

paul snape consulting

Mr M Hayhurst

**Lea Barn, Four Acre Lane, Thornley with
Wheatley , Lancashire, PR3 2TD**

**Structural Condition Survey for Conversion to
Dwelling**



January 2020

Paul Snape Consulting
The Granary
Woodfold Farm
Crombleholme Fold
Goosnargh
Preston PR3 2ES



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1.0 Terms of reference

Paul Snape was appointed by Mr M Hayhurst to carry out a visual structural inspection and produce a structural condition survey report for the existing barn adjacent to 4 Acre Lane, close to the junction with Longridge Road, Thornley with Wheatley. The location is indicated on the plan included in Appendix A.

2.0 Purpose of the survey

It is proposed to convert the barn to form a new dwelling. The proposals are currently being prepared by PGB Architectural Services Ltd and they have provided details of the existing layout which are included in Appendix A, together with the proposed layout. The visual structural survey is required to confirm the current condition of the buildings and to assess their suitability for conversion. There are photographic records of the building in Appendix B and these are referenced throughout the report.

The drainage systems of the building have not been inspected. These will be renewed as part of the proposals and detailed for Building Regulation purposes. The barn is not currently served by water, electrical or gas supplies.

We have not inspected parts of the structure that are covered, unexposed or inaccessible. Hence, we are unable to report if such parts of the property are free from defect.

Our inspection was undertaken on 13th December 2019 at which time the weather was dry and overcast.

The survey was undertaken by a Chartered Civil Engineer, Paul Snape BEng (Hons) CEng MICE

3.0 Description of Building

The barn is a sandstone, random stone building with a steel sheeted, pitched timber roof and a mixed earth/concrete/flagged floor. There is first floor hay loft at the western end which is timber boarded, with steel and timber beam supports. The building sits adjacent to Four Acre Lane with access directly onto the highway and is surrounded by an open field of grassland. The existing layout is indicated on the drawings in Appendix A.

4.0 External Survey

North Elevation (Photos 1 to 6)

This elevation is constructed as a 450mm random rubble wall in sandstone. The wall is generally plumb but a slight bow is present to the mid-section. The pointing to the wall is in reasonable condition for an agricultural building. There is no sign of ongoing movement to the main wall of this elevation. There are 2 existing openings to the main wall, the main barn door

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and a smaller access door at the western end. It is proposed to retain these. The large barn door opening has had some slight movement to the shallow stone arch as can be seen on photo 4. The arch is made up of shaped stone pieces and a number of these have fallen slightly. However, this movement occurred some time ago and appears to have halted. The conversion will allow this arch to be repaired but it would also be acceptable to leave it in its current state. In addition, photo 5 indicates a quoin stone to the right-hand side of the barn door which has moved, probably due to being hit by a tractor. This should be moved back into place.

Photos 2 & 3 show the lean-to building to the east gable. The north elevation of this has suffered from movement and this should be re-built. The re-build will be approximately 3 to 4 m². This elevation has an existing door opening which will be retained.

West Gable (photos 7 to 12)

This elevation is a 450 mm random stone wall. The wall is plumb, reasonably well pointed and free from signs of movement. There has been some slight loss and weathering of the pointing to the lower and southern areas of the gable as can be seen in the photos. There is also some loss along the roof line (photo 8).

There are 2 existing window openings to this gable and they are both proposed to be retained with no further openings introduced. There is also an owl box above the upper window.

South Elevation (Photos 13 to 17)

The elevation is a 450 mm random stone wall. It has two existing window openings and a door which are to be retained. The wall is plumb, reasonably well pointed and free from signs of movement. Photo 17 shows damage to the existing guttering but this does not appear to have caused rain damage to the stonework.

East Gable (photos 18 to 22)

This gable wall is a 450mm random stone wall. There is a single existing opening at a high level, together with an owl box at the apex. It is proposed to retain these openings and not introduce any further openings.

The gable is for the most part in reasonable condition and is plumb. There is an area of movement/cracking just to the right of the south east corner which can be seen on photo 19. Internal inspection did not reflect this and this should be repaired externally by inspection of the founding stones and re-building or re-pointing. An allowance of 2m² of re-build should be made for this area. As with the west gable, there is some loss of pointing along the roof line (photo 22) and this has also led to some loss of stonework. An allowance of 1 m² of repair should be allowed for this.

The east gable has a single storey lean to attached with a pitched roof and 450mm random sandstone walls. This appears to have been added after construction of the main barn and has a straight joint with the main gable (photos 20 & 21). The north elevation of the lean-to has

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been discussed above but the two other elevations are in reasonable condition with no sign of ongoing movement.

Roof (Photos – External – 1, 3, 13 to 15, 17 & 18, 22 Internal – 26, 27, 29 & 37)

The main roof is corrugated steel sheeting sitting directly onto purlins only which are supported by 2 trusses. It is in reasonable condition with little sign of movement, and limited signs of rot or infestation. Photo 27 shows a detail of the king post on one of the trusses which shows some cracking and warping of the timber. The roof will be re-constructed under the proposals but existing elements may be retained subject to structural checks and treatment for rot/infestation.

5.0 Internal Survey (Photos 24 to 37)

Internal inspection of the walls generally reflected the external inspections noted above. The walls were pointed internally and lime washed. Photo 36 indicates a curved timber beam to the arch under the barn wall which provided further support to the stone arch.

The timbers to the roof and mezzanine show little or no sign of rot or infestation. The roof is to be reconstructed but some of the timbers may be re-used either structurally or cosmetically subject to design checks and inspection plus appropriate treatment by a timber specialist.

The floor of the barn is a mixture of earth sections, concrete slabs and areas of flags.

6.0 Suitability for Conversion and Method of Construction

It can be seen from the survey detailed above that this barn is in good condition with little sign of previous movement and no sign of ongoing movement. The area identified for re-build is around 7m² which is negligible in percentage terms given the size of the building. It is considered suitable for conversion to a dwelling. When converting barns, it is essential that the construction techniques and sequence are carefully considered.

PGB Architectural have indicated the construction of a new inner leaf. This may comprise of a cavity with insulation plus a block inner leaf or a backing block to the stone with a cavity and a further block inner leaf. With this technique, care must be taken as the existing walls may be founded at a shallow depth. Trial holes should be dug to ascertain the actual depth. Ground floor levels should be set as high as possible and we would recommend the use of a concrete floor slab with thickened edges along external walls and thickenings under new internal walls. The thickening can be taken down to a similar depth as the existing walls. We would recommend a minimum depth of 400mm for the thickenings. Levels lower than the existing foundations should be avoided and if this is necessary an Engineer should be consulted as underpinning may be required. The new inner leaf (and backing block if used) should be tied to the existing wall with suitable cavity and/or specialist ties.

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It is recommended that this new internal skin is in place and the ground and first floor are put in place prior to the roof being removed and reconstructed. This will add stability to the existing walls.

The architectural layout does not introduce any new openings to the external walls and the layout introduces two full height cross walls. These new internal walls will add stability to the existing structure.

The existing trusses and purlins appear to be in reasonable condition with little sign of rot or infestation. Any timber retained should be assessed by a timber specialist, with regard to rot and infestation. All retained timber should be treated against rot/infestation and an indication of residual section given for structural purposes. All retained timber to be used structurally should be checked for structural adequacy.

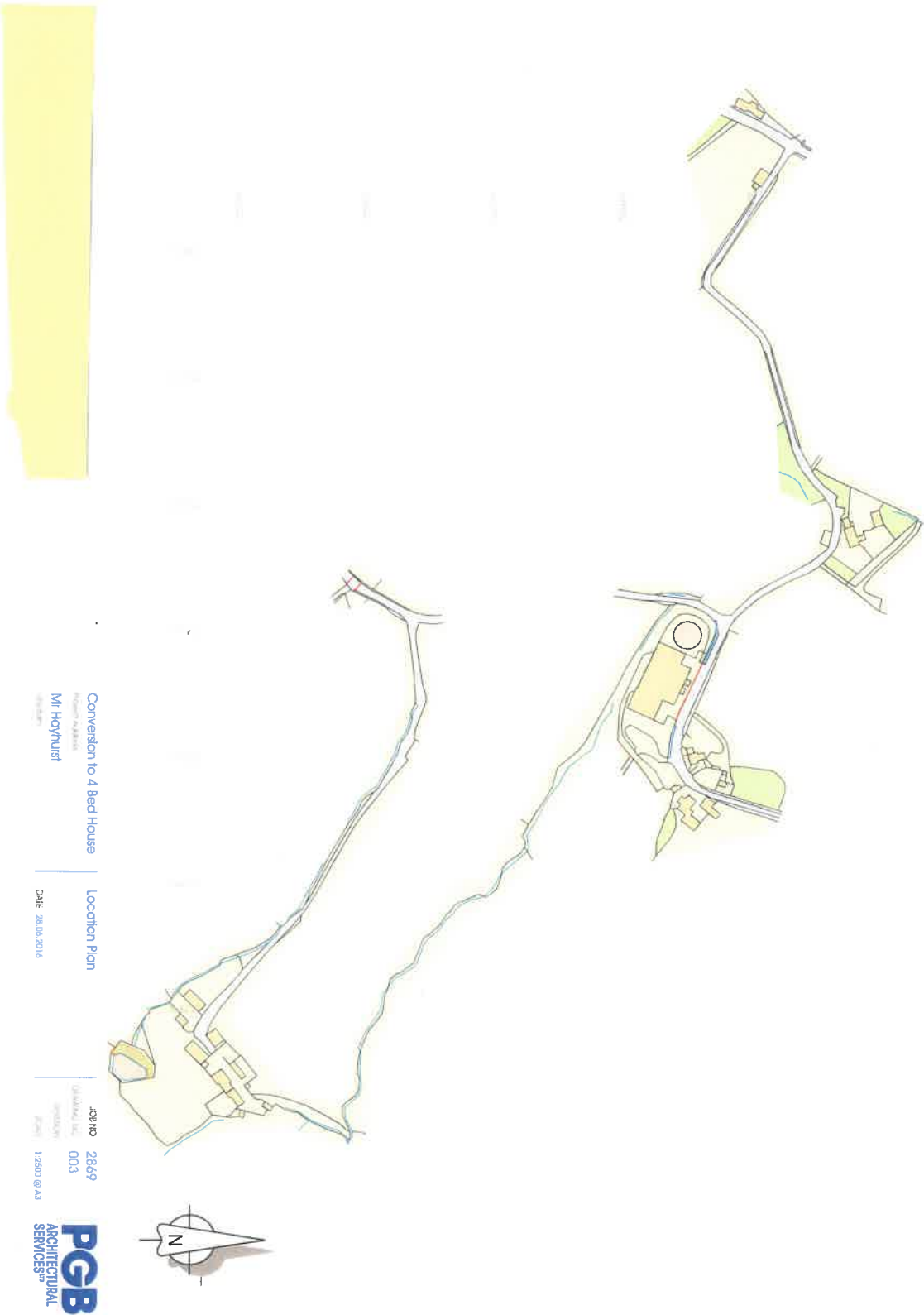
7.0 Conclusions

The barn is in a good structural condition and is considered suitable for conversion. The construction should follow the guidance set out above and a structural engineer should be consulted with regard to the final layout for Building Regulation compliance.

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Appendix A Drawings

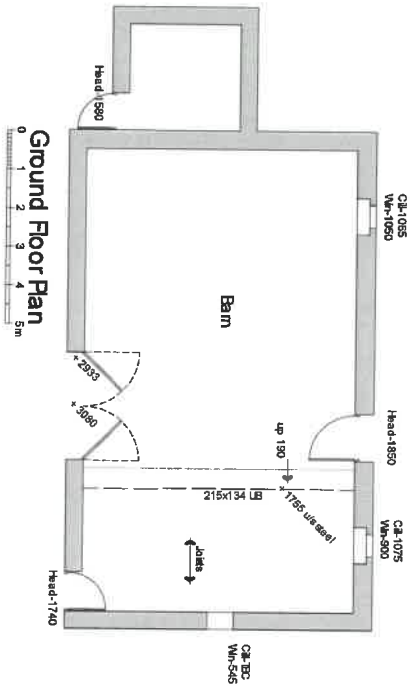
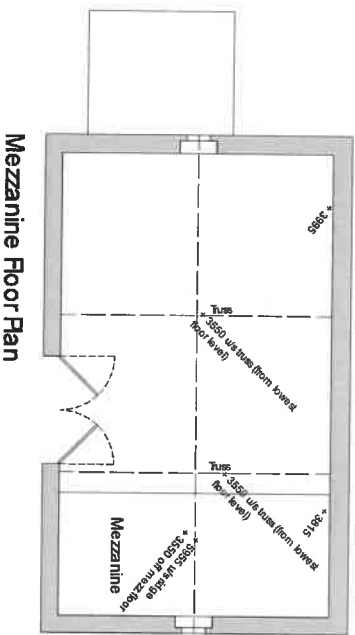
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NOTES:
1. Do not scale this drawing, use figured dimensions only. 2. The Contractor, Sub-Contractor or specialist supplier are responsible for confirming the dimensions prior to construction. 3. Any dimensional discrepancies are to be reported to the Architect immediately.

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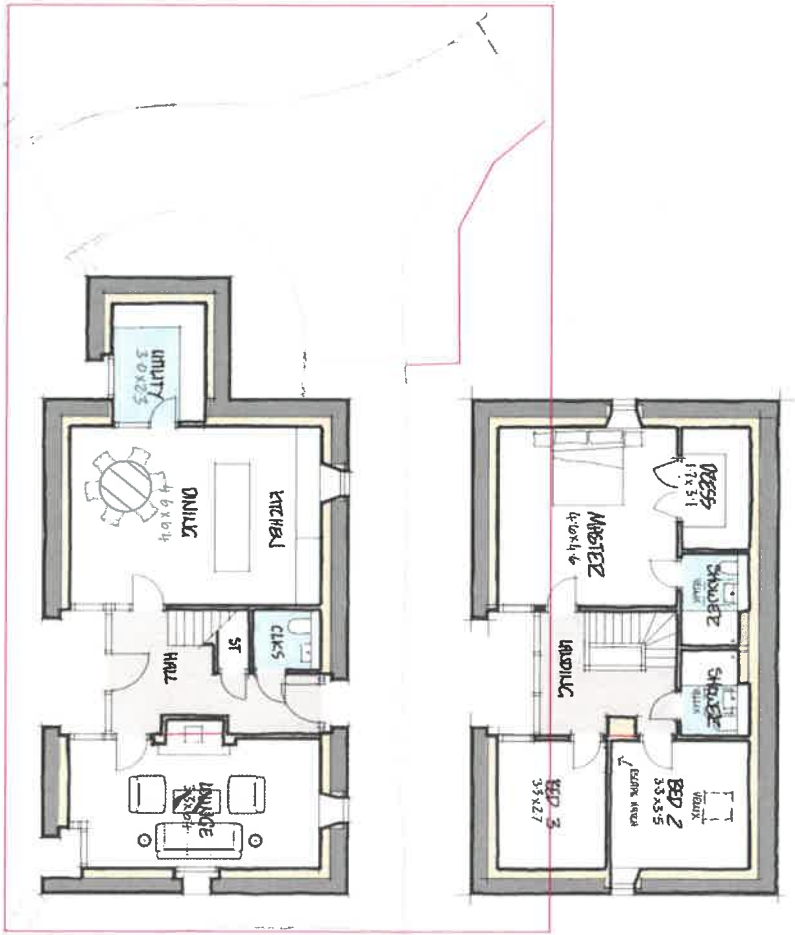
Plans As Existing
 Date: 29.10.19

JOB NO. 2869
 DRAWING NO. 01
 REVISION
 SCALE 1:100 @ A3

PGB
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SK1 Lea Barn 1:100



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Appendix B Photographs



Photo 1 - North Elevation



Photo 2 – North Elevation – Lean to



Photo 3- North Elevation – Lean to and North East Corner



Photo 4 – North Elevation - Door



Photo 5 – North Elevation – Damage at corner of Door



Photo 6 – North Elevation West Corner



Photo 7 – West gable



Photo 8 – West Gable – South End



Photo 9 – West Gable – South End



Photo 10 – West Gable – South End



Photo 11 – West Gable – Lower Window



Photo 12 – West Gable – Higher Window and Owl Box



Photo 13 – South Elevation



Photo 14 - South Elevation – West End



Photo 15 - South Elevation – mid section



Photo 16 - South Elevation – Door



Photo 17 - South Elevation – upper section with gutter



Photo 18 - East gable and Lean to



Photo 19 – east gable – Movement



Photo 20 – East gable – joint with Lean to



Photo 21 – East gable and lean to



Photo 22 – East gable Upper and roof to lean to



Photo 23 – Internal looking west



Photo 24 – Internal looking east



Photo 25 – Steel beam to loft



Photo 26 – Roof Truss



Photo 27 – Roof Truss detail



Photo 28 – Timbers to loft



Photo 29 – Truss and loft timber



Photo 30 – Rear door



Photo 31 – Main door



Photo 32 – Window to south Elevation



Photo 33 – Concrete floor



Photo 34 – Flag Floor



Photo 35 – Earth Floor



Photo 36 – Detail to barn door



Photo 37 – Roof Purlin and sheeting