

Structural Survey on a Barn. Town Head Farm. Foxt, Staffs, ST10 2HW.

Prepared For
Ideal Design Solutions

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1.0 Introduction

This report is to provide evidence of structural suitability for conversion into residential dwelling in support of a planning application. We have also assessed the structural integrity of the barn with respect to the intended change of use.

The agricultural barn was built in and around 1950's on the grounds of Town Head Farm in the village of Foxt, ST10 2HW

1.1 Site Location

Access to the Agricultural Barn off Foxt Road in the village of Foxt.

2.0 Condition Survey

2.1 Existing Structure

A visual inspection was made of the existing structure which appears to be in a particularly good state of repair and in a robust condition considering the age and previous use of this building for the farm's dairy herd.

The structure comprises of stonework walls to the envelope, each skin of stone formed with 225-250mm thick local stones. The cavity width if any is currently unknown, however due to the age and type of property it is assumed to be 25-50mm max. (see photos 1-2).

Both gables are full height stonework wall to the apex (see photo 4). The walls appear in a good state of repair with no signs of significant distress. Superficial cracking can be seen on the face of the walls however this does not appear to have occurred recently and will not have a detrimental effect on the performance of the structure.

The roof is approximately 35° pitch and clad with Staffordshire Blue roof tiles and ridge tiles running along the full length of the barn. (see photo 3).

The roof is held in place by traditional 'A' framed timber trusses which look in particularly good condition with no signs of weather damage or woodworm.

A more modern lean-to has been constructed in the north/west corner of this 'T' shaped barn, which has been constructed in a modern contrasting brickwork construction in a buff colour, this has been assumed to have more traditional foundations in the form of a strip footing. The lean-to is found in a good state of repair there are some tell-tale signs of damage from farm machinery on the corner of this structure but nothing of note, a small opening in the gable of this lean-to has been crudely blocked up.

A concrete floor slab was present within the confines of the barn and visually was in good condition with no signs of stress or adverse cracking.

2.2 Existing Foundations

At the time of this structural inspection, the main foundations to the barn were not exposed and therefore no visual inspection of the foundations was undertaken.

It is apparent from the nature of the superficial cracking to the masonry elevations and the lack of any cracking caused by excessive movement; that the foundations are adequately fulfilling their intended design function and will offer no reason for concern when considering the structural stability of this barn.

The foundations to the lean-to will be typically more modern foundations. Their size is approximated at 450mm wide and 600 deep strip foundation (not visible at the time).

3.0 Design Appraisal

The following section will look to appraise the structure in its existing form with respect to the intended change of use. An assessment has been made of the proposed structural loading imposed on the various structural elements and whether they are suitable for the proposed design intent.

3.1 Roof

It is proposed to remove the roof tiles to enable a new water-tight and breathable felt layer to be installed.

The roof will then be re-lathed and retiled. It is proposed fit insulation to the underside of the rafters to ensure that the barn complies with the latest building regulations.

Prior to a more detailed structural analysis to assess the capacity of the timber trusses & rafters being undertaken.

The trusses & rafters in their current state are deemed appropriate to form part of the new roof structure. It is likely that due to the small increase in the magnitude of dead load, they will still be within capacity in supporting the slightly increased load applied by the added insulation. This is the only increase in load and will amount to circa 7kg/m².

This is an approximate increase of 5% when considering both dead and imposed load. Should the rafter go beyond their capacity when considering the additional load, additional members can be added to ensure that the roof will be capable of resisting the applied loads.

The lean-to roof is made up from more modern timber rafters which are large enough to support the new roof.

3.2 Stonework Walls

The marginal increase in load imparted on the Stonework walls will not have any adverse effect on their structural integrity. However remedial works to the corners of the walls where the Stonework units have loosened over time will be required.

We recommend a scheme of repointing to be undertaken as part of the wider remedial strategy. Once the required (minor) remedial works have been undertaken both the lateral and vertical capacities of the walls will be above the applied loading associated with the intended change of use. As there is no first-floor construction the loading regime on the walls will have changed extraordinarily little.

Therefore, the walls are considered structural suitable for the intended use.

The wall plate to the top of the walls will need to be replaced. This should be appropriately strapped to the wall, as too should the rafters to the gable walls, in accordance Part A of the building regulations.

3.3 Ground floor slab

The existing slab shows little or no signs of structural distress. As the barn has been used as a general agricultural storage structure in recent years, the imposed load associated with its intended domestic use will be less than that previously applied.

Therefore, the slab is considered structural suitable for the intended use.

3.4 Foundations

The only increase in load on the foundations arises from applied insulation to the underside of the roof. As has been outlined previously, the magnitude of this load is considered insignificant and will not have a detrimental effect on the structural stability of the existing foundations. No further settlement of the foundations is expected.

Therefore, the foundations are considered structural suitable for the intended use.

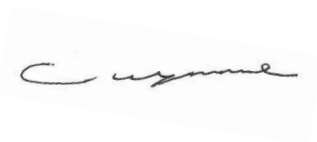
4.0 Conclusions

Outlined below are a number of conclusion and recommendations in progressing the structural appraisal to a comprehensive structural justification for the purposes of building control.

- The roof structure is considered appropriate in its current condition as part of the support required for the proposed roof build-up. Following a detailed structural analysis, any additional members to be added will be done so as part of the more detailed structural design.
- The walls are satisfactory in their current state of repair in supporting the applied loading associated with the intended use.
- The ground floor slab is satisfactory in their current state of repair in supporting the applied loading associated with the intended use.
- The foundations are satisfactory in their current form in supporting the applied loading associated with the intended use.
- The lean-to structure will be capable of resisting the new applied loading.

Signed:

Date: 1/03/2021

A handwritten signature in black ink, appearing to read 'Craig Wynne', is written on a light-colored rectangular background.

Craig Wynne MSc (ENG) BSc.

For & on behalf of Ideal Design Solutions.

5.0 Appendix I

Photographs

Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

