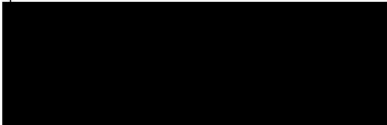


# STRUCTURAL ENGINEERS REPORT

<b>Subject</b>	Conversion of Barns to Domestic Dwellings Beechwood Barn North Moor Lane Martin Lincoln LN4 3RR
<b>Client</b>	Mr & Mrs Child
<b>Our ref</b>	AM21_07
<b>Inspection Date</b>	1 <sup>st</sup> February 2022
<b>Prepared by</b>	Andy Marlor BEng (Hons) CEng MICE MIStructE (Chartered Civil & Structural Engineer)
<b>Signature</b>	

## 1) Introduction

- a. In accordance with your instruction, we confirm our inspection of the barn buildings on 1st February 2022, in order to investigate their general structural condition and stability. Our particular brief is to comment on any structural issues which may need consideration as part of their proposed conversion to domestic dwellings.
- b. All structural comments are based on our observations on the date of our inspection.
- c. For identification purposes the barn has been split into three numbered sections as follows: Barn Area (1) (single storey); Barn Area (2) (single storey); Barn Area (3) (two storey).
- d. In describing the barn all references to front, rear, left and right assume that it is viewed from the enclosed crew yard.
- e. We must stress that we have not inspected the woodwork or other areas of the property which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the structure is free from defect.

## 2) Topography and Geology

- a. No trial holes had been excavated adjacent to the barns. We are therefore unable to comment on existing foundation depths.
- b. The British Geological Survey website indicates that the underlying bedrock is Mudstone of the Oxford Clay Formation. Overlying the mudstone, there are superficial deposits consisting of Sands and Gravels.
- c. The ground is generally level. There are no significant topographical features which impact on the proposed conversion.

## 3) Barn Area (1)

- a. The right-hand gable wall has a double timber garage door, positioned centrally. Some rebuilding has been carried out above this door. There are remaining signs of distress, in the form of cracking.

- b. There is evidence of structural movement in the rear wall approximately a metre in from its right-hand end. Similar evidence of movement can be seen in the front elevation approximately aligning.
- c. In the front elevation there is a vertical crack that follows the line of an untied butt joint between an infill masonry panel and original outside wall.
- d. The timber lintel above the double door is inadequate and in need of replacement.
- e. It is noted that a tree stump (hawthorn or similar) remains projecting out of the gravel, just outside the double doors. This will need to be removed completely.
- f. The right-hand outside walls, including the boundary wall, have their foundations exposed, following the apparent lowering of the outside ground crew yard level.
- g. Damp is clearly evident at the junction where the boundary wall meets the outside wall of the barn area.
- h. The roof is in fair condition with no sign of roof spread or undulation in the roof externally.

#### 4) Barn Area (2)

- a. A section of brickwork around the small window facing the crew yard has become cracked and loose and will need rebuilding.
- b. At the junction of the single storey and 2 storey barns there is little masonry connection. A timber door frame, fixed against the 2 storey wall, is all that is present.
- c. The 1<sup>st</sup> floor is of lime/ash construction. This floor is considered unsuitable to walk on without a detailed assessment.
- d. Most of the plaster has been removed, exposing the bare brickwork at ground and first floor level.
- e. The roof is in fair condition with no sign of roof spread or undulation in the roof externally.

## 5) Barn Area (3)

- a. This is a mostly 2 storey Barn Area with a single storey barn abutting.
- b. A pattress plate at 1<sup>st</sup> floor level on the two storey gable is present.
- c. There are a number of weathered bricks which will need cutting out and replacing. There are no signs of any significant structural distress or movement.
- d. Externally, the walls appear to be plumb with no signs of structural distress.
- e. The roof of barn 3 is in good condition from both inside and out. The rafters are supported by purlins which in turn are supported by trusses.
- f. All roof elements appear to be in a well-maintained condition.
- g. The ground floor of the barn has been laid to clay bricks generally.

## 6) Conclusions & Recommendations

- a. Following our structural inspection of the three barn areas, we are of the opinion that all buildings are in a satisfactory condition for conversion, provided a sympathetic approach is adopted.
- b. Numerous weathered bricks will need to be cut out and replaced, as a matter of course, but this will not involve mass demolition of walls in any of the buildings.
- c. The cracking in the barns appears to be historic and can be repaired with Helifix reinforcement, to reduce the likelihood of it re-occurring in the future.
- d. Masonry strapping, to modern standards, should be used along the verges, eaves and edges of the first floor.
- e. The main area of concern is the exposed foundations on both Barn 3 & 4.
- f. Further investigation should be undertaken to confirm that the depth of foundations is a minimum of 450 mm below finished ground level, to protect from frost.

- g. If the foundations are confirmed to be less than 450 mm below ground level, it may be necessary to underpin down to suitable strata or 450 mm, whichever is greater

## 7) Summary

- a. By adopting Helifix bedjoint reinforcement and masonry straps, as discussed above, long term structural stability can be achieved.
- b. Based on the above findings and recommendations, we are of the opinion that the buildings inspected are suitable for conversion to domestic living without major demolition being necessary.