



Paul Waite Associates

Consulting Civil, Structural & Geo-Environmental Engineers

Structural Report

Project:

Old Sawley Grange,
Sawley, Nr Clitheroe.

Report Ref:

21073-PWA-00-XX-RP-S-1000.A01

Prepared For:

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Date:

October 2021

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1. Brief

- 1.1. This report is confined to an inspection of an agricultural building located at Old Sawley Grange, Sawley.
- 1.2. Whilst we will use all reasonable skill and care in preparing this report, it should be appreciated that we cannot guarantee that the building will be free from future defects or that existing defects will not suffer further deterioration without remedial works.
- 1.3. The purpose of this report is to comment on the structural condition of the building and its suitability for residential conversion.

2. Unexposed Parts

- 2.1. Internal inspection is made within the limits of ready accessibility, and it is not normal practice to expose foundations, encased beams or give detailed inspections to the roof timbers.
- 2.2. Inspection externally of some of the lower portions of the blockwork walls was not possible due to the large amount of overgrown vegetation, particularly to the western and southern elevations of the building. External inspection to the western side of the building was not possible.

3. Method Inspection

- 3.1. External and internal inspection of the agricultural building has been carried out from ground level. This means that parts of the structure, such as the roof members could not be inspected in detail and we cannot confirm that they are free from defect. Access was possible internally into all the stables.

4. Disclosure to a Third Party

- 4.1. This report may not be relied upon by a third party for any purpose without written consent of this practice. Furthermore, this report has been prepared and issued specifically for the benefit of the addressee and no responsibility will be extended to any third party for the whole or any part of its content.

5. Description of the Site

- 5.1. The agricultural building is located off a track leading directly off the A59.
- 5.2. The building is a detached, single storey, robust agricultural building.
- 5.3. The building is constructed of single skin concrete 215mm hollow blockwork.
- 5.4. To the eastern and western elevations, the blockwork is only 7 courses high and above this is Yorkshire board cladding up to eaves level.
- 5.5. The roof is composed of steel rafters, with timber purlins spanning between them and it is covered in what appears to be a corrugated cement sheet. It is not known if this contains asbestos.
- 5.6. The roof is a split height monopitch roof (Photo 2), the western portion being the higher of the two.
- 5.7. The rafters take support onto a single line of steel columns in the middle of the building. On the same line as the columns, a single skin blockwork wall has been constructed to around half the total height of the steel columns.
- 5.8. At roughly midspan of the rafters on the western elevation, the rafter span is broken by another line of steel columns.
- 5.9. The rafters are picked up at ends on
- 5.10. The floor slab is a cast insitu concrete floor slab with cubicles. There are slurry pits to the north of the building beneath the floor slab level.
- 5.11. The door openings are located on the north and south elevation. There are no openings to the eastern and western elevations.

6. Inspection of the Site

- 6.1. The building is in an average structural condition considering its nature of use.
- 6.2. All blockwork walls appear mostly plumb.
- 6.3. There is some cracking noted to the north elevation, above the door opening to the left hand side (Photo 1). This appears to emanating from where the rafters have been built into the wall. This can also be seen internally in the same location.
- 6.4. Above the right hand door opening on the north elevation, some of the blockwork is crumbling slightly around where a timber purlin protrudes through the wall (Photo 16).
- 6.5. The timber purlins are all exposed along the north elevation as they have been placed through the full thickness of the blockwork wall.
- 6.6. The steel lintels above the door openings on the north elevation are also fully exposed, and these are showing signs of rusting. However there does not appear to be any obvious loss of material or over deflection at present. Internally, the rusting appears more progressive (Photo 7).
- 6.7. To the eastern elevation, there is a missing block near to the northern corner which has been filled with an animal feed back presumably to prevent weather ingress. Above this, another block has become loose. There is also a loose block near to the eaves line which appears to have been more recently re mortared however there is a gap between this block and the wall plate (Photos 3 & 9).
- 6.8. It was not possible to inspect the lower half of the eastern elevation, however it does look like the wall may retain some ground.
- 6.9. There is a missing downpipe on the eastern elevation.
- 6.10. To the south elevation, the door lintel composed of steel is also showing signs of rusting. This was also apparent internally (Photo 5).
- 6.11. There is roof flashing missing to the western side of the south elevation (Photo 6).
- 6.12. The timber purlins are also exposed on the south elevation.
- 6.13. Internally, to the north elevation, the ends of the timber purlins appear quite wet and some are starting to decay. These purlins are strapped to the inside face of the blockwork. This is the same for the south elevation of the building and the purlins appear to be in a similar condition.
- 6.14. To the eastern internal face of the blockwork, there is some cracking mainly towards the top course of the wall.

- 6.15. It was noted that where the steel rafter sit on the blockwork piers to the eastern wall, they are not always located centrally to the piers.
- 6.16. The steel rafters are showing signs of rusting, which will have been caused by water ingress and exposure to freezing weather conditions (Photo 10).
- 6.17. The timber purlins within the building have been bolted to the steel rafters using steel plates.
- 6.18. There are visible signs of deflection of the timber purlins supporting the roof (Photo 18).
- 6.19. To the western side of the building internally, the roof is damaged at eaves level where sections of the roof are missing and there are also damaged roof lights visible (Photos 12 & 13).
- 6.20. There is a tree growing out of one of the feed passages (Photo 8) to the western side of the building and ivy is also growing in this portion of the building.
- 6.21. The patterns on the floor slab suggest there has been some water ingress to the western side.
- 6.22. The Yorkshire boarding to the western side of the building is very wet to touch (Photo 15) and would best be described as saturated.
- 6.23. To the internal face of the south elevation, there is diagonal cracking in the blockwork to the right hand side. There is also a block which has cracked within the same area (Photo 17).
- 6.24. To the south eastern area of the building, cracking was noted in the floor slab to one of the cubicles (Photo 11).
- 6.25. The central wall within the building is showing signs of dilapidation. Whilst the wall is mainly plumb, there are some missing blocks and there are various places where the top course blockwork has become loose.
- 6.26. The columns throughout the building are showing signs of rusting and peeling.

7. Recommendations

- 7.1. As part of the proposal for residential refurbishment, the roof cladding should be removed and advice should be sought from an asbestos specialist as to whether the sheets contain any dangerous material.
- 7.2. The blockwork walls are in generally good condition, any loose block or missing mortar should be replaced.

- 7.3. Whilst there are only a few examples of cracking within the building, most of the cracking appears near the bearing of structural members or near the building corners. This may suggest that the load from the members has not been adequately distributed by a padstone or that there is currently a lack of ties within the building. An Engineer can advise on suitable methods of tying the building within a design phase. Cracking can indicate settlement has occurred in a foundation either immediately after construction or over time and we can further advise on a monitoring period dependent on the final scheme.
- 7.4. Subject to finalised proposals, we would recommend that a core of the slab is drilled to understand the thickness/type of the existing slab and therefore allow loading capacities to be calculated.
- 7.5. Specialist advice should be sought for the remediation of the former slurry pits during the course of conversion works.
- 7.6. Dependent on the final approved scheme, a further appraisal should be undertaken on the condition of the steel frame.
- 7.7. A timber specialist should be appointed to inspect the timber purlins and advise on reuse. This will also be dependent on a finalised scheme with regards to spans and loadings.
- 7.8. We would recommend that a blockwork liner wall is installed to allow for insulation to be installed and so that any structural members bearing onto the external walls can bear onto the inside lead of blockwork preventing them from being exposed. We would also recommend that trial pits are dug to the side of the existing footings to understand if they can take any additional load.
- 7.9. Vegetation should be cleared from the sides of the building we were unable to fully inspect so it can be verified whether the blockwork walls are retaining any land to these sides. The proposed future levels should if possible be designed so that the external walls do not retain any land, otherwise a new retaining wall may need to be constructed.

8. Conclusion

- 8.1 The building is in a fairly good structural condition considering its usage as an agricultural shed where cattle have been previously housed. The concrete floor slab and block liner walls make it a robust structure and whilst we have noted defects within the building, we would not consider they pose any serious structural threat to the robustness of the building. Addressing these defects as part of the residential conversion scheme will only add longevity to the building and prevent more serious deterioration of the structure in future.

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Appendix A

Site Photographs



Photo 1: Cracking to North Elevation of the Agricultural Building



Photo 2: North Elevation of the Agricultural Building showing split level roof



Photo 3: Eastern Elevation of the Agricultural Building showing missing block, localised cracking and loose blocks.



Photo 4: Eastern Elevation of the Agricultural Building showing Largely overgrown vegetation.



Photo 5: Southern Elevation of the Agricultural Building showing steel lintel rusting.



Photo 6: Missing flashing from Southern Elevation.



Photo 7: Rusting lintel on internal face of northern elevation



Photo 8: Tree growing in feed passage on western side of building



Photo 9: Diagonal cracking/missing blockwork on internal eastern elevation of building



Photo 10: Section of roof sheeting missing and ivy growing within the building.



Photo 11: Broken roof light.



Photo 12: Timber purlins showing signs of water damage.



Photo 13: Yorkshire Boarding saturated with water to western side of building.



Photo 14: Ends of timber purlins fully exposed on gables of buildings.

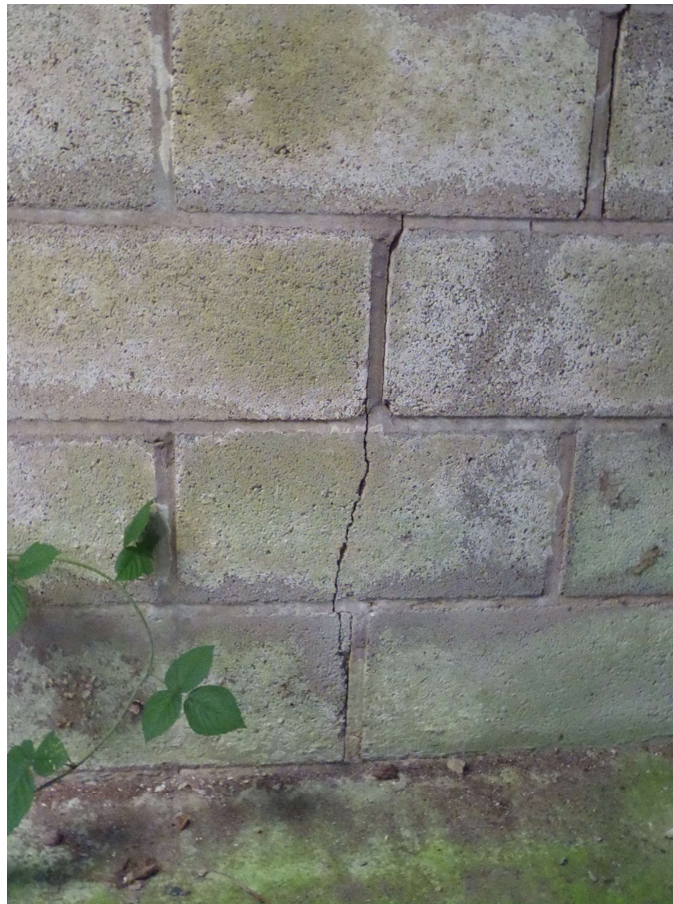


Photo 15: Cracking in blockwork and a split block on south elevation.

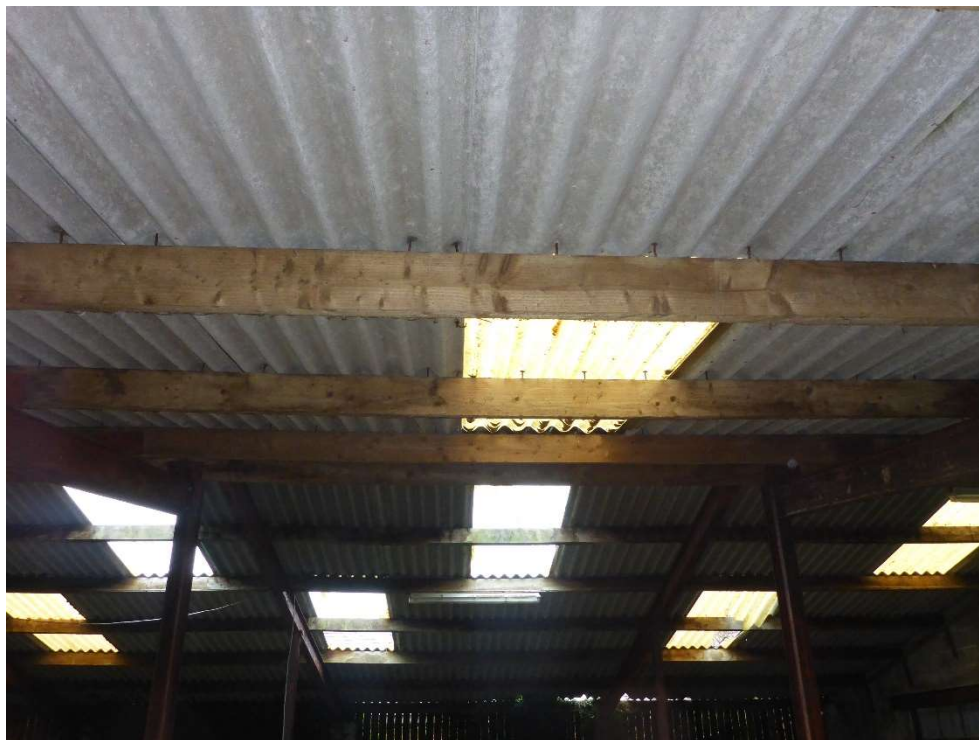


Photo 16: Timber purlins.

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Site Location Plan

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