Derek LOFTY & Associates
Consulting Structural Engineers

Date: 22nd March 2022

Job Number: 12497

Client: Regent Estates

Project: Green Barn, Adjacent to Cakeford

Report on the Existing Barn Structure

at

Green Barn, (Adjacent to Cakeford)
Little Horwood Rd, Great Horwood, Bucks
MK17 0NZ

1. Introduction

1.1. In accordance with instructions received from Regent Estates on 17th March 2022, Derek LOFTY & Associates carried out a specific structural inspection of the barn structure at Green Barn, (adjacent Cakeford), Little Horwood Road, Great Horwood, Bucks, MK17 0NZ. The purpose of this report is to confirm or otherwise report on the structural adequacy of the barn for conversion to habitable use.

1.2. The inspection was carried out on Friday 18th March 2022. The weather at time of survey was sunny and bright.

1.3. Comments are generally based on a single visual inspection and notes taken during a walk over survey from ground level. Whilst no intrusive investigation was deemed necessary for this exercise, a trial pit was excavated to expose a column foundation.

1.4. This report is limited to the structural elements of the property only and no comment is made on any part of the property which is not the subject of this report.

1.5. Where the terms “right hand” or “left hand” are used, they assume that the reader is facing the front or north elevation.

2. Background Information

2.1. The project includes the proposed conversion of a single ancillary barn structure, within the curtilage of Green Barn, Little Horwood Road, Great Horwood. the barn is generally of traditional construction, and currently utilised for storage by the current owners.

2.2. The barn subject of this investigation is situated on a mature, gently southward sloping plot on the outskirts of Little Horwood, approximately 7miles west of Bletchley. The site is bounded to the north by Little Horwood Road, east by the domestic dwelling house ‘Cakeford’, to the south by open fields and to the west by Sunny Hill Farm.

2.3. The proposals are to convert the barn for habitable use.

2.4. In order to understand the suitability of the existing structures for conversion, a walkover survey was carried out. The purpose of this report is to examine the main structural elements of the barn, commenting on the structural significance and condition together with overall suitability for conversion.

2.5. Refer to the appendix for an ariel view of the barn, Figures A1 and a structural layout A2.

3. The Existing Structures

3.1. The barn subject of this investigation is a steel framed agricultural barn type building with a shallow duo pitched roof. The barn walls are fully clad with a proprietary profiled sheet metal cladding with a low block work wall at the base. A number of translucent sheets are incorporated in the perimeter walls to form obscure glazed windows. The duo pitched roof is similarly covered with proprietary profiled cladding sheets, again a number of translucent panels have been included. The south and west elevations are surrounded be overgrown vegetation.

3.2. The steel framing is a regular arrangement of portal frames; steel columns and racking steel beam members with stiff connections for lateral stability. The frames span perpendicular to the long side of the barn building. A series of timber cladding rails and purlins support the external cladding.

3.3. The main access to the barn is via a sliding to the left hand side of the front elevation..

3.4. The internal floor of the barn is a brush-finished, concrete, ground-bearing slab.

3.5. At the time of our inspection a trial pit had been excavated along the left hand flank wall whilst the top of the foundation had been exposed, the depth or plan area of the foundation had not been determined. It is believed the column foundations are of a mass concrete pad foundation with strip foundation between to support the low level block work that provides a permanent shutter to the ground bearing concrete floor slab.

3.6. At the time of our inspection the barn is presented in what is considered to be good structural condition. The ridge line is horizontal and the roof planes even.

3.7. The steel-clad external walls are reasonably vertical and true to line.

3.8. The masonry construction external walls remain reasonably vertical and true to line.

3.9. The concrete floor slab is of unknown thickness but appears substantial, reasonably level and where visible, free form defect. The slab is considered to be in sound structural condition.

4. Ground Conditions

4.1. Geological Maps indicate ground conditions to be a thin layer of Glaciofluvial Deposits of generally sand and gravels over a head of clay and various other compositions. The superficial deposit overlays the more regular bedrock formation which is Predominantly pale grey, blocky, smooth, calcareous mudstones.

4.2. No further ground investigation has been carried out at this time; or thought necessary for the proposed conversion. The existing barn building is substantial with no signs of any significant structural defects. The current structure is considered to be performing adequately.

4.3. Whilst there are a number of mature trees in proximity of the barn building, none are considered to be within a range that might influence the foundations. Furthermore, the prevailing ground conditions in the area are not of those susceptible to volume change or influenced by the presence of trees.

5. Project Summary

5.1. The proposals are to convert the existing barn into habitable accommodation. The development will include the renewal of the external cladding with a watertight and thermally efficient system.

5.2. Similarly, the existing corrugated sheet roof will be replaced with a new, thermally efficient light weight roof panel.

5.3. The existing slab can be reused, but levelled with a grout prior to a layer of insulation and screed applied to form a raised ground floor level, 150mm above the external ground level.

5.4. The elevations will be modified to accommodate appropriate window and door apertures to suit the proposed conversion. These new apertures will be formed through non-structural elements of the external building envelope, and are therefore not presently of concern for the purpose of this report.

5.5. All the proposals will be of a light-weight construction, commensurate with the currently applied loadings.

7. Suitability of Existing Structure for Reuse

7.1. The existing roof and wall coverings cannot be retained due to the risk of thermal inefficiency. However, these are non-structural elements of the building and therefore are considered irrelevant as part of a structural appraisal.

7.2. The site investigation has established a concrete strip foundation to the external walls and pad foundations to the structural columns, founded at least 0.45m below ground level in what is considered to be naturally occurring deposits.

7.3. The cladding will need to be replaced with a thermally efficient, lightweight stud partitioning, to keep the loadings commensurate with the existing structure. The external finishes should be lightweight, as prescribed by the architect.

7.4. The existing floor slab is substantial and can be reused; however, should be upgraded with the introduction of a damp-proof membrane and the addition of thermal insulation and screed to ensure the finished floor level is at least 150mm above external ground level.

8. Conclusion

8.1. Based on the walk over survey, together with the results of the trial pit investigation, it is considered that the existing building is substantial, structurally sound and can readily be adapted to accommodate the conversion proposals.

8.2. It is considered that the building could be readily converted without major reconstruction or demolition of any of the existing structural elements. However, the building will be subject to significant upgrading as part of the conversion process to habitable accommodation.

9. Disclaimer

9.1. This report is based on a visual inspection of the property, together with an intrusive investigation of the ground locally. This report is copyright and is restricted to the sole use and benefit of the above-named Client and shall not extend to any third party. Furthermore, this report shall not be reproduced or copied without prior written permission from Derek Lofty & Associates. This report is further restricted to the general stability of the building; no other aspect of the property was inspected and cannot therefore be considered as part of this report. Finally, this report is only valid for a period of 6 months, after which its accuracy can only be fully relied on following a full re-inspection and revision.

9.2. We also reserve the right to amend our opinions in the event of additional information being made available at some future date.

Prepared by Adrian Lofty

BEng. (Hons.) CEng. MIStructE MFPWS

Appendix

Photographs Etc.

Figure 1 - Aerial View of The Old Grain Store

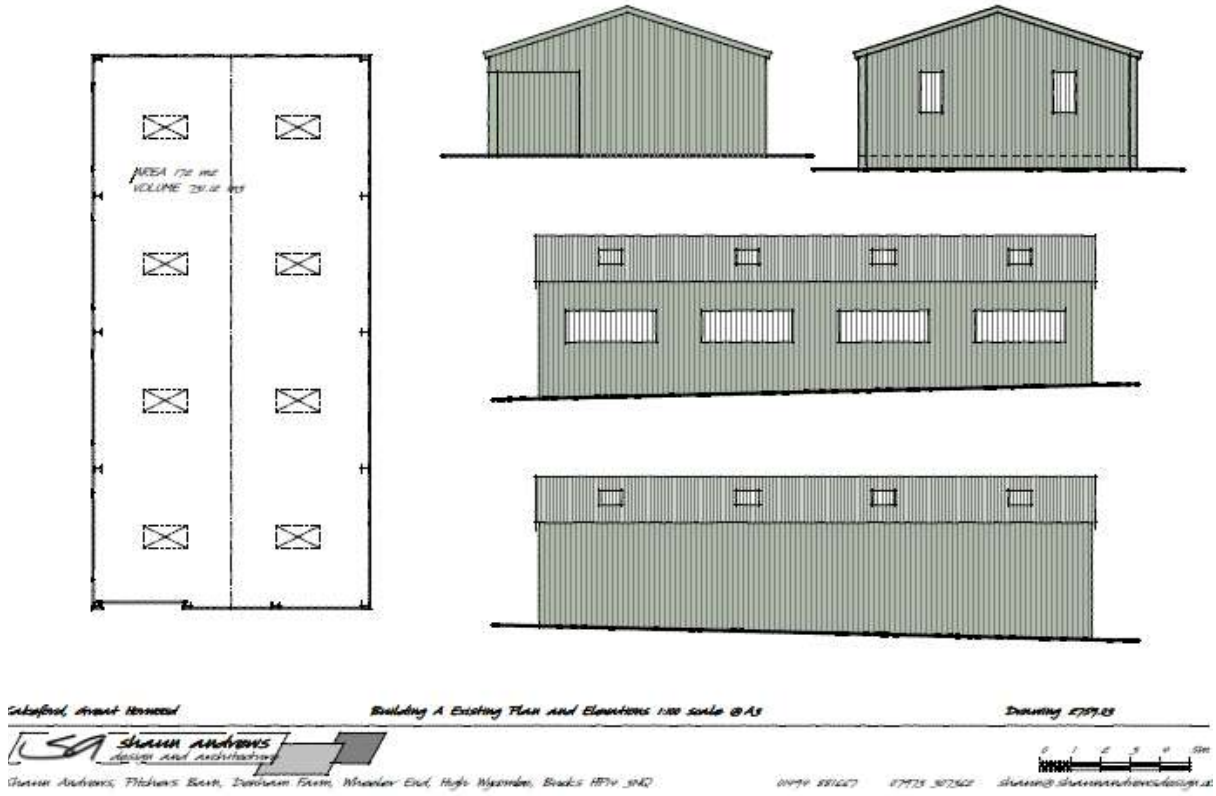

Figure 2 – Barn Layout

Figure 3 - Rear (South) Elevation

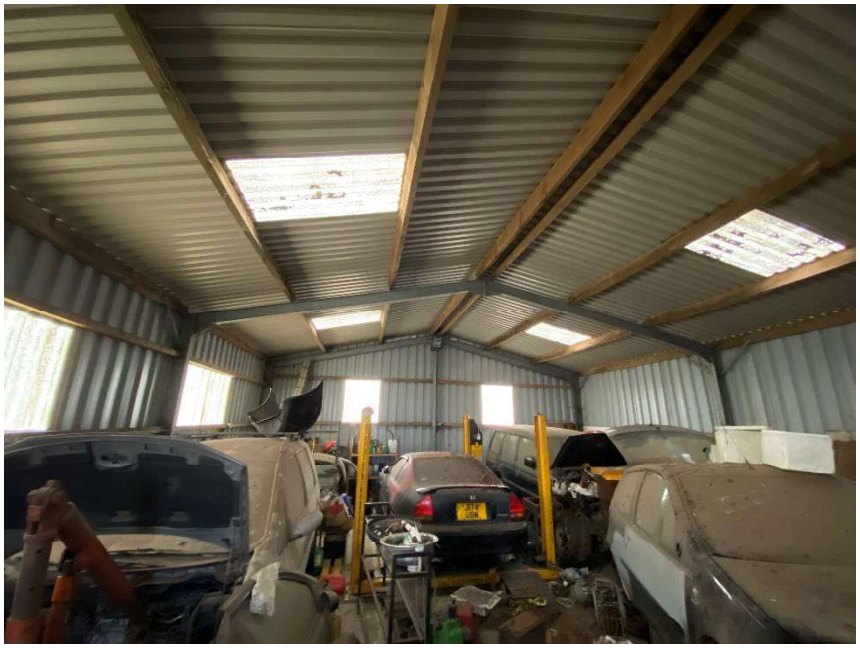

Figure 4- Internal

Figure 5 - Left-hand side elevation

Figure 6 – Front (North) Elevation