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Lois Plaistow Structural Engineers Ltd

Structural Report on Barn 1

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 dry but overcast during the inspection.

This was a visual inspection only. No opening up or material testing was carried out in the barn other than trial holes against the existing footings. 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, 22.5m 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 open internally with no internal walls. The South gable has the large opening forming access to the space. The site is generally level with thick vegetation on the North and East sides, concrete ramp to the South entrance and farm storage yard to the West, bounded by straw bales. The West elevation was not accessible externally because of the close proximity of the straw bales.

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.

Walls

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

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 is concrete, with drainage grooves formed in the surface as is usual in agricultural buildings used to house animals.

A trial hole was dug against the North gable wall and the East wall. Both trial holes showed the brick wall corbels out 140mm and bears on brown silty clay at a depth of 600mm below external ground level (approx. 1m below internal floor level). The British Geological Survey online geology map shows the superficial deposits locally to be Tidal Flat Deposits - Clay and Silt overlaying West Walton Formation - Mudstone and Siltstone.

Observations

- The walls are generally plumb and show no signs of significant differential vertical movement;
- There are timber plates built into the North and South gables and the West wall;
- The ridgeline appears relatively level;
- The eaves are relatively straight;
- The South gable wall appears to be leaning in above the lintel;
- There are diagonal cracks in the wall at each end of the lintel;
- Concrete in the reinforced concrete lintel is split and spalling where the reinforcement is corroding;
- The walls have corbelled spread footings onto firm silty clay;
- There are signs of worm infestation and decay in the roof timbers and wall plates;
- There are areas of mortar loss in the brick walls, particularly at low level externally in the East elevation;

Proposed works

The proposals for converting the building into a dwelling include:

- Cast new concrete ground floor slab;
- 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;

Recommendations and Implications of Proposed works

- The new dividing 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;
- Localised repairs to weathered bedjoints;
- Gable walls will be strapped to the roof;
- The roof planes will be braced or sheathed;

Summary

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