

STRUCTURAL INSPECTION

Of

FIELDS FARM BARN, MEARLEY, PENDLETON

For

STANTON ANDREWS

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1.0 INTRODUCTION

Acting on instructions from Stanton Andrews Architects, Reid Jones Partnership carried out an inspection of a barn at Fields Farm, Mearley, Pendleton.

A structural inspection was required to establish the general structural condition of the building, the structural implications of its conversion to residential use, and the repairs required during refurbishment and conversion.

Mr John Reid BSc CEng MICE FStructE of Reid Jones Partnership Ltd carried out the inspection on Wednesday 9th April 2025. This report details the observations made during the inspection and gives recommendations on the work required during conversion. Photographs taken during the inspection are included within Appendix A.

The inspection was of a visual nature, and no opening up of the building fabric was carried out.

This report shall be for the sole use of Stanton Andrews Architects and their professional advisors and shall not be relied upon by any other party without the full written consent of Reid Jones Partnership Ltd.

2.0 DESCRIPTION

The building is located at the end of a farm track off the A59. For orientation purposes, reference will be made to the four compass points, with the front of the barn facing south west. When viewing a wall or other structural element from inside or outside the building, reference to left and right relates to the element as viewed.

The barn is a traditional stone-built agricultural building, dating from the 1700s or early 1800s (photos 1, 2, & 3). The main part of the barn provides double-height storage space to the north west, with the part to the south east occupied by cattle stalls with a hay loft above. At the front are further two-storey sections on each side of a wagon entrance, with animal houses at ground floor and hay lofts above. To the rear is a single-storey lean-to shippon, located to the east of the rear wagon entrance.

The outer walls are of stone and the roof is of sandstone slates, concrete tiles or Welsh thin slates on timber rafters spanning between timber purlins and timber king post trusses (photo 4, & 5). The hay loft within the main part of the barn is of timber boarding on timber joists, supported on steel beams (photo 6). The lofts at the front are entirely of timber (photo 7).

3.0 OBSERVATIONS

Internal

- To the north end of the main barn space, in the end bay, the timber battens have moved, and the stone slates have slipped (photo 8). Elsewhere the roof has been re-covered with relatively modern concrete tiles on new rafters and battens over roofing felt.
- Some original oak purlins have been replaced, but most remain. Several are severely twisted (photo 9), others are decayed, particularly near roof lights or where slates are missing (photo 10).
- One timber truss close to the north west gable wall is of relatively modern sawn timber (photo 4), and a further modern truss has been installed alongside the next truss from the wall (photos 5 & 9). The four original oak trusses are in an advanced state of decay due to insect infestation (photos 11 & 12).
- The loft floors to the front and the roof void above the shippon were inaccessible, and no inspection of the roof timbers could be made.

- Inspection of the hay loft floors from below revealed widespread timber decay due to insect infestation in all timber boarding, joists and beams (photos 6 & 7).
- Vertical cracking was noted in the main barn walls, at the north west corner (photos 13 & 14), and at the opposite south east corner (photo 15). Separation between the internal wall and the south east gable wall was noted (photo 16).

External

- The front and rear roof pitches of the barn and shippon reflect the deformations noted internally in the supporting purlins. Many slates and tiles are slipped or missing.
- The front wall is generally straight and vertical. The timber lintel above the wagon entrance is decayed (photo 17). An area of stone to the left of the entrance has collapsed, revealing decayed embedded timbers (photo 18).
- The south east gable wall is generally straight and vertical, but an area of stone masonry at the south corner shows severe bulging and cracking (photo 19).
- The rear walls to both barn and shippon are generally straight and vertical. The timber lintels above the rear wagon entrance show signs of severe decay due to insect infestation (photo 20).
- The north west gable wall is generally straight and vertical. There is a vertical crack at the north corner, at the inner edge of the quoin stones (photo 21).

Outbuildings

- Both outbuildings are in a state of extreme disrepair, with missing or partially collapsed roofs and leaning stone walls (photos 22 & 23).

4.0 CONCLUSIONS AND RECOMMENDATIONS

The original oak purlins and roof trusses show signs of advanced decay due to insect infestation and wet rot. The two more modern sawn timber trusses appeared to be in reasonable condition when viewed from ground level, but some decay may be present at the outer ends where they rest on the solid stone walls.

The four main external walls are generally straight and vertical. The vertical cracking noted, mainly on the internal faces, is due to thermal and moisture movement of the poorly bonded stonework. At the south east gable, the internal wall is not bonded to the external wall, allowing separation to occur. Localised collapse on the front wall is due to decayed embedded timbers, and the bulging at the south corner most likely due to thermal movement, delamination of the outer stone leaf from the rubble core and lack of connection to internal buttressing walls or floors. No significant foundation movement was noted.

The barn is suitable for conversion to residential use. Its robustness will be improved by tying the external walls to new internal blockwork lining walls and to a new first floor. The existing foundations may be shallow and will need to be underpinned prior to reduction in levels to construct a new insulated ground floor slab.

The outbuildings could be re-constructed. Damaged or badly leaning walls would need to be taken down and rebuilt.

The following repairs will be required as part of the refurbishment and conversion process:

- The barn should be re-roofed, complete with new roof trusses and purlins. It may be possible to re-use some rafters and the two more modern roof trusses, subject to detailed inspection and evaluation.
- The loft floors are severely decayed and not suitable for re-use. They should be removed.
- Cracks in the stone walls should be stitched using stainless steel helical bars epoxy-grouted into the stone bedjoints, or at corners, drilled and grouted into the stones. Surface-fixed straps could be used internally, in areas where new lining walls will be provided.

- Internal walls that are unbonded to external walls should be tied with stainless steel bars, drilled from the outside and epoxy grouted to the stone.
- The damaged masonry at the south corner should be taken down and re-built.
- Decayed timber lintels and bonding timbers should be removed and replaced with new pre-cast concrete items.
- Loose and partially collapsed areas of masonry should be consolidated by local re-building.

APPENDIX A

PHOTOGRAPHS



Photo 1 – View of front of barn from south



Photo 2 – View barn from north west



Photo 3 – View of barn from east



Photo 4 – Internal view, looking north west



Photo 5 – Internal view – looking south east



Photo 6 – Cattle stalls below main hay loft



Photo 7 – Timber loft floor (front)



Photo 8 – Slipped slates and battens



Photo 9 – Twisted purlins



Photo 10 – Decayed purlin



Photo 11 – Oak roof trusses



Photo 12 – Decayed roof truss



Photo 13 – Vertical cracking – north west gable wall



Photo 14 – Vertical cracking – north west corner



Photo 15 –Vertical cracking – south east corner



Photo 16 – Vertical cracking and separation



Photo 17 – Front wall – decayed lintel



Photo 18 – Front wall missing stones



Photo 19 – South corner – cracked and bulging stone



Photo 20 – Rear wall – decayed lintel

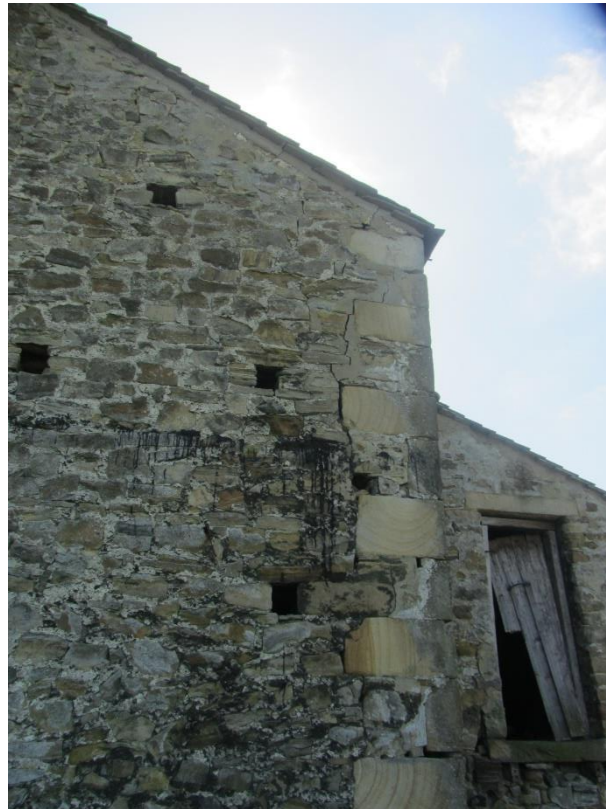


Photo 21 –North west corner – vertical cracking



Photo 22 – Outbuilding to south east



Photo 23 – Outbuilding to south west