

Messrs N and S Ostler

Existing Barns

at

**Bridge Farm
Holbeach Road
Spalding
PE12 6JP**

**Visual Structural Appraisal
Report for Proposed Conversion
to Residential Dwelling**

Report No: **5557 / 01**

Issue: **01**

Survey Date: **3 December 2021**

By: **Mr P A Hage**
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1. Introduction

- 1.1 Siddle Grimley Hage (SGH) was instructed by Mr Charles Hall of Robert Doughty Consultancy (RDC) on behalf of Messrs N and O Ostler (the client) to undertake a visual structural appraisal of the existing Barns at Bridge Farm, Holbeach Road, Spalding, PE12 6JP (the property).
- 1.2 The client is considering conversion of the barns into a residential dwelling. The purpose of the visual structural inspection was to advise on the suitability of the structure for conversion, to identify any structural defects which require remedial works as part of the conversion and any items of structure which will require replacement and/or further investigation.
- 1.3 We were provided with RDC drawings 1490-1_PL_PL01, PL02 and EL01 which identified the barns to be retained and those which are proposed for demolition. This report only covers those barns which are to be retained and converted.
- 1.4 The client has advised us that the building will be converted to a single storey dwelling as there is a requirement to increase the ground floor level by 1m due to flood risk.
- 1.5 The barns are currently used for storage and are partially unlit. We have not moved any large items/stored goods. We have not inspected those parts of the property, which were covered or unexposed and are therefore unable to report that any such part of the building was free from defect.
- 1.6 Details within this report specifically exclude items generally considered to be non-structural, including condition of finishes, etc. No testing of materials or monitoring or long-term investigation has been undertaken.
- 1.7 No in-depth investigations of the local ground conditions or services have been made and we have no direct knowledge of the history of the property. Due to current limitation on access foundations have not been exposed, and we are unable to comment on their type and depth at this time.
- 1.8 The visual appraisal was made from ground level, with the aid of binoculars.
- 1.9 The property was inspected by a Chartered Structural Engineer on 3 December 2021. Weather was cold 6°C with overcast sky and light rain.
- 1.10 This report has been prepared on the basis of the visual observations made at the time of the inspection, supplemented by a review of the above documents.
- 1.11 This report is issued in accordance with our standard limitations of inspection set out in Appendix C. This report has been prepared on behalf of Messrs N and O Ostler for the purposes stated above. This report shall not be used for any other purposes and should not be relied upon by any other party and no liability will be accepted for such reliance.
- 1.12 The property to be converted is approximately rectangular on plan, with the long sides facing north-west and south-east, with the latter facing the public highway. Observations assume that the reader is standing facing the element being inspected.

2. General Description

- 2.1 The structures proposed for conversion are identified in *Appendix A*. They comprise of three linked masonry barns which are approximately rectangular on plan. For ease of identification the central barn is referenced 'Barn A'. 'Barn B' is attached to the south-west gable of 'Barn A' and it is the same height and width, but also has a lean-to which extends out on the north-west side. 'Barn C' is joined to the north-east gable of 'Barn A'. It is slightly narrower and lower than 'Barn A'.
- 2.2 The lean-to on the north-west side of 'Barn B' continues along the side of 'Barn A'. This element of structure is proposed for demolition and is excluded from the appraisal.
- 2.3 A lower single story building is also attached to the south-east side of 'Barn B'. This building will not form part of the conversion and has not been assessed.
- 2.4 There is a substantial steel portal framed building adjacent to the south-east elevation of the brick barns. This is not directly connected to the other barns and is proposed for demolition. It is excluded from the appraisal.
- 2.5 We have been unable to obtain exact dates of construction, but from research of historic maps it would appear that 'Barn A', the original 'Barn B' and the return building forming an 'L' on plan were constructed before 1887. A lean-to was added to both sides of Barn 'A' prior to 1932. Barn 'C' was added prior to 1951.
- 2.6 From the site inspection the extent of the original walls and outline of the roof of 'Barn B' are visible. It appears that the building was extended vertically and the lean-to added to tie in with the 'Barn A'. The date of this work is unknown, but we understand from the client that it was done prior to 1950.

3. Overview Observations

3.1 Barn A

- 3.1.1 Walls are constructed from standard format clay brickwork in 'English Bond'. The walls are generally 370mm thick and have internal brick piers either side of the large door opening on the long sides.
- 3.1.2 The large door opening within the walls are formed with brick arches. One has been partially infilled.
- 3.1.3 The barn walls were seen to be in good condition given the age of the structure. Walls were found to be plumb and bed joints were generally level.
- 3.1.4 The floor is constructed from in-situ concrete which has a number of changes in level. Most of the floor was obscured by the stored equipment. The surface condition appears to be fair.

- 3.1.5 The roof comprises of three timber king post roof trusses, mid height purlin and ridge beam supporting intermediate rafters. The roof is covered with corrugated roof sheeting which is supported via timber counter battens spanning between the rafters (Plate 1). Given the age and appearance of the roof sheeting, it is likely that it is made from asbestos cement. (This should be confirmed).
- 3.1.6 There was evidence of undulations to the external roof sheeting suggesting possible sag to the counter battens.
- 3.1.7 Generally the roof appeared to be in good structural condition and appears to be supporting the current loads adequately. Structural design checks will be required for the counter battens, rafters and purlins to confirm their adequacy.

3.2 Barn B

- 3.2.1 The south-east and south-west walls of the barn up to 2.4m above ground level appear to be the original barn walls, which are constructed from standard format clay brickwork 215mm thick in 'Common Bond' with brick headers every fourth course.
- 3.2.2 The south-east and south-west walls appear to have been extended vertically to match the wall height and roof pitch of the central 'Barn A' (Plate 2).
- 3.2.3 The barn has also been extended outward along the north-west elevation, with a lean-to element which ties with that to the side of 'Barn A'. From the appearance of the masonry it would appear that this work was carried out at the same time that the building height was increased.
- 3.2.4 A number of defects were seen to the masonry which are identified in 'Detailed Observations'.
- 3.2.5 The floor is constructed from in-situ concrete. The floor appeared to be generally flat with evidence of historic cracking and patching. There was also evidence of an infilled pit. The concrete floor to the lean-to appears to be newer.
- 3.2.6 The roof comprises of cement board (considered likely to be asbestos), supported by steel purlins which are supported by a central truss fabricated from steel angles (Plate 3).
- 3.2.7 The lean-to roof is of a similar construction.
- 3.2.8 A steel beam supports the truss and lean-to roof on the line of the main barn wall which has been removed.

3.3 Barn C

- 3.3.1 The walls are constructed from standard format clay brickwork in 'English Bond' which is 215mm thick. (Plate 4). The walls were found to be plumb with level bed joints.
- 3.3.2 There is an internal wall across the barn mid-way along its length. The cross wall has a large unsupported opening (See 5.3).
- 3.3.3 The floor is constructed from in-situ concrete throughout.

- 3.3.4 A section of ramped floor and a trough (dated 1973) has been formed adjacent to the gable wall of 'Barn A' (Plate 5). We understand this was to allow grain to be transferred.
- 3.3.5 The floors were in fair condition, but we do not know the floor thickness or details of the formation.
- 3.3.6 The roof structure comprises of widely spaced timber rafters supporting four timber purlins and a ridge beam. A number of the rafters have a raised horizontal tie, forming trusses (Plate 6).

4 Defect Specific Observations

4.1 Barn A

- 4.1.1 External gable wall at junction with 'Barn C' ridge- Loose brickwork (Plate 7).
Remove and repoint.

4.2 Barn B

- 4.2.1 Gable wall inside - Bottom of brick pier removed (Plate 8).
Recommend pier is reconstructed immediately
New method of lateral restraint for gable wall required as pier alone is insufficient for residential property.
- 4.2.2 Gable wall - Vertical crack in new masonry in line with end of original wall. New and original walls are not toothed, unknown if ties have been installed (Plate 9).
If lean-to section is to be retained, provide crack stitching across vertical butt joint. Replace fractured bricks and stitch bed joints.
- 4.2.3 Gable wall, low level - Brickwork mortar joints weathered back from face (Plate 10).
Rake out mortar joints and point with lime mortar
- 4.2.4 Side wall Inside – Vertical crack extends from the top of the original wall upwards to eaves level where it is estimated to be 5mm wide (Plate 11). Crack could also be seen externally in line with the adjoining roof ridge (Plate 12).
Remove fractured bricks; install Heli-Bar crack stitching. Final details are to be developed.

4.3 Barn C

- 4.3.1 The walls above the large unsupported opening within the cross wall of 'Barn C' is at risk of collapse (Plate 14). **Temporary props should be installed.**

5 Assessment of the Current Condition

- 5.1 We consider the property to be in good structural condition given the buildings age.
- 5.2 The roof to 'Barn C' is unlikely to be proven structurally adequate to current codes but appears to be suitable for the current agricultural use. This should be periodically inspected to look for signs of movement or distress, particularly after heavy snow or high winds.
- 5.3 The walls above the large unsupported opening within the cross wall of 'Barn C' (Plate 14) is at risk of collapse. **Temporary props should be installed.**
- 5.4 The missing section of masonry pier to the south-west gable wall of 'Barn B' should be reinstated.

6 Assessment of the Structure for Conversion to a Dwelling

- 6.1 The visual inspection did not identify evidence of significant movement to the barns structure, to indicate subsidence or ongoing movement. Structural defects which were seen appear to be historic and can be rectified.
- 6.2 In addition to the local structural defects identified requiring actions within *Section 4* the following will need to be considered as part of the conversion scheme:
- 6.3 Roofs
 - 6.3.1 The timber roof structure to 'Barn A' appears to be in good order; it should be possible to retain, but this may require some strengthening. A design calculation check will be required.
 - 6.3.2 The steel roof structure to 'Barn B' is unlikely to support the loads from a traditional tiled replacement roof. We suggest this is replaced. The steel beam supporting the roof will require calculation to determine if it is adequate for the new roof loadings.
 - 6.3.3 The timber roof structure to 'Barn C' is not considered adequate to support a tiled roof. We suggest allowance is made to replace the roof structure unless a suitable strengthening scheme is designed.
 - 6.3.4 Any timberwork which is to be retained should be inspected by a specialist and treated as necessary
- 6.4 Walls
 - 6.4.1 The gable wall panel to 'Barn B' is not considered to have adequate lateral restraint to resist design wind loads. Nor is the small masonry pier deemed adequate. A scheme to strengthen the panel and to provide additional support will be required as part of the conversion works.

6.5 Floors

- 6.5.1 The concrete floors thickness and formation strata are unknown, but visually they do not appear to have suffered significant movement or distress. A site check on the floor construction should be undertaken to confirm their thickness.
- 6.5.2 There is a number of ways to lift the floor level by 1m. If the floor needs to be voided then sleeper walls and beam and block flooring could be adopted. The walls may be built off the slab (if determined suitable) or off new strip footings. If there is no requirement for voids then Cordek Filcor with in-situ concrete slab over would be a suitable solution. Either solution would be subject to detailed design.
- 6.5.3 There are various changes in level, slopes and pits within the existing floor slabs. Consideration on how these will be dealt with will need to be considered at the detailed design stage.

6.6 Foundations

- 6.6.1 Foundations have not been exposed and we have no knowledge of the founding strata or ground conditions. Whilst there is no evidence of significant movement and the future foundation loads are not expected to greatly increase, there may still be a requirement for underpinning if the existing foundations do not meet the minimum depth of 450mm for a non-shrinkable soil and 900mm for a shrinkable soil. The presence of trees can further increase minimum foundations depths.
- 6.6.2 A foundation inspection will be required to clarify foundation requirements.

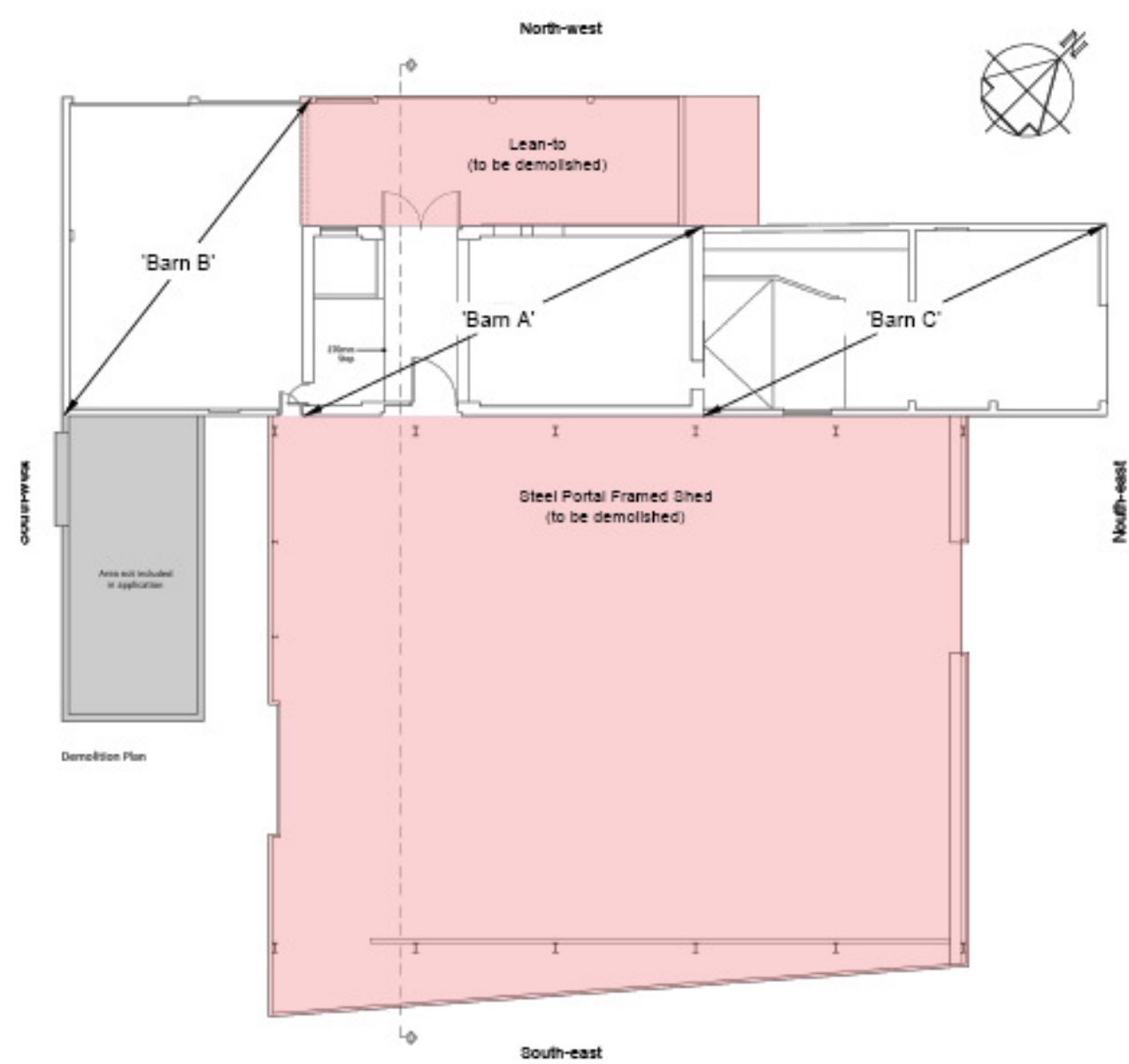
7 Conclusions

- 7.1 Based on our visual structural inspection we consider the barn to be suitable for conversion to a residential dwelling' subject to the remedial works identified within section 4 being undertaken and the points within section 6 being addressed.

Existing Barns at Bridge Farm, Holbeach Road, Spalding, PE12 6JP

Appendix A

Building Plan – Marked-up extract of RDC drawing 1490-1_PL_PL02



Appendix B

Photographs



Plate 1



Plate 2



Plate 3



Plate 4



Plate 5



Plate 6

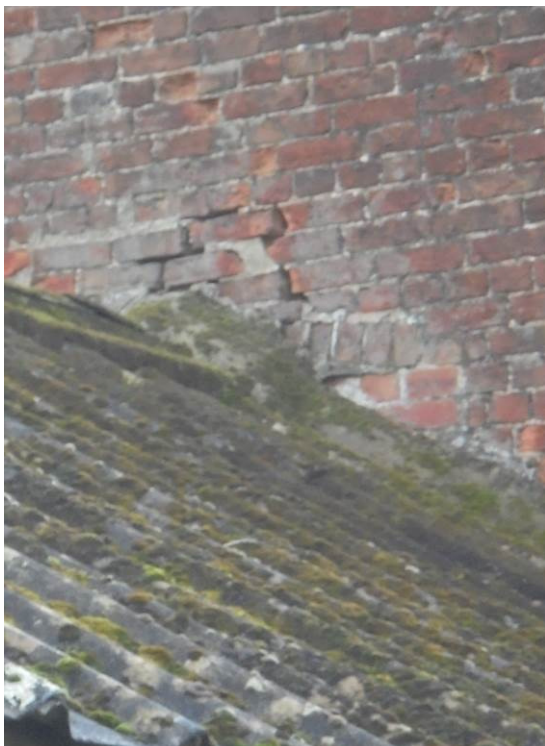


Plate 7



Plate 8



Plate 9

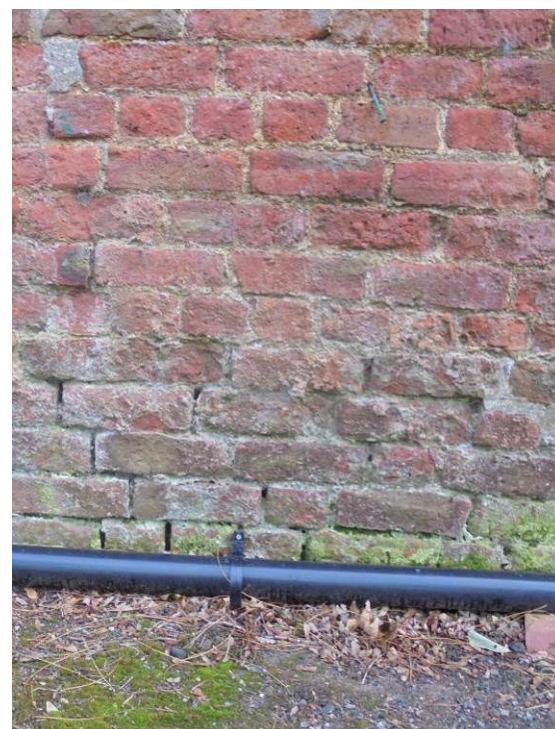


Plate 10

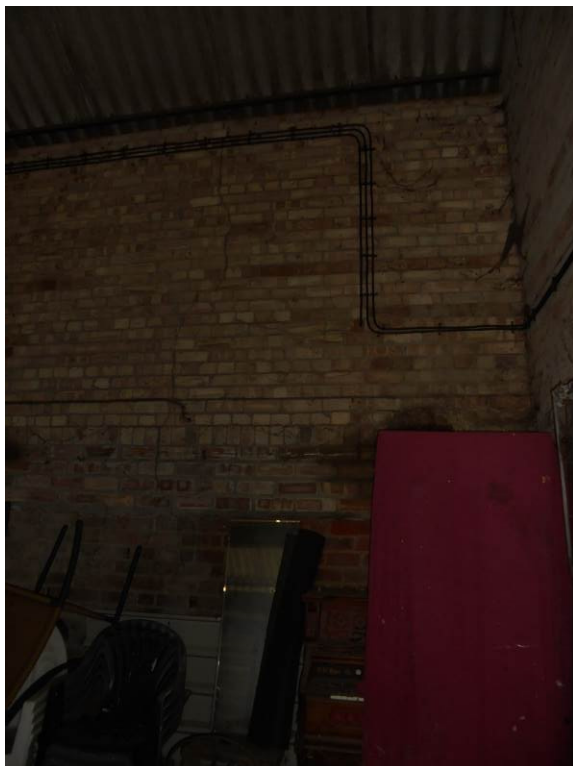


Plate 11



Plate 12



Plate 14

Appendix C

Inspection Limitations

1. Details within this report are confined to structural aspects as detailed in item 1.1 and 1.2. This report does not constitute a full building survey and specifically excludes items generally considered in a surveyors report such as those listed below:
 - The decorative condition of the property.
 - The condition of the property with respect to dampness, dry rot, timber infestation and the like, unless structurally relevant.
 - The condition of services.
 - The condition of roof, floor, wall and ceiling coverings, including plaster, panelling or other decorative features unless there are obvious signs of damage or disruption of structural significance.
 - The location of the property, its value and other aspects such as searches and boundaries, etc. We have not inspected separate garages and outbuildings, unless forming a part of our brief.
 - The use of or presence of hazardous materials in the structure, such as asbestos.
2. External observations are from ground level only, aided by binoculars where necessary. No testing of materials, monitoring, breaking out or long-term investigation has been undertaken. We have not moved any large items of furniture or personal effects or lifted any fitted floor coverings. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are, therefore, unable to report that any such part of the property is free from defect.
3. The report has been prepared upon the basis of a single visual inspection of the property and we have not, to date, undertaken any monitoring, long-term investigation or testing of the materials of construction. Therefore, we cannot categorically state that future movement will not occur, particularly should some unforeseen event occur or our recommendations are not implemented within a reasonable period of time.
4. No in-depth investigations of the locality, ground conditions or services have been made. We have also not made any inquiries of the Local Authority or other bodies or agencies and have no direct knowledge of the history of the property. Within the scope of this report, we have not made any investigations to determine whether the site has suffered from any uses which could lead to contamination.
5. Recommendations are of a general descriptive nature and should not be read as a detailed schedule of works.