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Lois Plaistow Structural Engineers Ltd

Structural Report on Barn 2

Leadenhall Farm, Holbeach St Marks, Spalding, PE12 8HB



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Introduction

This report is a summary of findings of a visual inspection of the existing barn structure, carried out on 7th July 2020, in respect of its current condition and the proposal to convert the shed to a single storey dwelling. The weather was raining during the inspection.

This was a visual inspection only. No opening up or material testing was carried out in the barn. All observations were made from ground floor externally and internally.

This report is intended solely for use by Beeswax Dyson Farming Ltd and their consultants.

Description of the Existing Building

The building is rectangular in plan, 22m long and 6.5m wide, and 2.3m to the eaves. For reference, the short gable elevation facing the farm yard will be the South Elevation, the opposite face the North Elevation and so on. The roof is a duo-pitch roof with the ridge running North-South. The barn is divided into three internal spaces by two internal cross walls: Southern space, Storeroom, Northern space. The South gable has the large opening forming access to the largest (Southern) space. The central storeroom is accessed by a door on the West wall. The Northern space is accessed by an open elevation with a timber post and beam eaves frame on the West elevation.

The site slopes gently towards the farm yard (ie towards Barn 1) and the external ground level is at roughly internal floor level on the West, North and South sides and is lower by approximately 550mm on the East side. There is tall grass in and soft landscaping to the North, hard landscaping to the West and South and the concrete yard to the East. The East elevation is hidden by the proximity of straw bales at the edge of the farm yard.

Roof

The roof covering is corrugated steel sheets on multiple inclined purlins on each roof slope. The purlins span onto timber rafters at approximately 1.2m c/c. Every pair of rafters have collar ties and alternate pairs of rafters also have ties at wall plate level. There are no roof gutters at the eaves. The roof planes are underdrawn with timber boards running downslope in the store and Southern space.

Walls

The walls are all solid 225mm (9 inches) thick brick with intermittent internal brick piers. The two internal dividing walls are brick. The main entrance is in the South gable. There is a reinforced concrete lintel over the door opening. Above the lintel is a window opening.

The internal walls in the Southern space are rendered for the bottom 1m.

The door opening to the central storeroom has a brick arch lintel over it externally. There are timber plates built into the North and South gables. The dividing wall to the South of the storeroom has a timber plate built into it.

There are window openings in the East and West walls which have timber or steel lintels over them internally and brick arch lintels externally.

Ground floor and Foundations

The floor in the Southern space is concrete. The floor is also concrete in the storeroom but is approximately 225mm lower than the Southern space. The open Northern space floor is paved. Trial holes were not excavated.

Observations

- The internal dividing walls both have diagonal cracks at each end and are not well bonded to the external walls;
- The external walls are generally plumb and show no signs of significant differential vertical movement;
- A ceiling tie is missing in the Southern room;
- The ridgeline appears relatively level;
- The eaves are relatively straight;
- The South and North gable wall appears to be leaning in at high level;
- There are diagonal cracks in the South gable at each end of the lintel;
- Concrete in the reinforced concrete lintel is split and spalling where the reinforcement is corroding;
- There are signs of worm infestation and decay in the roof timbers and wall plates
- There are signs of decay in the timber beam and post eaves frame in the West elevation;
- There are areas of mortar loss in the brick walls, particularly at low level externally in the East and South elevations;
- The high level window opening in the South gable has no lintel over it;

Proposed works

The proposals for converting the building into a dwelling include:

- Cast new concrete ground floor slab with one level throughout;
- Subdivide the internal space with block walls built off the slab;
- Create new door and window openings in the East and West elevations;
- Add roof guttering, connected to a drainage system/soakaway;
- Infill the beam and post frame in the West wall with glazing;

Recommendations and Implications of Proposed works

- Possibly rebuild the retained dividing wall off a new footing or slab thickening;
- The new internal walls may be used to support a ridge beam if a new vaulted roof is adopted;
- The timber plates buried in the walls need to be cut out and replaced with brick;
- The roof load on the existing walls will not be significantly increased by the proposals;
- The lintel over the main entrance opening needs to be replaced and the wall above rebuilt plumb;
- Consider rebuilding Northern gable above eaves level once timber plate removed;
- Localised repairs to weathered bedjoints and cracks in external walls;
- Gable walls will be strapped to the roof;
- The roof planes will be braced or sheathed;
- Replace the timber post and beam eaves frame with new;
- Replace roof and wall plate timber;

Summary

Provided that the above recommendations are implemented, the building is structurally suitable to be converted into dwellings.