FRITH BLAKE
CONSULTING LTD
STRUCTURAL ENGINEERING SOLUTIONS

STRUCTURAL APPRAISAL

Project:

3444 – Weybread Lakes Barn, Mill Lane Farm, Weybread. IP21 5TP

Client:

Mr & Mrs Chapman

Quality Assurance

Report Title: Structural Appraisal

Project: 3444 – Weybread Lakes Barn, Mill Lane Farm, Weybread. IP21 5TP

Client: Mr and Mrs Chapman

Date: 25th March 2024

Revision: V1 – First Issue

Prepared by: Dominic Blake IEng MIStructE

Signature: 

Position: Director

On Behalf of: Frith Blake Consulting

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Position: Director

On Behalf of: Frith Blake Consulting Ltd

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1 Introduction

Frith Blake Consulting Ltd were instructed to undertake a structural appraisal of an agricultural building located off Mill Lane, Weybread, Suffolk, IP21 5TP. The purpose of the appraisal is to establish the suitability for conversion into a single residential dwelling.

An aerial photograph showing the barn surveyed is included below.

Fig 1 – Aerial Photograph of site

We have prepared this report based on a visual appraisal of the structure and a review of the information pertaining to permitted development rights under the General Permitted Development Order (GPDO) as outlined below and understand this will be submitted to Mid-Suffolk District Council in support of the application:

1.1 *We understand that Part 3 Class Q.1(i) of the General Permitted Development Order (GPDO) restricts building operations pursuant to Class Q to:*

a. the installation or replacement of –

i. windows, doors, roofs or external walls, or

ii. water, drainage, electricity, gas or other services, to the extent reasonably necessary for the building to function as a dwellinghouse; and

iii. partial demolition to the extent reasonably necessary to carry out building operations allowed by para. Q.1(i)(i), above.

1.2 *Further guidance on the extent of building works allowed when changing to residential use is provided in the National Planning Policy Guidance (NPPG) where at para. 105 it states:*

Paragraph: 105 Reference ID: 13-105-20180615 Revision date: 15 06 2018

"… the (Permitted Development) right assumes that the agricultural building is capable of functioning as a dwelling. The right permits building operations, which are reasonably necessary to convert the building, which may include those, which would affect the external appearance of the building and would otherwise require planning permission. This includes the installation or replacement of windows, doors, roofs, exterior walls, water, drainage, electricity, gas or other services to the extent reasonably necessary for the building to function as a dwelling house; and partial demolition to the extent reasonably necessary to carry out these building operations. It is not the intention of the permitted development right to allow rebuilding work, which would go beyond what is reasonably necessary for the conversion of the building to residential use. Therefore it is only where the existing building is already suitable for conversion to residential use that the building would be considered to have the permitted development right Internal works are not generally development. For the building to function as a dwelling it may be appropriate to undertake internal structural works, including to allow for a floor, the insertion of a mezzanine or upper floors within the overall residential floor space permitted, or internal walls, which are not prohibited by Class Q.

It is the intention of this report to demonstrate that the proposed residential conversion may be executed in compliance with the terms of the GPDO.

2 Limitations

This report is based on an appraisal of elements visible from ground floor level externally and internally. Additionally, internal finishes and stored materials covered other elements preventing a detailed inspection, particularly at low level. We can therefore not accept responsibility for items which were not seen at the time of the inspection, nor made aware of. Access at high level was not possible in all areas, nor were there any intrusive investigation works to determine the extent and condition of foundations or concealed structures.

This report is based on conditions which were apparent at the time of our inspection on 27th February 2024. We cannot accept responsibility for conditions which may occur at other times. The appraisal is not intended to form a detailed schedule of all required repairs, but to highlight the overall condition of principal structural members and the viability of the proposed works.

The appraisal covers structural aspects of the buildings only and comments made on any other aspects are noted for information only and should be verified by a specialist in that particular field. Any other issues noted within the report are for information only and should not be relied upon.

This information is provided for the sole use of the named client and is confidential to them and their professional advisors. No responsibility to other parties will be accepted.

Recommendations made in this report represent the views of Frith Blake Consulting Ltd acting as Chartered Structural Engineers with over 20 years relevant experience in the assessment of agricultural buildings.

3 Site Description

3.1 Site Location:

- The site is located off Mill Lane, Weybread, Suffolk, approximately 2.5km to the south of Harleston and the A143.
- The nearest postcode for the site is IP21 5TP;
- The approximate National Grid Reference to the centre of the site is TM 24907 80203

The location is indicated on the below images:

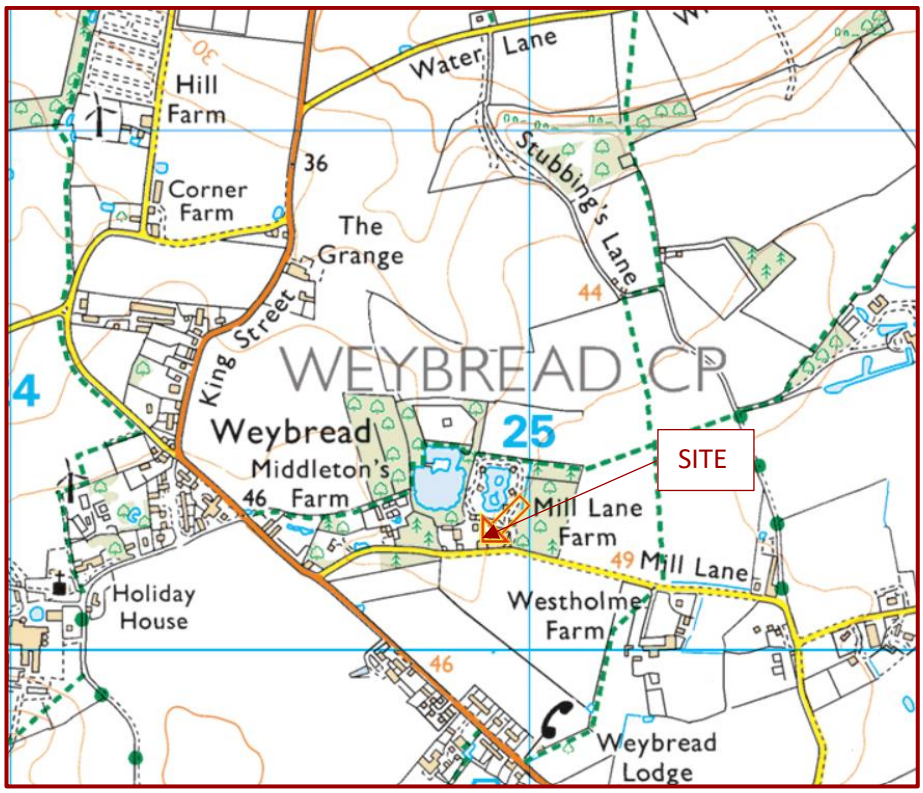

Figure 3.1 Site Location Plan

3.2 Existing Site Description:

Access to the site is made via a rubble track entrance off Mill Lane which leads to Weybread Lakes. The rubble track leads to a private residential driveway and shared concrete hardstanding which provides access to the barn frontage, immediately adjacent to Mill Lane.

The existing barn was originally a chicken shed, and still has a small area which houses chickens in a segregated bay. The remainder of the barn is used for general equipment storage. To the north and east of the is an area of open pasture with a tree lined boundary adjacent to the main access serving the lakes. The south of the barn sits close to the road side with a low level hedge providing the site boundary to Mill Lane. The west of the barn is the main access served by a concrete apron ramping down to a private driveway and adjacent dwelling.

3.3 Proposed Development:

The application proposes the conversion of the barn into a single domestic dwelling. The conversion will be carried out within the constraints of the GPDO as cited in Section 1. Where the installation of new windows or doors or infilling/replacement of walls is required, these will not extend beyond the existing external dimensions of the barn.

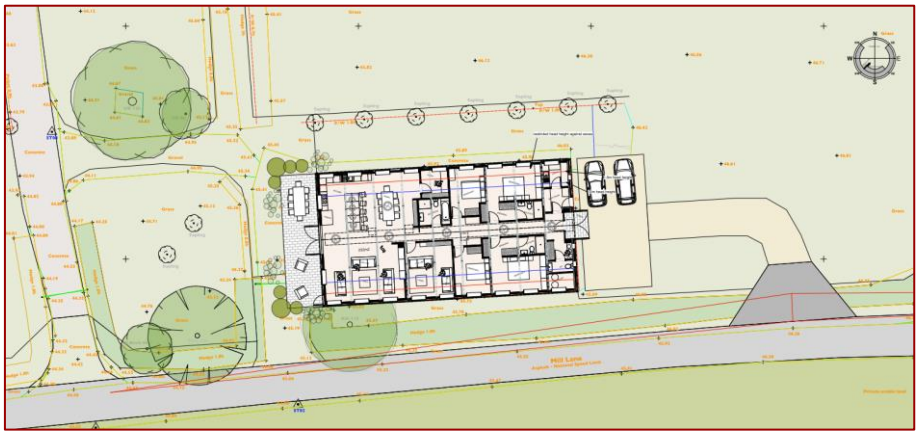

Figure 3.2 Proposed Site Plan

There are no significant alterations that affect the structural integrity of the existing frame. A limited number of new openings to the elevations are likely, as is the installation of insulation and internal lining to the roofs and walls.

4 Description of Barn

The existing building is set back from Mill Lane and separated by a low level native hedge and small grassed area. The north and east of the barn are also set within an area of pasture with the main access being to the west via a concrete apron slab.

The barn is a timber framed structure, with principal trusses and knees braces at regular bay centres of approx.. 2.5m forming the central frame with lean-to rafters beyond extending to the external walls supported on further columns. The approximate eaves height is 1.8m with an overall building span of 11.5m.

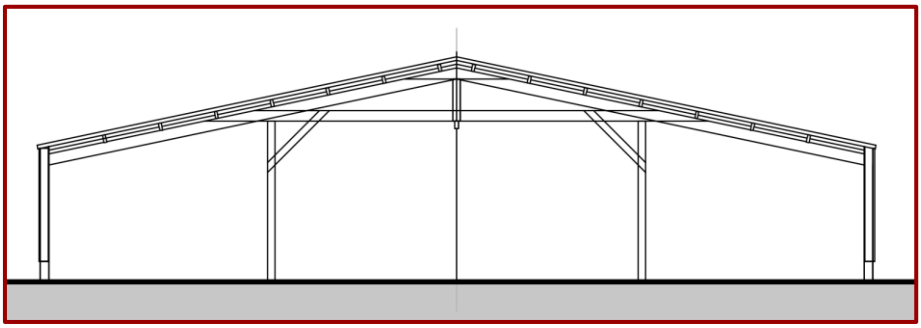

Figure 4.1 Existing Typical Section of Building

The principal trusses support purlins at regular centres which provide support to the corrugated asbestos / fibre cement roof cladding which has been insulated internally with spray foam insulation.

The external walls are formed in timber frame panels supported on a concrete block plinth above the slab. Internally, one side and both gables are internally sheathed with horizontal boarding to the outside.

The north side elevation has deteriorated in several places resulting in some bays where the cladding is partly open and other bays sheeted in using plastic sheet.

Each gable has access doors providing the main access to the front and rear of the building.

The structure is constructed onto a concrete slab which appears to encapsulate the timber columns. It is not know if the principal internal columns are constructed on pad foundations as these were not exposed.

All perimeter walls are constructed off the existing floor slab which is typically a mass concrete slab and does not appear to show any signs of stress.

Foundations were not exposed.

General photographs are included below:

Photo 1 – North Elevation

Photo 2 – South Elevation

Photo 3 – East Elevation

Photo 4 – West Elevation

5 Site Observations

The barn appears to have been reasonably well maintained and protected from the elements historically and as a result the building is for the most part in good condition. The only exception to this are some areas of the northern elevation which have become exposed to the external elements due to deterioration of the external cladding.

The principal structures and individual elements are not displaying any significant vertical or lateral displacement indicating the building is performing adequately in its current form.

External elevations to the south, east and west are in good condition with no sign of significant deterioration.

The north elevation has some supporting columns and ends of rafters currently exposed and are displaying some signs of structural deterioration and damp which will require repairing. These repairs may be spliced with appropriate timbers and can be undertaken insitu and thus meet the requirements of the GDPO outlined in section 1 of the report.

Some columns have undergone historic splices with steel shoes connected to the floor slab, spliced onto the existing timber columns.

The majority of the principal structure is generally fully covered and therefore has performed adequately with resistance to the elements.

The roof is permanently covered and reasonably well maintained, with little sign of deterioration to the principal structure or cladding.

The building was previously used for housing poultry and machinery. Under this use the building was potentially accommodating loads of up to 5kN/m² to the floor areas. There does not appear to be any sign of settlement within the slab areas or wall construction to the pens, suggesting the area to be performing well.

Currently the longitudinal stability of the building is provided by the rigidity of the external timber frame and sheathing, tied to the timber columns, as well as the cladding to the roof. The knee struts to the principal frames resist wind loading laterally.

Drainage of surface water discharges directly onto the ground as no formal guttering is provided.

6 Conclusions

The existing barn is generally in good condition. There are no signs of significant vertical or lateral displacement indicating that the foundations, slab, walls and principal structures are all performing adequately.

We can confirm that none of the existing structures will be required to be replaced as part of the proposals, however some of the external columns to the north elevation will need repairs splicing in, which can be undertaken insitu without any requirement to replace full members.

We consider that the installation of infill wall panels to close off the existing openings, insulation and internal lining are reasonably necessary to convert the agricultural building into a dwelling in order to ensure compliance with current Building Regulations. Using lightweight materials supported on new internal walls to divide the large open areas into habitable spaces will transfer all new loadings onto the existing floor slabs and place no additional loadings onto the original structural frames. Thus, a comparison of the weights of the proposed materials are such that the loadings applied to the existing slabs and new first floor structural frames will be comparable to the existing and will therefore place no significant additional load on the existing structures.

Due to the above there will not be a significant increase in the vertical loads transferred to the existing foundations from the installation of insulation and internal linings or walls. The existing foundation / slab will have been dictated by the existing agricultural uses and therefore the loadings generated by use of a domestic property should not affect the existing slabs or foundations.

The existing concrete floors will be suitable to be retained. Given the former uses and loadings, they will be adequate to support any new loadings for the domestic conversion, including internal walls and linings as stated above.

New openings can be formed in the external envelopes without any consequence to the principal structural elements.

External building operations necessary in order to convert the existing agricultural building into residential dwellings will include (but not limited to) the installation and replacement of windows and doors.

As outlined above, the existing building is structurally robust enough to accommodate the loading to undertake these building operations and thus has the potential to be converted to a dwelling whilst adhering to the terms of Class Q of the GPDO.