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STRUCTURAL APPRAISAL REPORT

Existing Barn;-
Adj Old Brickyard Farmhouse,
Peartree House Road,
Holbeach, Spalding,
Lincolnshire.
PE12 8DW



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Property;-	**Existing Barn;-** Adj Old Brickyard Farmhouse, Peartree House Road, Holbeach, Spalding, Lincolnshire. PE12 8DW.	**Instructed**;- Dec 2023 **Survey & Report by**;- JC Consultancy Limited
Client:-	**Mr & Mrs Matthews** c/o **G R Merchant Ltd**, 4 Wrights Mews, Holbeach Spalding Lincolnshire. PE12 7EE	**Checked by**;- J. Ellington BSc. CEng MIStructE, FRSA, MIoD **Authorised By;-** J. Hicks BEng(Hons) MSc. PgDipCHE.,MIoD
Reference:-	JC/23/12/7391	**Issued**:- Feb 2024

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The Institution of Structural Engineers

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1.0 BRIEF

1.1 JC Consultancy Limited was requested by Mr & Mrs Matthews, to assess and comment on the structural condition of an existing barn that is located adjacent to Old Brickyard Farmhouse, Peartree House Road, Holbeach, Spalding, Lincolnshire. PE12 8DW

2.0 INTRODUCTION & SCOPE

2.1 The building is located in a rural location, north of the market town of Holbeach in Lincolnshire. The barn is accessible off the highway known as Peartree House Road.

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, G.R.Merchant Ltd in December 2023. The instruction to carry out the structural appraisal was provided by the clients' agent via email correspondence dated 11th December 2023.

2.3 This report is to be regarded as confidential to the party to whom it is addressed, and it is intended for the use of that party only. No responsibility will be accepted to any other party in respect of its contents in whole or in part. Prior to the report or any part of it being reproduced or referred to in any documents, our written approval as to its form and content must first be obtained.

2.4 JC Consultancy Limited visited the property on 11th January 2024, in order to carry out a structural appraisal survey.

2.5 The weather conditions at the time of the visit was overcast but dry.

2.6 The purpose of this report is limited to an opinion on the structural condition of the building. We have only reported upon those structural defects that materially affect the stability of the building and provided that these defects are reasonably detectable at the time of our inspection. Whilst we have used all reasonable skill and care in preparing this report it should be appreciated that we cannot offer any guarantee that the buildings will be free from future defects or that existing ones will not suffer from further deterioration. This report is limited to commenting on elements of the structural fabric only. No further assessment will be made to elements elsewhere in the property. Comments will relate to structural condition and performance of elements only.

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. A number of the elevations could only partially be inspected due to prevalent Ivy growth.

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 property is a relatively small, traditionally constructed, rectangular shaped building. The building is considered as being a storey and a half in height. The building is divided in half via a partition wall. The West end of the building incorporates a first-floor structure, with the remainder, towards the East end of the building being full height.

3.2 The building is understood to have been formerly used as general agricultural storage, and more recently the West end of the building had been used as a farm office over the two floor levels.

3.3 The original construction date of the property is unknown, but it is likely to be late C19 – early C20. The property is understood to be generally in its original format.
To the best of our understanding and belief the property is not Listed.

3.4 The general construction of the building under consideration consists of; -

Roof

A profiled roof sheet covering over a traditional timber hand cut roof, consisting of a collared purlin roof, with rafters over and a series of eaves ties.

Walls

Predominantly solid wall construction throughout of varying thickness (215 / 330) consisting of clay masonry units laid English Garden Wall bond, in soft mortars. An Internal partition is of timber construction.

First Floor

A part first floor forming to the West end of the building. consisting of timber floor boards, presumably over floor joists spanning between the flanking masonry wall, however the floor joists were not accessible for inspection.

Ground Floor

The ground floor consists of rough cast concrete of unknown specification.

Foundations

Foundations were inspected via a hand excavated trial hole and confirmed to consist of a shallow corbelled masonry foundation system bearing onto the ground strata below.

3.5 Published Geological records show the building to be within an area where the soil sequence consists of a solid formation of West Walton Formation (Mudstone and Siltstone) at depth overlain by a considerable thickness of Tidal Flat Deposits (Clays & Silts).

4.0 OBSERVATIONS & CONCLUSIONS

4.1 The existing barn is in a reasonable structural condition considering its age and previous use. The building is long-standing and there was no evidence that the element is currently accommodating any significant structural defects that compromises its overall structural stability.

4.2 The buildings basic, rectangular shape and solid wall construction, some of which are in excess of 300mm in thickness, results in it being a reasonably robust structure which can be seen to have performed well under loading during its lifetime. No immediate structural intervention is deemed required to the building at this stage in order to prepare the structure for accommodating any conversion scheme.

4.3 The building has suffered from a degree of minor movement in various locations, some of which may be related to foundation movement. A reasonable amount of foundation movement could be expected for this geographical area, however considering the age of the building, observed movement was reasonably low.
The existing foundations are shallow, but typical of this style and age of building. However, with no evidence of significant vertical movement noted in its present form, and additional loading within any proposals being considered likely to be minimal in the form of residential type loadings, we see no reason at the time of writing why the building will be subject to any long-term progressive movement that will cause building instability in the future as a result of a proposed conversion.

4.4 The existing roof structure is slender in construction and supports a lightweight profiled roof covering. There has been a degree of movement to the roof structure, and it is displaying longitudinal ‘racking’ movement in the West to East direction.

The predominant cause of any movement within the building fabric and any subsequent fractures present within the masonry is likely to be partly due to the general relaxation, deflection and racking of the hand cut collared purlin roof structure, which is a common defect in traditional, agricultural style barns, together with general wetting and deterioration of fabric from defective rainwater discharge from the roof structures.

4.5 A new roof structure will be required throughout, which should not only provide a durable and watertight structure but will also help to eliminate the principal catalysts of stress within the original wall fabric. In order to protect the original masonry fabric from long term stress, a conversion would lend the opportunity for the new roof structure to be supported off a remedial inner leaf wall of loadbearing blockwork, which itself can be constructed off an engineered remedial ground floor slab. This is a typical proposed arrangement in conversions of agricultural buildings of this age and nature. Rainwater goods should be installed as part of any conversion to allow reliable discharge of rainwater.

4.6 The area of existing first floor structure could not be inspected in full during our visit, however, it is likely that due to current headroom at ground floor level, a slight raising of first floor levels within any conversions proposals will be conducted and a replacement timber first floor structure will be installed throughout. The implementation of a new first floor structure throughout is beneficial as it will enhance the lateral performance of the masonry walls.

4.7 The original wall construction to that could be inspected appeared in reasonable condition for a barn of this age. A number of localised fractures were noted, primarily around window / door openings. In addition, areas of individual brick units are disapplying evidence of defacing and weathering, predominantly at lower levels, and there has been small areas of historic infilling of former openings and panels of rebuilt. Upper elevations do display slight lateral undulations along their length, which is generally the result of defective roof structures.

General repairs required to existing masonry walls are envisaged to be low key. The performance of all walls that accommodate fractures can be improved by low key stitching using the 'Helifix' masonry repair system, which involves installing remedial 'Heli-bar' rods into the bed joint of the masonry at regular vertical centres over any open cracks.

Any repointing conducted should be done with a sympathetic soft lime based mortar.
Any defective arches over window openings that are to be retained will need to be reset as deemed required and any timber lintels / backing timbers that are present over any openings should be replaced throughout. Any timber coursing plates that are present in the original wall construction should be removed and replaced with remedial brickwork.

A number of existing tie bars, complete with external pattress plates, are present across the barn. Following the installation of a new first floor structure, further tie bars can be installed across the barn within the floor zone as deemed required.

4.8 We recommend that the existing ground floor system is to be removed and replaced with a ground bearing, concrete ground floor slab as part of any conversion. The slab should be engineered to ensure that it is suitable to accommodate loadings from the proposed use, including any internal blockwork walls proposed. Once installed, the slab will act as an internal raft type slab system, which will minimise any additional loadings placed upon the existing foundations. This should assist in improving the overall structural performance of the building.

Whilst the new floor slabs will need to be placed upon a hardcore sub-base, we recommend care should be taken during any excavation and installation of sub-bases. The existing foundations should not be undermined or disturbed as part of the sub-base installation, however the slabs can be engineer designed in order to achieve suitable performance whilst keeping slab thickness and sub-base requirement to a minimum.

4.9 In conclusion, having considered the existing structural arrangement, we are satisfied that the existing building is structurally stable and appears suitable for a conversion.

Whilst reference to damp is outside the scope of this report it can be seen that the structure has suffered from a degree of water penetration over the years.
As such it is essential that advice and any required treatment from specialists in the field of damp and decay should be carried out in conjunction with the conversion, in order to ensure that damp and timber decay are not trapped within the fabric post completion.

Finally, we confirm that this report is for advice and guidance only, and that consideration of any conversion proposals should be done only following liaison with the Architect, and guidance / Approval from the Local Authority Planning Department.

JC Consultancy Limited
Consulting Structural & Civil Engineers

Oct 2023

6.0 PHOTOGRAPHS



Photograph # 1 (Front, North Facing Elevation)



Photograph # 2 (Front / East Facing Gable Elevation)



Photograph # 3 (Front / West Facing Gable Elevation)
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Photograph # 4 (Rear / West North Facing Elevation)
(Note – inspection limited due to ivy growth)



Photograph # 5 (Rear - South Facing Elevation)
(Note – inspection limited due to ivy growth)



Photograph # 6 (Rear / East Facing Gable Elevation)
(Note – inspection limited due to ivy growth)



Photograph # 7 (Typical Internal / Roof)



Photograph # 8 (Typical Internal / Roof)



Photograph # 9 (Typical Roof)



Photograph # 10 (Typical Internal – First Floor)



Photograph # 11 (Typical Internal First Floor)



Photograph # 12 (Typical Floor Slab – West End of Barn)



Photograph # 13 (Typical Floor Slab – East End of Barn)



Photograph # 14 (Typical Foundations.)

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