

Building Survey:

Castle Farm
Wragg Castle Lane
Pitchcombe
Stroud
GL6 6LU

Date: 23/06/2022

Author:

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Introduction

Western Building Consultants Ltd are a firm of RICS & CIAT accredited building surveyors and chartered architectural technologists, we have been instructed to carry out a feasibility report and structural survey at Castle Farm, Wragg castle Lane, Pitchcombe, Stroud, GL6 6LU. The primary aim of this report is to assess the current structure of the building and comment on the suitability for conversion to a residential dwelling.

About the Author

The surveyor carrying out the inspection and author of this report is [REDACTED] [REDACTED] he graduated with a CIAT accredited degree in Architectural Technology and a RICS accredited Masters degree in Building Surveying. He is a Chartered Architectural Technologist, Chartered Building Engineer (fellow of CABE) and associate RICS building surveyor. As managing director of Western Building Consultants, he has vast experience in the conversion and restoration of buildings including multiple conversion projects, involving varying types of structure. He has designed many buildings and conversions using non-standard and standard building construction methods and regularly assesses many types of structure including historic and listed buildings. He is highly skilled in delivering renovation and conversion projects, has a background in consulting and advising as a Building Control officer and also has experience providing strategic advice on the thermal upgrading of large stocks of buildings. His expertise is that of a building fabric specialist.

Current Construction, Usage and Layout

The Barn is nestled within a small group of agricultural and domestic dwellings on the outskirts of the village of Pitchcombe. The building is accessed via Wragg Castle Lane and is a short distance away from the main Cheltenham Road and A4173 road. The main building itself is a large stone built barn, the front and rear walls being approximately four meters high up to eaves level with gable walls at either end. The roof cut over the top is covered with an asbestos cement sheet throughout, these sheets have then been laid over a timber substructure.

The building is currently used for agricultural storage / animal housing and is simply constructed with a mixture of rubblestone and coursed stonework.

The barn in question is approximately 12.4m x 5.1m so given the existing plan the proposals would facilitate cross ventilation and adequate natural lighting if converted into a dwelling. The size is also adequate to accommodate good space standards, both for living accommodation and amenity space. The plan does not give rise to any fire related safety issues due to excessive travel distances.

General Condition

The general condition of the existing structural elements appear to be good for an agricultural building of this age and type. The stonework walls do not require any major structural repair and it is likely that localised repointing and making good would suffice.

Suitability for conversion

Roof

The roof is covered with an asbestos cement sheet throughout, these sheets are laid over a timber substructure and 50mm x 100mm timber rafters at approximately one meter centres over the top of these are timber binders, the binders being 75mm x 50mm laid across again approximately one meter centres. There are ceiling ties at high level on three / four of the trusses and three ceiling ties which appear to be approximately 75mm x 150mm spanning across from front to back. The roof timbers and structure appear to be in reasonable condition although it does contain slight deflection in areas and potential staining from historic water ingress however when tested this is not damp at present.

Externally the roof generally appears to be in reasonable condition although is covered with a fairly heavy build-up of moss and to the rear corner it appears that vegetation has grown up over the edge of the roof that requires cutting back prior to any conversion.

As the roofing material potentially contain asbestos which is hazardous to health, it is suggested that the opportunity to remove this finish and replace it with a lightweight covering before conversion would potentially advert any contamination to a habitable space in the future. There are several ways in which the roof structure could be converted to habitable use, the first of which is to ensure that any new roof covering has a breathable membrane, this would allow for 75mm of celotex to be installed between the rafters and underdrawn with a 50mm celotex insulation board, vapour control layer and 12.5mm plasterboard.

Another option would be to install timber ceiling joists from the wall plate, this would allow an insulation zone to be installed above, typically 300mm of mineral wool insulation could be installed with plasterboard under drawn. A vapour control layer should be installed below the plasterboard layer. This would achieve a U-value of approximately 0.16 W/m²K over and above the limiting value under Part L of the Building Regulations.

Walls

The walls are constructed of a mixture of rubble stone and coursed stone. The stonework generally appears to be in reasonable condition and is approximately 500mm thick to the external walls. The far gable end of the barn is painted internally and appears to be in reasonable condition although requires repointing. The inner lintel on this gable is a thin timber lintel and appears to show signs of historic insect attack. It may be suitable to stabilise and treat this lintel where invasive inspections show that the heart wood is still intact. If not a simple oak lintel replacement should be sought.

To the side of the barn there are two large openings; one facing out into the court yard of the farm which has two steel beams running across at high level. These appear to be fairly old and have surface corrosion. This should be rubbed back and coated in rust resistant paint. The reveals of the opening have been rebuilt to the left hand side in what appears to be dense block laid on flat. To the

right hand side the stonework appears to be cut away and a number of the large stones that have been left in situ appear to be damaged. It is likely this will need repair and infilling. To this elevation there is a small arrow slit window towards the rear end of the barn and at high level towards the front end there is another door opening, this appears to have been cut out of the stonework. The stonework around the opening appears to be in fairly poor condition and it is recommended this will need to be rebuilt.

To the opposite side of the barn there is an opening through into another lean to barn area. There are two steel beams running across at high level forming this opening, these appear to be suffering from heavy surface corrosion. Above the beams it appears that the wall has been removed or collapsed previously and has been rebuilt in block work. The block work appears to either side of the opening at low level, this has also been reconstructed in blockwork and have been covered in what appears to be a Vandex tanking slurry.

There is also an arrow slit window at high level towards the rear elevation. All of the arrow slit windows have what appear to be timber lintels above and have suffered some decay over time, a number of them appear to have been replaced with more modern timber although appear to be suffering from historic insect attack. Again it would be prudent to carry out an invasive inspection of the lintels prior to any replacement to check the heartwood.

The wall to this side of the barn at low level has sections of timber lintels and timber work inserted into the wall which appears to have degraded over time, a number of the stones have fallen away and it is recommended that this will require minor patch repairs with the repointing works.

The wall internally have some historic character and it may be prudent in any conversion to negotiate with the building control body to retain the natural exposed stone in some areas such as the gables where the stone has the least alterations. This may be achieved by uprating the insulation installed to other covered sections of the barn.

New internal wall linings could be installed to introduce a suitable insulation and sealed air zone. The new frame should be constructed with 50x150mm timbers, additionally a horizontal wall plate and pole plate of 2no 75x100mm is recommended to be installed bearing from the existing or new slab where appropriate. The walls should be sheathed in 9mm marine ply wood, breather paper and have air ventilation installed between the cavity. It is also suggested that the opportunity should be taken to treat any retained timbers against insect and fungal attack. Internally the walls can be filled with 100mm PIR insulation and internally lined with an insulated PIR plasterboard. A vapour control layer should be installed below the plasterboard layer This would achieve a U-value of approximately 0.23 W/m²K over and above the limiting value under Part L of the Building Regulations. The walls could also be simply lined with tanking slurry and insulated plasterboard although such conversion methods are generally frowned upon in conservation techniques due to their irreversible and non-breathable nature.

Externally the front of the barn faces into an adjoining barn structure, at low level the gable end can be partially seen from further up the driveway. It appears to be slightly leaning inwards, possibly due to historic movement. It is not considered to be in a state of imminent collapse and is stable at present. Any risk of further movement can be minimised by installing gable strapping to the roof structure at 1200 centres when the roof covering is changed. It is not thought necessary to take the

gable and reconstruct it. Generally the stonework's condition from the observations made appears to be in reasonable order and fairly well pointed although it has a build-up of moss and lichen.

The stonework to the front elevation at low level appears to be in reasonable condition, the construction is a coursed rough stone which has been repointed with different types of pointing in several areas but appears to be in reasonable condition and only requires minor repointing works in these areas.

The side of the barn that faces away from the farm house can only be partially seen. There is barn structure connected to the side of the barn being surveyed which only runs along approximately half the depth and is an enclosed paddock which cannot be accessed at present. The stonework here is rough coursed stone although there are several areas where there are stones missing and there appears to be a small arrow slit window at low level which has a stone or concrete lintel over the head.

Inspections from a very acute angle can be made of the rear external elevation of the barn from further up the farm yard-parking area. The general shape of the wall appears to be similar that that of the front end and the top of the gable has a slight bow that can be managed as previously discussed. There does not appear to be any significant cracking inside the barn and this is likely to be due to historic moment when the roof structure was replaced and is not considered to be a major structural issue.

The door opening at high level towards the front of the barn can be seen externally, it appears that the stonework has been cut out; the stonework externally appears to be in reasonable condition although as mentioned internally it requires some patch repair. The timber binders in the roof structure protrude out through the eaves on the gable ends. The ends of the timbers can be seen and at present and appear to be in reasonable condition, although it is likely they will require treating or weathering to stop rot occurring overtime.

Mezzanine

Inside the barn at the front end there is a mezzanine structure which has been constructed of a steel frame to the edge of the mezzanine platform with steel columns running down onto the floor slab. There is also a steel beam running from side to side almost at mid span on the mezzanine, these beams are set into the wall at either end, the beam at mid span does not have any posts, the one at the edge of the mezzanine has two posts. At the front edge of the mezzanine where it meets the front wall the timber joists structure that's cut over the top of the steel beams runs into the wall and sits on top of a historic timber wall plate, this appears to be fairly heavily degraded and suffering signs of decay. It is recommended that is removed and replaced and the wall is infilled back with stone to match.

The mezzanine deck structure is timber joists at approximately 700mm centres, laid over this are painted timber floor boards all of which appear to be suffering heavily from insect attack and it is recommended that the floor covering is replaced and the retained timbers treated for insect attack. The steel work is showing signs of surface corrosion although it is likely to be structurally sound. The connection detail at slab level of the posts cannot be seen at this time and subsequent further

investigations are recommended during any conversion works. At the time of inspection it is not known if there is a plate detail bolted to the slab or if they are cast into the slab.

Floor

The floor to the main building is appears to be possibly concrete throughout although at the time of inspection there were active chicken coups occupying most of the space which contained soil that has been scattered over the concrete that runs throughout. It is likely that the floor can accept a sand blinding with a high grade 1200 gauge damp proof membrane and gas barrier. This would provide a level and dry surface to insulate. The current set level of the floor including for insulation and new floor topping such as screed gives sufficient head height to accommodate a habitable space.

The retained area of concrete floor structure where visible is in generally good condition and is suitable for conversion/re-use. The floor should be cleaned back and recovered with a damp proof membrane lapped at least 200mm up the existing external and internal walls and held in place with a treated batten sealed with silicone. Adequate head height exists to insulate the floor with 100mm of PIR insulation a 500 gauge DPM should be placed over this insulation with 22mm moisture resistant T&G flooring or 75mm sand/cement screed. Given the perimeter to area/ratio such a construction would achieve the minimum elemental target U-value of 0.25W/m²k, required for new dwellings under Part L of the Building Regulations. The floor is therefore considered suitable for conversion.

Fenestration

To the near gable end there is a door opening at low level, the opening appears to be reasonably well executed and the stonework around the edges is in reasonable condition with areas of stone at low level which have come away. There is a timber lintel over which appears to have suffered from rot and decay and will likely require replacement.

The proposed windows allow for a sufficient fenestration pattern to support natural lighting and ventilation to the proposed dwelling. The glazing will need to have double glazed units, achieving a U-value of 0.16 W/m²K or better, it is recommended that these frames are timber to suit the agricultural aesthetic of the barn and in particular the cladding.

Rain water goods

The side elevation facing the farm house looks as though it contained a historic guttering running across this elevation. Steel rise and fall gutter brackets can be seen protruding from the wall these are heavily corroded and are likely to require replacement. There are also sections of timber fitted to the inside of the stonework and it is recommended these are replaced.

The barn will require new guttering and down pipes, the surface water runoff from these could be easily and sustainably dealt with via a traditional soak away in the surrounding land, designed to BRE Digest 365. In regards to other services the property is in close proximity to mains electricity and water supply, there is also ample room and access to an on-site sewerage treatment plant.

Conclusion

Generally the structure appears to be in reasonable condition, the external walls are substantial at over 500mm thick and it generally appears to be in fair condition requiring only minor patch repairs. The building will not require any new structural elements or rebuilding to be converted and represents a good opportunity to form a dwelling from an agricultural building.

It is thought that the property would be suitable for conversion and the external walls would be suitable for load bearing and it is likely that no new steel frame or internal structure will be required to support any of the elements of the building, a new roof covering is likely to be required although it is thought that with minor patch repair works and repointing that the existing structure could support a more substantial roof covering. Almost all conversions of agricultural buildings require such upgrades due to their functional design and higher standard of finish required in new dwellings.

The building is of a substantial nature and perfectly capable of being converted into a dwelling without any substantial alteration to the existing super structure.

Whilst any building could potentially be saved for reuse our client has asked us to especially consider the financial efficiency of converting this building in relation to the existing structure. It is our view that the structure is of sound condition and that the works required to the building are not in excess of any other conversion of an agricultural barn or similar building. The renovation works to the main structural elements are minor and upgrades can be achieved in a cost-effective way.

Photographic Schedule



Figure 1 - Overview of barn through view of cattle store







Figure 2 - Asbestos roof sheeting and external images of roof / high level wall structure



Figure 3 - Rubblestone walling



Figure 4 - Internal view of main barn and timber mezzanine storage area





Figure 5 - Historic steel beam sat on pad with more modern walling addition above

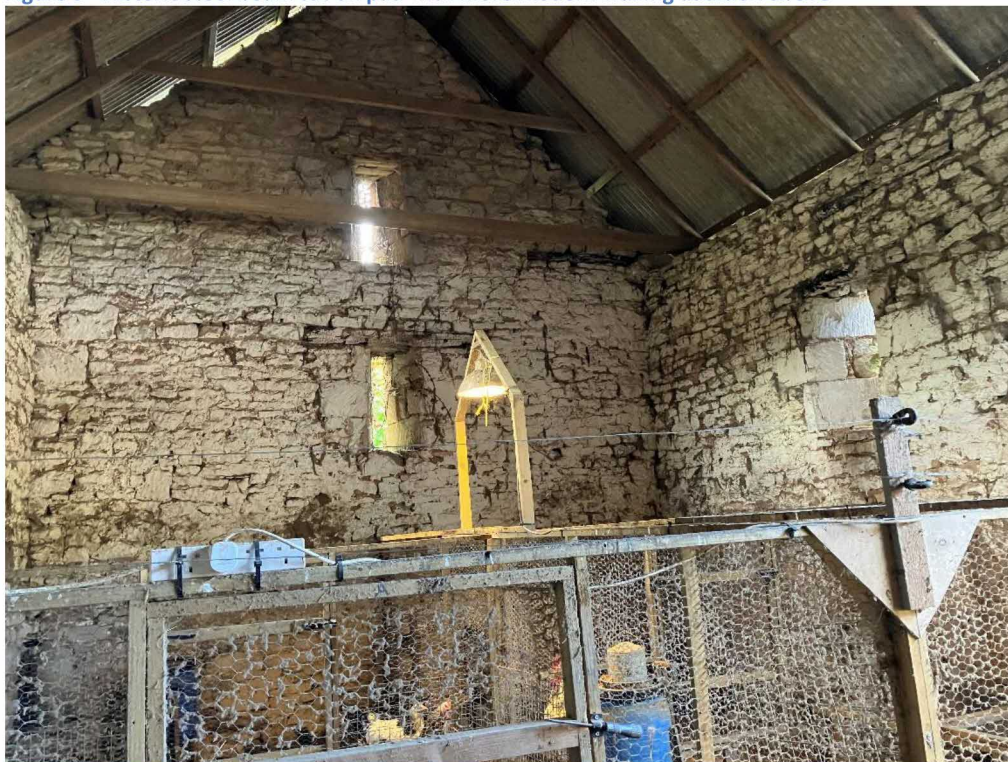








Figure 6 - Internal view of rubblestone walling in main barn





Figure 7 - Internal roof structure / timbers of main barn