
ANDREW MARCHAM & Co.

Chartered Structural Engineers

Our Ref:- 21/198/AWM/kb

Date:- 25th January 2021

Mr C Mellor
21 The Avenue
Churchdown
Gloucester
GL3 2HB

Dear Mr Mellor,

Re:- Cider Mill Barn, Coldpool Lane, Badgeworth, GL51 4UP

I refer to instructions conveyed in connection with your application to the Local Planning Department for permission to convert the above property to residential use and in this respect, a report of my findings and recommendations is as follows:-

Preamble The subject Barn basically comprises a single storey open-plan redundant agricultural building which is likely to have been constructed circa 1850 or earlier. The building occupies a relatively level plot with single storey lean-to projections on each side of the front elevation and is understood to be Grade II Listed.

The object of my involvement is to provide an independent appraisal as to the structural feasibility of converting the building to the proposed residential usage. The scope of this report therefore is confined to structure only and must not be construed as a comprehensive survey including the condition of other unrelated items.

My appraisal took the form of an internal and external visual inspection carried out during dry sunny weather conditions on the 3rd May 2021. At this stage, trial pits have not been excavated to expose foundations although from my knowledge of the local geology, subsoil conditions beneath the site will comprise a brown clay of medium Plasticity Index and thus of moderate susceptibility to volumetric change in response to variations in moisture content.

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Cider Mill Barn, Coldpool Lane, Badgeworth, GL51 4UP

Inspection

Notes

An external inspection was carried out from ground level around the perimeter of the building and for the purposes of this report, any notes made are with the walls described handed facing the front entrance elevation. Notes made on a particular wall however, are described handed facing the elevation in question.

The main Barn is approximately 11.0m in length by 6.1m deep with a height to eaves of approximately 3.6m. The building is of open-plan with a predominant door opening at the front and with a smaller door opening at the rear. The structure of the building basically comprises a traditional vertical and horizontal timber framework to perimeter walls under weatherboarded elevations all rising off a fair faced natural stone plinth.

The roof basically spans to a central ridge between the front and rear walls formed with a traditional arrangement of rafters, timber purlins and Queen-post trusses. The roof covering currently comprises interlocking red pan tiles.

When viewed externally, the main Barn walls were found to be in reasonable vertical and horizontal alignment given overall age of building with no evidence to indicate any ongoing lateral, vertical or foundation related movement present. Similarly, and whilst some surface undulation can be seen at the purlin support locations, the roof slopes are in reasonable alignment with no evidence to indicate any progressive lateral displacement.

The single storey lean-to projections located on each side of the main front part of the Barn appear to be of a similar form of construction with weatherboarded elevations and a red tiled roof covering. The elevations have suffered dilapidation, particularly to the weatherboarding, although this is not considered to be of any major structural significance in the absence of any ongoing lateral or vertical displacement.

Proceeding now to an internal inspection, vertical timber framing to the main Barn basically comprises 130mm x 75mm hardwood timbers with five such members between the main vertical posts supporting the trusses. The truss support posts are substantial members of 200mm x 160mm cross section and whilst some evidence of earlier worm attack is present, all such timbers are in a sound and serviceable structural condition with no evidence to indicate any significant deterioration to the point where structural integrity would be compromised.

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The natural stone plinth around the perimeter of the main Barn has suffered weathering to mortar joints although this is simply a maintenance item and not the result of any ongoing structural movement.

The main roof trusses are of Queen-post configuration of 200mm x 300mm hardwood sections which incorporate knee bracing at the support post locations to maintain lateral stability. There is some evidence of lean towards the rear of the building albeit clearly longstanding and non-progressive. The purlins comprise two, 200mm x 150mm hardwood timbers to each slope which span between the gable ends and the intermediate Queen-post trusse. Such timbers exhibit some evidence of deflection although this is clearly longstanding and non-progressive.

The roof to the single storey front left and right hand projections comprise a simple arrangement of lean-to timbers albeit again generally serviceable for then current roof covering.

Conversion

Proposals

I understand that the current proposals are to convert the Barn to form a predominantly single storey dwelling albeit perhaps with local formation of mezzanine areas at the gable ends.

Timber framed construction is now quite common in the UK where the main load bearing fabric is generally formed using 140mm x 50mm softwood timber struts spaced approximately 600mm apart. This form of construction is adopted for two storey dwellings generally with external brick cladding.

In the case of the Barn, the vertical timber framing is of a far more robust form of construction consisting of quite substantial Oak or similar hardwood members spaced at approximately 400mm c/c. There will of course be a need for upgrading to improve thermal qualities of the perimeter walls although the existing timber frame is in sound condition and thus clearly capable of supporting roof loading together with provision of mezzanine floor accommodation.

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In the case of the roof, the existing purlins and main trusses are also in a sound and serviceable condition although again, upgrading will be required to improve thermal qualities preferably by formation of a “warm roof arrangement” where insulation is applied directly to the external face of the rafters. Alternatively, if a more traditional form of insulation is required, this could be achieved by provision of battens and counter-battens to cater for the increase in insulation thickness. A similar situation would of course apply to the perimeter walls where insulation should be provided on the external face of the vertical timbers or between the members internally.

Regarding existing foundations, conversion to a dwelling will not result in any significant increase in vertical loading and it should not therefore be necessary to underpin or otherwise improve the existing footings. Any stonework found to be in a loose condition should be made good and general repointing is required. Provision of a damp proof course in the stone plinth is not normally recommended for a Grade II Listed building although dampness could be catered for by provision of lime plaster internally.

In the case of the left and right hand single storey projections, these areas can also be upgraded to form part of the converted building albeit perhaps with rather more maintenance than that required to the main Barn. In this respect, framing timbers are quite capable of supporting loading from the roof.

Concluding Remarks

Based on the findings of a careful internal and external visual inspection, it is my considered opinion that the subject Barn is structurally capable of conversion to form the required residential accommodation in the absence of any progressive lateral, vertical or foundation related movement in the main load bearing fabric of the building.

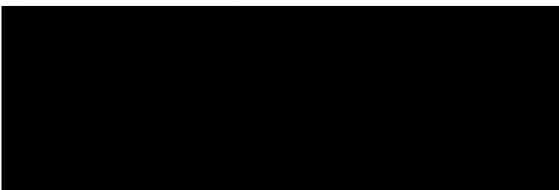
The conversion proposals will not result in any significant increase in overall vertical or lateral loading to the existing structure and the building can be upgraded to comply with current Building Regulations with regard to thermal qualities by provision of insulation to the side walls and roof.

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This report is for the private and confidential use of the Client to whom it is addressed together with any other party directly involved in the Planning Application. The report therefore must not be used or relied upon by any other third party without prior written consent from Andrew Marcham & Co.

I trust the above is self explanatory and sufficient to the purpose for which the report was commissioned however please do not hesitate to contact me without delay should any clarification be required.

Yours Sincerely,

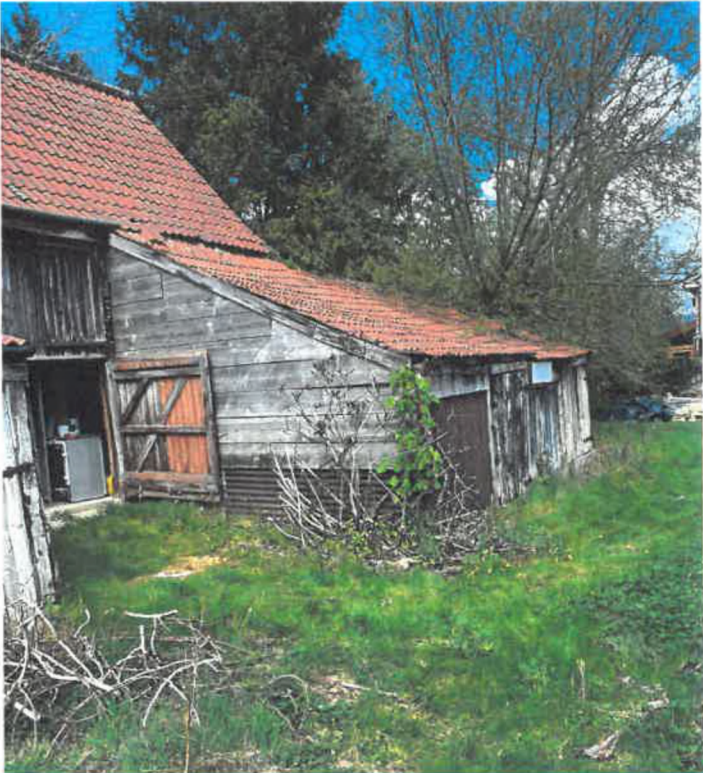


Andrew Marcham
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Appendix A

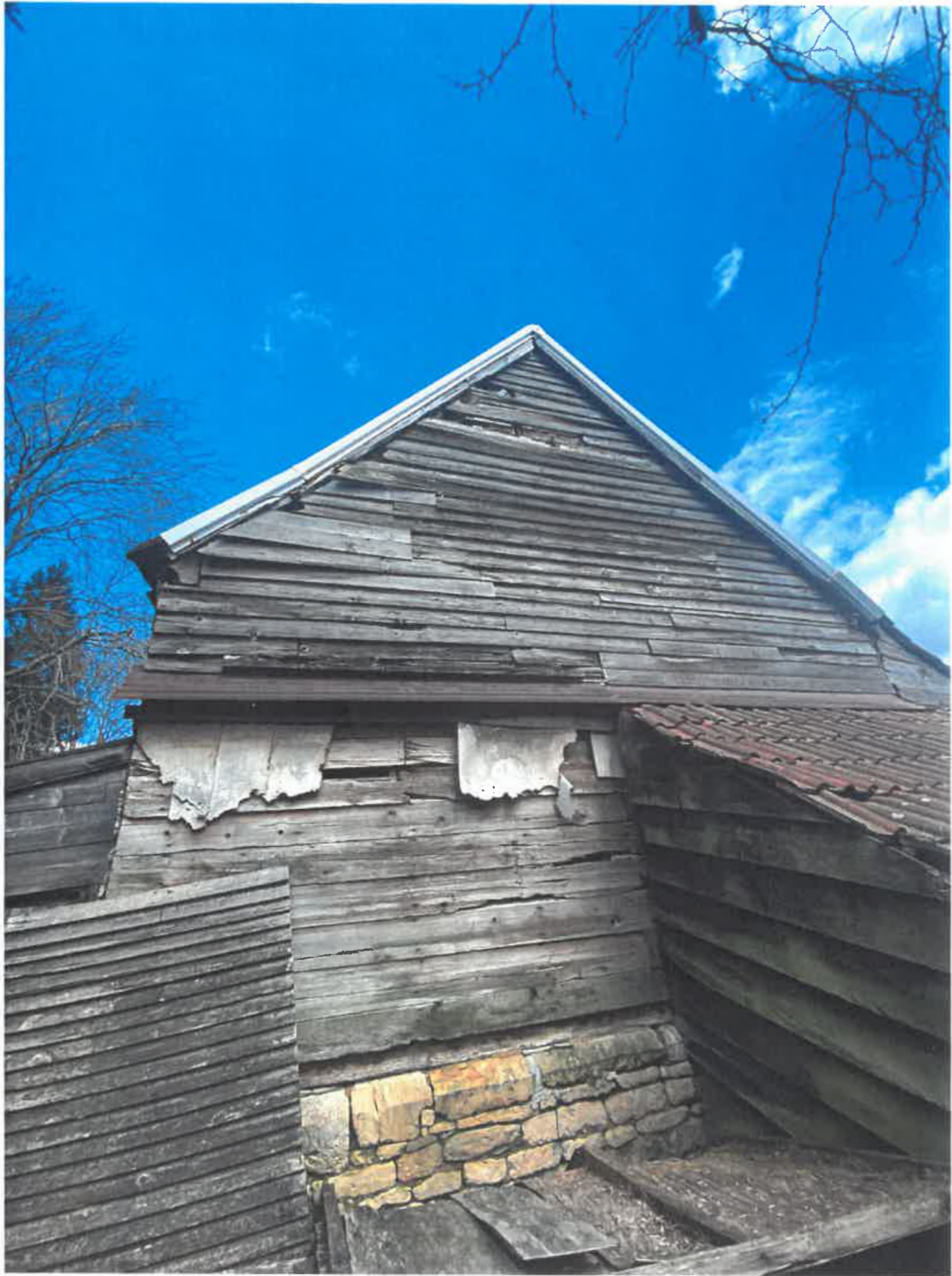
**Contents:-
Record Photographs**

Front of building with right hand lean-to projection. Note, roof slopes in very good alignment



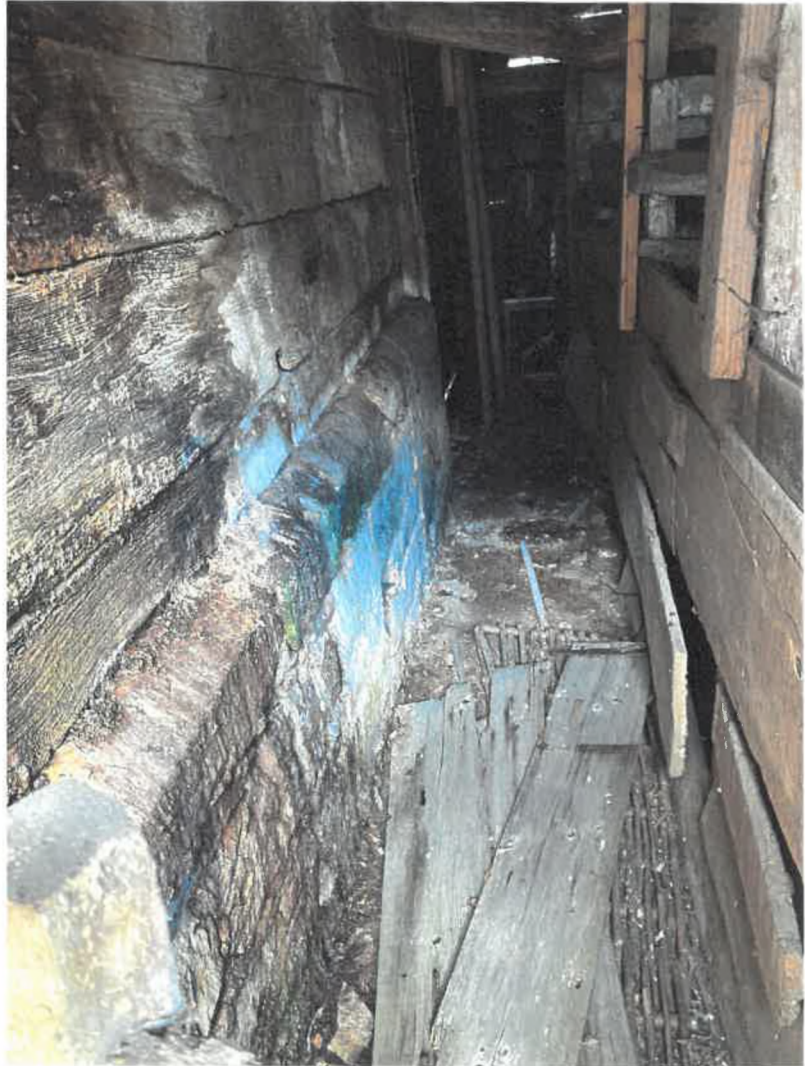
Front roof on left side again in very good alignment to main Barn





Weather boarded Gable wall rising off fair faced stone plinth

Masonry plinth to main Barn
front wall within lean-to
projection



Lean-to roof





Roof truss with substantial knee bracing to maintain lateral stability

View on underside of roof within Barn, note substantial truss and purlins



Another view on the substantial roof trusses and purlins

