Structural Engineers Inspection

Agricultural Barn
Peak Hill
Cowbit
Lincolnshire
PE12 6BN



PCC Document Management	
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This report has been prepared by PCC Consultants Ltd with all the reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions

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1 INTRODUCTION

1.1 Instructions

I have been instructed by Origin Design Studios, on behalf of J W E Banks and Co to undertake a structural engineer's inspection of the barn located at Peak Hill, grid reference: TF 26618 15887. The survey is to identify if the barn structure is suitable for conversion to residential use.

1.2 Basis of Report

This report has been prepared from visual observations made during the course of a structural engineer's walkover survey which was carried out on 24 August 2023. At the time of the inspection no monitoring, long term investigation or testing of the materials of construction had been undertaken and no trial holes excavated to confirm ground conditions or the configuration of existing foundations.

1.3 Report Limitations

This report does not constitute a full structural survey and does not contain information normally dealt with in a surveyor's report. Specifically excluded from this report are the following aspects:

1. The decorative condition of the property.
2. The property location and valuation.
3. The condition of wall, floor and ceiling finishes, coverings and insulation.
4. The condition of services.
5. The condition of external drives, patios, slabs or the like.

This report is a non-destructive visual inspection only and as such I am not in a position to comment upon any latent defects or defects not readily identifiable from a walk over inspection of the building. I have not inspected any inaccessible voids nor carried out an inspection of drains or the like.

Due to the quantity of stored materials, my inspection was restricted to an external examination of the building fabric.

1.4 General Description

The building is located on a flat, level site, approximately 1.9 kilometres to the south of the centre of Cowbit Village, Lincolnshire. The building currently has a corrugated steel roof supported on timber laths, rafters and purlins, supported by diagonally propped tie beams at eaves level. The external envelope of the building is formed in pier reinforced 13.5 inch thick masonry walls with former arched openings that have been infilled.

Historic maps indicate the existence of a barn at this location and of identical proportions in 1887. It appears as part of Bellesmere Farm and appears to have formed part of an enclosed farmyard. The geological map of the location indicates tidal flat deposits of clay and silt overlying The Ampthill Clay Formation.

2 STRUCTURAL OBSERVATIONS

2.1 Roof Construction



The pitched roof construction is formed in rafters, with collars providing lateral support to the upper purlins and with lateral restraint provided to the walls by braced beams with tie irons connected to the wall plates. The roof structure appears to be of original construction and has therefore stood the test of time and shows that it is of robust construction.

With all old structures such as this, it will be necessary, in the process of conversion to residential use, to ensure that the timbers are checked and if there are any localised areas of rot or infestation, these may be restored and appropriately treated by a specialist company. However, I was not able to detect any specific defects.

The following photograph appears to confirm that the ridge line is reasonable horizontal and true and does not exhibit any indication of major settlement. The photograph also indicates that there is one section of the roof that is covered with original slate tiling. There is one location where the roof appears to be distorted with a "hump" in the alignment. This may be indicative of deterioration of the roof purlins and particular attention should be paid to the localised repair of timber elements at this location.

As part of the conversion, it is anticipated that the roof will be recovered using an insulated composite sheet that will not increase the dead load that the roof currently supports



2.2 Masonry

In general, the masonry shows signs of age with evidence of several alterations to openings and elevations.

The original map of 1887 indicates that the barn extended to the west, and it is apparent that the building did extend in this direction and the gable wall appear to be more recent with evidence of buttressing on this gable end.



The north gable wall does show evidence of erosion and repointing will be required to repair the wall, particularly the central zone. It is estimated that approximately 1 square metre of brickwork will need to be replaced due to excessive erosion. Fracturing above the western buttress should be repaired using Helifix reinforcement to restitch the cracking. The leadwork at high level of the wall suggests the level of the original line of the roof where the building extended further to the north. The leadwork should be removed. The wall is, however in a condition where it may continue to provide structural support.

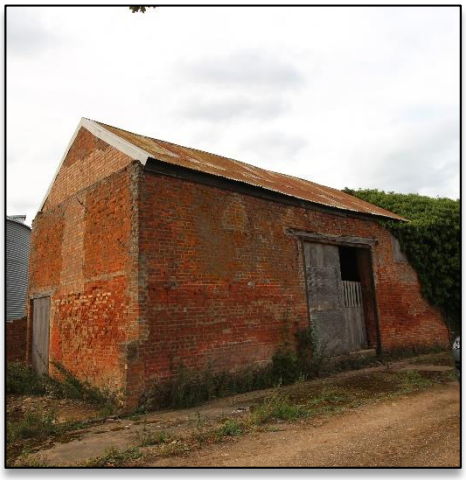
The east face of the building does indicate some evidence of settlement movement, but bearing in mind the age of the building, movement associated with consolidation should by now have ceased. The presence of a timber beam above the opening to the north end of the elevation will have shrunk over time leading to the diagonal fracturing above the north end of the timber lintel. This damage may be repaired by repointing with localised restitching.



Erosion of the original arch supports is apparent this damage is likely to be associated with deterioration due to the effects of livestock urine that accelerates deterioration of mortar and masonry. Repair of the brickwork using brickwork salvaged from the formation of window and door openings should be undertaken.



The ivy growth on the central section of the east elevation should be removed that the roots removed. Ivy can cause damage to the masonry to which it attaches as the roots will penetrate the mortar joints causing expansion of the masonry. Any damage joints should be raked out and repointed. General repointing of the masonry will be required, and any missing or badly eroded masonry units should be replaced from salvaged bricks.



The lintel above the large doorway towards the southern and of the east elevation has settled and may have suffered deterioration due to rot. The timber lintel should be replaced.

The south gable has suffered erosion and rebuilding has been carried out in common bricks, and although this is unsightly, the wall is structurally robust and may be utilised subject to a suitable architectural finish. Repointing of the eroded brickwork should be undertaken.



The west elevation of the building shows the same defects as present on other elevations including masonry erosion and some locations of cracking. The elevation is, however, intact and stable and subject to repointing repairs as well as replacement of any seriously eroded masonry units and restitching any historic fracturing, the masonry will form an effective and robust construction that is suitable for inclusion within a barn conversion dwelling.

2.3 Ground Floor

The ground floor of this building should be replaced in its entirety to allow for the introduction of insulation and to provide a suitable level floor.

3 GENERAL COMMENTS, RECOMMENDATIONS & CONCLUSIONS

3.1 General Comments and Recommendations

Notwithstanding the fact that this building has suffered general exposure and deterioration over a period of time, it is apparent that the external walls are in satisfactory condition and display no obvious evidence of major structural movement, except where affected.

The roof structure is in good condition and is of an unusual form that is worth retaining within a suitably designed conversion.

3.2 Conclusions

It should be appreciated that this report has been prepared from a single visual inspection of the property and that I have not at this stage undertaken any monitoring, long term investigations or testing of the materials of construction. However, this barn is considered suitable for conversion to residential use and displays no obvious indication of significant ongoing or progressive structural movement.

P J Cole BSc CEng FIStructE MICE
PCC Consultants Ltd
Chartered Structural Engineers



Signed: _____
On behalf of PCC Consultants Ltd

06 December 2023
Date: _____

4 APPENDICES

4.1 APPENDIX 1 – TERMS & CONDITIONS

Structural Engineer's Survey and Report

1. The structural engineer shall mean the director or employee of PCC Consultants Ltd who undertakes the inspection of the property.

2. The property shall mean that building that is to be inspected and shall include all external walls retaining structures and solidly constructed outbuildings. It will not include timber sheds, substantial ranges of derelict barns or the like, swimming pools, ornamental ponds, paths, drives or patios.

3. The report is intended for the sole use of the client mentioned in the introductory section of the report, their mortgage company and their insurance company. The report must not be reproduced or transferred to any third party without the written consent of PCC Consultants Ltd. PCC Consultants Ltd may agree that the report may be re-issued to a third party within six months of the date of the original inspection subject to an administrative fee. Beyond six months, a re-inspection of the property will be required which will attract a full inspection fee.

4. We reserve the right to refuse to issue copies of our report to third parties, other than those named in paragraph 3 above. We reserve the right to vary the conclusions should further information be revealed or become available at some future date.

5. The scope of the report will be defined in Section 1. The report will not cover the condition of the DPC, dampness and condensation or the condition of the timber elements of the property with regard to rot or infestation. The report does not cover those aspects covered in a full survey and excludes the condition of wall floor and ceiling finishes, window and door frames, decorations and building services including gas, water, electrical and drainage services.

6. A structural engineer's inspection and report is usually required because a general surveyor or property purchaser has identified structural movement, fracturing or other defect which has caused concern. The inspection will focus on the building structure only and will include an external and internal inspection of roof voids (where adequate and safe access is available), the load-bearing walls, and floors. The inspection will be restricted to visible parts of the structure and any heavy items

of furniture and carpets or other fixtures and fittings will not be moved or removed.

7. The structural engineer will not remove plant growth from external walls and will advise the client where plant growth restricts the inspection.

8. During the process of undertaking repairs or alterations, or as a result of more extensive investigation, further defects may be encountered that could not have been identified by a non-intrusive investigation. We reserve the right to alter the conclusions of this report in the light of such discovery.

9. Should we observe or become aware of any significant defect that falls outside the scope of our report, we are required, by the Institution of Structural Engineers Code of Conduct, to comment on the defect. If we do identify such defect, this does not imply any requirement upon us to evaluate the financial costs or implications of such observations and will be included in the report with a note to indicate that the defect "is not included within the scope of our report". It is then the responsibility of the instructing client to make any further investigations that are required to evaluate the costs of any further surveys, investigation or repairs that may be required. This requirement does not imply that the scope of our report extends beyond the scope stated in section 1 of this report or the terms and conditions set out above.