

Structural Report

On

Ash Farm
Morse Lane
Drybrook
Glos

20093

For

Anne Sullivan and Hazel Bullock



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1. EXECUTIVE SUMMARY

From my inspection of the buildings and consideration of previous reports and comments I conclude that the nature and extent of work required to convert the buildings is typical of what would be commonly required for such an application. This work would be undertaken as part of the conversion of the existing buildings and with the exception of the lean-to on Barn 1, are structurally sound and lend themselves readily to conversion.

2. INTRODUCTION

This report has been prepared under instruction from Bruton Knowles Property Consultants to inspect a number of agricultural buildings at Ash Farm, with a view to completing an assessment of their suitability for residential conversion. Proposals for the scheme have been developed and submitted to Forest of Dean District Council, along with a previous engineering report that provided a commentary on the evidence of movement and structural damage within the buildings.

Whilst the previous report discussed the buildings and the likely degree to which each would require intervention as part of the conversion, it did not directly address the question of whether, from a structural engineer's point of view, the inclusion of these works would be considered typical of that associated with agricultural conversions or would be so extensive that the scheme would amount to demolition and replacement of the existing buildings. The report was however supplemented by a specific specialist detail demonstrating how the most pronounced area of movement noted on the loadbearing walls of the buildings could be repaired in situ, without the need for demolition and reconstruction. The thrust of the earlier report is that a degree of structural repair and renewal will be required to allow the buildings to be converted, a view which the proposed masonry repair detail would appear to support.

The previous report and the specialist repair detail are presented in Annex A and Annex B below, respectively.

Following review of the information submitted with the application the view has been expressed by the Case Officer that the extent of work required does exceed that which could be considered reasonable for a conversion, such that the proposal would amount to the erection of new dwellings within the open countryside. Such a proposal would not be supported. The purpose of this report is to expand the discussion of the condition of the structures as recorded in the earlier assessment, thereby providing a greater degree of clarity on the nature and extent of intervention required and subsequently drawing a conclusion as to whether retention of the existing structures would be possible. The report follows a simple visual inspection, carried out without the benefit of a geological study or site investigations plus review of associated documents. The limitations of the existing structure are considered in determining its suitability for residential conversion.

The report is intended solely for the use of our Clients, and their professional advisors in connection with the proposed application for planning approval to undertake the development. A valuation of the properties will not be undertaken within the report and no comment will be made on rights of access, tenure or ownership.

3. THE BRIEF

The brief that has developed as a result of the discussion with the instructing Surveyors and review of the third party comments can be summarised as follows:

- To comment on the condition of each of the three existing structures, highlighting elements that are considered to require renewal/replacement.
- To comment on the structural form of each of the buildings and highlight any inherent weaknesses that may limit the scope for continued agricultural use or indeed for proposed residential conversion.
- To discuss the comments made by the Planning Officer in response to the submission, particularly with respect to the extent and cost of structural works, loading assessment, the degree of structural intervention in terms of new roofing and the fact that all buildings "... are in poor condition."
- To consider, given the past use of the buildings whether the existing structural elements will be subject to increased loading as a result of the proposed conversion.
- To assess whether the proposed conversion as outlined in the submitted Architectural drawings can be undertaken within the existing building envelopes.
- To provide a commentary on the nature of necessary upgrading required to meet current Building Regulations requirements for dwellings and conclude as to whether this can be achieved by working with the existing structural elements.
- To reach a conclusion for each of the three buildings as to whether they can be considered suitable for residential conversion.

4. ASSESSMENT BASIS

The judgement being made in relation to what can be considered an acceptable level of renewal of existing structural elements within a compliant conversion has been undertaken in light of prior successful applications, along with those passed at appeal. It is appropriate with existing buildings to consider the question of the adequacy or otherwise largely on the basis of the performance levels achieved by those elements previously, in comparison with those that they will be required to achieve as part of the conversion.

A differentiation is usually made between perishable structural elements such as timber beams, joists and rafters plus windows, doors, screens etc. and the more substantial permanent components of the structure such as the main loadbearing walls, structural frames, floor slabs, foundations and stability elements. Extensive renewal of the perishable elements has been an accepted norm in agricultural conversions, provided that the principal loadbearing elements are deemed to be largely sound and capable of retention.

This approach will be used in this assessment with the intention being to provide an overall opinion as to the feasibility of a conversion scheme, accepting that, as has been suggested in the previous report that, there are elements of structural repair and renewal that will be required.

5. THE SITE AND THE BUILDINGS

Ash Farm is located approximately 1km west of the village of Drybrook in Gloucestershire, with the farmhouse supplemented by a total of four agricultural buildings arranged around the farm yard. The site has direct vehicular access to Morse Lane. The three buildings being considered for conversion comprise two traditional stone barns with pitched roofs, plus what appears to be a livestock shed or dairy, which is of brick construction with a corrugated sheet roof supported by steel trusses. There is also a large modern steel framed shed at the rear of the farmyard, which is not included within the proposed scheme.

The site has a level access to the highway, which is independent of the access retained by the farm and is bordered to the north and west by open farmland, with residential properties to the east.

Barn 1 is a single storey brick building with a pitched roof covering consisting of a mixture of corrugated asbestos and profiled steel sheeting, fixed over steel purlins and trusses. The trusses span the full width of the building between vertical steel columns built in to the loadbearing walls. The floor appears to be a concrete slab generally with the brickwork and steel columns appearing to extend below the slab onto independent footings. The original building appears to have been extended with a lean-to structure to the rear, consisting of masonry gables walls with timber purlins and posts supporting the roof sheeting on the open fronted rear elevation. There are a number of openings in the external elevations, including full height vehicle doors to the west facing gable, an access door to the south elevation plus windows on the north and south elevations.

Barn 2 is a traditional two storey stone barn that is attached to the farmhouse. The loadbearing walls are of random rubble stone construction set below a slate covered roof which is supported by timber purlins and frames. The building also has a lean-to structure with random rubble stone walls supporting the remains of a timber support structure which has partially collapsed. The front elevation has an arched cart opening and low level window opening plus additional slit ventilation openings. The rear elevation has a full height central cart opening. There is a further modern external canopy to the rear of the barn consisting of steel sheeting on beams supported by the stone wall on one side plus steel columns externally. The barn has a first floor over the eastern half, consisting of timber joists taken onto

steel beams that span between the front and rear walls. This would appear to be a replacement to what would appear to have been an original threshing floor. The barn appears to have a concrete floor slab.

Barn 3 is a traditional two storey barn and attached single storey byre with loadbearing walls of random rubble stone and brick construction, all set below slate covered roofs. The higher roof appears to be supported by purlins on timber frames but this has not yet been confirmed due to the restricted access at the time of the inspection.

The lower roof structure consists of Kingpost trusses supporting purlins and rafters. The original threshing floor appears to remain, with hardwood joists spanning across the width of the barn. This floor covering could not be inspected from above. The ground floor is a stepped concrete slab with a central drainage trough, as is typical of traditional livestock byres. There are a series of low level and high level openings within the masonry walls facing the farmyard plus a low level window in the east gable, a full height opening in the single storey west gable and a single, high level opening on the south elevation that faces Morse Lane.

6 PROPOSED DEVELOPMENT

The proposals for the building have been set out in the drawings submitted with the application with Barn 1 divided into two dwellings and a single dwelling formed in each of Barns 2 and 3. The lean-to on Barn 1 has been incorporated with the step in floor levels maintained. The lean-to to Barn 2 has also been retained with first floor accommodation provided within the two storey section of barn 3. Floor levels appear to have been retained generally as existing with internal sub-division included to facilitate the change of use.

As can be seen from the drawings presented in Annex C, the accommodation is contained within the footprint of the original buildings with eaves and ridge maintained. Car parking and amenity space is allocated around each of the buildings with existing levels generally maintained.

7 VISUAL INSPECTION AND REVIEW OF EARLIER PREPRT

A visual inspection of the each of the three buildings has been completed which has been used in tandem with the comments made in the earlier report to provide a record of condition and structural adequacy, upon which the suitability of each for conversion can then be judged.

7.1 Barn 1

The structure combines a steel frame to support the roof loads with external masonry walls and a structural floor slab. The steel trusses are formed in 90mm rolled steel angle sections and sit on 203 x 133 Universal Bam sections which are built into the masonry walls. The wall panels provide restraint to the columns about their weaker axis, with the steel sections in turn providing lateral support to the wall panels. As described above the columns appear to extend below the floor slab onto independent

foundations, thereby providing a degree of fixity, offering resistance to lateral loads to ensure overall stability. The trusses support RSA purlins at regular centres, to which the roof sheeting is fixed. The inspection of the structure confirmed the steel sections within the trusses to be in reasonable condition with a degree of surface corrosion but no significant loss of section.

The RSA purlins were noted to have deflected to a degree but the main frames and supporting columns appeared to be aligned with the masonry walls and as originally installed. The outer flanges of the steel columns are exposed externally and have therefore suffered more obvious corrosion but again there is no significant loss of section. Local deterioration at the bases of small number of the sections was noted, which appears to be as a reaction to material previously stored within the building. The outer face of the brick masonry has experienced local loss of pointing to mortar joints in a number of places but generally the brickwork is in sound condition with appropriate lintels over openings.

The structure to the lean-to is clearly less robust than the main building with more pronounced deflection of the timber support purlins. The support posts and edge beams framing the pen elevation are of a relatively slender section and have suffered a degree of deterioration as a result of the exposure, with additional propping added to supplement the original structure. These observations appear to accord with those made within the previous report, which commented that the degree of movement noted within the brickwork was "...not critical."

7.2 Barn 2

The walls on the main section of the building were noted to be 450mm thick and in reasonable condition generally. Local deterioration within the lime pointing was noted along with a degree of settlement over deflected lintels. A timber prop has been installed to provide additional support to the lintel over the cart opening on the north elevation. A noticeable sag was evident on the roof structure with the deflection of the original hardwood rafters and purlins, accompanied by a loss of section of the central truss and purlins where they bear onto the stone walls, a number of which have been repaired with the addition of a steel support plate. The distortion in the roof has caused a degree of lateral movement to the front and rear walls as evidenced by fine vertical cracking at high level in the internal face of the walls at the corners.

The first floor appears to have been renewed at some point in the past with new Universal Beam sections spanning onto block masonry piers, constructed against the inner face of the original stone walls. The piers appear free from significant movement and the steel sections themselves are suitably sized to support the timber joists and boarding. Whilst there is clear deterioration within the timber elements where they sit into the walls, the masonry itself is largely free from movement and the walls are of an appropriate thickness to ensure stability and adequacy of support to the floor and roof construction. The ground floor slab remains intact with no obvious signs of settlement or disturbance noted. The masonry walls within the lean-to structure remain in place but as noted above the timber roof structure and covering have been lost. A detailed inspection of the external canopy has not been undertaken.

The previous report noted the deterioration of the timber elements within the roof structure and suggested that a number will need to be renewed, with the central truss also likely to require further repair to allow the failing slate covering to be renewed. A comment suggesting that there would be a requirement to re-build the lean-to structure was also made but this should be taken to mean that the timber roof structure and covering will need to be renewed with the original loadbearing walls retained.

7.3 Barn 3

Significant structural movement was noted to the stone masonry walls to the two storey section of the barn, with a marked outward lean at eaves level towards the centre of the front elevation, above the first floor window, accompanied by a series of diagonal cracks on the external face of the side gable wall, following a line up towards eaves at the front corner. A vertical crack was also noted on the inner face of the wall at the junction between the front wall and the gable. The remaining areas of the stone walls and the brick masonry to the single storey element appeared free from significant movement.

The roof structure to the two storey barn was noted to have suffered pronounced movement in the form of a marked dip in at the centre of the ridge, with the lowest point visibly much lower than the ends over the gables walls. Both roof pitches had become dished as a result of this movement with accompanying lateral spread of at eaves. The roof over the single storey range was noted to be sound with the Kingpost trusses and purlins all in good condition, protected by an under-slate felt laid over the common rafters.

The joists supporting the first floor were noted to be in reasonable condition but subject to a notable deflection within their span and with a degree of deterioration at bearings. The upper surface of the floor could not be inspected and whilst it was not possible to view the main roof internally, significant deterioration to the timber elements is likely. The floor slabs appeared to be free from significant movement or disturbance.

The previous report did not offer any detailed comments on this structure but did note the cracking to the gable and the sagging of the roof structure.

8 DISCUSSION

As noted above the buildings, comprise a pair of original stone buildings plus a more modern brick and steel framed shed, all of which would have been built to norms and methods that were in use at the time of construction, rather than following any statutory design standards. Each of the buildings follows a recognised structural form with the vertical loads carried by timber or steel elements that span between either loadbearing walls, as in the case of the stone barns, or onto vertical columns set into the external masonry walls as noted on Barn 1.

The stone walls are of sufficient thickness to limit slenderness to a range that would be deemed acceptable under current standards. The single leaf brickwork to Barn 1, could not in itself be considered to be of adequate thickness to ensure its stability but the presence of the steel columns at

regular centres provides a buttressing system that is adequate and which has ensured the stability of the structure.

The roof structures to both traditional barns have clearly suffered deterioration within the timber support elements that has allowed significant movement of both the roof and in the case of Barn 3, the supporting walls. In both cases the deterioration within the structure would appear to relate to past failure of the roof coverings, allowing water to penetrate, with rot developing in the timber sections.

The degree of movement on Barns 2 is such that local repairs, such as splicing of new timber sections to the existing, possibly supplemented by stiffening of joints with bolted steel plates should be sufficient to restore stability to the structure. The cracking noted on the internal corners of the stone walls at high level appears to be the result of slight lateral displacement of the eaves as a result of the movement in the roof, which should not progress once the roof has been repaired. Simple stitch bonding of the masonry will then be sufficient to ensure future stability. The roof to the lean-to will need to be renewed.

The degree of movement to the higher level roof on Barn 3 suggests that there has been a relatively major failure of the timber support structure and it does appear likely that renewal of the central truss plus the purlins will be required, with the rafters and coverings also replaced. As with Barn 2 however, once the roof is renewed the lateral forces that have been applied to the stone walls will be eliminated and the walls themselves can then be repaired in line with the submitted proposals, with the possible addition of local rebuilding to the masonry over the first floor opening on the front elevation. The lower roof to Barn 3 is in sound condition with purlins and trusses that are clearly capable of supporting the loads that they have been subjected to. This deterioration of the timber elements of the structures appears to be a consequence of the failure of the roof coverings, with the subsequent water penetration causing the rot within the roof structures, as opposed to an inherent weakness in the structures.

In both cases the movement and damage noted on the masonry walls of the traditional barns does not appear to arise as a result of ground instability, failure of the foundations or lack of loadbearing capacity within the masonry itself. There is little evidence of significant movement or instability within the walls of Barn 1, which again can be seen to have been capable of supporting all dead, imposed and wind loads to which it has been subjected. The roof to the lean-to section of barn 1 is not as substantial as the main roof and it is likely that stiffening of the purlins and enhancement to the support on the external elevation will be required. The gables to the lean-to would also require local repair and making good.

Internal lining of the masonry walls to achieve the required levels of thermal insulation should be possible on all three buildings with the external envelope retained. The timber floor structure within Barn 2 is well supported by the steel beams and piers and the intensity of imposed load that it would be expected to support for agricultural use is likely to be at least equal to that required under current standards for a floor within a single dwelling. The upper floor in Barn 3 has clearly suffered a degree of deflection under load but remains intact and continues to provide support. Again the intensity of loading associated with residential use will be no greater than with its existing use and subject to a more detailed inspection once safe access is possible, retention of the floor, with a degree of repair should be possible.

The ground floor structures within each of the buildings would appear suitable for retention as a substrate over which a new insulated floor can be built up, incorporating protection against damp and the required level of thermal insulation. Other improvements such as the renewal and reinstatement of rainwater goods will be required together with the introduction of new windows, doors and screens within the existing openings.

The structural repair work required to Barn 2 is not extensive or particularly intrusive and can be readily incorporated in the proposed scheme for change of use. Whilst the degree of structural intervention required on barn 3 is much greater, it does not encompass require the reconstruction of a significant proportion of the loadbearing walls and can again be incorporated within the proposed conversion.

In both cases, the proposed repairs will ensure that the roofs will be capable of supporting the weight of a renewed covering, plus insulation and a ceiling. For Barn 1, the weight of the current asbestos sheeting is actually greater than the weight of a modern composite profiled metal roofing system such that there would be no net increase in load associated with the renewal of the roof covering. The requirement to introduce a ceiling in these two units may result in a modest increase in total dead load on the roof, which can either be accommodated by strengthening of the existing purlins as part of the scheme or by providing a secondary support frame spanning between the lower chords of the steel trusses.

9 OUTLINE SCOPE OF STRUCTURAL WORK

The scope of structural intervention that is envisaged will be required to be incorporated within the conversion of each of the buildings is set out below.

9.1 Barn 1

- Removal of the existing roof cladding to the upper level structure and replacement with a modern equivalent that provides the required level of thermal insulation and air-tightness.
- Stiffening of the existing purlins at both upper and lower levels, or alternatively the introduction of an independent support frame spanning back to the main loadbearing columns and walls.
- Introduction of plan bracing within the roof structure to provide enhanced overall stability.
- Reconstruction of the support structure to the lean-to roof or alternatively complete removal of this particular structure

Additional work of a non-structural nature will also be required as discussed including the introduction of an internal lining to the existing wall and upgrading of the floor slab by overlaying

with a new screed on insulation and a DPM. New rainwater goods will be required throughout and it will be necessary to introduce building services and foul drainage, all of which appear to be possible without adverse effect on the existing structure.

9.2 Barn 2

- Removal of the existing roof covering to safely expose the timber rafters, purlins and the central truss and remove all existing load from the timbers.
- Renovation of the timber support structure which is likely to include renew plus perhaps complete replacement of two sections.
- Repair to the main truss encompassing the introduction of a new spliced principle rafter to the north slope, taken into the original socketed joint, with the decayed end of the collar also spliced with a bolted connection to ensure full transfer of the tensile forces into the remaining section of the collar.
- Renewal of the lintel section and timber boarding over the cart opening in the north elevation with other lintels inspected and repaired as required.
- Insertion of tie straps on all four corners to reinstate the bond between the side elevations and the gables.
- Renewal of the roof covering and support structure to the lean-to.
- The introduction of suitable system of temporary support will be required to allow the roof reinstatement to proceed safely.

It will be possible to retain the existing first floor structure as a mezzanine as the existing timber and steel sections are of adequate capacity to support a domestic floor. However the current proposal does not show this retained and therefore local making good of the masonry should be anticipated.

Additional work of a non-structural nature will again be required including the introduction of an internal lining to the existing walls and upgrading of the floor slab as for Barn 1. New rainwater goods will be required throughout and it will be necessary to rationalise the provision of building services and foul drainage, all of which appear to be possible without adverse effect on the existing structure.

9.3 Barn 3

- Introduction of a shoring scaffold to the south and east walls to ensure the stability of the masonry during the course of the roof repairs/renewal.
- Removal of the existing roof covering, rafters and purlins with sound timbers set aside for later re-use. Inspection of the damaged central truss which it is also envisaged will require extensive repair and possibly complete replacement.
- Stitch repairs to the gable masonry in the form suggested in Annex B, supplemented by the local reconstruction of the masonry over the opening in the front elevation to provide adequate support for the roof structure.
- Additional internal stitching at all four corners to address the restore the bond between the side and gable walls
- Inspection and repair of the first floor timbers and boarding as required.

As with the other buildings, further work of a non-structural nature will also need to be included such as the introduction of an internal lining to the existing walls, upgrading of the existing ground floor and the introduction of new rainwater goods and foul drainage. This work can be incorporated within the conversion undertaken without adverse effect on the existing structure.

10. CONCLUSIONS

The two traditional structures that are being proposed for conversion are substantial and largely intact, although Barn 3 has clearly suffered significant structural damage as a result of the failure of the roof structure. This is however rectifiable under the proposed scheme, without extensive demolition and reconstruction of the masonry walls as the damage noted does not suggest a failure of the foundation or an inherent weakness within the masonry itself. The proposals submitted for repair by Helifix are appropriate and sufficient to restore stability when accompanied by the renewal of the roof structure, which will then provide sound restraint to the tops of the walls. The proposed work to either of the two traditional barns does not therefore constitute the erection of a new structure as the original loadbearing walls, foundations and floor slabs will be retained.

For Barn 1, the work required to achieve a residential conversion is again not atypical and amounts largely to stiffening of the roof structure to carry additional load, plus additional bracing considered appropriate to meet current design recommendations. The lean-to structure is less substantial and given the need to replace the roof covering and provide a new support structure, the extent of replacement is greater than on the other buildings. However even demolition and reconstruct of the lean-to framing would leave all of the existing masonry walls in place and allow a newly designed open fronted timber support structure to be incorporated which would provide a carcass to which glazing/cladding and a modern roof covering could be installed

The structures are in varying states of disrepair but not to such an extent that they require any works that would typically be considered excessive for a conversion of agricultural buildings. As covered above there is no requirement for extensive or even significant demolition and reconstruction with the possible exception of the lean-to on Barn 1.

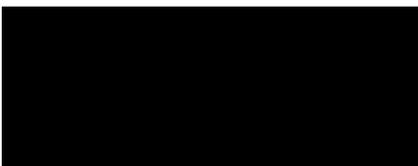
The three buildings are of each of a suitable structural form and have resisted the combinations of dead, live and wind loads to which they have been subjected, successfully. Whilst, as a result of water ingress the roof structures on the traditional barns are in need of attention, all of the loadbearing walls remain intact and can be retained.

There is likely to be little if any significant increase in load to be carried by the structures as a result of the conversion and where dead load does increase the walls, repaired timber elements and the principal the steel sections have adequate capacity to support this increase. Stiffening of the purlins on Barn 1 should be anticipated but the removal and replacement of the asbestos sheeting is a very positive component of the proposed conversion, eliminating a source material known to be hazardous to human health.

The works required to implement the proposed conversion to residential use in line with current standards is broadly typical of such conversions. Each building is of a permanent nature and as such the scheme being proposed is one of conversion rather than the erection of new dwellings.

Where improvements to non-loadbearing elements are required to meet current regulations the effect will not be detrimental and the accommodation shown is all contained within the footprint of the existing buildings. The structures have sufficient capacity to accommodate the variety of dead, imposed and wind loads to which they have been subjected and to which they will be subjected under the proposed scheme.

Each of the buildings lends itself readily to residential conversion therefore without the need for enhancement of the supporting structures, with the exception of the lean-to to Barn 1. The completed scheme would retain all of the original loadbearing walls with the perishable elements within the roofs of the traditional barns renewed using traditional methods and materials.



M S P Walsh BEng(Hons)CEngMIStructE
September 3, 2020

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For

Anne Sullivan and Hazel Bullock

Annex A – Previous Report



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Ash Farm Barns

Ash Farm Drybrook

Gloucester GL17 9BE

1 Introduction

TB Associates Ltd were instructed to undertake a site inspection and to prepare a report concerning the structural condition of the three barns at Ash Farm. The barns were inspected on 24th May.

2. Site

The site is located approximately midway between Drybrook and Ruardean on the north side of the highway.

The three barns being considered are;

The Red Barn running along the right of the entrance roadway,

The Blue Barn which is 'attached' to the dwelling, and

The Green Barn which is adjacent to the highway.

3. Building surveys

3.1 Barn 1 (Red Barn)

Ref drawing 750 A3 01

The Red Barn is a single storey structure nominally 32m x 6m comprising 7 no 4.57m (15ft) bays with trussed steel frames supporting the roof. The walls are single skin brickwork and the roof sheeting is asbestos cement on bays 1 to 4 and profiled metal sheeting bays 5 to 7. Details are shown on Drawing 750 A3 01.

Bays 5- 7 include a lower section which is presumed to have been added to provide additional livestock space. In the lower section the roof has been 'propped' as the timber purlins are in very poor condition.

It was noted that there has been a degree of movement in the brick walls but that this is not considered critical at this stage.

Any plans to convert this unit for residential purposes would require full re-roofing, the introduction of an internal leaf to the brick walling which should be designed to stabilize the existing masonry. The trusses will need to be inspected in detail to check the steel sections sizes, and all the joints with particular reference to bolt diameters and types. Further to confirm that there has been no corrosion in the steel members.

3.2 Barn 2 (Blue Barn)

Ref drawings 750 A4 02 and 750 A4 03

The Blue Barn is probably one of the original barns on the site and comprises a 2 storey structure with stone walls and a slate roof. The barn is attached to the 'recent' dwelling and the foul drains from that property can be seen in the barn. The details of the drainage discharge points were not established.

The barn has slotted windows and full height door openings suggesting this might have been a threshing barn originally.

The upper floor is supported on modern steel beams which in turn are supported on 'modern' piers formed with concrete blocks.

The roof is slate and the batten has been 'packed' off the 'wonky' rafters to achieve an even profile. The mid-span purlins are nominally 150 x 150 hardwood and have a significant sag. It was not established whether the movement is ongoing but it is very probable that strengthening – plating of the purlins - will be required, or that they will have to be replaced.

The trusses appear to be original and whilst theoretically adequate may also require strengthening or replacing which will be subject to a close inspection.

At the end of the barn furthest from the dwelling is a derelict lean-to structure. This was not surveyed.

On the side of the barn is a 'lean to' structure supported on the outer edge on 3 steel columns with a profiled metal sheeting roof.

The conversion of the Blue Barn to residential use will certainly require full re-roofing and the re-construction lean to at the gable end. Other structural works may also be required which will only be revealed once work commences.

3.3 Barn 3 (Green Barn)

Ref drawing 750 A4 04

The Green Barn is adjacent and parallel to the road and comprises a 2 storey unit of stone construction at one end with a single storey extension on the west side with stone walling adjacent to the road and single skin brickwork on the other side.

Access to the upper – loft – floor was not possible as the door was locked. It is presumed that this was from a safety point of view as the roof displayed severe 'sagging' and significant cracking was noted in the stonework with a focus on the south east corner.

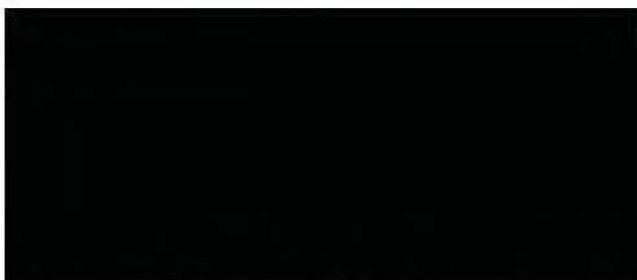
The 225 x 150 timber loft floor beam displayed decay at the bearings.

In the single storey section the south (roadside) wall appeared to be in good condition although a vertical joint was noted where the floor level changes suggesting that the building may have been constructed in stages.

4. Conclusion

All three buildings on the site are showing signs of neglect and all will require significant investment if they are to be converted from agricultural to residential use.

Details of the remedial works will, to a very large extent, be determined by the schemes that are proposed for the future use of the Barns.



Tim Block C Eng MICE
10th June 2019

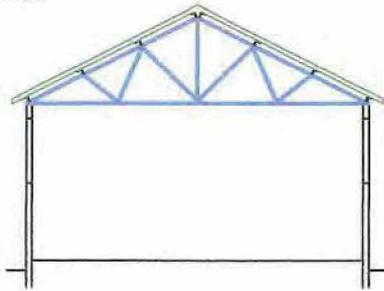
Ash Farm, Drybrook



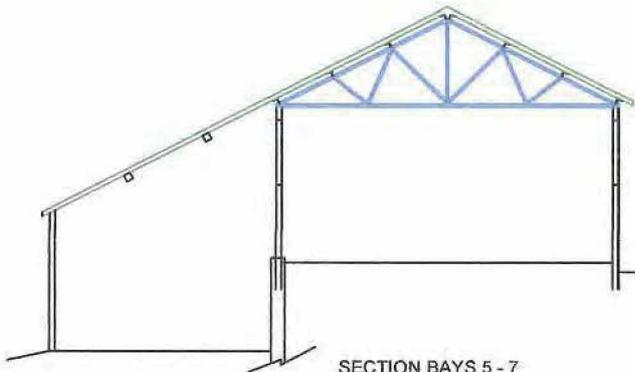
Roof:
 Big 6 profiled asbestos cement roofing,
 90 x 90 ms angle purlins
 Steel trusses at 4.57m c/c's fabricated ex
 90 x 90 ms angle, with
 Steel columns UKB 203 x 133 at each
 bearing.

Walls
 Single skin 100 thick brickwork,

Floor to barn; Concrete details
 not known.



SECTION BAYS 1 - 4



SECTION BAYS 5 - 7

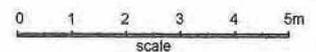
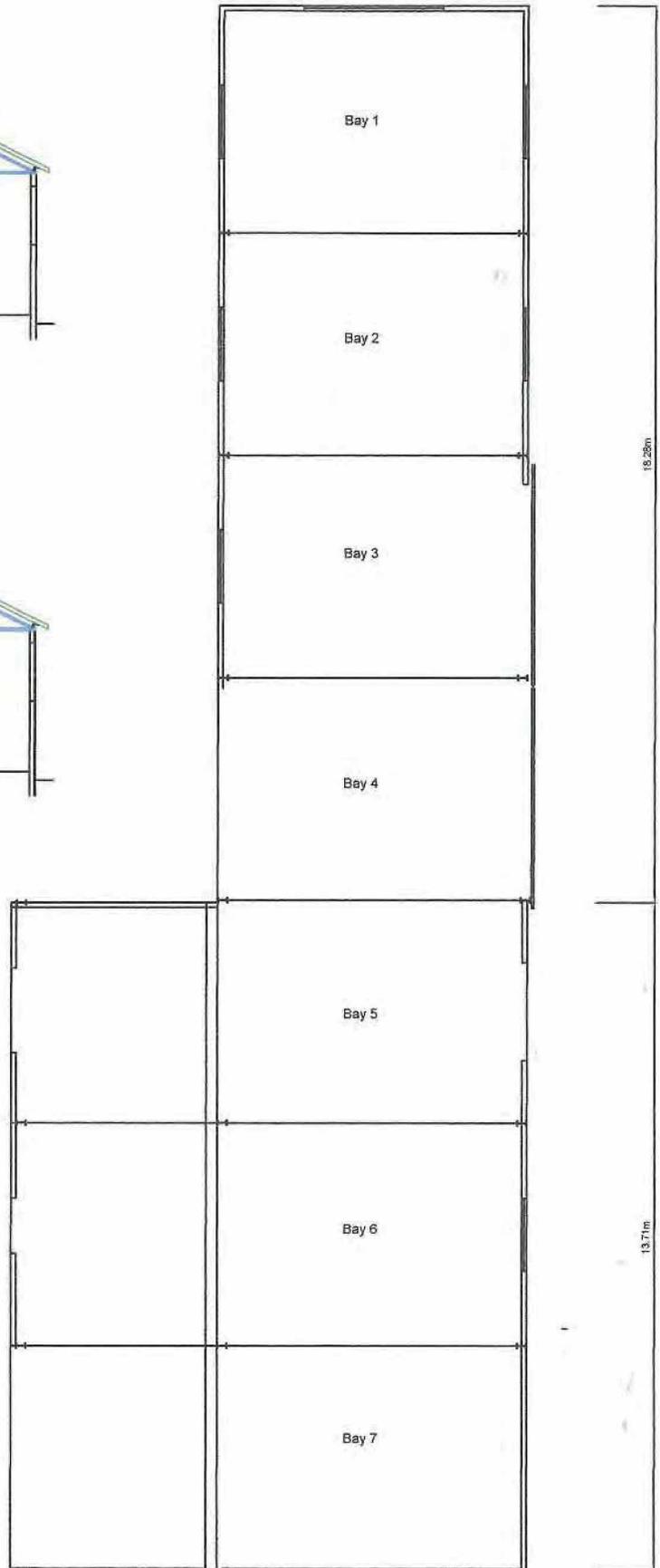
Roof:
 Profiled corrugated steel roof sheeting,
 90 x 90 ms angle purlins
 Steel trusses at 4.57m c/c's fabricated ex
 90 x 90 ms angle, with
 Steel columns UKB 203 x 133 at each
 bearing.

Walls
 Single skin 100 thick brickwork,

Lower Section:
 Profiled corrugated steel roof sheeting with
 timber purlins at third points. Purlins in
 poor condition.

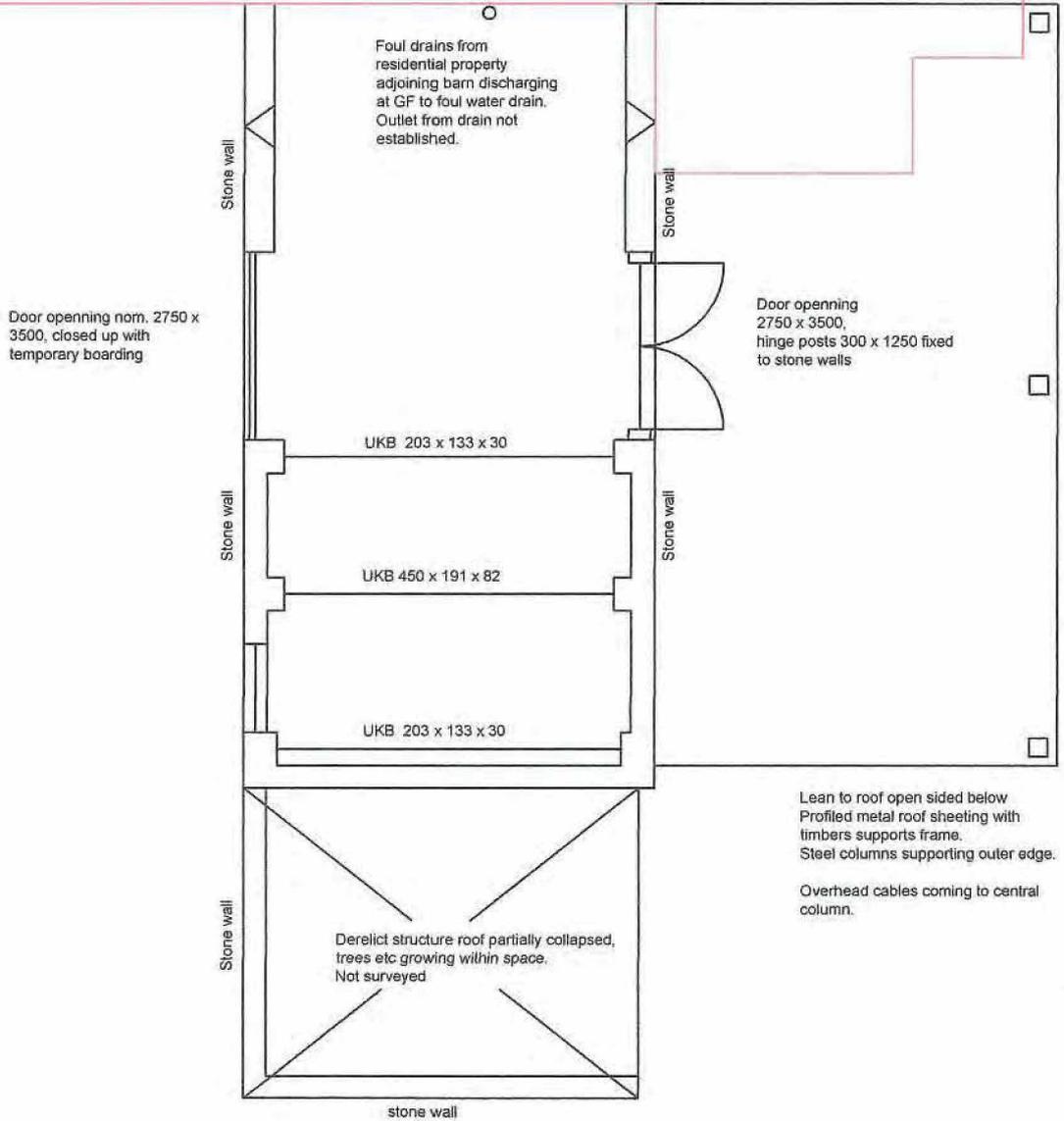
Retaining wall brickwork nom 225 thick.
 Further details not known

Floor concrete.

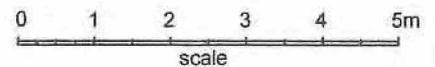


Ash Farm Barns Drybrook Gloucs GL17 9BE		Title/Name BARN 1		
Date of issue May 2019	Drawing number 750 A3 01	Scale 1: 100 @ A3	Revisions -	

Adjoining dwelling
(outlined in red)

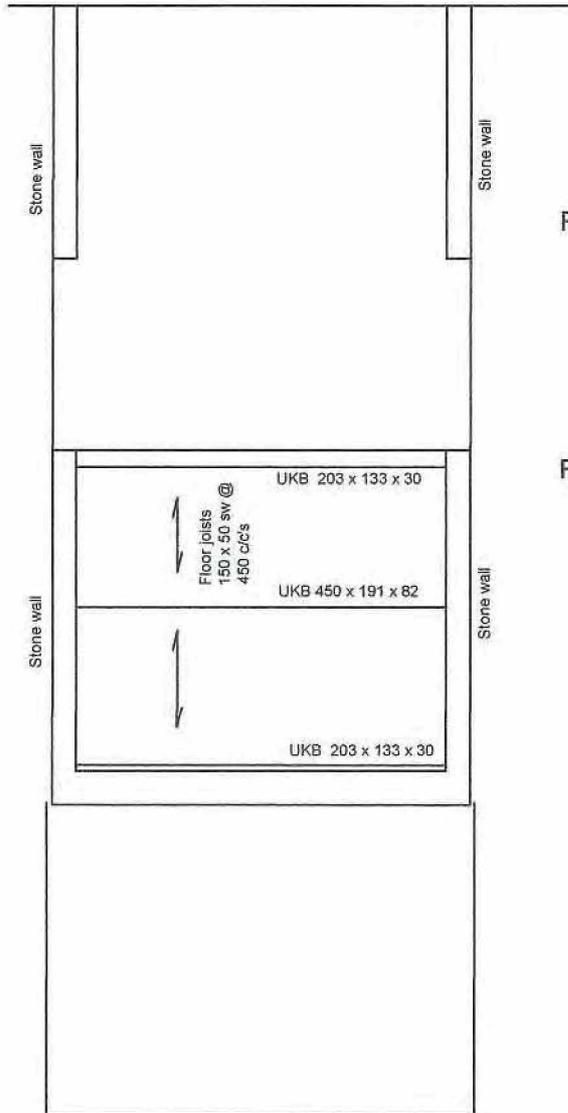


GROUND FLOOR



tb associates ltd
Consulting Engineers
Tel: 01544 388288
e-mail: timblock@tba.ke3.co.uk

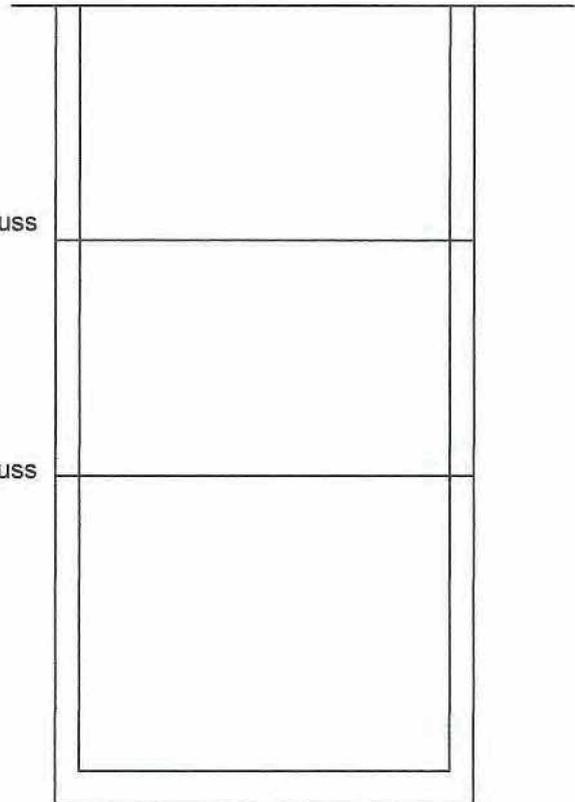
Ash Farm Barns Dryrook Gloucs GL17 9BE	Title/Name BARN 2		
	Date of issue MAY 2019	Drawing number 750 A4 02	Scale 1:100 @ A4
			Revision -



UPPER FLOOR

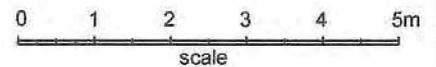
Roof Truss

Roof Truss



Slate Roof on
25 x 50 sw timber battens over,
75 x 75 sw rafters at 450 c/c's,
150 x 150 timber purlins at mid span.
Ridge Timber 75 x 75 sw.

ROOF

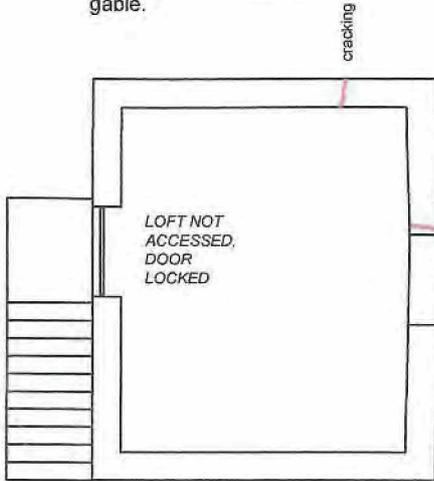


tb associates ltd
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Ash Farm Barns
Dryrook
Gloucs GL17 9BE

Title/Name BARN 2			
Date of Issue MAY 2019	Drawing number 750 A4 03	Scale 1: 100 @ A4	Revision

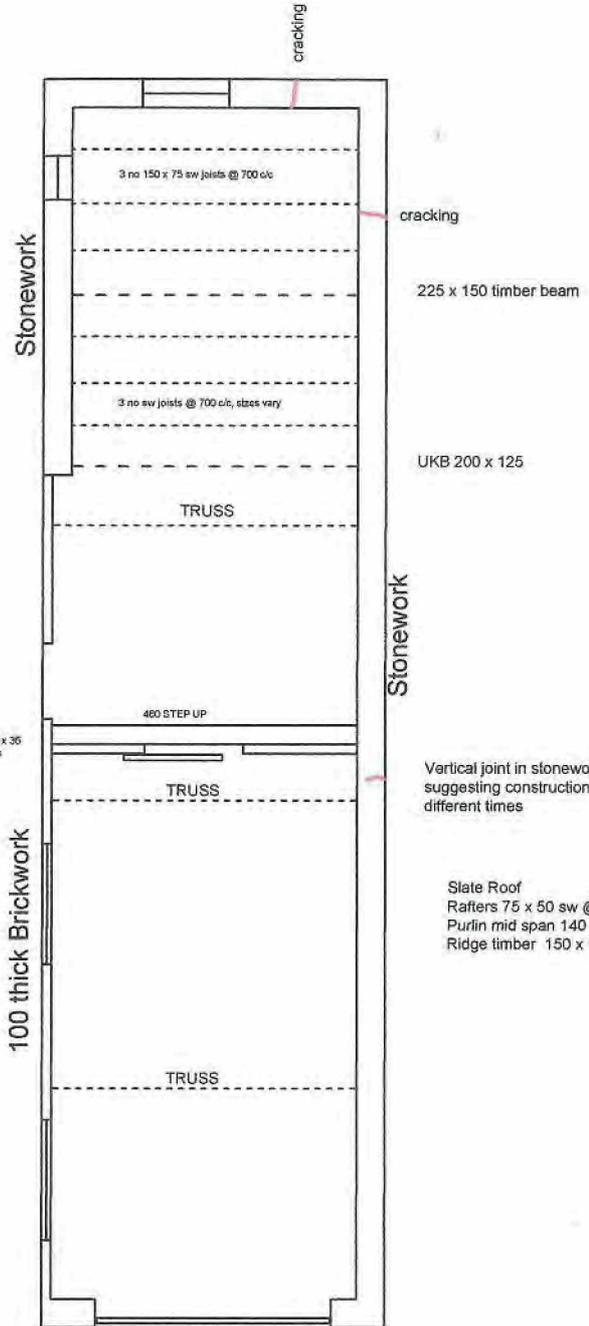
Significant movement and cracking in stonework on gable.



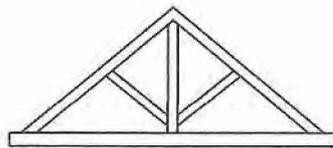
LOFT

Ridge sagging and wall plate bulging above external loft access

Diagonal cracking below access to loft



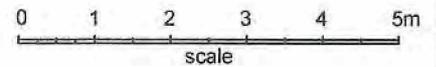
GROUND FLOOR



TRUSS DETAIL

- Truss collar 175 x 75
- Principal rafters 135 x 75
- Centre post 125 x 75
- Diagonals 110 x 75

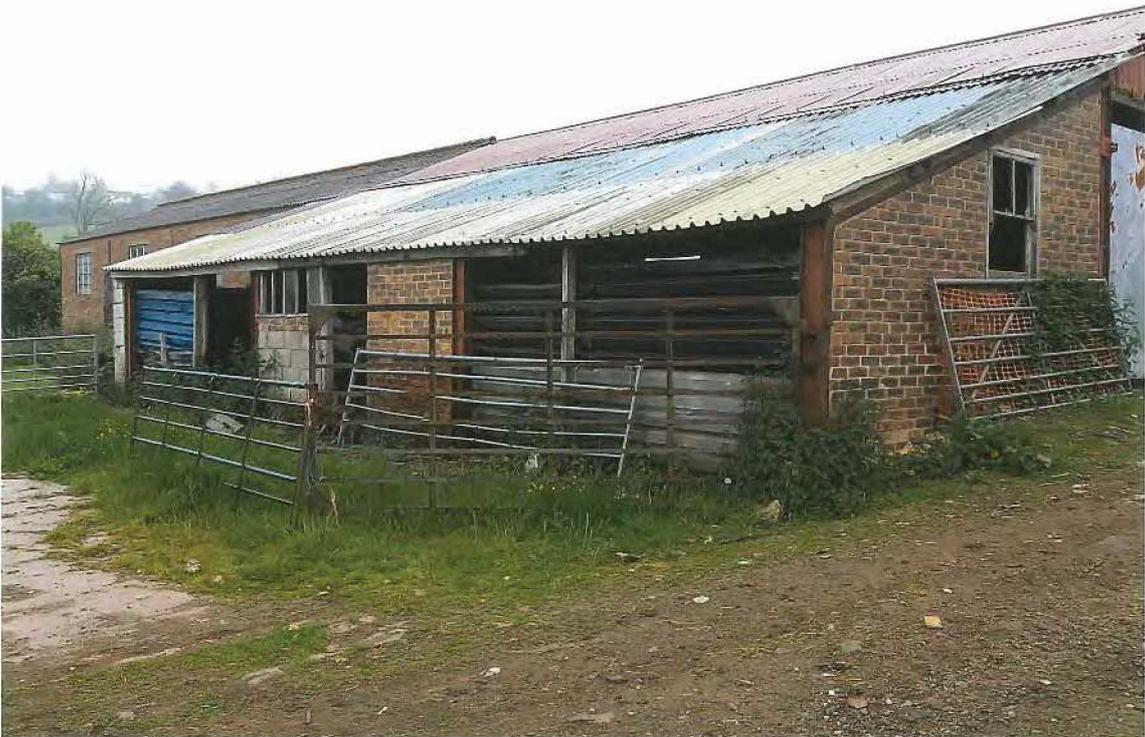
Timber panelling on 65 x 36 sw studs spacing varies



Ash Farm Barns Drybrook Gloucs GL17 9BE	BARN 3		
	Title/Name Date of Issue JUNE 2019	Drawing number 750 A4 04	Scale 1:100 @ A4



BARN 1 Bays 1 and 2



BARN 1 Lower Section



BARN 1 Bays 5, 6 and 7



BARN 1 From Bay 3 looking
to Bays 5, 6 and 7.



BARN 2 South Side



BARN 2 North Side



BARN 2 Drains from dwelling



BARN 2 Sagging Roof structure



BARN 3 Front



BARN 3 Front



BARN 3 Gable



BARN 3 Roadside

Structural Report

On

Ash Farm
Morse Lane
Drybrook
Glos

20093

For

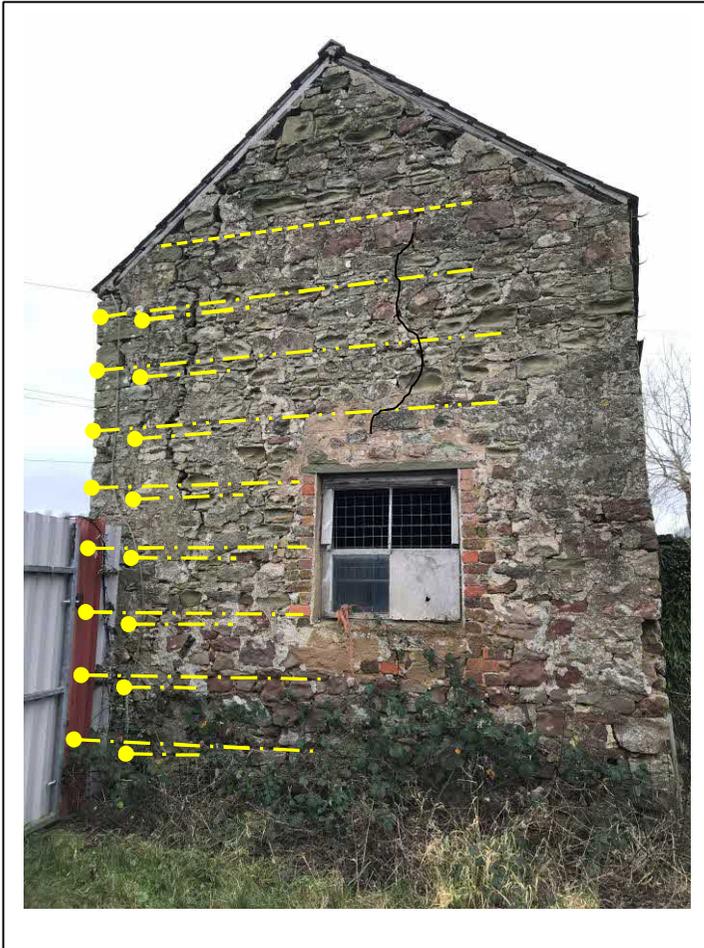
Anne Sullivan and Hazel Bullock

Annex B –Barn 3 Masonry Repair Proposal

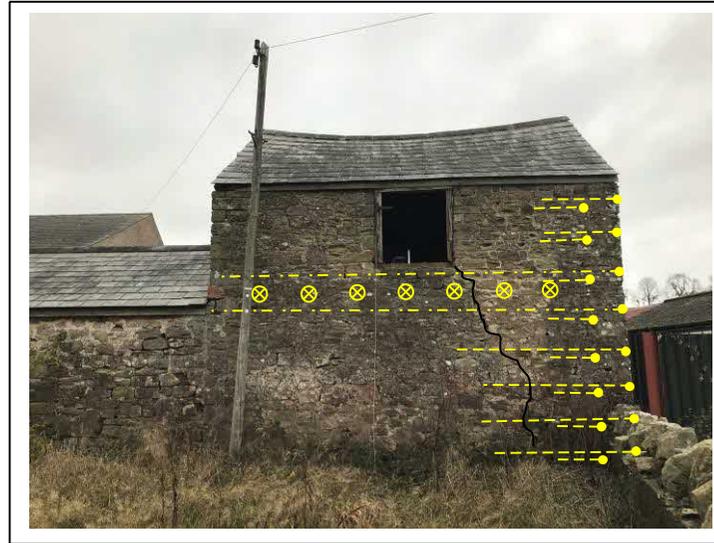


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Gable Elevation



Road-side Elevation

Roadside/gable corner to be re-connected with Helibars installed internally and externally at 450mm vertical centres. External bars to be continuous around corner extending to 500mm min beyond external cracks.

Note chords running at first floor level to be twin Helibar to form a HeliBeam in external face along line of BowTies

Internal bars to be drilled through wall and returned on external face as per detail RF11. Bars to return a minimum of 500mm on external face or extend a minimum of 500mm beyond adjacent cracking (as indicated). Bars on internal face of walls to extend a minimum of 500mm from corner or 500mm beyond internal cracks.

HD BowTies to be installed into pairs of noggins fixed between first floor joists at 600mm centres max. BowTies installed as per detail RB10

Notes:

Not to scale. All dimensions to be checked on site prior to installation.

This drawing to be read in conjunction with the Helifix Project Form, Helifix Repair Details and all other associated documents.

Project:

Ash Farm
Morse Lane
Drybrook, Glos

Drawing Title:

Front Barn
Masonry Repair Details

Date:

Dec '19

Drawn By:

CW



Sustainable Structural Solutions

Drg No: 222592/SK01

Structural Report

On

Ash Farm
Morse Lane
Drybrook
Glos

20093

For

Anne Sullivan and Hazel Bullock

Annex C –Proposed Architectural Layout

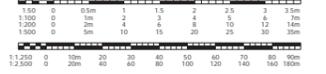


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NOTE:
Do not scale except for planning purposes. All dimensions to be checked on site. This drawing is copyright and may not be reproduced without written consent.

All works to be carried out in accordance with relevant British and European Standards and Codes of Practice. All products to be CE marked and used in accordance with manufacturer's recommendations and applicable BIM certification. TO ORDER FROM HOMERHOUSEFLP-PCBMD

This drawing to be read in conjunction with all relevant Architect's and other Specialist drawings, details and specifications.



- Concrete paving setts, Charcon Woburn Rumbled or similar.
- Soft landscape amenity area.
- Native hedge and shrub planting.
- 1.2m high timber post and rail boundary fence.

access to barn retained along existing track

existing boundary retained
wall mounted bat boxes for crevice dwelling bats
former outdoor privy retained as a roosting site for lesser horseshoe bats

space for access to services to existing house

existing house

existing garage

wall mounted bat box for crevice dwelling bats

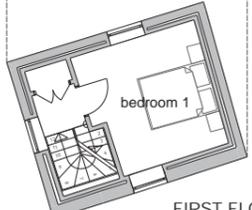
wall mounted bat boxes for crevice dwelling bats
existing stone boundary wall retained and repaired

existing boundary retained

existing stone boundary wall retained and repaired

existing access to Morse Lane

MORSE LANE



FIRST FLOOR

A	External openings, planting and boundaries indicated.	19/03/20	MA
First Issue		05/03/20	MA MA KD
Revisions		Date	Drawn Checked Approved

Client
Ann Sullivan & Hazel Bullock

Project
Ash Farm, Drybrook

Drawing Title
Proposed Site and Floor Plan

Drawing Scale & Format
1:100 @ A1

Drawing Status
FOR COMMENT

DJD Architects
2 St Oswald's Road, Worcester WR1 1HZ
E: 01905 612864 F: 01905 610011
mail@djdgrp.co.uk www.djdgroup.co.uk/architects/

Project No. - Drawing No. - Rev.
K944-010(A)