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STRUCTURAL REPORT AND APPRAISAL ON EXISTING BARN AT RIDDINGS FARM, MOISTY LANE, MARCHINGTON

DATE: SEPT 2015
OUR REF: A2409

1. INTRODUCTION

We have been instructed by Mrs Anne Matthews, the property owner, to carry out an inspection and appraisal of an existing barn at Riddings Farm, Moisty Lane, Marchington. We are to assess its suitability for conversion to private domestic use and recommend any structural repairs or strengthening works that may be necessary as part of the conversion works.

External inspection of the barn has been carried out from ground level by visual sighting and without special access arrangements. We cannot confirm that obscured parts of the structure are free from defect.

The lack of specific reference to any structural element or form of construction does not signify compliance with current codes of practice, building regulations or British Standards.

An engineer from this office attended site on Wednesday 26th August 2015.

2. GENERAL DESCRIPTION

The part two storey and part single storey detached barn structure is constructed from solid 225mm load bearing brickwork, with a dual pitched Staffordshire blue tiled roof on traditional timber rafters, supported by timber purlins at mid-span and timber trusses.
The single storey flat roof to the West of the barn is constructed from timber rafters, supported from brickwork and from an internal steel goal-post frame; it has a flat roof covering of profiled metal roof sheeting, laid to a shallow fall.
There is also a small single storey lean-to structure to the East of the barn, this has the external walls constructed as per the main barn, with the roof constructed from timber purlins spanning between brickwork to support corrugated profiled roof sheets.

The building occupies a level site to the North, West and East elevation whilst there is a drop to ground level in the region of 1 metre to the South Elevation (rear of the barn) with the ground sloping away from the barn beyond.

No foundation investigations were undertaken, however, it is expected for a property of this type and age that foundations will be shallow spread brick footings nominally below ground level.

There are no substantial trees in the vicinity of the building with the exception of a small tree adjacent to the rear of the property (South Elevation).

We have no knowledge of any incoming services to the building.

3. ROOF

The roof to the two storey structure is generally in a serviceable condition, although the ridge and eaves lines do display signs of roof spread and a variation towards the gables of the building. There are several areas where tiles have lifted or have slipped, these do not appear to be extensive at present, gutters and downpipes are evident and appear to be in a serviceable condition albeit no extensive drainage survey was undertaken.
The timber rafters and purlins appear to be slender and exhibit signs of woodworm and rot in their structure, there is also no roof triangulation at present and it appears that the existing timber truss has been altered at some stage.
There are no wall straps from the timber wall plate to the brickwork and although there is a felt membrane under the roof tiles there is no roof insulation inserted within the roof construction.

The roof to the single storey structure to the East of the building is supported by timber purlins, the condition of these could not be inspected, as the roof has been lined with a plastered ceiling finish and false aesthetic timbers, we have not inspected the profiled steel roof covering but envisage that the whole roof would be replaced within the proposed conversion works.

The West lean-to roof timbers appear to be in reasonable condition, although there is no strapping present to the brickwork or any insulation to the underside of the profiled roof sheets, which appear to be in a serviceable condition, although we would consider it prudent that the roof would be replaced for a traditional tiled construction in the new works.

4. INTERNAL INVESTIGATION

The ground floor throughout the property has extensively cracked it is not clear whether this is limited to the top screed layer or through to the concrete floor slab itself, we doubt whether there would have been a damp proof membrane or under floor insulation in the original construction and would recommend a completely new floor be constructed as per section 6.0 of this document.

The first floor to the two storey structure appears in a very poor and unsafe condition, and exhibits characteristics of being very "live" when standing in certain positions. The whole floor would require a full replacement conforming to current Building regulations and standards and as the floor also provides support to the roof trusses this also requires consideration.

5. WALLS

The brickwork is generally in fair condition for the age of the property, although there are extensive areas where the mortar between the brick courses is missing, there are also isolated bricks which have spalled, probably due to water ingress and frost damage.

There are a number of timber lintels present above the window and door openings, and these would require replacement. Furthermore there are several areas above these openings which have cracked vertically or diagonally, probably due to movement in the brickwork due to the effects of the natural properties of the timber lintels.

There is no proper damp proof course in evidence at the bottom of the walls and there is evidence of ingress of water and damp in several locations.

The external wall to the East elevation of the lean-to structure is displaying signs of "bellying" local to the door opening there is also extensive cracking to the brickwork to the eaves and to the corners due to the movement evident and localised rebuilding of this wall would be considered necessary. A timber wall plate is also evident to the outer brickwork skin, this is not in accordance with current building practice.

Where the lean-to brickwork abuts the two storey barn, there is a straight line joint and this has cracked probably due to differential movement, we have also noticed that the condition of the brickwork to the door threshold for the entrances to the lean-to structure and two storey barn are in a poor condition with cracking to the brickwork in evidence.

To the inside of the barn, there are no ties provided to the insides of the door frames and there is generally no strapping to either the timber floor joists or roof timbers.

6. CONCLUSIONS AND RECOMMENDATIONS

The timber lintels currently utilised in the property should be replaced with modern proprietary lintels to include the external timber to the eaves of the lean-to structure, the wall to this elevation should also be taken down where it has "bellied" and re-built and tied back into the existing structure.

The existing tree to the South elevation should be removed along with other overgrown vegetation and plants, following which the affected areas should be treated to prevent re-growth.

The existing roof should be stripped and the purlins and rafters replaced with new timbers conforming to current regulations where appropriate, this can be done by inserting new timbers alongside the existing purlins. All woodworm infested timbers should be treated as required and all rotten timbers should be replaced and the roof should be felted, insulated and re-roofed using the existing tiles, with matching tiles as appropriate, all in accordance with current regulations.

Walls should be provided with a new proprietary injected damp proof course in accordance with current regulations, this should not detrimentally affect the existing wall stability.

The ground floor should have a new insulated concrete floor slab installing with damp proof membrane, all to current regulations, again this should not detrimentally affect the existing structural stability of the building.

The existing timber first floor should be removed and replaced with a new timber floor conforming to current building regulations and codes of practice and with provision to support the roof as necessary.

All existing brickwork and mortar joints should be inspected and repaired to current standards, new gutters and downpipes should be provided and linked to an effective underground drainage system to ensure that roof rain water is affectively discharged away from the building.

Provided the aforementioned remedial works are carried out to an acceptable standard and in accordance with current regulations and codes of practice then we consider that the building is eminently suitable for its proposed conversion works, and provided regular routine maintenance is undertaken the property should remain so for the foreseeable future.

Signed:

02.09.2015

Steve Sammans BEng (Hons) IEng AMIStructE
For and on behalf of AJS Structural Design Ltd