

STRUCTURAL INSPECTION

HILL FARM, BELLBROUGHTON



ENGINEERING INNOVATION

INSPECT : INVESTIGATE : REPAIR

Consulting Civil & Structural Engineers | Geotechnical Investigations | Structural Inspections
Expert Reporting | Structural Repair Specialists | Foundation Systems



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1.0 INTRODUCTION

- 1.1 Shire Consulting were appointed by Mr Richard Fairbairn to carry out a structural inspection of the farmhouse and adjoining barn at Hill Farm, Hockley Brook Lane, Belbroughton, Stourbridge, DY9 0AD.
- 1.2 The inspection was carried out on Tuesday 10th October 2023 by A. Wood of Shire Consulting. The weather at the time of the inspection was dry and overcast.

2.0 SCOPE OF EXAMINATION

- 2.1 The examination comprised a visual survey of the building both internally and externally from ground level. No 'opening-up' works were carried out so no guarantee can be given that hidden areas are free from defects or otherwise.
- 2.2 There was limited access on the first floor due to decayed floorboards/holes in the floor, so the western end of the house was not surveyed at first floor level.

3.0 BUILDING DESCRIPTION

- 3.1 The farmhouse is a two-storey building with a duo-pitched roof. There is a small basement under the western end of the building. On the rear of the building there is a single storey extension with a mono-pitched roof. There is a single link building on the eastern end of the house with a flat roof.
- 3.2 On the eastern side of the house is a single storey adjoining barn with a duo-pitched roof.
- 3.3 The roof structure of the farmhouse comprises tiles supported by battens and timber rafters. The rafters span between timber purlins, a ridge board and the front and rear brickwork walls. The purlins span between the gable brickwork walls. The roof structure to the western end of the roof was not inspected but assumed to be the same construction.
- 3.4 The first-floor construction comprises timber floorboards supported by timber floor joists and beams. The beams and joists are partially exposed with the ceiling between the joists.

- 3.5 The pitched roof to the rear extension comprises tiles supported by timber battens and timber rafters. The rafters are supported by the brickwork wall to the house, a central timber purlin and the rear brickwork wall. The purlin is supported by the gable walls and a central timber truss.
- 3.6 The barn roof is similar to the house with tiles, timber battens, rafters and timber purlins spanning between masonry walls. The roof to the eastern end of the barn is the same construction although partially collapsed. There was no safe access inside this section of the barn.
- 3.7 The external walls to the house are brickwork. There is a render applied to the brickwork on the east, west and north elevations.

4.0 INSPECTION OBSERVATIONS

- 4.1 Externally on the front south elevation of the farmhouse, there is some vertical cracking in the brickwork beneath one of the windows, several patches of vegetation/ivy growth up the brickwork and patches of spalled bricks at high level over the front door. (Photo 8, 9 & 10).
- 4.2 The timber lintel over the front door has decayed at the bearing and there are cracked and missing bricks to the left-hand side of the front door. (Photo 11 & 12).
- 4.3 On the west gable elevation, there are spalled bricks within the chimney and missing tiles to the chimney. The chimney also appears to be leaning slightly at high level. (Photos 13, 14 & 19).
- 4.4 The chimney towards the centre of the roof has missing and loose bricks near the top. (Photos 15 & 20).
- 4.5 On the rear, north elevation, there are missing roof tiles at eaves level. (Photo 16).
- 4.6 On the rear extension, there is significant damaged/missing bricks to the northwest corner and the roof appears to be uneven suggesting deflection of the roof structure. (Photos 17 & 18).

- 4.7 On the east elevation of the farmhouse, there are a couple of cracks in the render. (Photos 21 & 22).
- 4.8 On the north elevation of the barn, there is a diagonal crack in the brickwork, missing roof tiles to a small section, a collapsed roof to the central part of the barn with the north elevation brickwork leaning outwards and significant vegetation growing through and over the eastern end of the barn. (Photos 23-26).
- 4.9 Within single storey link section between the main house and the barn, there are gaps in the timber boards forming the roof with missing felt over which is allowing water ingress into the building. (Photo 28).
- 4.10 There are large cracks in the brickwork arch above the doorway between the link building and the barn. There are smaller cracks in the brickwork arch above the door between the link building and main farmhouse. (Photos 30 & 31).
- 4.11 Internally, within the kitchen on the ground floor, there are signs of damp within the ceiling from a leaking roof above and significant section of timber missing from one of the floor joists above the kitchen, although this appears to be historic. (Photos 33 & 34).
- 4.12 Within the room forming the rear extension to the building, the ceiling has collapsed in places revealing decayed timber ceiling joists and rafters. There is also a diagonal crack in the brickwork to the gable wall to the side of the window. (Photos 36-40).
- 4.13 Within the front rooms on the ground floor there is a crack in the wall above the fireplace. It is unknown if this is just in the plaster or continues into the brickwork wall. There are also signs of damp in the front (south) wall and ceiling. (Photos 44 & 46).
- 4.14 Within the basement on the western end of the house, there is some spalled brickwork on the external gable wall. (Photo 48).
- 4.15 On the first floor, there is a partially collapsed ceiling above the landing to the stairs. (Photo 49).

- 4.16 In the first-floor bedroom on the front of the building there is a hole in the ceiling and a decayed rafter is visible. (Photo 51).
- 4.17 On the first-floor corridor, there is a hole in the floorboards due to decay/water ingress from the roof above. There was no safe access to the remainder of the first-floor rooms beyond this point. (Photo 53).
- 4.18 There are several sections of missing/collapsed ceiling above the first-floor corridor. The roof structure to the eastern end of the farmhouse was mostly visible from these areas. The majority of the roof timbers look to be in reasonable condition, but a closer inspection is recommended. There are several holes in the roof which is allowing water ingress. (Photos 55-57).

5.0 CONCLUSIONS & RECOMMENDATIONS

- 5.1 The farmhouse is generally in good structural condition however some water ingress from holes in the roof have led to isolated areas of deterioration that we recommend are repaired. We recommend the following repairs are carried out.
- 5.2 We recommend that all the vegetation growing up and through the external walls is removed.
- 5.3 The cracks in the brickwork walls both internally and externally should be repaired by installing Helifix or similar crack stitching bars inserted into the joints. Any cracked bricks would be locally replaced. Any spalled bricks should be locally cut out and replaced. The large cracks around the arch internally will need the arch to be locally demolished and rebuilt due to the size of the cracks/movement.
- 5.4 The decayed timber lintel over the front door will need to be removed and replaced. The missing bricks to the side of the door should also be replaced and bonded into the existing brickwork.
- 5.5 A closer inspection of the chimney's should be carried out. The missing/loose bricks will need to be replaced and the verticality of the potentially leaning chimney checked. This may need to be demolished down to roof level and rebuilt if necessary.

- 5.6 The outer leaf of brickwork on the corner of the rear extension will need to be rebuilt. We also recommend the roof and ceiling structure of this extension be removed and replaced due to the condition of some of the timbers.
- 5.7 There are a few cracks in the external render, but we understand this is due to be removed as part of the refurbishment. This will also allow a closer inspection of the brickwork behind to check for any defects.
- 5.8 The leaning section of the northern wall to the adjoining barn will need to be demolished and rebuilt. The missing/collapsed section of roof will also need to be replaced.
- 5.9 Based on the extent of the visual inspection, the majority of the floor and roof timbers to the main farmhouse appear to be in reasonable condition and can remain. There may be a few timbers that need to be replaced locally to where the water ingress has occurred if they have decayed. The holes in the roof and floorboards will need to be locally repaired. Once the floor is safe, we recommend the western end of the house is inspected for any defects.
- 5.10 We also recommend the ceilings are removed to allow for a closer inspection of the timber structure where not currently visible.

Signed:



Adam Wood BEng (Hons), PgD

Date: 27/10/23

APPENDIX A
SITE PLAN



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**APPENDIX B
PHOTOGRAPHS**



Photo 1: South Elevation of Farmhouse



Photo 3: North Elevation of Farmhouse
and Single Storey Rear Extension



Photo 2: West Elevation of Farmhouse



Photo 4: East Elevation of Farmhouse

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Photo 5: South Elevation of Single Storey Link Building



Photo 8: Cracking in Brickwork Beneath Ground Floor Window



Photo 6: South Elevation of Adjoining Barn



Photo 9: Vegetation Growth on Brickwork



Photo 7: Part North Elevation of Adjoining Barn



Photo 10: Spalled Brickwork at High Level



Photo 11: Decayed Timber Lintel over Front Door



Photo 13: Spalled Brickwork to Chimney on West Elevation



Photo 12: Cracked/Missing Brickwork to Side of Front Door



Photo 14: Missing Roof Tiles to Chimney



Photo 15: Missing Bricks to Top of Chimney



Photo 18: Uneven Roof to Rear Extension



Photo 16: Missing Roof Tiles



Photo 19: Leaning Chimney



Photo 17: Damaged/Missing Brickwork to Corner of Rear Extension



Photo 20: Loose/Displaced Brickwork to Chimney



Photo 21: Crack to Render on East Elevation



Photo 23: Crack in Brickwork on North Elevation of Barn



Photo 22: Crack to Render on East Elevation



Photo 24: Missing Roof Tiles to Barn Roof



Photo 25: Collapsed Roof to Barn and Leaning Side Wall

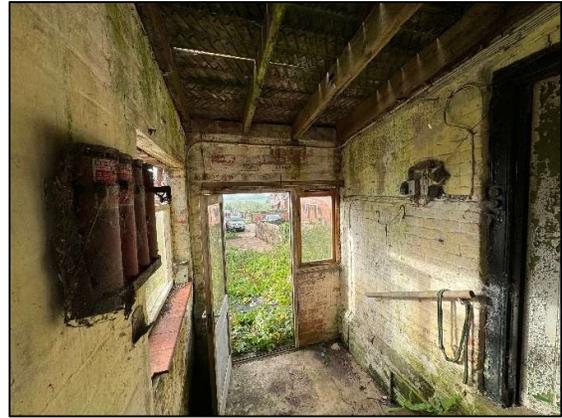


Photo 27: Internal View of Link Building



Photo 26: Tree Growing Through and Over Barn Roof



Photo 28: Gaps in Link Building Roof with Missing Felt



Photo 29: Internal View of Adjoining Barn
(western end)



Photo 31: Cracks in Brickwork above Door
Between Link Building and House



Photo 30: Cracks in Brick Arch above Door
between Link Building and Barn



Photo 32: Internal View of Kitchen



Photo 33: View of Damp to Kitchen Ceiling



Photo 35: Internal View of Rear Extension



Photo 34: Missing Section of Floor Joist
over Kitchen



Photo 36: Collapsed Ceiling to Rear
Extension



Photo 37: Decayed Roof Joists to Rear
Extension



Photo 39: Decayed Ceiling Joist to Rear
Extension



Photo 38: Collapsed Ceiling Joist to Rear
Extension



Photo 40: Cracking to Gable Wall to Rear
Extension



Photo 41: View of Front Room at Ground Floor

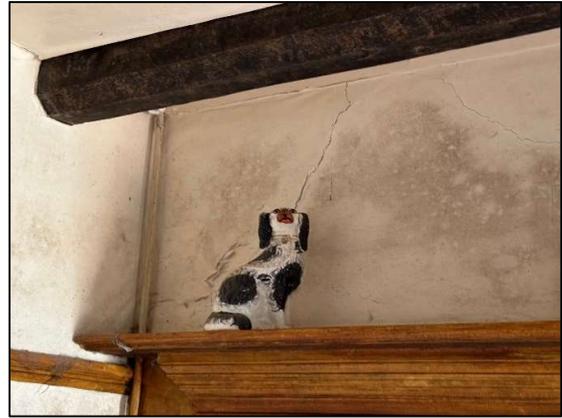


Photo 44: Crack in Wall above Fireplace



Photo 42: View of Front Room



Photo 45: View of Ground Floor Front Room to Western End of House



Photo 43: View of Front Room

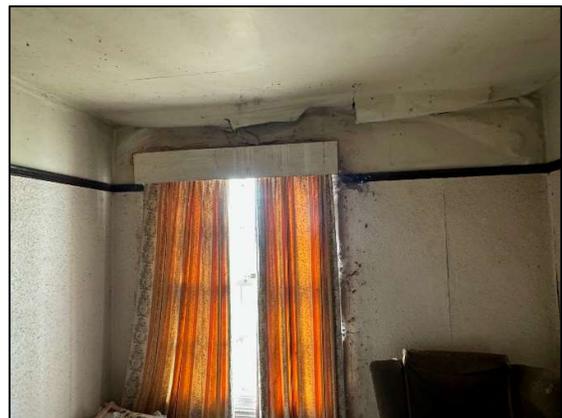


Photo 46: Damp to Front Wall and Ceiling



Photo 47: Internal View of Basement



Photo 50: View of First Floor Bedroom



Photo 48: Spalled Brickwork to External Wall to Basement



Photo 51: Decayed Ceiling/Rafter in First Floor Bedroom



Photo 49: Partially Collapsed Ceiling at First Floor Landing



Photo 52: View of First Floor WC



Photo 53: Hole in Floorboards in First Floor Corridor



Photo 55: View of Roof Structure to Eastern End of Building with Hole in Roof



Photo 54: View of First Floor Corridor (No Safe Access Beyond This Point)



Photo 56: Holes in Roof



Photo 57: Decayed Ceiling at First Floor
Level