

STRUCTURAL INSPECTION REPORT
OF
OUTBUILDINGS
AT
HENDRE FARM
BODFARI

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1. Introduction

- 1.1 We confirm having visited the buildings on 21 February 2007 in order to assess their structural condition with a view to their conversion into domestic accommodation.
- 1.2 The purpose of this report is to outline the extent of any major repairs required to achieve the conversion.
- 1.3 Our inspection consisted of a visual appraisal of the buildings referred to as Block A (larger building) and Block B (smaller building).
- 1.4 The layout of the buildings is as shown on the enclosed sketches Sk01-Sk03.
- 1.5 Block A is 'L' shaped on plan with one leg being single storey and the other leg two storey. The two-storey section measures approximately 46m x 6.7m with the single storey section being around 21m x 6.1m.

Block B is again a mix of single and two storey construction with the two storey section measuring around 12.4m x 6.3m and the single storey section around 13.7m x 5.0m.
- 1.6 The buildings are constructed in a mix of brick and stone walls, a solid ground floor and a timber first floor under a rafter and purlin roof supported on timber trusses/brick walls.
- 1.7 We do not know the age of the buildings but would estimate that they date from around 150 years ago.

2. Survey

Larger Building

External

Elevation D

- 2.1 Distorted and cracked masonry around right hand end. Wide door opening together with severely out of plumb gable corner return.
- 2.2 Sagging timber lintel above wide opening.
- 2.3 Butt joint brickwork jamb to the right dips to the right.
- 2.4 Repaired brick jamb.
- 2.5 Steel beams across wide opening with original timber beam above.
- 2.6 General out of plumb and some bulging to first floor masonry above openings.
- 2.7 Various areas of cracking above openings.
- 2.8 Wall in overall reasonable condition. Wall in the order of 100mm out of plumb over its height.
- 2.9 Timber beam above wide opening.
- 2.10 Missing section of brickwork at low level.
- 2.11 Stepped butt joint above first floor level.
- 2.12 Wall in reasonable condition.
- 2.13 Wall in reasonable condition.
- 2.14 Weathered brickwork and eroded joints to lower three courses.
- 2.15 Wall appears in reasonable condition above single storey lean-to roofs.
- 2.16 Thick joint/poorly bonded brickwork at vertical junction.
- 2.17 Large water filled vertical gap between brickwork and stone section.
- 2.18 Fairly widespread weathered brickwork.
- 2.19 Wall out of plumb over its height and basically takes a 'S' form when viewed in section.

Elevation D1

- 2.20 Timber beam across wide opening.
- 2.21 Stone rubble base courses.
- 2.22 Repointed presumed former wavy vertical crack.
- 2.23 Repointed sections.
- 2.25 Brickwork supported on timber surround to first floor opening.

2.26 Wall appears in serviceable condition accepting poor aesthetic appearance.

Elevation E

2.27 600mm height stone rubble base.

2.28 Diagonal cracking.

2.29 2 No raking timber shores.

2.30 Bricked in former openings.

2.31 Timber spreader.

2.32 Butt joint.

2.33 Wall in the order of 125mm out of plumb in the area of the raking shores.

2.34 Wall in the order of 100mm out of plumb.

2.35 Wall in poor aesthetic appearance with many areas of roughly mortar patched masonry and other areas of general weathered brickwork and eroded mortar joints. Wall is in the order of 50-75mm generally out of plumb.

2.36 Large stone piers topped with masonry, which is in poor condition. Piers are out of plumb.

2.37 Infilled brickwork at ground floor in poor condition.

2.38 Corrugated sheeted opening above first floor.

Elevation F

2.40 Very large filled vertical crack and severely distorted gable end return.

2.41 Out of plumb stonework.

2.42 Missing section of stonework.

2.43 Full height butt joints.

2.44 Damp section of wall below damaged roof.

2.45 Very weathered patches of brickwork.

2.46 Damp sections of brickwork below damaged roof.

2.47 Sagging timber lintel and bulging brickwork above.

2.48 Full height butt joint.

2.49 3 No long thin pattress plates.

2.50 Low level moss covered brickwork and eroded mortar joints.

2.51 No significant out of plumb noted.

Elevation G

- 2.52 4 No pattress plates.
- 2.53 Stone wall exhibits significant out of plumb over its height.
- 2.54 Top of wall leans out noticeably above abutting lean to corrugated roof.
- 2.55 Timber lintel supporting outer leaf unsupported inner 9".
- 2.56 Poor condition bricked in former opening.
- 2.57 Bricked in former openings.
- 2.58 Butt joint.
- 2.59 Weathered brickwork and eroded mortar joints to lower four courses.
- 2.60 Repointed corner.
- 2.61 Wall exhibits noticeable out of plumb to window head height in the order of 50-75mm.

Internal

Ground Floor

Room G1

- 2.62 Access not possible.

Room G2

- 2.63 Dirt and straw covered floor. White washed walls, white washed exposed timber joisted first floor.
- 2.64 Large wavy vertical crack.
- 2.65 Wide vertical gap at junction of internal to external wall.
- 2.66 Wavy vertical cracking.

Room G3

- 2.67 Straw covered floor, half rendered, half whitewashed walls. Exposed timber beam and joisted first floor. Access denied due to cows.

Room G4

- 2.68 Straw covered floor, part rendered, part whitewashed walls. Exposed timber beam and joisted first floor.

Room G5

- 2.69 Straw covered floor, exposed brick walls, timber joisted first floor over part of room.

Room G6

- 2.70 Straw covered floor, exposed brick walls, exposed roof consisting of king post timber truss supporting canted purlins and timber rafters.

- 2.71 Wide mortar repointed vertical joint.
- 2.72 Diagonal and vertical cracking full height.
- 2.73 Deflecting timber beams over wide opening.

Room G7

- 2.74 Concrete floor, part rendered, part white washed brick walls, trussed roof supporting canted purlins and timber rafters.
- 2.75 Trusses supported on brick piers, which terminate on timber corbels at mid height. Piers are out of plumb consistent with distortions noted externally.

First Floor

Rooms F1-F3

- 2.76 Access not gained.

Room F4

- 2.77 Timber first floor. Mix of exposed brickwork and plastered walls. Exposed canted timber purlins and timber rafters.

Room F5

- 2.78 Timber first floor. Exposed brick walls. 2 No king post timber trusses supporting canted timber purlins and timber rafters.

Smaller Building

External

Elevation A

- 2.79 Main two storey section in good condition.
- 2.80 Wall leans out in the order of 50mm.
- 2.81 Wall leans out in the order of 100mm.
- 2.82 Wall leans out in the order of 50-75mm.
- 2.83 Low level weathered brickwork and eroded mortar joints.

Elevation B

- 2.84 Brick and stone steps in poor condition.
- 2.85 A series of slight wavy vertical cracks.
- 2.86 Wall appears in overall reasonable condition.

Elevation C

- 2.87 End of wall covered in ivy.
- 2.88 Top of wall in part loose due to water ingress from damaged roof.

- 2.89 Wall in serviceable condition.
- 2.90 Damp sections of wall below damaged roof.
- 2.91 Wall appears in overall reasonable condition, no significant out of plumb noted.

Internal

Ground Floor

Room G1

- 2.92 Straw covered floor, exposed stone walls, timber beam and joisted first floor.

Room G2

- 2.93 Concrete floor, mix of rendered and whitewashed stone and brick walls. Raised collar timber truss roof supporting canted purlins and timber rafters.
- 2.94 Lower 1m height of wall acts as a retaining wall and exhibits dampness and general tendency to lean inwards.
- 2.95 Diagonal cracking to side of window.
- 2.96 Diagonal cracking to both sides of timber truss bearing.
- 2.97 Damp wall at low level.
- 2.98 Damp wall and weathered brickwork at high level.

First Floor

Room F1

- 2.99 Timber first floor, many stored items, exposed brick wall, 2 No king post timber trusses supporting canted purlins and timber rafters.

3. Conversion Proposals

- 3.1 Proposed drawings are currently unavailable. Notwithstanding, based upon our experience of conversion projects, we would expect that the external elevations, in terms of openings layout, will remain basically unchanged and the internal layout will be revised to suit domestic requirements.
- 3.2 From speaking to the Client's Agent, Denton Clark & Co, we also understand that the conversion proposals may be tailed to suit the condition of the buildings ie areas requiring substantial repairs or reconstruction may be excluded.

4. Discussion and Conclusions

Block A

4.1 It would appear that the building has undergone longstanding repairs and alterations contributing to its current mixed brick and stone appearance and variable overall structural conditions.

4.2 Distortions to external walls (out of plumb/cracking) are apparent in part to all elevations meriting repair or reconstruction works.

Most affected is the stone gable Elevation G (2.53) which is severely out of plumb associated with the distortions and cracking to its returns along Elevation F (2.39) and Elevation D (2.1-2.7); these areas merit reconstruction.

The remainder and majority of Elevation F appears in reasonable condition accepting that typical repairs are required ie replacing weathered brickwork, resetting top courses under the eaves and repointing throughout.

Repairs to the remainder of Elevation D could be subject to some discretion. Length (2.8) and across to (2.10) exhibit some out of plumb and age related deterioration but could be repaired. The remaining length from (2.12) and (2.19) appears in reasonable condition and are suitable to remain. The end section (2.19) is fairly heavily weathered with some distortions meriting reconstruction.

The single storey leg (elevation E, D1 and G1) exhibits fairly widespread distortions most noticeable towards its gable end where the end three roof trusses are supported on brick piers, which are built off timber corbels at mid height of the wall.

Raking shores have been introduced on Elevation E to limit lateral movements; the opposite Elevation G1 mirrors these movements (2.61) but has remained stable probably due to its thickness being 328mm brickwork rather than the thinner 215mm brickwork opposite.

If required, structural remedial works could be investigated in order to retain these walls and our initial view would be to resupport the trusses (to avoid the current eccentrically applied loads on the walls) and introduce ties/patress plates across the building. From an aesthetic viewpoint however we cannot foresee a pleasing final appearance and we would choose to reconstruct these areas.

The adjoining length of Elevation E (2.35) is built in a poor quality brick and exhibits many patches of roughly repointed bricks; again we would choose to reconstruct this area as opposed to attempting to cut out and replace weathered brickwork.

The gable end to Elevation E consists of two basically freestanding stone piers with the infill brickwork at ground level and corrugated sheeting/timber support above. The piers have undergone movement and will need to be better restrained/bonded to the 'presumed' new first floor and roof to ensure stability.

4.3 Repairs to internal walls will be influenced by the proposed roof layouts. Normal repairs will be required in areas of differential wall movements eg (2.64) – (2.66) which has led to cracking at their junctions with the external walls.

4.4 Repairs to first floor and roofs are not normally an issue in outbuilding conversion projects as they are often in poor condition.

Here we would envisage replacing the first floor but we could foresee retaining parts of the roof structure certainly over the two storey section subject to inspection by a timber specialist (to check for decay etc) and normal consideration of headroom under trusses and additional loadings at Building Regulations stage.

Block B

- 4.5 It is clear that the two storey section of the building was built to a good standard and remains in a very reasonable condition suitable for conversion without the need to undertake major rebuilding or repairs.
- 4.6 The single storey external walls have undergone lateral movements due to roof spread and most noticeable along Elevation A. The opposite wall (Elevation C) also acts as a retaining wall and exhibits general out of plumb and dampness alongside its length (2.94).

Elevation A consists of 3 No wall panels in between 4 No door openings. The middle section (2.81) exhibits the most noticeable lean and should be reconstructed, the remaining sections are less distorted and could remain but our preference would be to rebuild them. Notwithstanding the design of the roof structure will need to be reviewed to minimise the potential for future roof spread.

The lower retaining wall section of Elevation G will need to be strengthened in order to demonstrate future stability; works could be undertaken from inside accepting some loss of internal space.

The upper section of elevation G will require to be reset along its eaves when the roof is replaced otherwise it can remain in our view.

5. Limitations

- 5.1 This report is limited to the items mentioned. We have not inspected woodwork or other parts of the structure which were covered, unexposed or inaccessible and we are therefore unable to report that any such part is free from defect.
- 5.2 It should be noted that we are not qualified to comment upon what effect the actual movement to date will have on the present or future value of the property.

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6. Sketches

7. Photographs



Elevation D



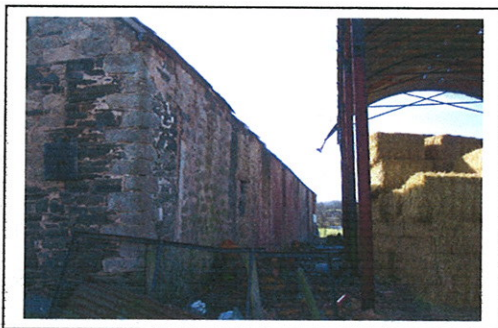
Elevation D



Elevation E



Elevation E



Elevation F



Elevation F



Elevation F



Elevation D1



Elevation G1



Elevation G



Room G7



Room G5



Elevation A



Elevation A



Elevation A



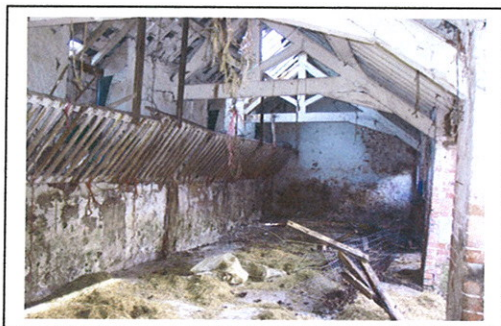
Elevation B



Elevation C



Elevation C



Room G2



Room F1