

**REPORT on VISUAL STRUCTURAL INSPECTION  
BARN CONVERSION FOR PERMITTED DEVELOPMENT**

at

**TOWER VIEW FARM**

**RIDGEWAY**

**NUNNEY**

**Beveridge**

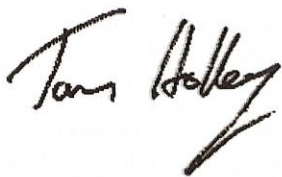
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**CLIENT** Lucy Marshall

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## 1.0 Introduction

- 1.1 We are instructed by Lucy Marshall of Tower View Farm to visit her property and carry out a visual structural inspection of the barn to the north of the farmhouse, as highlighted on the site plan below.
- 1.2 This report has been prepared solely for the benefit of the above-named client. No liability is accepted to any third party.
- 1.3 A written report is to be provided giving the structural condition of the barn together with recommendations for structural remedial measures that may be required to provide for conversion to habitable accommodation.



Figure 1 – Site plan

## 2.0 Scope of investigation

- 2.1 During our visit a condition survey was carried out and photographs taken. This report is based on notes taken from this visit, without benefit of monitoring or previous knowledge of the building.
- 2.2 All external observations were made from ground level unless noted otherwise.
- 2.3 The structure was generally accessible and could be inspected. I believe this is a fair representation of the building.
- 2.4 This inspection relates to the building outlined in red on figure 1. Other parts of the property were not inspected and do not form part of this report.
- 2.5 Two trial pits were excavated to allow assessment of the existing foundations and ground. One on the NW elevation, towards the north corner. The other on the SE elevations, towards the south corner.
- 2.6 A 100mm core was taken through the floor slab at roughly the center of the building.
- 2.7 Dimensions, where given in the report, are approximate and taken using a tape measure. Where appropriate I have rounded figures up or down to be conservative in my assessments.
- 2.8 Underground drains, if present, were not examined.



Figure 2 - View from East

### **3.0 Brief description of barn**

- 3.1 The barn is located on the NW edge of a former farm yard. The ground to the NW is lower than the yard (and the building floor level) by approximately 1.3m.
- 3.2 It is a single storey building with eave height approximately 2.4m above the yard level.
- 3.3 It has an apex style roof with ridge running SW-NE. The roof finish is corrugated cement board sheets, possibly containing asbestos. This is supported by steel purlins (5no per pitch). The purlins are supported by fabricated steel fink trusses. The trusses appear to have been welded together as two mirrored halves and then bolted together in-situ. All steel members are of circular cross section.
- 3.4 The external walls are generally 6" (140mm) concrete block, laid conventionally, with piers/buttresses to the flank walls which correspond with the roof trusses.
- 3.5 Internal walls are also generally of 6" concrete block with the exception of the NE building wall and the northern portion of the NW building wall. These appear to be newer and constructed in 100mm concrete block.
- 3.6 Internal walls are a mix of full height and low level. None of the internal walls are believed to be load-bearing i.e. they do not support the roof. There is a water tank supported by internal walls towards the SW.
- 3.7 It is believed that the building has been previously extended to the NE by removing a pre-existing 6" block wall. This alteration is not of structural concern.
- 3.8 Openings in the internal and external walls are spanned using concrete lintels, possibly cast in-situ.
- 3.9 The floor comprises a concrete slab, generally level but with a fall towards the opening in the SW gable.
- 3.10 In general, the construction appears robust and 'over-engineered'.





**Figure 3 - View from the NW**



**Figure 4 – Trial pit at SW**



**Figure 5 – Trial pit at NE**

#### **4.0 Findings of inspection**

- 4.1 The structural fabric of the building i.e. steel, masonry and concrete appeared to be in good condition generally.
- 4.2 There are no visible significant (category 3 to 5) cracks and the walls are generally straight and vertical, suggesting no significant foundation or ground movement has occurred.
- 4.3 The floor slabs are in good condition with no sign of significant movement.
- 4.4 The building appears to have been well ventilated and internally the visible steel is in good condition with only surface rust.
- 4.5 The roof cladding is un-distorted, suggesting that excessive deflection of the trusses or purlins has not occurred.
- 4.6 The foundations comprise approximately 400mm thick concrete with 150mm (or greater) projection from the face of the walls.
- 4.7 The floor slab is 225mm thick concrete at the location of the core.

## 5.0 Structural Analysis

- 5.1 A qualitative structural analysis of the superstructure has been carried out.
- 5.2 Under the loads associated with a conversion and on the assumption that external finishes are lightweight e.g., insulated cladding panels, the structure comprises all the primary and secondary elements required to adequately transfer vertical and lateral loads to ground.
- 5.3 Should a heavier weight e.g. tiled roof be required then the roof structure could easily be replaced with pre-fabricated timber trusses. The external walls and foundations are deemed adequate to support this additional weight.
- 5.4 Longitudinal and lateral stability of the building is gained via diaphragm action of the roof sheeting and masonry walls, as is typical in this form of construction.
- 5.5 The concrete floor slab can be reasonably assumed to be adequate to support the loads associated with new internal load-bearing and non-load-bearing walls, given its prior use, condition and thickness.
- 5.6 It will be possible to install a new floor system, if required, without undermining any of the existing foundations as there is ample headroom throughout.
- 5.7 Verification of the steel grades and connections will be required to provide calculations to justify the roof trusses (if required) for building regulations purposes, but the assumptions made are reasonably conservative and thus appropriate for this stage.



## 6.0 Conclusions and recommendations

- 6.1 The barn appears to be in a suitable condition to be converted into habitable accommodation.
- 6.2 The analysis carried out shows that the existing primary structure is adequate to support the loads resulting from the external (wall and roof) works associated with the conversion without significant or substantial improvement or repair.
- 6.3 Load-bearing partition walls can be built from the floor slab, to support any additional load from new ceilings, services and insulation.
- 6.4 Alternatively, new timber roof trusses could be installed between the existing steel trusses to support new roof and ceiling loads.



Figure 6 – Internal view looking NE

## Appendix A – classification of damage

It is common practice to categorise the structural significance of cracking damage in accordance with the classification given in Table 1 of Digest 251 produced by the Building Research Establishment.

<b>Classification</b>	<b>Description</b>	<b>Crack Width</b>
Category 0	Negligible	<0.1mm
Category 1	Very Slight	0.1<2mm
Category 2	Slight	2>5mm
Category 3	Moderate	5>15mm
Category 4	Severe	15>25mm
Category 5	Very Severe	>25mm

Extract from Table 1. BRE Digest 251

*Classification of damage based on crack widths.*