STRUCTURAL INSPECTION OF AGRICULTURAL BUILDING AT TOWN HEAD FARM FOXT STAFFORDSHIRE MOORLANDS ST10 2HW

On Behalf Of:

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Table of Contents

1. Introduction 3
2. External Inspection 4
3. Internal Inspection 6
4. Discussions and Conclusions 8
5. Summary 10
6. Standard Limitations 11

1. Introduction

We were requested to attend site to undertake a structural survey of an existing agricultural building to the rear of Town Head Farm, Foxt by our client Mr Titterton. We understand that a planning application has been prepared for the conversion of this building into residential accommodation. A structural survey is therefore required to confirm that the barn is suitable for conversion and does not require large scale demolition works for these works to take place.

A site visit was made on 10th November 2018 under cool but dry weather conditions.

2. External Inspection

2.1. The existing building consists of a series of portal frames and single storey lean-tos. These combine to form an equipment store for farming equipment with cattle sheds on either side. The existing layout is shown below on the planning drawings IT15/1 & 2.

2.2. The structure generally comprises a duo pitch portal frame to the double height equipment store. Principally the structure is constructed using a 178 x 201 UB legs and rafters with mono-pitch lean-to's to either side, constructed in 152 x 89 UB's legs and rafters.

2.3. A second duo-pitch cattle shed is also present on the left-hand wing constructed using 178 x 201 steel sections.

2.4. The external walls are finished in corrugated metal sheeting which is showing signs of weathering and disrepair, particularly towards its lower edges. The rear wall and western elevation also have a concrete pile wall up to approximately 1500mm in height to its lower edge. The roofs appear to be finished in asbestos cement corrugated sheeting throughout with asbestos cement ridge sections at each of the duo pitch positions. A considerable amount of moss is present on the roof sections although they appear to be intact structurally.







2.5. The external concrete panel or blockwork walls on the rear and western elevations appear to be relatively straight and free from signs of deterioration or structural movement.

2.6. The quality of the foundations is not proven but given the age and original use of the subject building we would suggest that the foundations are quite probably rudimentary in both nature and depth. However, the external elevations show no signs of structural movement or subsidence.

3. Internal Inspection

3.1. As has been recorded earlier, the existing duo-pitch bays are constructed in 178 x 102 columns using angle iron roof trusses at approximately 4 – 4.5m centres.

3.2. The trusses in turn support timber roof purlins onto which the asbestos cement sheets are bolted. The inspection of the roof trusses was carried out from ground floor level only, the and it was clear that a considerable amount of rust was present within the angle iron sections and lamination is taking place in at least two of the frames observed. In addition, the frames within the original farming equipment store appear to have been struck, presumably by farm machinery. It was noted that the front most frame to this bay had been replaced, probably due to repeated impact from equipment.



3.3. In the two mono-pitch bays the structure is simpler with the posts being recorded as 152 x 89 UB's with 152 x 89 principle rafters supporting timber rafters onto which the asbestos sheeting was bolted. These mono pitch sections of roof showed no signs of damage and appeared to be relatively intact.

3.4. Internally, it was noted that the separating walls between the individual bays comprised pre-cast concrete panels which had been struck repeatedly during the lifetime of the building by farming machinery and had failed completely in one or two places. As these panels were non-load bearing this has not influenced the overall stability of the building.



3.5. The existing floor slabs appeared to be mass concrete in nature with steps within the original cattle sheds where the cattle pens were situated. The existing floor had a level threshold at each entrance, and as such would not strictly be suitable for re-use as a domestic floor.

4. Discussions and Conclusions

4.1. We understand from discussion with the current owner that it is their intention to convert the existing building into residential use.

4.2. The principle issue regarding the above would be the construction of internal walls off the existing floor slab. We would need to confirm the adequacy of this slab by calculation but visually at this stage the existing slab would not be suitable for re-use and would require removal.

4.3. We would suggest that a new floor slab is constructed with insulation and screed above it, such that the new internal walls can be constructed directly off it. This would allow both the ground floor slab to be insulated to current building regulation requirements and provide enough support for any load bearing walls both internally and on the outer edge of the slab where new internal skins to the external walls may be needed.

4.4. The existing roof purlins appear satisfactory, although as has been noted earlier, the existing roof covering is in asbestos cement sheeting and the current owners may take a view as to whether this should be removed and replaced or whether it should be encapsulated such that its retention is made safe for future owners.

4.5. We do not have any information regarding the existing approval process with the local authority, but it is likely that the existing roofing material and cladding to the side walls may be retained for aesthetic reasons to maintain the appearance of an agricultural building. Some discussion was held on site as to whether the cladding to the side walls should be replaced with timber cedar cladding and whilst this would be more pleasing aesthetically, the future maintenance of this timber would need to be factored into the budget for the project.

4.6. If no further load is to be added to the existing structure, then we would consider that it is fully suitable for conversion with the provision that diagonal wind bracing should be considered as an addition to the structure in general.

4.7. The external walls will provide some restraint between the columns at low level but no similar level of bracing present above the heading of these existing blockwork panels or indeed in the roof structure at all. We would therefore recommend the insertion of tubular bracing elsewhere in the structure where the proposed window and door positions allow.

4.8. Insulation should be provided at ceiling level in the form of fibre glass or mineral wool quilting to current building regulation standards.

4.9. A formal threshold will be required to be provided at all new door positions, but we would suggest that this could be accommodated by 100mm of insulation and 70mm of floor screed onto the level of the new floor slab. This would be installed in effect at the existing slab level.

4.10. Care will be required when cutting out proposed windows in both gable and side elevations as the existing concrete blockwork/reinforced concrete panels will require support at the proposed window/door head level.

4.11. We assume that a new internal blockwork skin is to be provided to the structure for thermal purposes and that any new lintels should bridge the opening between the new and existing skins.

5. Summary

5.1. We are satisfied that the existing structural frame is adequate to cater for the present and future loadings provided that any new ceilings/floors and insulation are supported independently off the new ground floor slab.

5.2. The existing purlins appear sizeable enough to cater for any ceiling loads, although supplementary timbers could be provided at mid-span if required. The steel frame should require no further strengthening to cater for this minor increase in roof loading.

5.3. We have not inspected the existing foundations at this stage but given that the above scenario would generate no further loading to the existing structure we are satisfied that the existing foundations, whatever their depth and dimensions, are suitable for retention and re-use.

5.4. Structurally and in terms of condition, the building and concrete slab is more than adequate to allow the conversion to a dwelling provided none of the existing structural elements are removed

5.5. The existing steel frame and concrete slab is sufficient to take the loading which comes with the works required to provide for conversion to residential use without any new structural elements

5.6. The existing steel frame is adequately sized to cater for additional insulation and ceiling loads required for the proposed dwelling to comply with Building Regulations without new structural elements.

6. Standard Limitations

6.1. During our inspection of the premises as presently existing, which will normally be carried out in a single visit, we shall check all visible exposed and accessible elements of construction in order to identify defects and shortcomings which are likely to adversely affect the use of the property or give rise to expenditure in the future.

6.2. We shall consider the condition and durability of the building fabric in relation to the type and age of the property, the need for repairs or special maintenance and, where appropriate, comment on the suitability of the structure for its proposed use.

6.3. We shall, where possible, lift loose laid floor coverings and inspect cellars and roof voids where appropriate, but we shall not empty the contents of any fitted cupboards, move heavy furniture or lift carpets or floorboards and our report will specifically exclude all covered, and unexposed or inaccessible areas and buried elements of construction such as foundations and built-in steels and timbers.

6.4. Apart from any balconies and roofs to which external access may be available, our external inspection will be carried out from the ground level. Our report will include a summary of our findings in respect of any outhouses, boundary walls etc. which will be inspected briefly during our visit.

6.5. In accordance with our professional indemnity insurance cover we have to state that "we have not inspected woodwork or other parts of the structure which are covered unexposed or inaccessible and we are therefore, unable to report any such part of the property is free from defect".

6.6. We will not arrange for exposure works to be carried out to the superstructure or below ground, or carry out tests for high alumina cement concrete, calcium chloride, asbestos or the use of woodwool slabs as permanent shuttering, but where appropriate, will seek further instructions for these to be carried out for an additional charge.

6.7. With regard to service installations, incoming mains, waste and drains, we shall report on any matters which come to light during our inspection as requiring further investigation by specialists, but we shall not arrange for tests to be carried out unless specifically instructed beforehand.

6.8. Although where appropriate, we will be happy to examine any lease or title documents, planning or any consents or fire certificates which are made available prior to our inspection, we shall assume in such cases that solicitors will be advising in detail upon these matters and that they will also check on the responsibility for the maintenance of all boundaries and rights of way and the existence of any easements or necessary rights of light, drainage etc.

6.9. We require to be informed, prior to the undertaking of any excavation or boring work, of the positions of any underground services or plant beneath the site.

6.10. Whilst reasonable care will be taken during the execution of field work we cannot accept liability, either direct or consequential, for the damage to any service not clearly identified to us.