
6. POSITION THE PLASTIC SLEEVE OVER THE OUTER END OF THE RETROTIE AND SLIDE IT DOWN THE TIE WITH THE SUPPORT TOOL UNTIL THE MARK ON THE TOOL STEM IS FLUSH WITH THE OUTER. THE SLEEVE SEALS THE HOLE ADJACENT TO THE CAVITY.
7. SECURITY OF FIXING IN THE FAR LEAF IS TO BE TESTED WITH A HELIFIX LOAD TEST UNIT.
8. INJECT CRACKBOND TE RESIN UNTIL THE HOLE IS FILLED. ALLOW TO CURE AND MAKE GOOD.

TYPICAL TIMBER TO MASONRY FIXING DETAIL

1:10

Figure 16: Structural timber to brick detail.

Replacement structures

To the western lower section of unit 1 as well as Unit 3, as noted in the MLM structural report and BJHC historic reports, the softwood 20th century timber has been allowed to decay to an unsafe and unrepairable state. These sections of the buildings will be rebuilt using standard modern construction methods, to engineers' details, but keeping the same external form and appearance. Both buildings will be timber clad and have heritage clay tiles to match the adjoining roofs. Any roof trusses that are able to be preserved will be set aside and cosmetically reinstated once the new structures have been installed.



Figure 17: Unit 1 west lower timber section to be replaced

As noted in BJHC's report the courtyard side northern wall to unit 4 was originally an open cart shed style that was later infilled in patched cement brickwork with a range of different style bricks. The section is single thickness brickwork rather than the traditional solid brick wall surrounding it. This will be removed and replaced with bricks to match the surrounding solid brick wall in lime mortar with new openings to suit the approved plans. Area noted in blue on the photo below.



Figure 18: Unit 4 North elevation to be replaced

Internal Partitions

The internal partition walls will be formed in 4"x2" timber studs with acoustic quilt insulation between studs to all partitions finished with plasterboard to both sides.

Roof

The existing clay tiles to Units 1, 2 and 5 are to be removed by hand and set aside for re-use, all defective joists and trusses will be repaired or replaced. All rotten and defective timbers are to be replaced. Timbers to be retained are to have rotten sections cut away with new spliced in where feasible. New rafters are required due to the current defective structures, this will be designed on a like-for-like basis with the existing structural elements. A new structural steel ridge has been designed in order to keep the open plan designs without the need for roof ties that would usually form the ceiling in a domestic property. The new structural steel beams will be sited on pad foundations in the existing brickwork which also acts as a brace between the two end of the gable brickwork. New fascia boards will be installed with aluminium gutters and rainwater goods in a traditional cast iron style to soakaways under the gardens and courtyard.

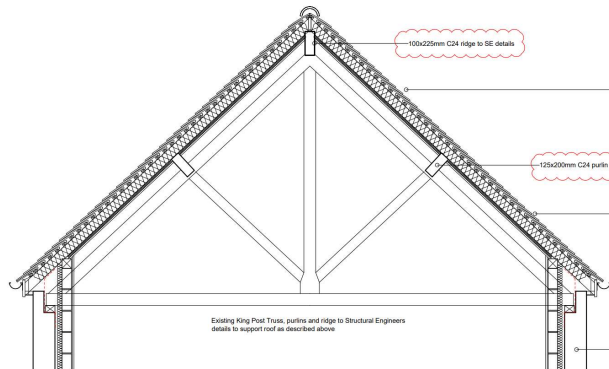


Figure 19: Warm roof detail using existing roof trusses

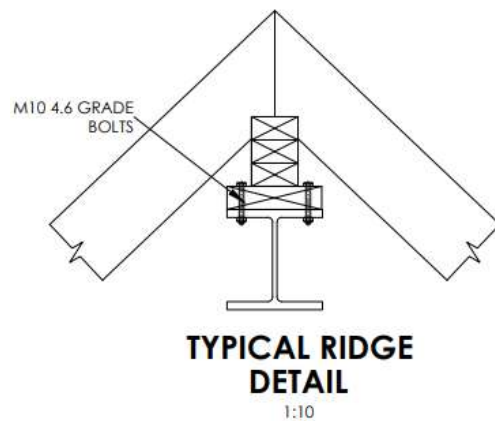


Figure 20: typical steel ridge detail

Services

New service penetrations in the existing structures will be minimised by using the space within the new timber studwork for service voids. A new electrical, plumbing and central heating system including under floor heating will be installed to the ground floor without compromising the existing wall structures. New surface water and foul drainage will also be installed without affecting the existing structure by taking services through existing doorway openings. Roof penetrations for extractor fans and soil vent pipes will be hidden by using vented tiles. As gas boilers are being used for heating a condensing flue will be required over the boiler and these have been sited as discreetly as possible in each property.

Barn – Unit 5

Foundations

Internally a new ground bearing slab will be installed within the existing structure to a size and depth to suite the ground conditions, all new load bearing walls will be built off this so no loads are exerted on the existing timber frame. The existing floor slab will be removed by cutting and breaking it into pieces, levels reduced as necessary to accommodate hardcore, sand blinding, DPM, concrete slab, insulation, screed and floor finish. Underpinning should not be required. By insulating over the concrete slab the underfloor heating is more efficient laid in screed and will aid to keep the barn at a constant, moderate temperature.

Where subsidence has taken place on the southeast corner a localised footing may be required on the corner to avoid this happening in the future. As the corner has cracked away approximately 0.5m in each direction this will be removed and rebuilt. Crack stitching may also be used, subject to the engineer's approval, in order to strengthen the corner and keep it aligned with the surrounding brickwork. This is done by inserting small metal rods into the joints, then covered by lime mortar.

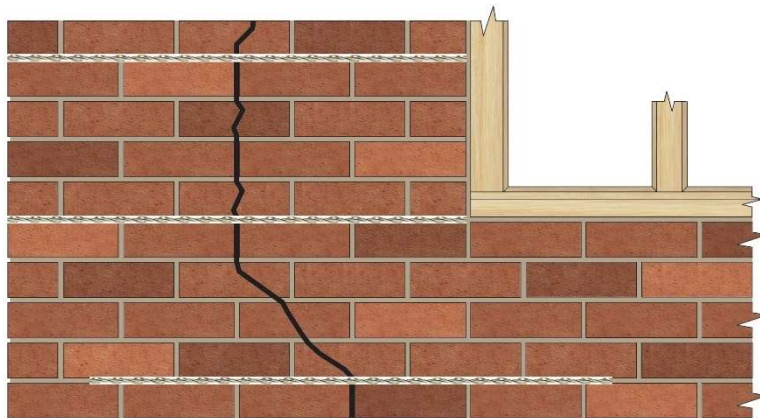


Figure 21: Diagram above of crack stitching being used.

The lower sections of the damaged brick plinth will be repaired and replaced where necessary. If subsidence has occurred then when the timber section is removed from on top of the brickwork to repair it the plinth will be repaired at the same time and new strip foundation added locally if required. All brickwork in lime mortar to match existing and allow water to drain away from the timber.

Below is a diagram of a new ground bearing slab foundation to be installed inside of the existing brick wall and also the section drawing showing the floor make up.

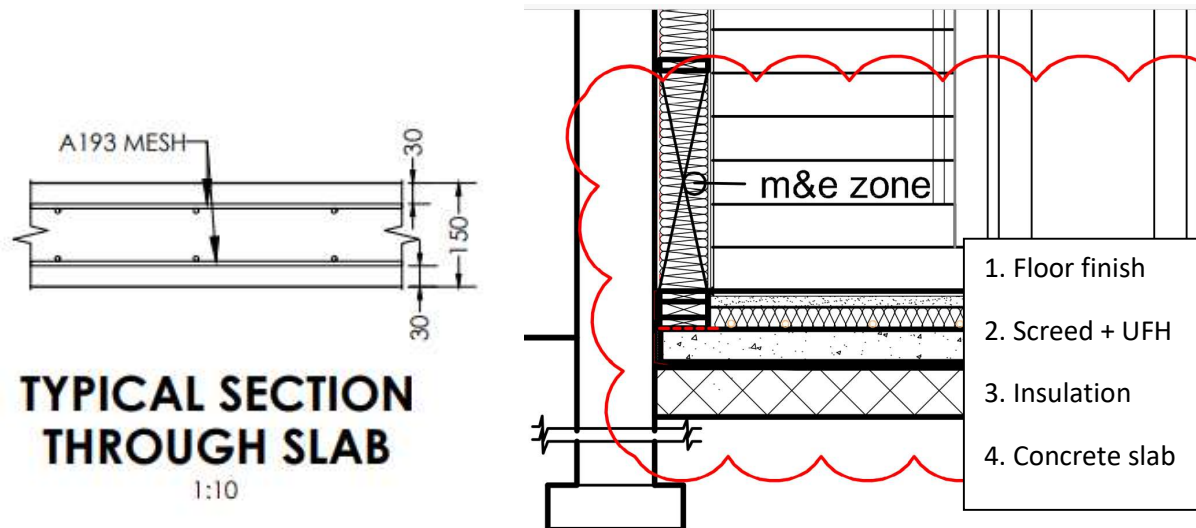


Figure 22 and 23: Slab section detail drawings

Structural Walls

The existing timber frame, once repaired, will remain with no additional loads imposed on it. The new internal walls and floors will be supported from (220mmx50mm) structural stud walls built independently on the new concrete slab.

Timber floor joists, to the structural engineers specification will be installed over the structural studwork walls. With the first floor joists covered with new floor boards, acoustic insulation quilt between the joists and underlaid with plasterboard and plaster skim finish.

To the eastern end of the barn as the structure is remaining in situ when repaired the existing first floor will remain. The floor will be levelled up using furring strips and then boarded over the existing timber and the same technique will be used on the underside for the ceiling below. Rockwool insulation will be used between the existing floor joists.

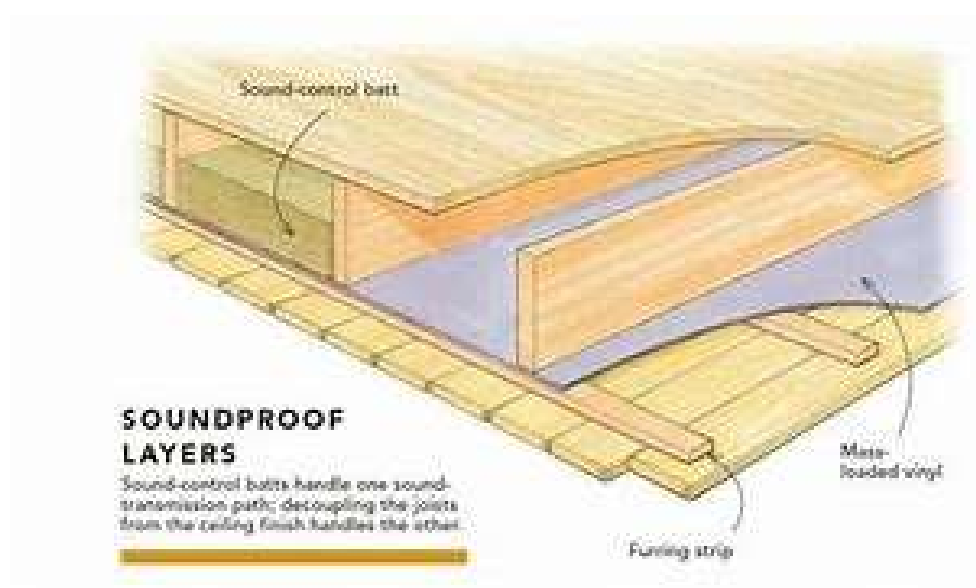


Figure 24: First floor make up diagram

All of the timber weatherboarding will be removed to expose structural timber framework. The main oak framework will be repaired or replaced as required on a like for like basis using traditional joinery. The barn walls are to be constructed using a partial 'warm' wall design as well as between timber insulation in order to maintain the character of the building and comply with building regulations, this will allow the undulating character of the roof and walls to be retained. Therefore the external walls will be wrapped externally, firstly with a 150mmx 22mm sawn treated softwood which adds rigidity to the structure, a 45mm rigid PIR board overlaid over the new timber then battens and draped breathable Multifoil insulation (TLX Gold) will then be added and counter battens installed for the weather boarding to be fixed to. Overall, the wall thickness will increase by about 75mm from its current state where the boards are fixed directly to the beams, this is the smallest recommended build up as per the conservation officers request (due to building regulation U values and also acoustic performance with the main road so close to the external façade).

Section detail of wall build up below:

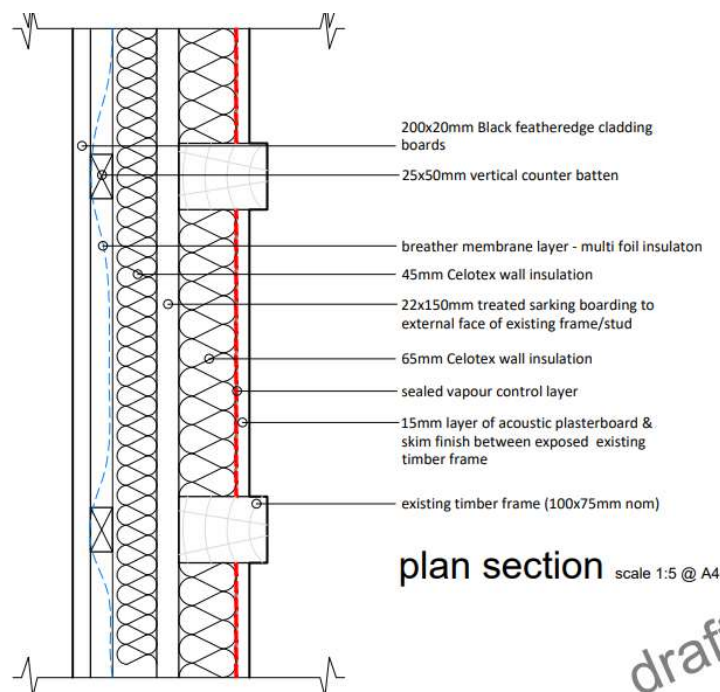


Figure 25: Section detail of unit 5 wall build up

Where the new external build up adjoins the eastern bay 7 of the barn with the wattle and daub panels that are to be left exposed a timber board will be used at the junction to cap off the insulation area. This detail has already been used, see photo below, in the existing construction method and will only marginally be more pronounced. It has been used in this instance due to the brickwork protruding at the base of the wall and timber frame under the roof leaning inwards.



Figure 26: Unit 5 south east corner timber to brick junction detail

All rotten and defective timbers are to be repaired or replaced. Timbers to be retained are to have rotten sections cut away with new spliced in where feasible. The joints on the main framework and trusses will have to be checked when exposed and strengthening may be required where metal brackets would be installed as required.

*Note: a detailed repairs schedule for the timber frame has been submitted separately.

The end 17th century bay of the barn will be repaired in-situ, rather than removing it with the rest of the timber frame, in order to not disturb the wattle and daub panels internally and externally. Where the wattle and daub panels have been replaced with brickwork in the four bays below the wattle and daub it is proposed, subject to the conservation officer's approval, these are removed and replaced with new wattle and daub as originally intended. This will allow the timber frame to move and breathe, minimising any future rot. When the rest of the structure is removed for repairs a 'tin hat' protective temporary roof will be added over this section to aid in weather protection and a heavy gauge polythene draped over the exposed western side.

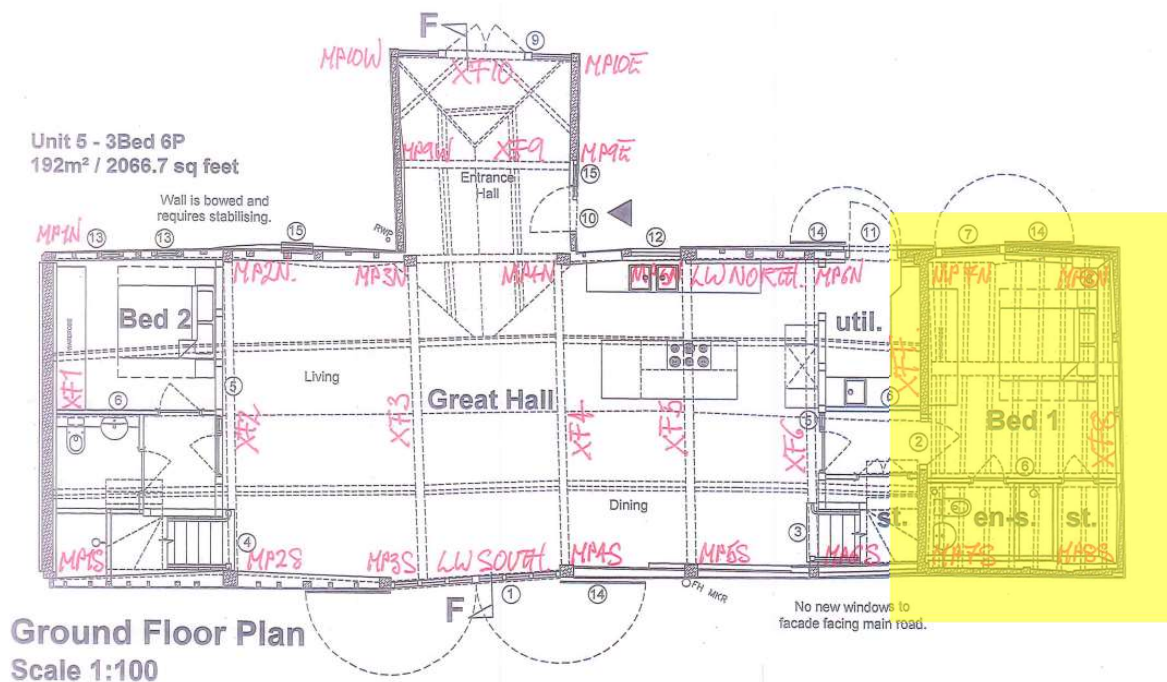


Figure 27: Unit 5 showing bay 7 to be left in situ highlighted

Internally in the eastern bay of the barn, being retained, the walls will be studded out in timber with insulation between and a plasterboard finish. This will enable the wattle and daub panels to remain exposed externally and protect them internally whilst allowing the rooms to be insulated.

Wattle and daub

The external wattle and daub panels to the later C17th end of the barn have been covered over in a cement render. As the cement is inevitably stronger than the latticework it is proposed to leave the panels, as disturbing them would likely involve replacing large sections due to damage. Below is a section drawing showing a typical wattle and daub panel build up and this will be applied in the repairs using traditional lime renders where the surface hasn't been washed in cement render.

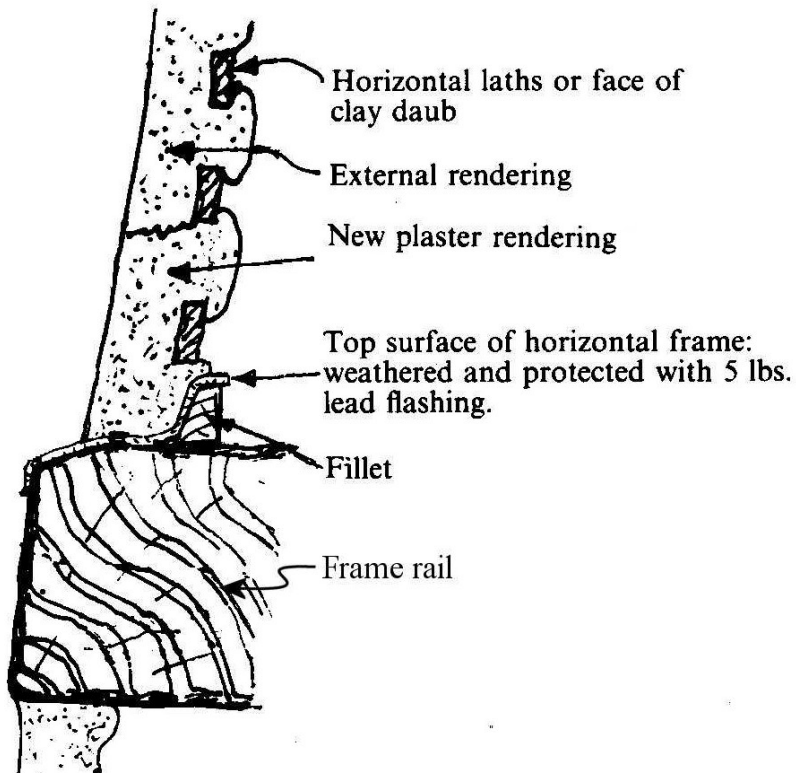


Figure 28: Diagram of traditional wattle and daub section detail

Below is a photo of the southern elevation where the lime render has been replaced with cement render panels. It is proposed that the four brick panels below are replaced back to their original wattle and daub make up so that the surrounding timber frame can move and breath better.



Figure 29: Photo of unit 5 south east corner panels

Internally there are also wattle and daub panels to the first floor over the mezzanine between bays six and seven. These will be sympathetically repaired where they are in poor condition in lime plaster in order to preserve as much historic fabric as possible. The western face will remain exposed and limewash applied as a finish. Due to the Eastern face being close to ground level on the first floor and having apoptotic witch marks in the areas in poor condition will be repaired and recorded and then a new timber stud wall will be installed in front of the wattle and daub so that it is encased and protected.

Below is a photo of the area on the first floor, eastern bedroom side of the wattle and daub plasterwork to be repaired and then encased for protection. The lower panel is in a poor condition.



Figure 30: Photo of unit 5 bay 7 internal lime plaster

The photo below is of the internal western wattle and daub panel that will be repaired in lime and left exposed.



Figure 31: Photo of unit 5 Bay 7 internal wall to remain in situ

The brick wall to the western elevation must have previously replaced part of the timber frame to the barn and is predominantly covered by ivy so cannot be fully assessed from the outside but it appears in reasonable condition and will remain in situ. A structural studwork wall will be built inside of this wall to give it structural integrity. This will then be braced back to the concrete slab for rigidity. This will act as temporary support whilst the timber frame is removed and repaired but will stay in place permanently so that insulation can be added between the studs and plasterboard added to the face whilst not affecting the brickwork. Where the existing brick wall meets the historic timber frame it is not currently tied together and a gap is visible. Internally the new stud wall can be fixed all the way across into the existing timber to maintain the thermal integrity. Externally as the different materials will move independently the gap will be filled with rockwool and capped with a timber strip, NOT fixed into the brickwork, this will act as a movement joint.

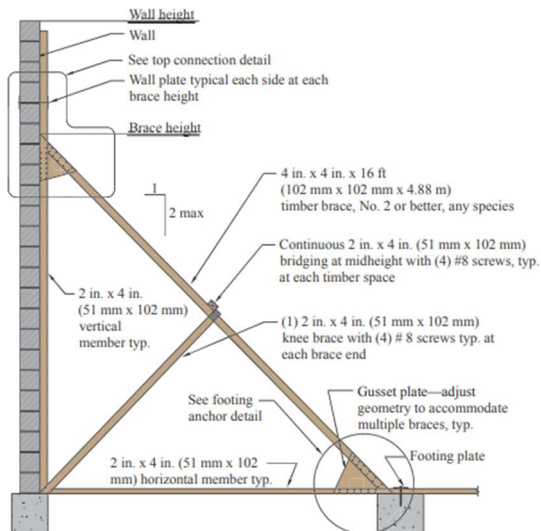


Figure 32: Diagram of bracing to be used on unit 5 existing brick wall

No mechanical or chemical cleaning such as acid brick wash will be used on the existing brickwork. Once it has been repointed a stiff brush will be used by hand to remove any algae and dirt.

The photo below shows the western elevation brick wall from the inside of the barn, this is where the temporary braces will be installed whilst the timber frame structure is removed.



Structural studwork and racing to existing brick wall being left in situ.

Figure 33: Photo of unit 5 western brick wall as existing

New openings will be kept to a minimum to maintain the agricultural feel of the barn but where they are proposed to the North elevation bedrooms they will be built into the new structure as to not affect the existing timber frame. Where roof lights are to be used, in replacing existing ones a

heritage style low profile will be used to minimise the effect of the roof line. The section drawing below shown how the window will be placed in front of and positioned between the existing timber.

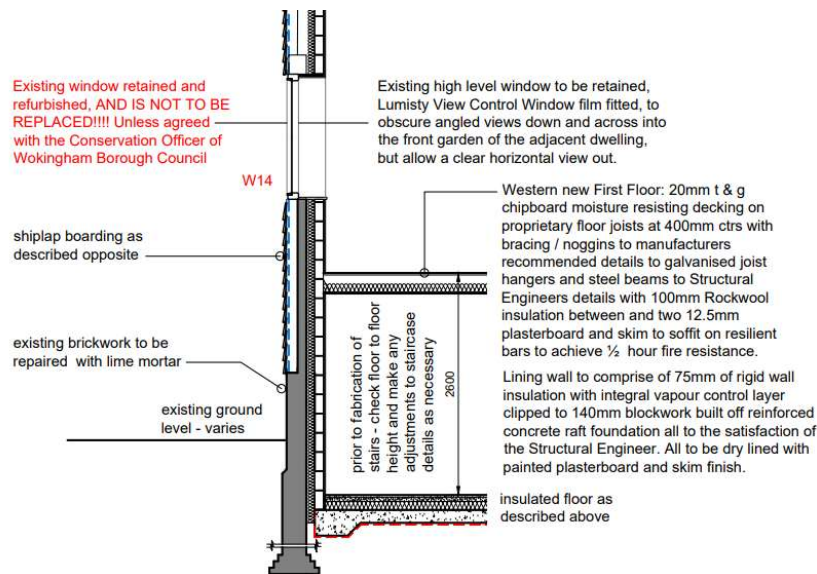


Figure 34: Section of Unit 5 showing windows

As the majority of the building has been surveyed as Oak it is unlikely that any treatment is required and the best method for cleaning the beams is to dry them out, in order to remove moisture that the insects need, then use a stiff brush to clean the exterior surface. If any softwood is found to be infested then a surface application of woodworm treatment will be used to preserve the timber.

Roof

The proposed new roof finish is a plain clay tiled roof, and in order to do this, strengthening works to the existing frame will be required as noted in the timber frame repairs schedule. An external perimeter scaffold will be used to provide a safe working environment whilst works to the external walls and roof progress. The existing roof tiles will be carefully removed and set aside for reuse. Defective joists will be replaced or spliced in new oak timberwork, the oak trusses are to be retained and new oak timbers will be installed as required to match. Metal plates and steel angles will be fitted to the outsides of the timber where necessary to strengthen them and reduce deflection whilst retaining the original timber and aesthetics from the visible side.

The roof construction will be essentially the same as the walls - installed using rigid (approximately 85mm, subject to building regs approval) insulation with a 150mmx22mm softwood inner skin on top of the existing structure in order to maintain the existing integrity. The roof is then to be covered with a multifoil breathable insulation membrane. The multifoil insulation is a two in one insulating breather membrane, venting moisture like a breather membrane, whilst insulating like a non-breathable PIR board. This improves the thermal performance of a roof without concern of condensation or having to adjust the height of the roof. By using this method of construction all of the historic fabric, mainly the timber beams, can remain exposed whilst insulating to a standard acceptable to building regulations and allowing the building to breath in allowing moisture to pass through the membrane. The roof covering will be with new heritage style clay tiles to match the tiles fitted to the other buildings. New aluminium gutters and rainwater goods will be fitted to run to

soakaways. To the underside of the roof insulation will be fitted between the rafters with a plasterboard finish.

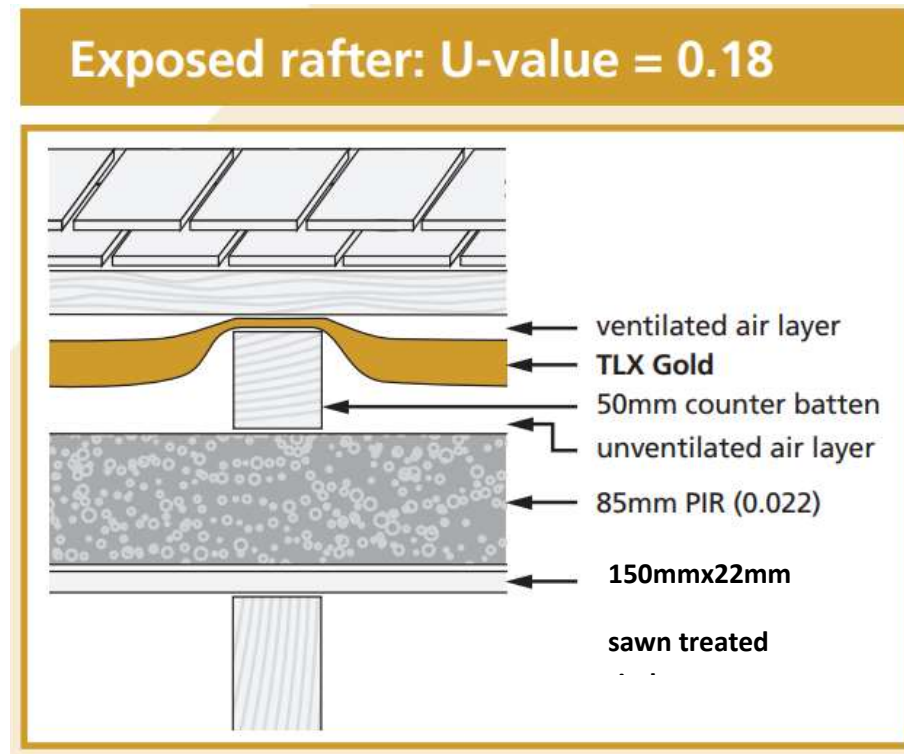


Figure 35: Diagram of unit 5 roof make up

The existing roof tiles will be carefully removed by hand and stored with an estimated 75% being in reusable condition, the further 25% required will be a new heritage tile mixed into the rear elevations away from the public's view. The chosen tile is a very close match, and the difference is negligible from ground level.

Internal Partitions

The internal walls are to be constructed in timber studs with acoustic quilt between studs to all partitions finished with plasterboard and skimmed.

Services

A new electrical, plumbing, and central heating system including under floor heating will be installed without compromising the existing structure. The majority of plumbing conduit will be installed in the new screed. The electrical conduit will be installed within the insulation void of the roof and walls, if original timber beams clash with a cable run then surface mounted metal cable conduit will be used and left exposed instead of drilling through the timber. New surface water and foul drainage will also be installed without affecting the existing structure, this will be cast into the new floor slab and routed through existing door openings. The gas boiler will have a flue that will penetrate the roof on the courtyard side, but this will not affect any historic fabric, a route for the pipework will be within the insulation void of the walls and roof. 'Hidden' vented roof tiles will be used for extract fans that cannot be seen from the ground.

Windows

There are two existing windows that are to be reconditioned and reused (subject to a condition survey). They are the high level, four panel, window to the western elevation and also a smaller casement window on the eastern elevation of the porch. All other new windows and doors are to be bespoke manufactured in traditional joinery. Details to be approved in material specification.

5. Existing construction work update

Since the approved 170883 and 170884 approved planning permission, construction work has started on site. This section of the report looks to update the reader as to each building's current situation.

Unit 1

The lower western timber section of unit 1 has been taken down and a new block and beam floor installed. This was required due to the ground conditions and proximity to surrounding trees. The new steel ridge beam has been installed on posts ready for the external walls and roof structure to be built in the same profiles as the original structure. Within the existing brick structure the ground floor slab has been replaced and walls lined with structural studwork. The roof has been removed with tiles set aside for reuse. A new steel ridge is installed and roof trusses practically complete ready to be re-tiled.

Unit 2

Internally the ground floor slab has been replaced and the brickwork walls have been lined in structural studwork. The roof has been removed, leaving the original trusses in situ, and new steel ridge beam installed. The existing roof tiles have been carefully set aside for reuse. This is sited between the end gable walls on padstones, aiding in bracing the walls whilst the new roof is installed.

Unit 3

The timber structure of Unit 3 has been removed, replaced and extended as per the plans. As can be seen on the photo below the new block walls are up to roof height, ready for the new roof to be installed, in the same profile as the previous structure. As modern fluted tiles had been used as the roof covering these have not been saved and will be replaced by a heritage plain clay tile to match the surrounding historic roofs. Once the windows and doors are installed the blockwork will then be clad in feather edge timber as originally intended.



Figure 36: Units 3 and 4 current photograph

Unit 4

The rotten timber roof structure, modern tiles and softwood posts to the north elevation have been removed and the new lime brick wall has been reinstated. Internally block walls, formed on a new concrete slab, line the existing brick walls with a cavity to allow the old structure to breathe. The new roof structure will be sited on the new blockwork so that no additional loads are imposed on the old structure.

Unit 5

The structural timber studwork lining has been installed to the existing brickwork wall internally on the West elevation in order to protect the brickwork whilst the timber frame repairs are completed.



Figure 37: Unit 5 current photograph

6. Conclusions

Based on the MLM consultancy report and follow up walkover surveys by Red Rose Developments and Green Oak Carpentry it was concluded that the structural condition of the buildings is such that the existing fabric of the buildings requires extensive repair in order to safeguard the historic fabric as well as being able to bring the buildings up to modern structural standards for domestic use. The ground floor slabs will be removed and replaced to all the units. To Units 1, 2 and 4 sympathetic repairs will be completed as required with no major changes affecting current integrity to the structure of the buildings, this being that the brick walls will remain, and original roof structure reused. There is no historic fabric of Unit 3 and lower western section of Unit 1 that is salvageable due to its current poor condition and relatively modern softwood construction. These will be entirely rebuilt to aesthetically the same designs as originally intended. To the Unit 5 barn there will be a small number of structural members replaced due to rot, the remaining dilapidations will be repaired like for like, and other areas strengthened but keeping the original timber. Due to the poor condition of the structure and the complex repairs required it is recommended that these repairs are done in a workshop rather than on site, as explained in the repair schedule.

By following the good practice guidance from those previously noted it ensures that the special historic environment is retained in accordance with the National Planning Policy Framework Section 12 (Conserving and Enhancing the Historic Environment) and Managing Development Delivery Local Plan policy TB24.