

STRUCTURAL APPRAISAL REPORT

Existing Barn;-
Claydyke Barn,
Off Martins Cross Drove,
Amber Hill, Boston,
Lincolnshire.
PE20 3RQ



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Property;-	Existing Barn;- Claydyke Barn, Off Martins Cross Drove, Amber Hill, Boston, Lincolnshire. PE20 3RQ.	Instructed;- May 2021 Survey & Report by;- JC Consultancy Limited
Client:-	Mr & Mrs R Gadd Charnwood Sutteton Drove, Amber Hill, Boston, Lincolnshire. PE20 3RQ.	Checked by;- J. Ellington BSc. CEng MStructE, FRSA, MIOd Authorised By;- J. Hicks BEng(Hons) MSc. PgDipCHE., MIOd
Reference:-	JC/21/05/6056	Issued:- Jun 2021

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1.0 BRIEF

- 1.1 JC Consultancy Limited was requested by Mr R Gadd, to assess and comment on the structural condition of an existing barn, known as Claydyke Barn, Amber Hill, Boston, PE20 3RQ.

2.0 INTRODUCTION & SCOPE

- 2.1 The building is located in a rural location on the outskirts of the village of Amber Hill in Lincolnshire. The barn is accessible by the highway known as Martins Cross Drove.
- 2.2 The client has instructed a structural appraisal report is to be carried out in order to assess possible options for future development, change of use and conversion. The enquiry was received from the client's agent, JMAD Architecture in May 2021. The instruction to carry out the structural appraisal was provided by the client via email correspondence dated 17th May 2021.
- 2.3 This report is solely for the purposes of the client and no other third parties.
- 2.4 JC Consultancy Limited visited the property on 1st June 2021, in order to carry out a structural appraisal survey.
- 2.5 The weather conditions at the time of the visit was clear, warm and sunny.
- 2.6 This report is limited to elements of the structural fabric of the property, i.e roofs, walls and floors, and comments only upon their structural condition and performance.
- 2.7 This report does not contain observations, comments or recommendations to any non-structural items including, but not limited to drainage, electrical, heating and plumbing services, timber work and any decorative finishes / plasters.
- 2.8 Decay associated to damp, fungal attack, insect infestation or contamination (including the presence of asbestos materials or similar) is outside the scope of our appointment or report. Any reference to decay associated to damp, fungal attack, insect infestation or contamination to either structural or non-structural items are observations only. As such we recommend that further advice is sought from specialists in the fields of damp, fungal attack, insect infestation or contamination in order to guarantee peace of mind from these potential defects.
- 2.9 The inspection was of a visual nature only. There has been no opening up works involved in this investigation.

- 2.10 Any part of the structures that were hidden, covered or otherwise inaccessible, have not been inspected or commented upon. We therefore cannot guarantee that any such parts are free from defect.
- 2.11 The performance of the existing ground strata, general ground conditions and foundations may be referred to within this report; however, the ground conditions and foundations have not been fully inspected or investigated as part of this survey. Therefore, comments made will be based on analysis sought from indicative desktop sources including but not limited to the 'British Geological Society'. These sources generally provide sound interpretation, however local anomalies can occur, and as such we cannot guarantee their accuracy.
- 2.12 The observations and defects noted within this report should not be read as a comprehensive inventory of each and every single item witnessed during our survey. Instead the records should be taken as an indication of the condition of the outbuildings in general and should demonstrate the likely defects that may be present elsewhere in areas of the fabric that have not been surveyed or recorded.

3.0 GENERAL DESCRIPTION

3.1 The barn consists of a single storey, rectangular shaped, concrete portal framed building, located on a predominantly level site. The approximate dimensions of the barn are 18 metres long x 13 metres wide, with an eaves height of approximately 4.0 metres and a ridge height of approximately 6.5 metres. Small single storey projections are present to the side and rear of the main barn, however these have not been surveyed as they are outside of consideration for future development. The building is predominantly surrounded by a concrete hardstanding to the front, and agricultural land and fields to the remaining elevations. Opposite the concrete hardstanding, in front of the barn is a watercourse known as the 'Clay Dike'. There is a farm house in close proximity to the South East elevation of the barn.

3.2 The construction date of the building is thought to be 1968, and it is the form of a typical 'Atcost' style building, which were manufactured and supplied throughout the country by Atcost Pre-Cast Structures Limited, a well-known supplier of such building frames. Atcost (and many similar and subsidiary companies) supplied and erected many similar buildings to farms and small holdings across South Lincolnshire during the 1950's - 1970's.

The current use of the building is agriculture commodity storage, and includes a 'drying floor' which is commonplace in buildings of this use.

3.3 The general construction of the building consists of; -

Concrete Frame

The building has 5No frames, each consisting of Precast Concrete Columns (approx. 300x180mm) and Precast Concrete Rafters (approx. 700x180mm at Eaves Haunch, tapering to approx. 250x180mm at Ridge). Precast concrete tapered purlins of approx. 200mm depth. span between the rafters. Each gable has 2No Precast Concrete Gable Posts (approx. 180mm square)

External Walls

The upper section of external walls consists of profiled sheeting. The lower section of external walls predominantly consists of solid masonry brickwork laid between concrete columns, for a height of approximately 2.0m from ground floor level.

Ground Floor Slab

The ground floor between the first bay of frames (adjacent the large sliding doors on the front elevation) consists of a ground bearing concrete slab, the specification of which is unknown.

The ground floor to the rear 3No bays consists of a typical raised timber 'drying floor' arrangement over presumably the continuation of the floor slab that can be seen in the first bay.

Foundations

Existing foundations were not inspected but based on the age and construction of the building are likely to consist of mass concrete pad and strip style foundations.

Typically, the arrangement in buildings of this type is a series of pad foundations located at each column base. The pad foundations are likely to be mass concrete, containing a 'pocket recess' for which the precast concrete column was housed.

Between pad foundations, concrete strip foundations are typically found, usually of reasonable thickness and specification, in order to support the solid masonry all construction.

- 3.4 Published Geological records show the building to be within an area where the soil sequence consists of a solid formation of Ampthill Clay (Mudstone) at depth overlain by a considerable thickness of Tidal Flat Deposits (Clays & Silts).

4.0 OBSERVATIONS AND DEFECTS LOG

(Read in conjunction with Sections 2.6 - 2.12 of this report)

4.1 Concrete Portal Frames

- Portal rafters and columns, appear in good condition, with no signs of distress or concrete spalling.
- The frames appeared plumb with no distortion or deflection of members noted.
- Concrete roof purlins are in sound condition and did not display any excessive spalling or deflection along their length.

4.2 Walls

- Externally, the upper profiled cladding is in reasonable condition.
- When viewed along their length, elevation and gable, columns appeared plumb and vertical and are not showing signs of distress.
- Internally much of the brickwork walls were hidden by a temporary profiled insulated sheeting system that had been installed, however where they could be inspected, they displayed little signs of defect. When inspected externally, the brickwork walls displayed little signs of defect or movement. Minor defacing of brick units was noted to localised areas of the external rear corners; however, their condition is typical of agricultural use to a building of this age.

4.3 Ground Floor

- The concrete floor is of unknown specification. No major fractures were observed to the area of floor that could be inspected
- A large part of the building accommodates a raised timber 'drying floor' that will have been installed over the concrete floor however, its specification is unknown. Typically this type of arrangement generally protects the lower concrete slab from long term deterioration.

4.4 Foundations

- Existing foundations were not inspected, but there was no evidence from the superstructure to suggest that the foundations are accommodating any degree of stress or settlement.

5.0 CONCLUSIONS AND RECOMMENDATIONS.

- 5.1 The building is small in agricultural terms and consists of a simple but robust 'Atcost' style building, which were manufactured and supplied throughout the country by Atocst Pre-Cast Structures Limited and similar suppliers, during the 1950's – 1970s.
- 5.2 The main elements of the structural frame, i.e portal rafters, columns and purlins, appear in good condition, with no signs of distress or concrete spalling. The frames appeared plumb with no distortion or deflection of members noted.
- 5.3 The existing building is a simple framed arrangement, with only a few, key, loadbearing elements present. The buildings overall lateral stability is obtained from the portal frame action of the concrete frame and its connection with the pad foundation. The brickwork walls that have been constructed between the columns provides further stability in the longitudinal plane of the building.
- 5.4 Its open plan arrangement provides scope for various uses, and if desired it could lend itself for conversion into a habitable dwelling. Due to its simplicity in construction, there is not likely to be any substantial loss of original structural elements during conversion.
- 5.5 Agricultural buildings such as this example were required to be designed to support an imposed roof load of at least 80% of that which was specified in the prevailing Code of Practice to BS 6399. This code specified an imposed load of 0.75kN/m².

Current design codes specify an imposed load of 0.60kN/m², resulting in a similar figure to that which this building would have originally been designed for. Therefore, we are satisfied that the existing frame will have sufficient capacity to accommodate imposed loading as dictated by current design codes.

- 5.6 Based on observations made, the building appears to have the capability to safely accommodate vertical, lateral and snow loadings applied in its current form without the need for any strengthening. It is likely that conversion would involve retaining all existing structural elements and complementing them with the introduction of further independent walls, of either blockwork or timber frame type systems, located internally to form the partitions and internal layout. As such additional load placed upon the existing superstructure and steel frame will be minimal, and of no concern from a structural perspective.

The side and small rear projections that have not been considered as part of this report are not contributing to the main buildings overall lateral stability and can therefore be ignored from a structural perspective as part of any proposed change of use or conversion.

- 5.7 The ground floor slab specification is unknown, and due to the part raised 'drier flooring system' cannot be fully inspected, however it appears to have been adequately serviceable to accommodate and distribute the high loadings from agricultural storage type use without undue distortion. Proposed loadings from a change of use will be significantly less than those currently applied. Therefore, we envisage that following the removal of the suspended 'drier floor' system, the existing lower floor slab can be retained, and supplemented with damp proof systems, screeds insulations and finishes as applicable.
- 5.8 There are no essential repairs required to the existing fabric in order to guarantee its overall stability. Some low-key, superficial repairs will be required to any damaged wall fabric / wall sheeting however it is likely that for aesthetical purposes, a replacement sheeting system will be adopted during architectural design and as such any defective wall and roof sheeting can be addressed at this time. Whilst reference to contamination, including the identification and survey of asbestos based materials, is outside the scope of our reports, we must highlight that the use of asbestos materials was common practice during the original construction of these types of building and initial inspections suggest that a large amount of the existing roof and wall sheeting on this building may contain asbestos materials. (See Section 5.10)
- 5.9 Similar to the floor slab, the foundations appear to be adequate to accommodate and distribute loadings from agricultural storage type use. Again, additional loadings applied within a change of use are likely to be minimal, and as such we do not feel that any strengthening to the foundation system is deemed necessary. We would recommend that all gutters and rainwater downpipes are checked and if deemed required repaired, to ensure efficient rainwater discharge away from the building.
- 5.10 Whilst reference to contamination, including the identification and survey of asbestos based materials, is outside the scope of our reports, we must highlight that the use of asbestos materials was common practice during the original construction of these types of building. This can include asbestos content within roof sheeting, wall cladding, eaves and fascia boarding, as well as within any insulations and foam based intumescent sprays. We therefore recommend that further advice is sought from specialists in the fields of asbestos survey, protection and removal during any design and planning stages, in order to guarantee peace of mind from the potential hazards when dealing with materials of this kind.
- 5.11 **In final conclusion, we are satisfied that the existing building is structurally stable and robust and could continue to perform adequately following a change of use without the need for any significant structural strengthening or rehabilitation.**

JC Consultancy Limited

Consulting Structural & Civil Engineers

June 2021

6.0 PHOTOGRAPHS



Photograph # 1 (Typical Elevation)



Photograph # 2 (Typical Elevation)



Photograph # 3 (Typical Elevation)



Photograph # 4 (Typical Existing Frame)



Photograph # 5 (Typical Existing Frame)



Photograph # 6 (Typical Existing Frame– Eaves Haunch)



Photograph # 7 (Typical Purlins)



Photograph # 8 (Typical Raised 'Drier' Floor)



Photograph # 9 (Typical Slab)



Photograph # 10 (Typical Internal Brickwork)



Photograph # 11 (Typical External Brickwork – Isolated areas of defaced masonry)

*******END OF REPORT*******