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OATRIDGE FARM

EASTCOURT

SN16 9HR



STRUCTURAL REPORT
ON
STONE BARN

Date of inspection

13 April 2021

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1. Introduction

We were appointed by Tim Bostwick of Oatridge Farm, Eastcourt, Wilts SN16 9HR to report on the structural condition of a stone threshing barn at the property and its suitability for conversion to residential use.

Our report is concerned only with this structural issue, all other aspects of the property are outside our report.

Our report is prepared for the use of the above named client in connection with a planning submission only and is not to be relied upon by third parties without our specific written authorisation.

No exposing work was carried out. Our report is based on a visual inspection.

A site visit was carried out in the afternoon of 13th April 2021. Weather conditions were dry and sunny.

Our report contains photographs of the building taken on the day of inspection.

2. General Description

The building is a traditional stone threshing barn about 28m long x 6.5m wide with an eaves height of about 4.5m.

The barn is orientated roughly east-west and sits on level ground in a traditional farmstead.

On the left hand side of the south wall there is a timber framed lean-to projecting about 3.5m.

The cart entrance on the south side is positioned about 10.5m from the right hand end. There is no projecting porch, but there is a stone-tiled canopy above the entrance supported on timber brackets.

On the north side of the barn there is a projecting porch with cart doors in line with those to the south.

To the right of the porch are the remains of a later blockwork lean-to, now largely collapsed. To the left is an unroofed blockwork enclosure housing an oil tank and other items. These blockwork elements are not considered in our report.

The roofs are covered with natural Cotswold stone tiles.

External walls are of rubble stone construction.

The barn is currently in agricultural / storage use.

3. External Observations

South Elevation

The main roof slope on this elevation is rather uneven and there are holes visible at the left hand end and above the entrance canopy.

The roof of the lean-to is also somewhat uneven.

The lean-to roof is supported on timber posts and an edge beam. There is timber boarding between the posts except in one bay which is open. The timber posts are all decayed and will need to be replaced as part of any conversion, including new staddle stones.

The lintel over the cart doors is quite shallow for the span but appears adequate at present. There is a 10mm crack running down from the left hand end of the lintel. There is minor cracking above the lintel.

The timber structure of the canopy is in poor condition. There is a strut missing from the left hand bracket.

The main south wall is reasonably plumb.

The pointing has been washed out of the masonry joints, particularly at low level and some repointing will be needed.

West Elevation

This wall rises to a gable, and is reasonably vertical.

There is a high level window with a rotten timber lintel.

At eaves level there are timber ties built in each side to restrain the wall plate from spreading. These are both moderately affected by woodworm.

The side wall of the front lean-to has been built against the main barn corner without toothing in. It has rotated away from the main barn, so that a gap of 50mm has opened at the top. This probably happened soon after construction and appears to be of long standing.

North Elevation

The roof is in similar condition to the south elevation and holes can be seen at the right hand end and more centrally.

The entrance porch projects northwards from the main wall. It has settled compared with the main barn, and diagonal cracks of up to 5mm can be seen in the two flank walls. The left hand flank wall has bulged outwards by about 75mm.

The gable above the porch door is timber framed and weather-boarded. Much of the boarding is missing and the timber lintel is rotten.

To the left of the porch there is a vertical crack about 20mm wide.

To the right of the porch and the ruined lean-to there is a door with a rotten timber lintel.

As with the south wall there is washed out mortar from the masonry joints particularly at low level.

The main wall is reasonably vertical.

East Elevation

This wall rises to a gable. There are four rows of pigeon holes set just below eaves level.

There is a central door with a satisfactory timber lintel.

To each side of the door there are minor cracks in the masonry.

As with other walls the mortar is washed out at low level.

Again this wall is reasonably plumb.

4. Internal Observations

The barn is a double storey height space throughout with no first floor structure.

The roof structure is largely as original, probably early 19th century.

There are eight main roof frames dividing the main body of the barn into nine bays.

The roof frames are simple triangular trusses with typically 200x150mm tie beams, 300x100mm principal rafters and 175x75mm upper collars. (All sizes estimated from ground level).

The frames support two rows of purlins in each slope, again largely original.

The roof timbers appear to be mainly of Elm.

The common rafters on both slopes are mainly original with some replacements. Some areas of roof are now underlain by bituminous (non-breathable) felt. In others the original lime torching and oak pegs can still be seen.

There is no bracing, and the roof structure has racked over slightly towards the west. This is of long standing and there is no sign of recent worsening.

As mentioned externally there are some holes in the roof, particularly towards the west end. Localized decay of rafters and purlins has resulted.

At the eastern junction of the north porch and the main barn there are two similar roof frames side by side, appearing to be of similar age. The tie beams of these frames are touching, but the apexes are some distance apart due to the racking of the western part of the roof. A bracket has been introduced between these two frames to stop them moving further apart.

The reasons for this arrangement are not immediately clear: possibly the eastern end roof was renewed, due to decay or fire and the additional frame introduced to make the connection to the western section easier. In any case this arrangement is of long standing and seems adequate structurally.

The frame nearest to the east end is a more recent replacement, with more bracing and smaller members. Purlins at this end are supported on metal brackets, which supports the idea that the east end of the roof was replaced at some point.

The north porch roof is supported by lay-boards on the main roof rafters ad lower purlin. There is an A-frame and single purlins supporting the rafters. The gable is timber framed and in need of repair and replacement of structural timbers.

In general the roof structure is in satisfactory condition considering its age and lack of recent maintenance. There is some beetle attack in evidence, and a few purlins may need to be replaced. At the south end of one of the central frames there is decay in the ends of the principal rafter and tie beam, which will require a structural repair.

When the roof covering is taken off, further areas of decay may be found in to the tops of the timbers, and in the wall plates.

The walls are unplastered apart from the lower part of the two long walls. They are generally plumb and have not been pushed out by the heavy roof structure as can sometimes happen in old barns. This is because the roof structure uses triangular frames rather than raised collar A-frames.

In the north porch walls there is cracking, showing that these have settled away from the main walls historically. Elsewhere, there are some areas of minor cracking and evidence of historical movement, but no evidence of significant recent movement.

The floor is a rather uneven concrete apart from the two westernmost bays which have an earth floor. In the north porch the concrete floor slopes down towards the doors.

In the lean-to against the south wall, the roof is supported by half frames, which span from the main wall to the front posts. The frames have 175x125mm tie beams, on which 300x75mm principal rafters are supported. The principal rafters support 150mm sq purlins and common rafters.

The tie beams are anchored through the main barn wall and held with a tusked tenon joint visible inside the main barn. An unusual and attractive feature.

The tie beams are overloaded by the reaction from the principal rafters and have all sagged.

The connection to the front eaves beams and posts is not very secure and it would be desirable to provide additional support in this area, set inside the line of the timber posts. This could be incorporated into the conversion.

Several of the timbers on the lean-to roof are in poor condition, but this structure can be repaired and strengthened without losing its character.

The floor of the lean-to is an uneven mixture of concrete and cobbles.

5. Comments & Conclusions

Existing Structure

This is a substantial and well-built barn, which has suffered from neglect in recent years.

The following areas as identified above, require attention in the short term to prevent further deterioration of the structure:

- Fixing holes in the roof, and replacement of any badly rotten timbers.
- Repairs to timber structure of south entrance canopy, including replacement of missing or decayed struts.
- Replacement of Sampson posts and staddles of lean-to, or provision of temporary additional props.

In the medium term, further repairs and maintenance should be carried out, including:

- Repointing of cracks and loose areas of masonry externally
- Replacement of rotten timber lintels.
- Cracks repairs to walls of north porch.
- Repairs and recladding of north porch gable.

In the longer run, the roof covering should be taken off, repairs carried out, and the tiles re-laid, but this work can be included in the proposed conversion.

Proposed conversion

In addition to the repairs outlined above, the proposed conversion will include the following elements:

- Re-roofing (if not already done) using a suitable breathable felt under the tiles, and incorporating conservation rooflights as permitted.
- Provision of insulation, vapour barrier and ceiling finishes to the roof.
- Insulation and lining of walls internally.
- Provision of new first floor structure and staircase, incorporating steelwork and timber joists.
- Replacement of existing concrete floor with a new insulated and damp proof slab and finishes.
- Minor alterations to door and window openings.
- New partitions to ground and first floor.

These repairs and conversion works can be carried out within the structure of the listed building without the need to demolish or rebuild any significant elements.

We will be pleased to answer any questions on this report.

James Birdwood MA CEng MICE MIStructE
800/ JGBB

Photographs 13 April 2021



South Elevation



East Elevation



View from North West



View from North East



North Wall looking towards Porch



West Gable Wall



Window in West Gable Wall



West Wall of Lean-to



Front of Lean-to



North Porch



Front of Lean-to



Canopy above South Doors



Roof Structure looking West



Roof Structure looking East showing Double Frame



Junction at North Porch



North Porch Roof Structure and Gable Frame



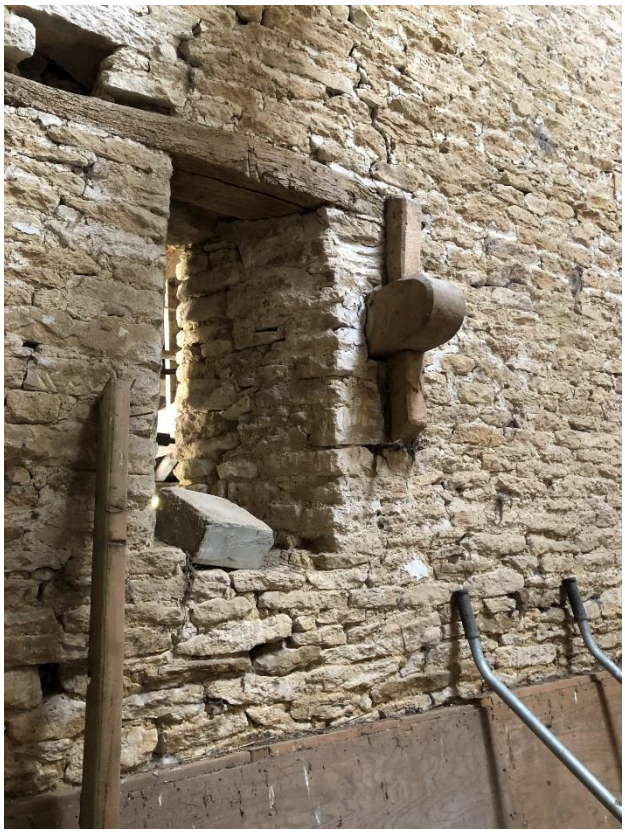
West Wall of North Porch



East Wall of North Porch



General Internal View



Tie Beam Anchorage from Lean-to



Lean-to Roof Frames



Lean-to Roof Frames



Lean-to Post Support



Lean-to Post Support