Reid Jones partnership

Consulting Civil & Structural Engineers

STRUCTURAL INSPECTION

Of

STONE BARNS AT WINKLEY HALL FARM, STONYHURST, CLITHEROE

For

STANTON ANDREWS

Project No.: 11342				
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QMS ISO 9001 : 2015 REGISTERED QUALITY MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Acting on instructions from Stanton Andrews Architects, Reid Jones Partnership carried out inspections of three stone-built barn buildings at Winkley Hall Farm, Stonyhurst, Clitheroe.

Structural inspections were required to establish the general structural condition of the buildings, the structural implications of their conversion to residential use, and the repairs required during refurbishment and conversion.

Mr S John Reid BSc CEng MICE FIStructE of Reid Jones Partnership Ltd carried out the inspection on Thursday 2nd October 2025. This report details the observations made during the inspection and gives recommendations on the work required during conversion. A Key Plan is included in Appendix A and photographs in Appendix B.

The inspections were 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

For orientation purposes, reference will be made to the four compass points. 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 three barns are traditional stone-built outbuildings to the rear of Winkley Hall Farmhouse (see Key Plan in Appendix A). They date from the 1700s, or early 1800s. Apart from the Farm Office, the other buildings on the farm are modern steel-framed sheds or extensions to the older buildings in brick or concrete block.

Barn 1 is two storeys high, and most likely originally had a hay-loft which has now been removed (photos 1-4). A single-storey lean-to shippon lies to the north. The barn walls are stone and the roof is of Welsh thin slate or asbestos-cement slate, on timber sarking boards, rafters, purlins and king-post trusses. The shippon is of similar construction, but with mono-pitch timber roof trusses. The building has been extended to the east and south with modern brick, block additions with asbestos-cement sheeted roofs. A relatively modern brick-built pigsty is attached to the north wall of the shippon.

Barn 2 is a two-storey building, the upper floor of which has been removed (photos 5 & 6). It has stone walls and a roof of concrete tiles on timber rafters, purlins and queen post trusses. A relatively modern workshop with concrete block walls and an asbestos-cement sheeted roof has been added to the east.

Barn 3 is a small two-storey building, with stone walls and a roof of stone slates on timber rafters and purlins (photos 7, 8 & 9). The roof has partially collapsed and the building leans significantly.

3.0 OBSERVATIONS

Barn 1 - Internal

- The roof structure of the main part of the barn was inspected from ground level (photo 10). Some decay due to wet-rot was noted in the sarking boards and rafters near eaves level on the south side, with widespread signs of insect infestation noted elsewhere. Some purlins are excessively warped (photo 11), and most show signs of insect infestation and decay. The timber

trusses all show signs of insect infestation, with one king post significantly reduced in cross-section (photo 12). Some water staining and possible wet-rot decay was noted on the truss bottom tie beams which rest on the south wall (photo 13). Two trusses are supported on bifurcated timber posts on the north side, and both posts show signs of insect infestation (photo 14).

- The roof structure of the shippon was inspected from ground level. Widespread decay due to insect infestation was noted (photos 15 & 16).
- The south wall of the main barn is reasonably straight and vertical, but the western part shows a slight outward lean (photo 17). The west wall is reasonably straight and vertical but bulges outward at around mid-height (photo 18). No significant structural defects were noted in the east or north walls.
- Minor vertical cracking was noted in the internal walls each side of the north wagon entrance (photo 19). Decaying timber lintels in the internal and external walls has caused the stonework to crack (photo 20).

Barn 1 - External

- The north and south roof pitches are reasonably straight and true, and no excessive irregularity or sagging was noted.
- At the south west corner, the stonework is poorly bonded and a quoin has cracked (photo 21). Some distortion and irregularity can be seen towards the top of the south wall.
- There is a noticeable outward bulge in the west wall at around mid-height (photo 22).

Barn 2 - Internal

- The roof structure and the south wall have been propped by a steel scaffold structure (photo 23). The timber purlins and trusses show signs of widespread and significant insect infestation (photos 24 & 25). The timber rafters are more recent replacements.
- The first floor joists and boarding have been removed (photo 26), leaving only the original timber beams (and one newer concrete beam).
- Vertical cracks were noted on the inside face of the north wall (photo 27) and west wall (photo 28).

Barn 2 – External

- The south wall is severely distorted and leans outwards. It has been stabilised by steel scaffolding (photo 29). The upper part has been re-built and there is a horizontal step between the old and more recent masonry (photo 30). There is cracking in the wall at multiple locations and one stone lintel has cracked (photos 31 & 32).
- There are cracks in the north wall in multiple locations, and a significant outward bulge at mid-height on the west side (photos 33, 34 & 35).
- One vertical crack was noted in the east wall (photo 36). The west wall is relatively straight and vertical, but with open-jointed stonework.

Barn 3 – Internal

- The upper floor was accessed via the external stone steps. A purlin on the southern roof pitch has fractured causing localised collapse (photo 37). The roof in general shows widespread signs of decay due to insect infestation (photo 38).
- The timber first floor is badly decayed and was unsafe to access.
- The ground floor was full of farm stores an equipment and was unable to be inspected.

Barn 3 – External

- The building tilts significantly to the west, with wide cracks forming in the north and south wall (photos 7 & 8).

4.0 CONCLUSIONS AND RECOMMENDATIONS

Barn 1

The original oak purlins and roof trusses show signs of decay due to insect infestation and localised wet-rot at their bearings. The rafters and boarding are similarly decayed.

The four main external walls are generally straight and vertical, with relatively minor distortion in the upper part of the south wall and some outward bulging of the west wall at around mid-height. The barn has been constructed to a good standard and the sarking boards have increased the rigidity of the roof, holding the walls in position. Cracking noted on the inside face of the external walls and on the internal walls, has been caused mainly by thermal movement and decay of timber lintels.

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

- The sarking boards and rafters should be removed. The purlins and trusses should be de-frassed of insect decay and their bearings exposed, then they should be fully inspected and their residual strength confirmed: if found inadequate, they should be repaired and strengthened. It may be possible to re-use some rafters, subject to detailed inspection and evaluation. The sarking boards should be replaced with plywood, hidden above new ceilings.
- 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.
- Decayed timber lintels should be removed and replaced with new pre-cast concrete items.
- Loose and damaged areas of masonry should be consolidated by local re-building.

Barn 2

The original oak purlins and roof trusses show signs of severe decay due to insect infestation and localised wet-rot. The whole of the roof structure should be removed and replaced.

The east and west walls are generally straight and vertical. Cracking noted on the inside and outside faces has been caused mainly by thermal movement. These walls require only minor repairs such as pointing of the open-jointed stonework and stitching of vertical cracks.

Most of the north wall is reasonably straight and vertical, except for the upper part near the north west corner which bulges significantly. Cracks should be stitched, open joints pointed, and decayed timber lintels replaced. The bulged part should be locally rebuilt, ensuring sufficient through-thickness bonding of the stonework to prevent future delamination.

The central part of south wall, particularly above first floor level, is in extremely poor condition and would collapse in the absence of the support provided by the scaffold system. This section of the wall should be taken down and re-built, leaving those parts close to the east and west corners that are straight and vertical, which should be repaired as described below.

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

- The roof structure should be removed and replaced in its entirety.

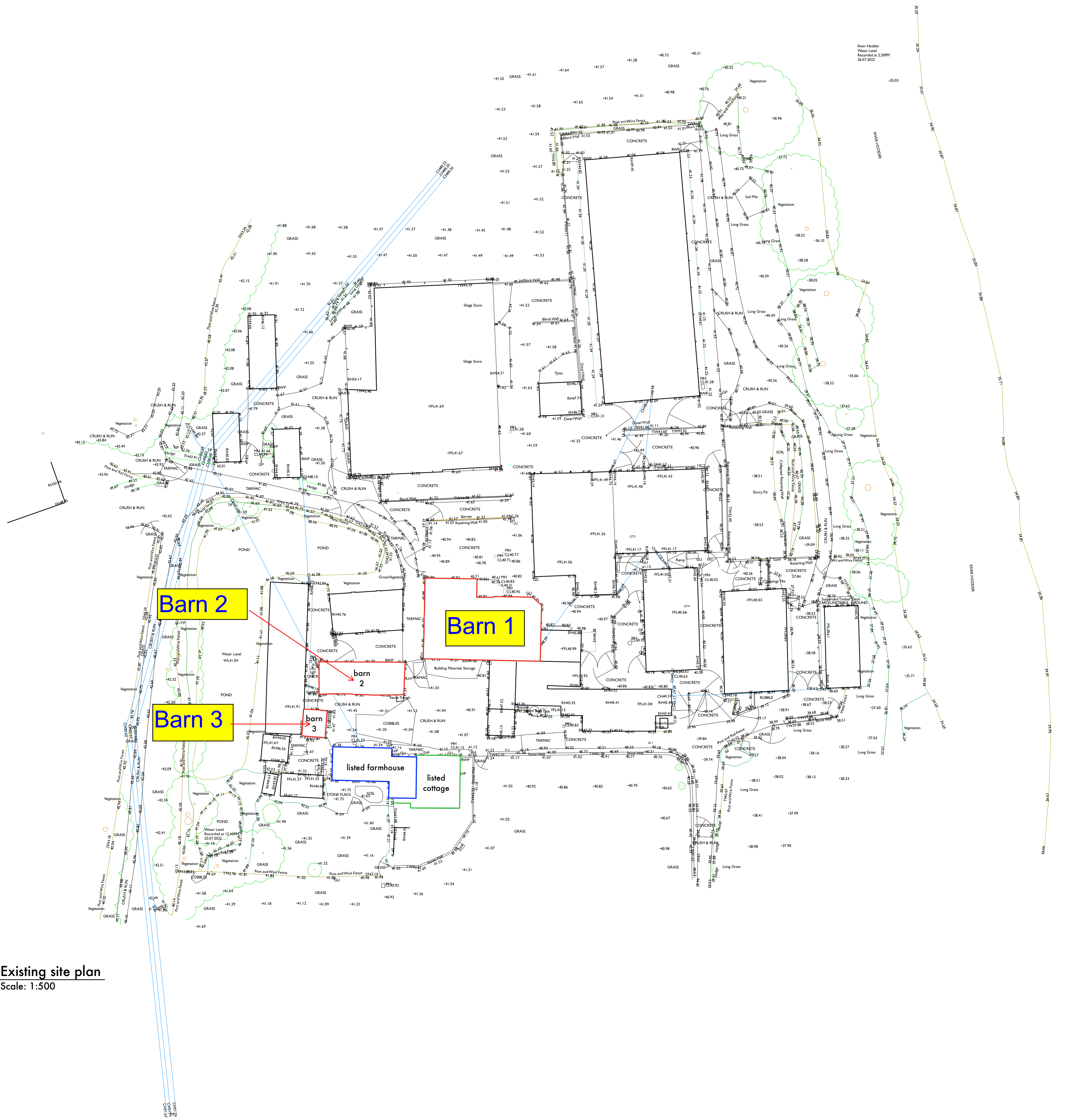
- The central part of the south wall should be rebuilt. Only parts at low level that are straight and vertical should be retained. The bulged upper part of the north wall close to the north west corner should be taken down and rebuilt.
- Cracks in the stone walls should be stitched using stainless steel 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.
- Decayed timber lintels should be removed and replaced with new pre-cast concrete items.
- Loose and damaged areas of masonry should be consolidated by local re-building and cracked stone lintels replaced.
- Parts of walls that are bulging due to inadequate bonding across loose rubble infill should be repaired by stitching new ties between the inner and outer stone leaves.

Barn 3

Barn 3 has been severely damaged by timber decay and foundation movement and is beyond repair. It should be taken down completely and re-built from new foundations.

APPENDIX A

KEY PLAN



A **Existing site plan**
Scale: 1:500

N

0m 50m scale

KEY PLAN

APPENDIX B

PHOTOGRAPHS

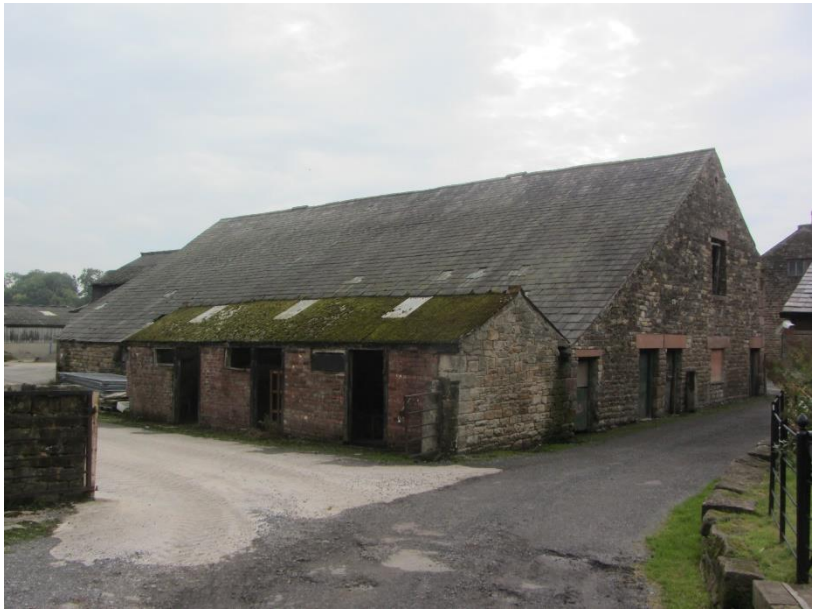


Photo 1 – Barn 1 - View from north west

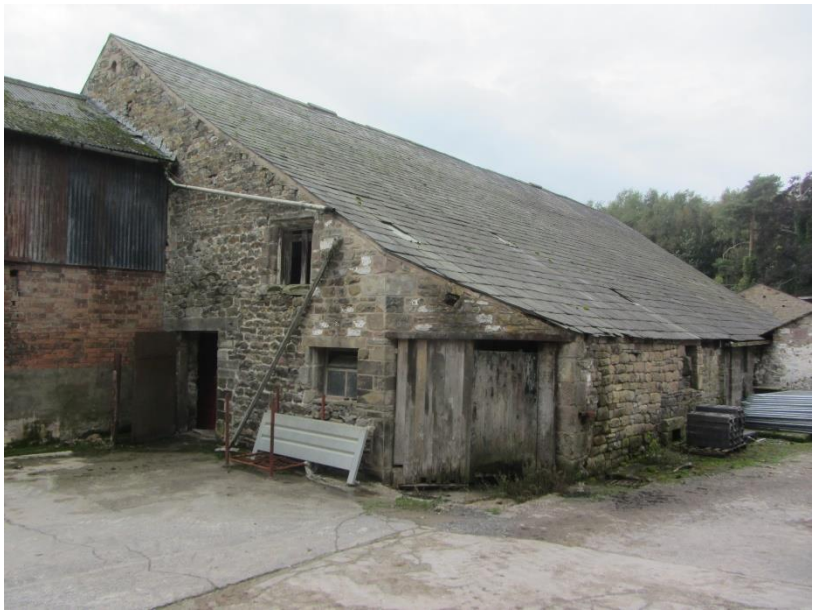


Photo 2 – Barn 1 - view from north east

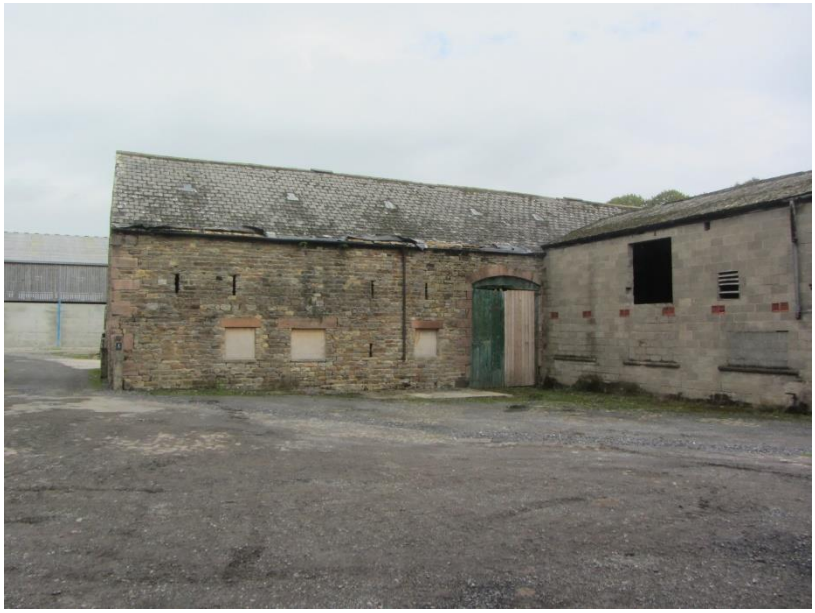


Photo 3 – Barn 1 – view from south

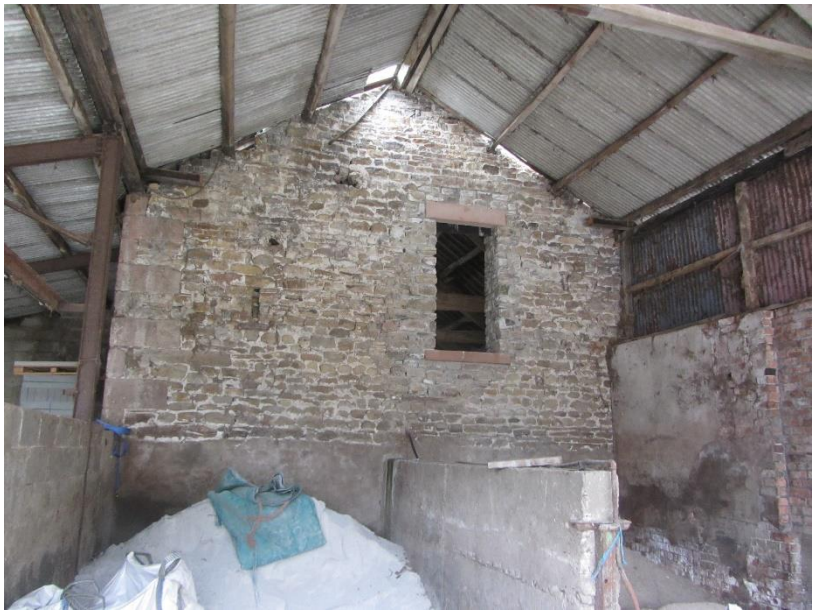


Photo 4 – Barn 1 – view from east (from within extension)

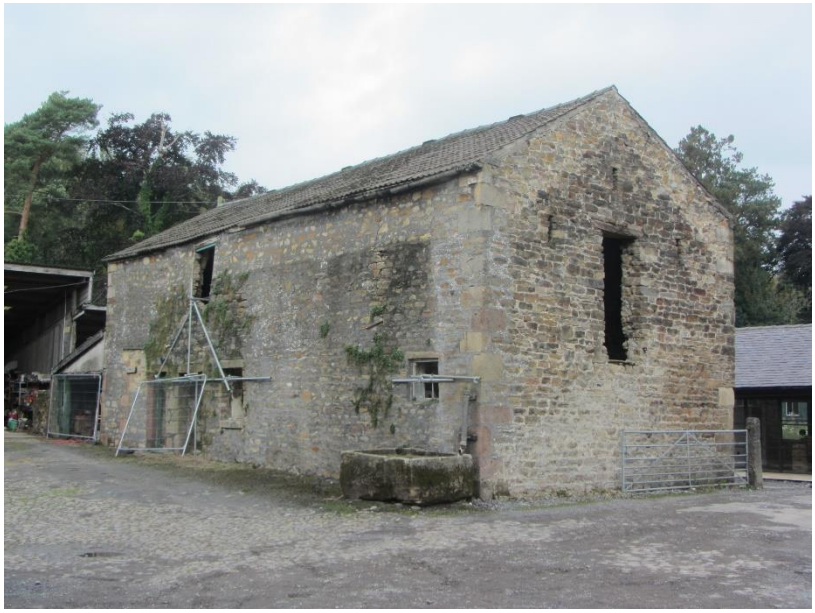


Photo 5 – Barn 2 – view from south east

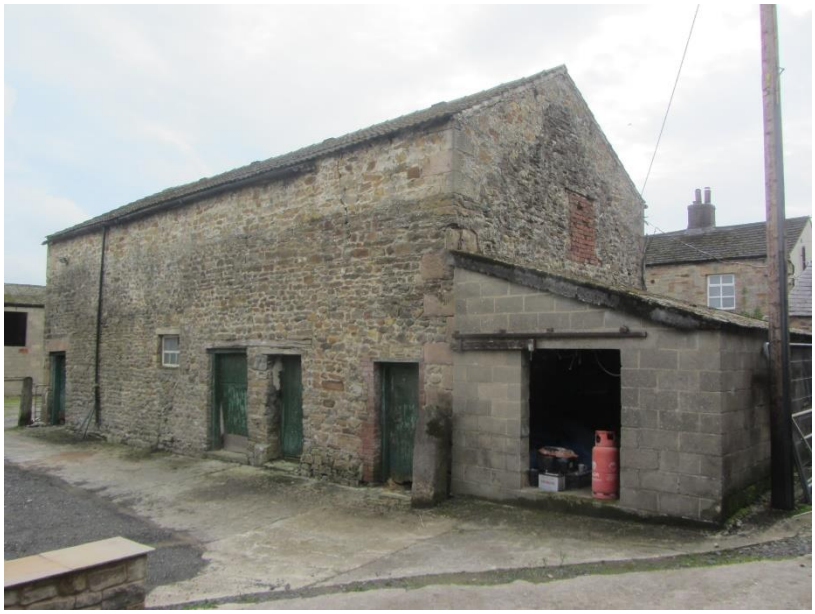


Photo 6 – Barn 2 – view from north west

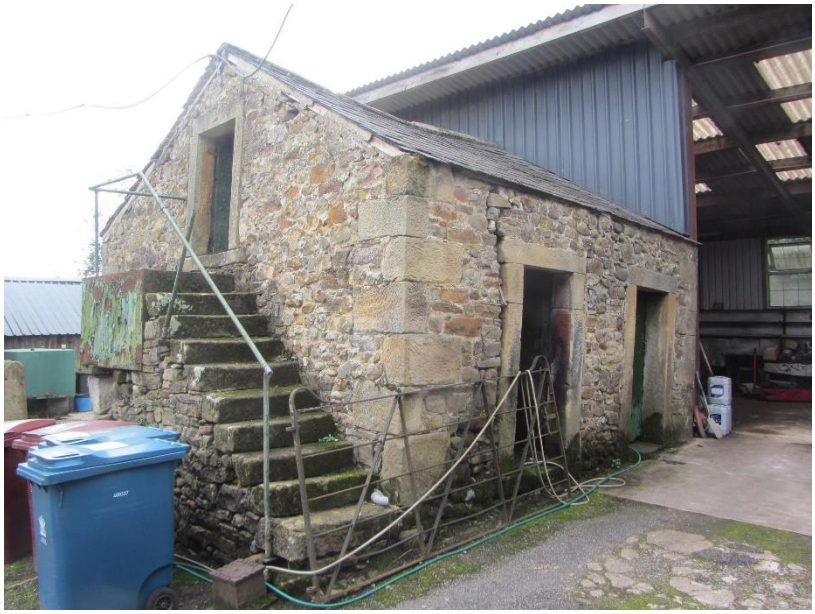


Photo 7 – Barn 3 – view from north east

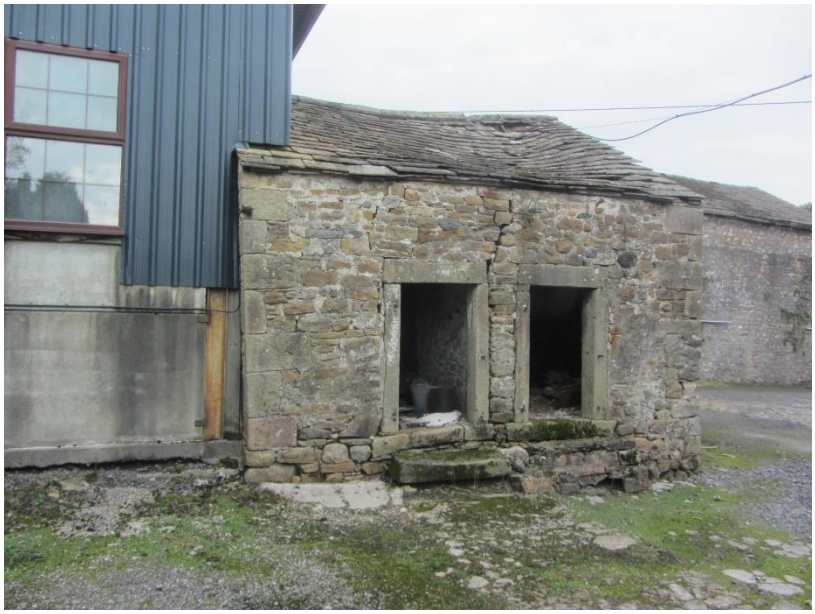


Photo 8 – Barn 3 – view from south

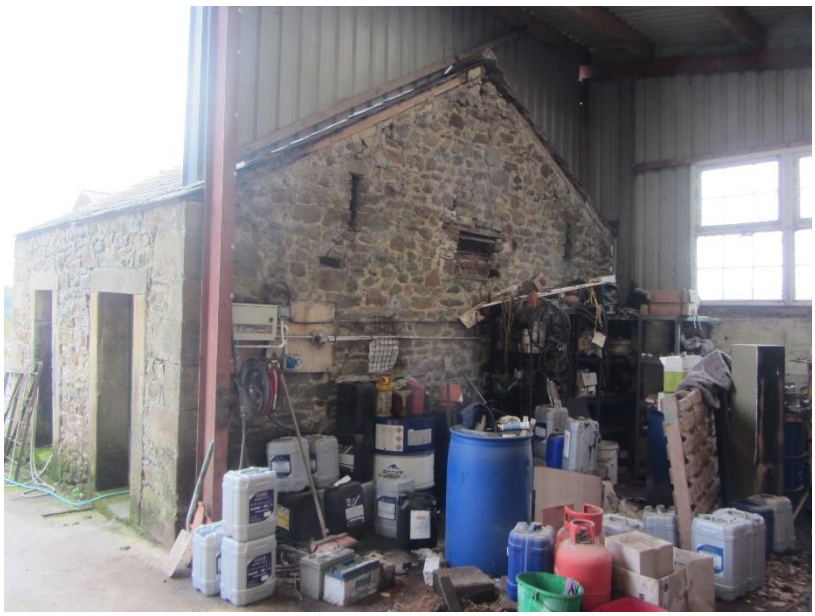


Photo 9 – Barn 3 – view from north west

Photo 10 – Barn 1 – main roof structure

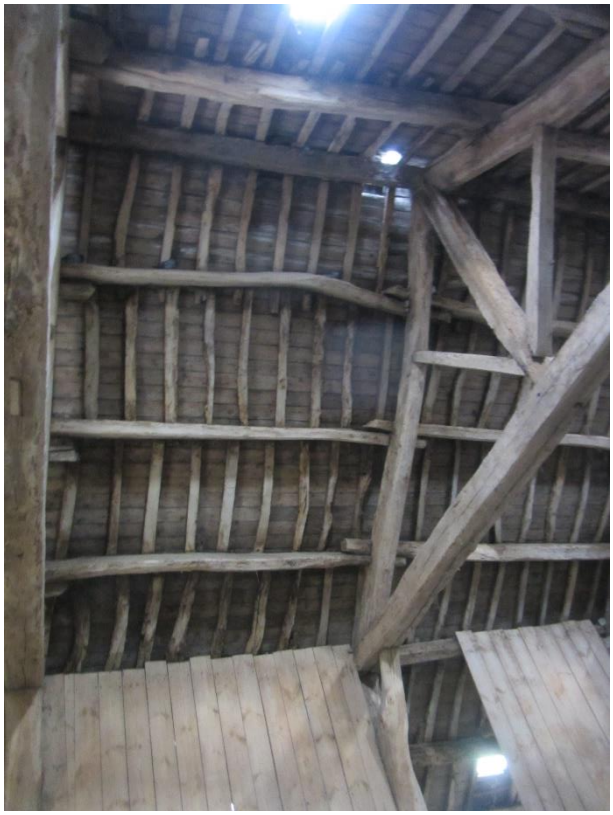


Photo 11 – Barn 1 – warped rafters and purlins

Photo 12 – Barn 1 – insect decay to roof truss

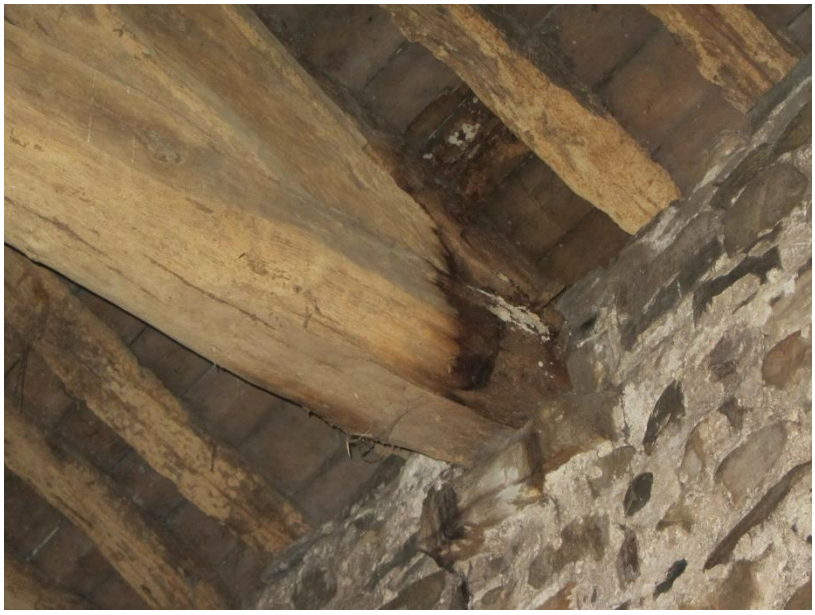


Photo 13 – Barn 1 – wet-rot at truss bearing

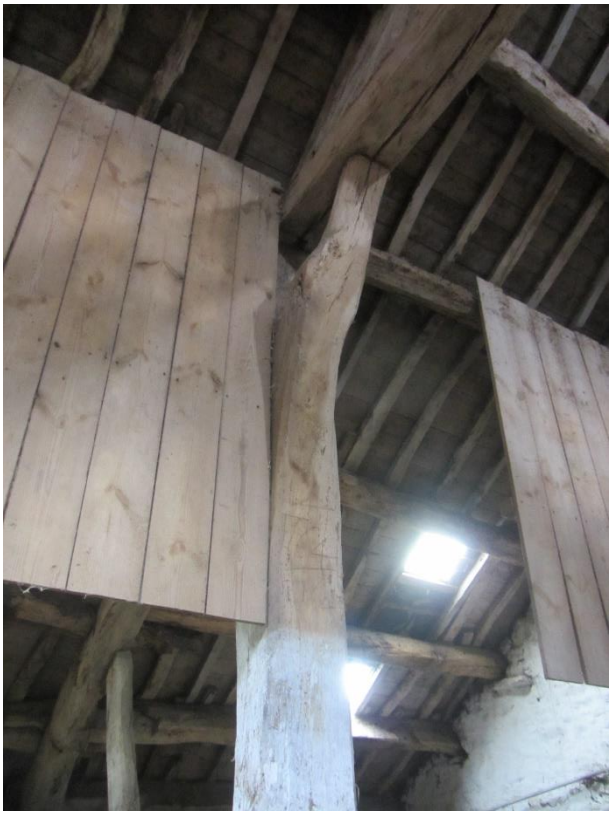


Photo 14 – Barn 1 – insect decay to timber post

Photo 15 – Barn 1 – insect decay to shippon roof timbers

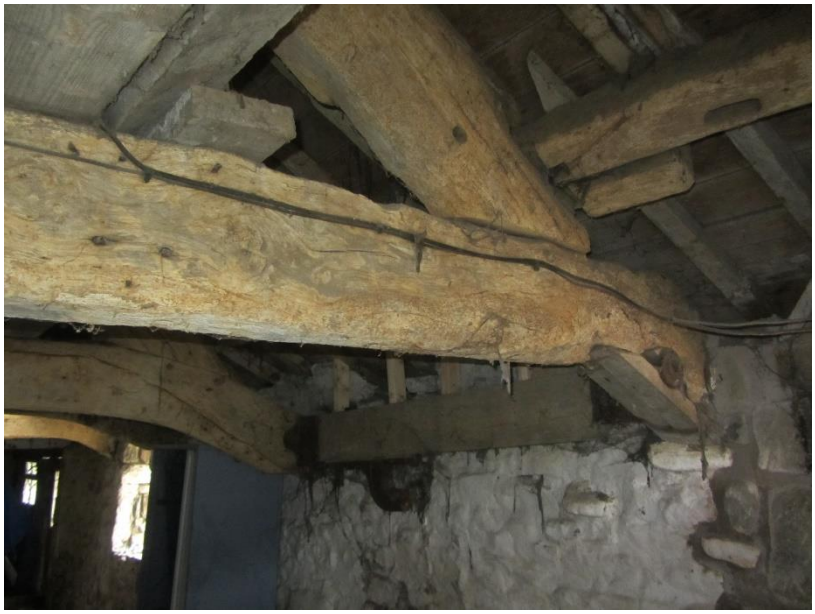


Photo 16 – Barn 1 – insect decay to shippon roof truss

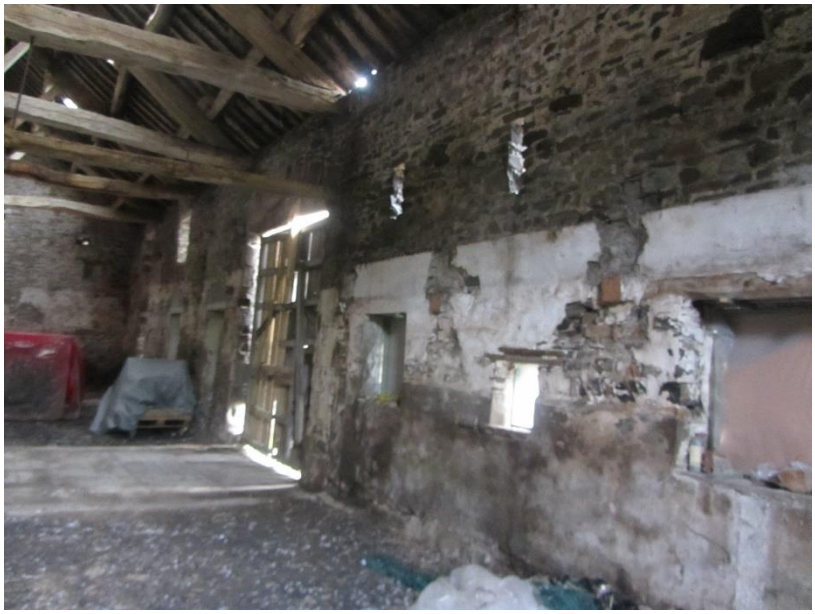


Photo 17 – Barn 1 - south wall

Photo 18 – Barn 1 – west wall

Photo 19 – Barn 1 – crack in internal wall

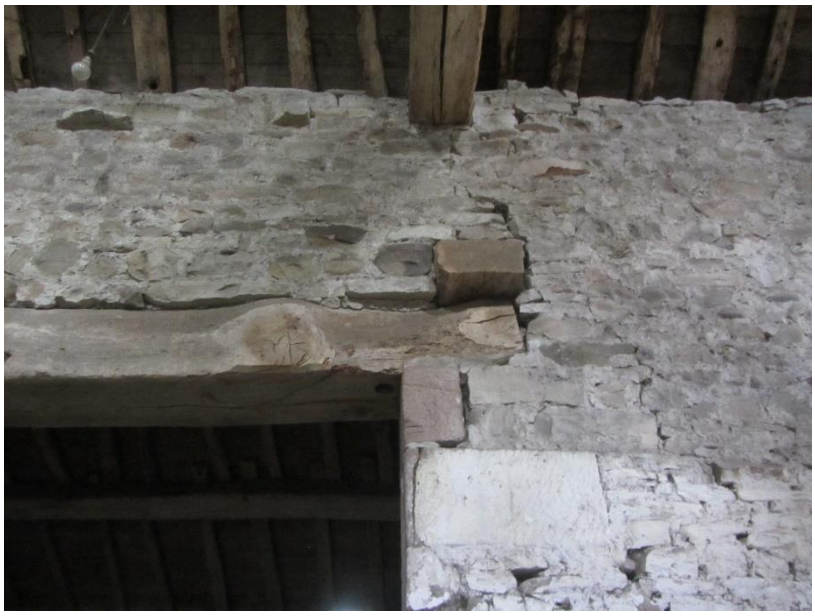


Photo 20 – Barn 1 – decayed lintel and cracks in wall

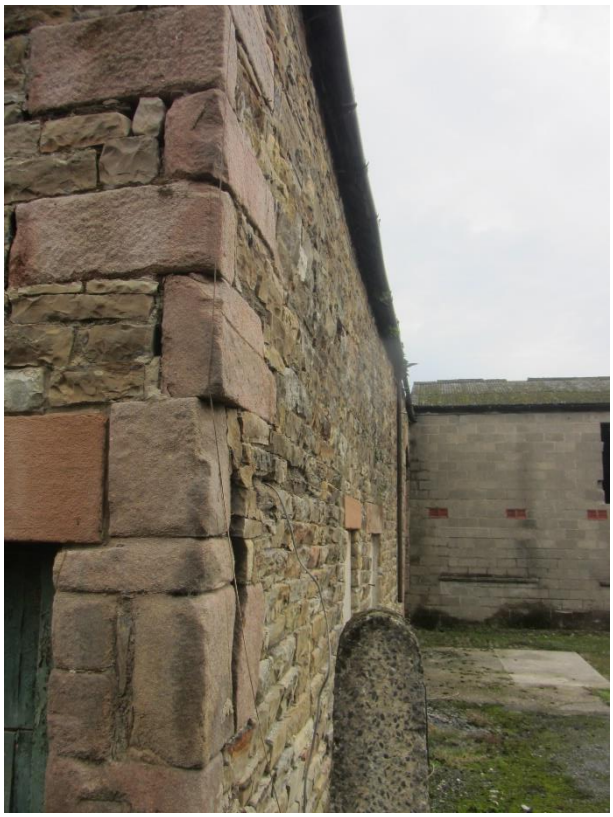


Photo 21 – Barn 1 - south west corner

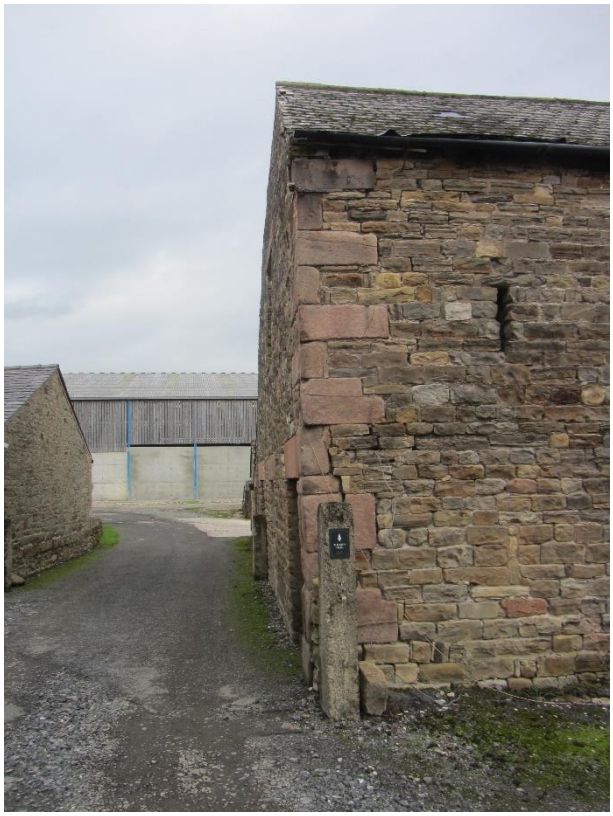


Photo 22 – Barn 1 – outward bulge in west wall

Photo 23 – Barn 2 – roof structure

Photo 24 – Barn 2 – decayed roof timbers

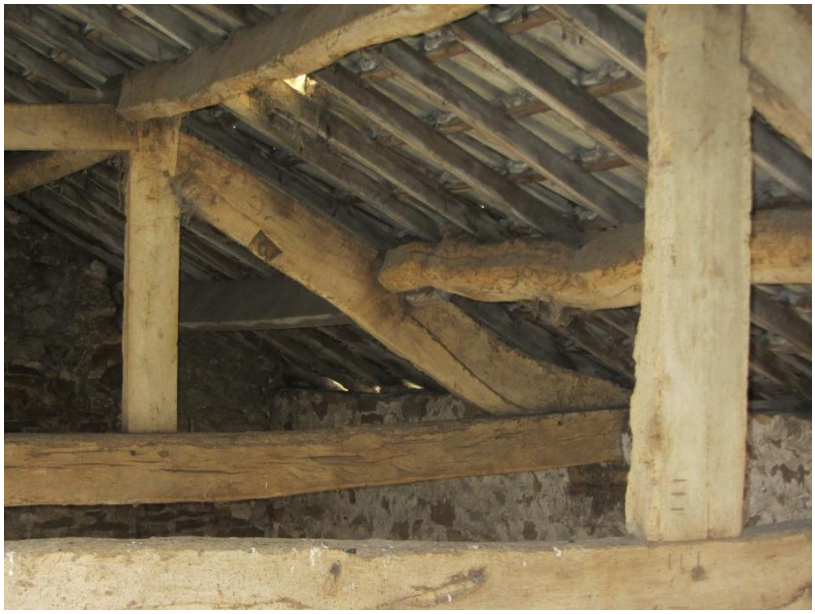


Photo 25 – Barn 2 – decayed roof timbers

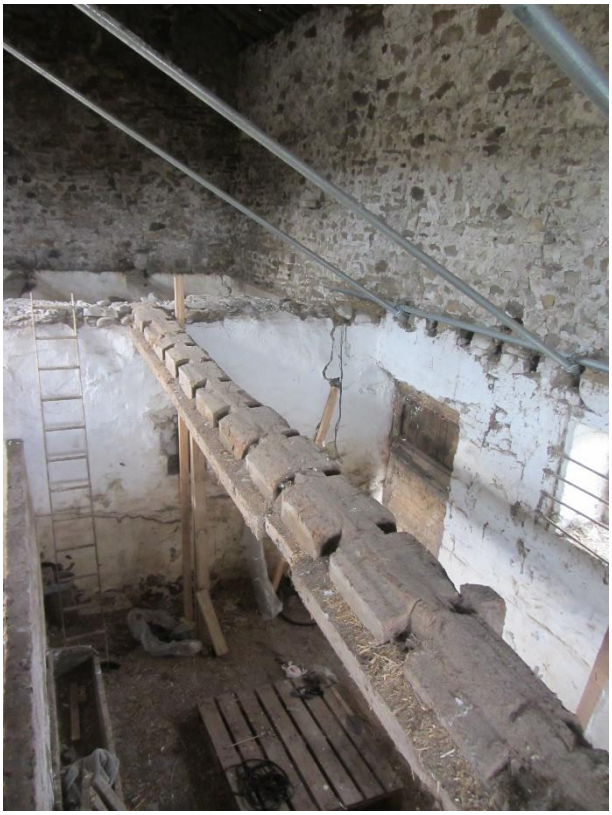


Photo 26 – Barn 2 – original floor beam

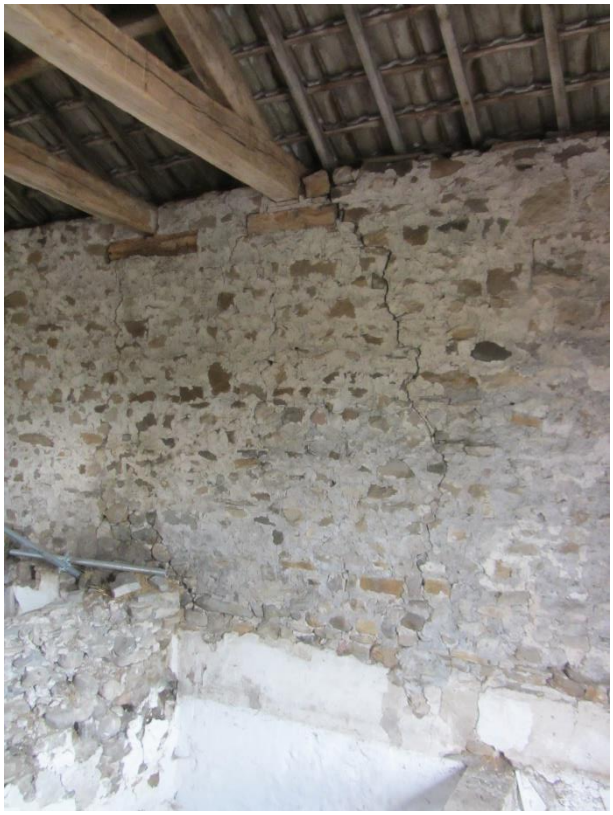


Photo 27 – Barn 2 – cracking in north wall

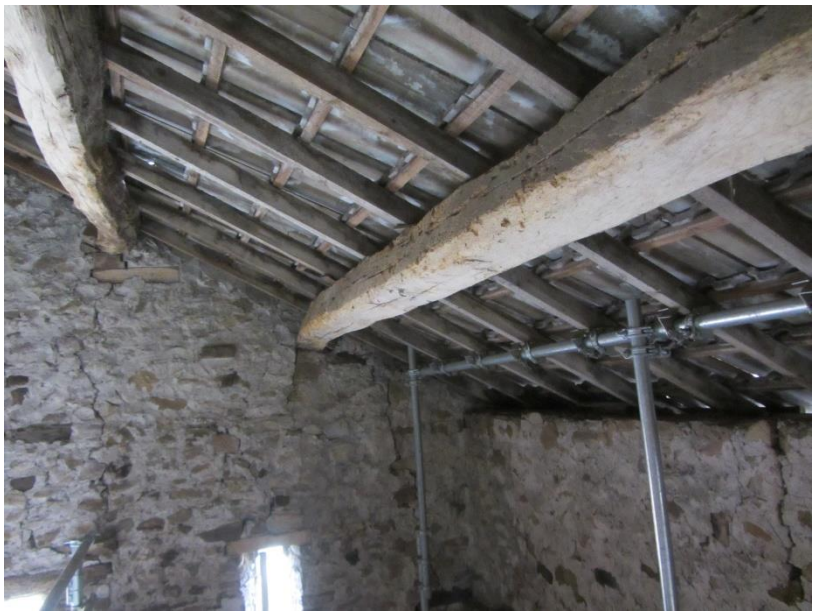


Photo 28 – Barn 2 – cracking in north and west walls

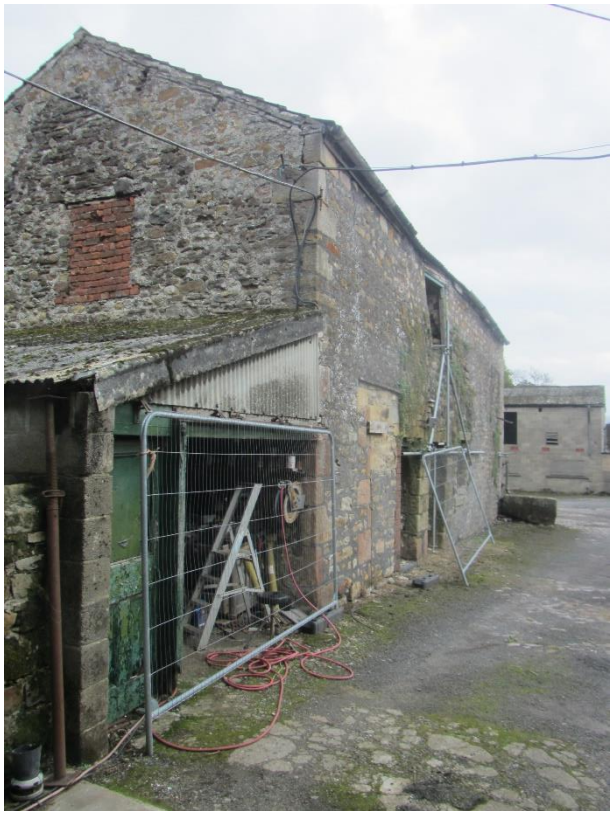


Photo 29 – Barn 2 – distorted and propped south wall

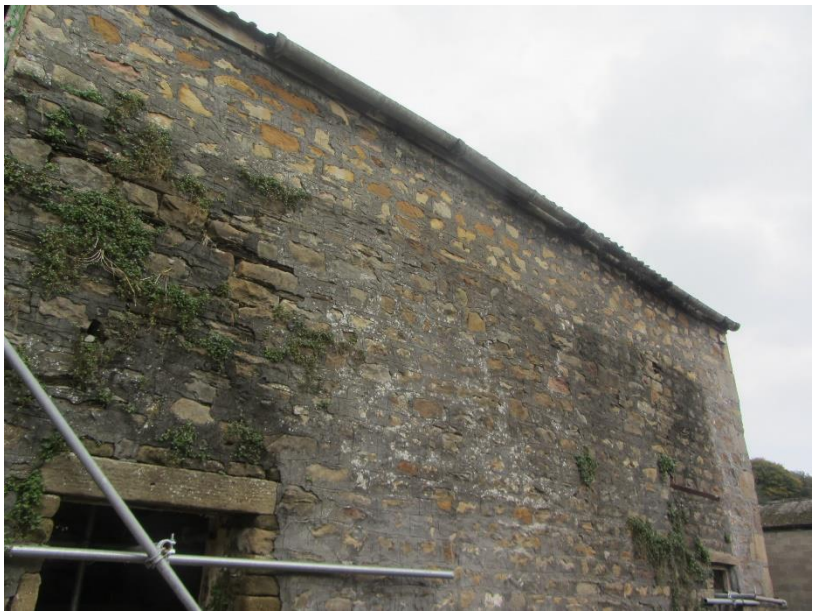


Photo 30 – Barn 2 – cracks and step in south wall

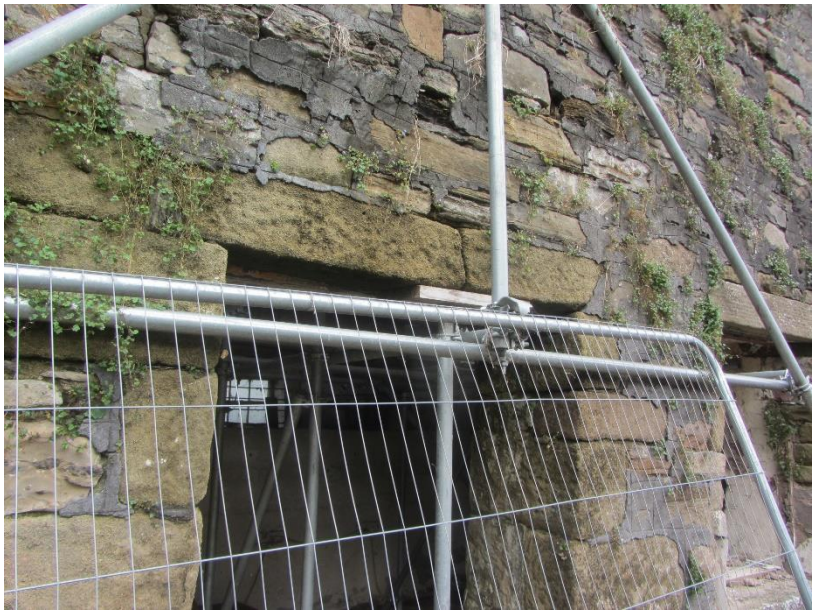


Photo 31 – Barn 2 – cracked lintel in south wall

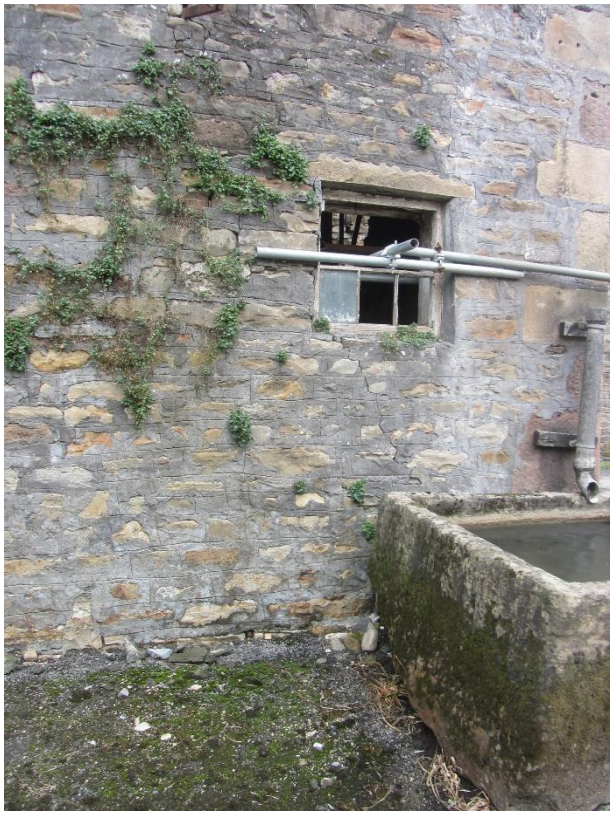


Photo 32 – Barn 2 – cracking in south wall

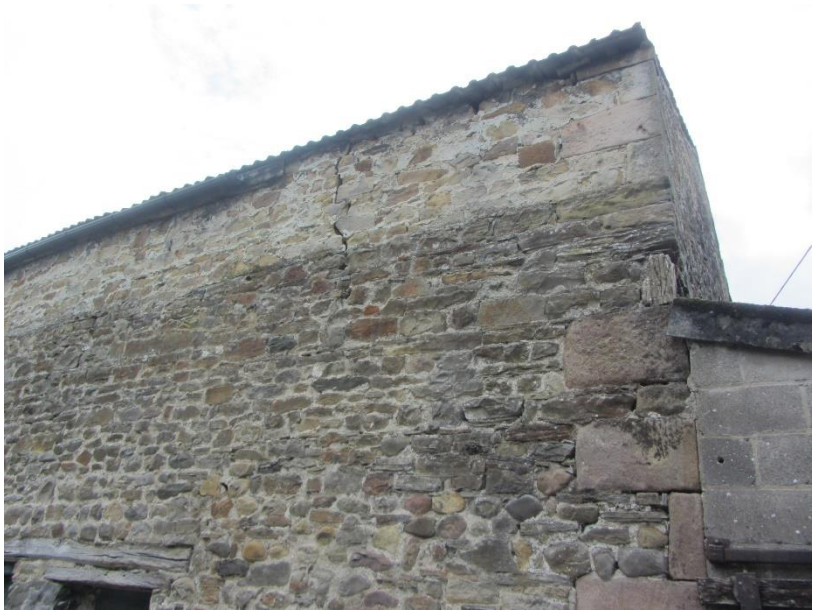


Photo 33 – Barn 2 – cracking in north wall

Photo 34 – Barn 2 – cracking in north wall

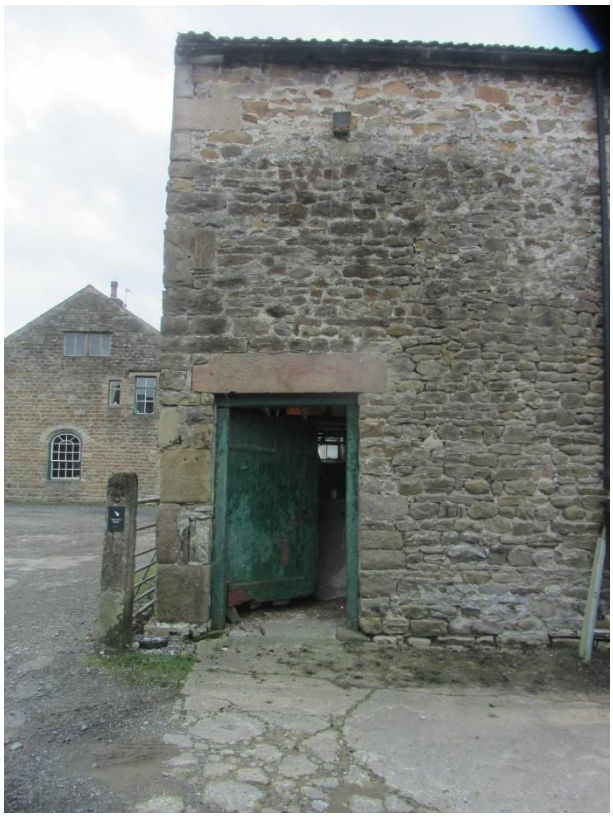


Photo 35 – Barn 2 – cracking in north wall

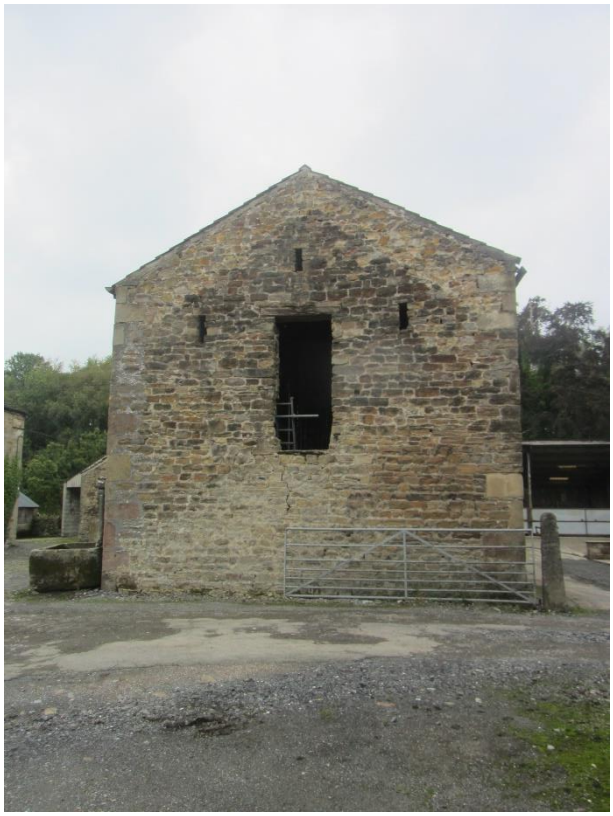


Photo 36 – Barn 2 – cracking in east wall

Photo 37 – Barn 3 – fractured purlin

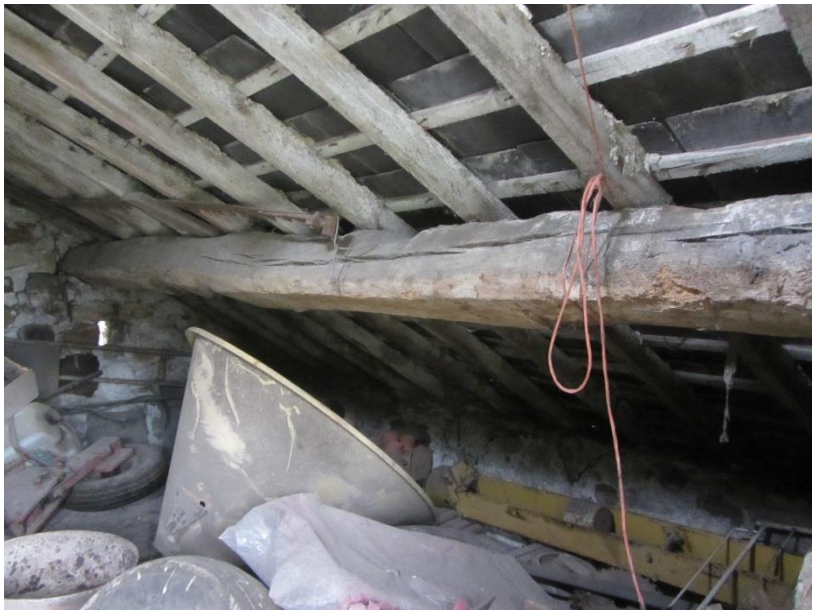


Photo 38 – Barn 3 – decayed roof timbers