WE. Consulting Engineers
Black Barn
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PE13 4AA

Structural Survey Report

on
Agricultural Barn for Domestic Conversion

adjacent
Cottage Farm
Bird's Drove
Sutton St. James
Spalding

for
Mr. S. Almey

Job reference: WECE-26-755

1. Client

Mr. S. Almey

By Email

2. Brief and Introduction

2.1. Instructions were received from Mr. S. Almey to undertake a structural survey of the agricultural barn adjacent Cottage Farm, Bird's Drove, Sutton St. James, Spalding.

2.2. The purpose of the survey was to assess the structural condition of the existing barn, thought to have been constructed mid to late 20th century, with the intention of conversion to a residential dwelling. The barn was advised as being previously used as an agricultural workshop and storage building.

2.3. The survey was undertaken on 20th May 2026 with Bradley Whyatt from WE. Consulting Engineers in attendance.

2.4. The survey was a visual inspection only. Access was limited externally by overgrown vegetation and internally by agricultural machinery. The roof structure was viewed from ground level, and no intrusive investigations were undertaken. At the time of issue, no structural calculations have been carried out for any members.

2.5. No monitoring or testing of materials was conducted.

2.6. The barn considered in this report is situated close to North Side Road and central amongst other smaller sheds and storage silos at the site.

2.7. In accordance with our standard practice, this report is for the sole use of the parties to whom it is addressed, and no responsibility is accepted to any third party for the whole or any parts of its contents.

2.8. The recommendations in this report are based solely on the findings of the site visit. We highlight that, other conditions may occur elsewhere on the site of which we have no knowledge and therefore cannot accept any responsibility.

3. Observations

3.1. The barn is rectangular, approximately 33.6m × 11.7m on plan and 4.6m to eaves.

3.2. The barn comprises profiled cladding supported on purlins and side rails over 9 trussed-rafter steel frames with a typical bay spacing of approximately 4.2m centres. The roof pitch is estimated at ~22.5°.

3.3. Access openings are on the front (north) and rear (south) gable elevations. Both consist of offset double sliding doors to the east, each approximately 5.9m wide × 4.6m high. The north door was unlocked and operated easily; the south door was locked.

3.4. Light gable end frames have not been utilised in the construction of this steel framed building. Door posts, propped at eaves level by roof bracing members, provide support to the gable end cladding side rails.

3.5. Measured and estimated steel sizes: columns approximately 203mm × 102mm I-sections; chord members of the roof trusses appeared to be 70mm × 70mm L-sections and internal web members 50mm × 50mm L-sections (estimates from ground level).

3.6. In-plane stability appears to be provided by the steel frames. Plan bracing L-sections are provided at eaves level to restrain the head of gable-posts. No specific roof-plane bracing was observed; it is assumed the roof sheeting provides diaphragm action together with vertical bracing (75mm × 65mm L-section) between columns to provide out-of-plane stability.

3.7. Roof and wall cladding appeared to be a historic fibre-cement sheet (approximate weight 0.17kN/m^2) supported on rolled steel L-sections at ~1.375m (roof) and ~1.500m (wall) centres.

3.8. Generally, no visible distortion to roof truss members was observed; columns appeared reasonably plumb and aligned within normal construction tolerances, and the ridge line was consistent. No local distress or visible column settlement was noted. Primary structural steelwork appeared serviceable.

3.9. Steelwork showed mild surface corrosion only, with no visible delamination or loss of section to primary members.

3.10. Evidence of historical patch repairs to wall cladding; no similar repairs noted to roof cladding.

3.11. The concrete floor slab (thickness and reinforcement not confirmed) has regular joint patterns. At the north end, joints run across the building approximately coinciding with frame positions; the last three bays at the southern end have two joints orientated along the building. No obvious reason for this was apparent from the survey

3.12. The floor slab is generally in good condition with only minor irregular cracking; no spalling or exposed reinforcement observed.

3.13. Along the western side (except two bays) and returning halfway along the north and south gable ends is a low-level non-loadbearing blockwork wall approximately 1.8m high. These walls appear to be constructed and founded independently of the floor slab.

3.14. Only minor longitudinal cracks were noted in the mortar bed joints of the wall panel in the penultimate bay at the southern end of the building. Farm equipment was observed in close proximity to the wall; it was not possible to confirm whether the cracks were caused by minor settlement or by impact with farm machinery.

3.15. An internal block partition wall of similar height divides a workshop area in the northwest corner. A mezzanine storage area is present, constructed from steel frame members and timber decking. Steel members vary in size; beams observed included T, I or L-sections, and columns were I-sections founded on the floor slab.

3.16. No roof guttering or downpipes were visible from ground level.

3.17. Externally, the building is bounded by Cottage Farm to the north, Bird's Drove to the east and fields to the south and west. External hardstanding exists at the north end and wraps partway along the west side.

4. Conclusions and Recommendations

4.1 The structural condition of the existing agricultural building envelope is generally good considering its intended agricultural purpose and age with little or no visible defects in the primary steel portal frame load bearing members.

4.2. With allusion to the Architectural drawing ref: SE-2475-PP1101 by Swann Edwards, we comment that the proposed single storey layouts could be constructed using light-weight timber frame methods to create the desired layouts without subjecting the existing structures envelope to additional loadings.

4.3. We comment that if the proposed new walls and ceilings are appropriately tied in laterally with the existing structural members, this will only enhance the overall stability of the existing structures through diaphragm action.

4.4. Given the available head room and that there is likely to be a requirement to provide insulation at ground level, the existing structural slab could be considered as part of a sub-base to be overlain with high compressive strength insulation overlain with a new reinforced concrete structural slab, and nominal screed finish; subject to levels being suitable. With domestic loadings no more than the those the floor slab has been subject to in the past, we do not anticipate significant settlement issues in the future, and we suggest this proposed build up will be suitable for founding the proposed timber frame walls.

4.5. Should approval for conversion be granted, we advise the steelwork will need to be prepared for and repainted to guarantee its condition for the foreseeable future. Some patch repairs to the steel members may be required following close inspection during the preparation for painting.

4.6. Rainwater goods will need to be provided and installed correctly. This includes connection of downpipes to an underground drainage network to transfer surface water a safe distance away from any building foundations to soakaways or similar as necessary. We expect that any new drainage system will be designed and installed to current Build Regulations.

4.7. We advise that the detailed structural design of this conversion project should be undertaken by suitably qualified persons. Further investigations may be required to confirm some parts of the existing buildings structural components that were not visible during the survey, to be confirmed by appointed persons.

4.8. Overall, subject to suitable and detailed structural design including load assessment, we consider that the existing building structure is suitable for the proposed single storey domestic conversion.

report prepared by

B. Whyatt

B. Whyatt BSc (Hons)
for and on behalf of WE. Consulting Engineers

Appendix A: Location Plan

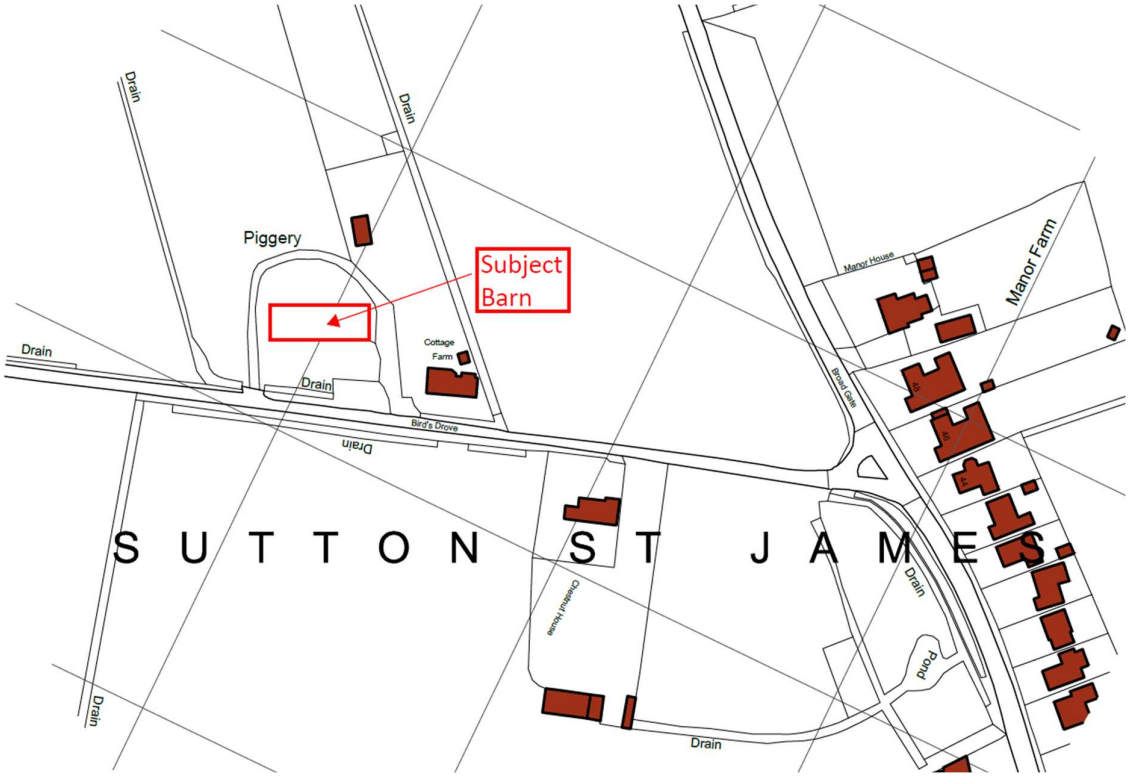


Image 1. Building location plan

Appendix B: Site Photos



Photo 1. North elevation



Photo 2. East Elevation Part 1



Photo 3. East Elevation Part 2



Photo 4. South Elevation



Photo 5. West Elevation Part 1



Photo 6. West Elevation Part 2



Photo 7. Internal Facing North



Photo 8. Internal Facing South



Photo 9. Mezzanine Floor



Photo 10. Gable Post and Associated Bracing



Photo 11. Vertical Bracing Type 1



Photo 12. Vertical Bracing Type 2



Photo 13. Vertical Bracing Type 3 and Internal Non-load Bearing Wall



Photo 14. Typical Concrete Floor Slab