Address: Former Brooks Barn

Job Number: 200092
Date: 6th April 2020

Structural Appraisal
of
Brooks Barn

at:
Brooks Barn
Hurst Road
Biddulph

Client:
Mr & Mrs Rutter
9 Ridgefields
Biddulph Moor
Staffordshire
ST8 7JG

C2C Consulting Engineers Ltd
The Old Church Offices
Shelton New Road
Hartshill, Staffs
ST4 6DP

Tel: 01782 980330
Fax: 01782 980331
Email: mail@c2cconsulting.co.uk

Contents:

1.0 INTRODUCTION

2.0 GENERAL DESCRIPTION

3.0 FRONT ELEVATION – NORTH EAST

4.0 GABLE ELEVATION – SOUTH EAST ELEVATION

5.0 REAR ELEVATION – SOUTH WEST

6.0 GABLE – NORTH WEST ELEVATION

7.0 INTERNAL

8.0 WORKSHOP

9.0 COWSHED

10.0 CONCLUSIONS AND RECOMMENDATIONS

1.0 INTRODUCTION

1.1 C2C Consulting Engineers Ltd were instructed to carry out a structural inspection of the Brick Built barn structure which stands on its own within an expanse of pastureland and is accessed via a farm track off Hurst Road, Biddulph.

1.2 Our engineer visited the site on Wednesday 18th March 2020 to carry out this inspection.

1.3 It is proposed to renovate and convert the existing masonry structure into domestic accommodation. Visual inspections were carried out both externally and internally to review the condition of the structure and its current state and to comment on the structural implications and factors to be considered and addressed for its suitability for conversion.

1.4 The inspection comprised a general, visual examination of the exposed accessible surfaces and areas of the property. We have not examined the woodwork, various surfaces and other parts of the buildings structure and fabric concealed at the time of inspection and we are, therefore, unable to comment on the condition of such areas. We have not consulted with the Local Authority or other statutory bodies.

2.0 GENERAL DESCRIPTION

2.1 The former barn building has a rectangular footprint and is believed to be constructed of 215mm solid masonry under a pitched roof formed of a system of king post type trusses which span between front and rear elevations. These support timber purlins which span between the trusses and internal/external masonry walls. The roof is clad in corrugated asbestos sheets.

2.2 The barn is single storey, with the adjacent ground levels being some 800mm lower along the rear elevation than the front elevation. The levels across the site fall front to back in a South Westerly direction.

2.3 The building is set to a mixture of concrete hard-standing to the front elevation (North East), and soft landscaping to the gables and rear elevation.

2.4 Three trial holes have been excavated around the building, to the front, rear and North West gable to expose the existing foundations and establish their nature, size and depth and the underlining ground conditions. These investigations indicated a concrete footing at a consistent depth of about 400mm below ground level, being 100mm thick with a 150mm spread. The nature of the ground at this depth appeared to be of orange/brown firm to stiff clay.

3.0 FRONT ELEVATION – NORTH EAST

3.1 This elevation has two door and two window openings with the support over being provided by concrete lintels.

3.2 The brickwork in general is in reasonable order, however, some defects are noted confined to localised areas.

3.3 Some bulging is noted to the brickwork above the right-hand door opening where the concrete lintel appears to have rotated slightly.

3.4 Areas of spalled and weathered brick faces are noted throughout with weathered mortar joints.

3.5 Diagonal cracking is noted at either side of the concrete lintel to the left-hand side door opening extending into the eaves. Further fracturing is also noted to the right-hand corner of the lintel support to the far-right hand window opening.

3.6 A minor vertical fracture is noted extending below the concrete windowsill to the right-hand side of the right-hand window opening.

3.7 Horizontal cracking is noted within the mortar joint one course below eaves level, running from the left-hand window location and terminating above the lintel to the right-hand door opening.

3.8 Rainwater goods, gutters and downpipe are present; however, these appear to be in poor condition and require attention.

3.9 The corrugated asbestos sheet roof appears to be in a poor condition with undulation and distortion noted along its length.

4.0 GABLE ELEVATION – SOUTH EAST ELEVATION

4.1 This elevation has no window or door openings within.

4.2 The masonry panel generally appears to be in reasonable order and is straight and plumb.

4.3 Localised areas of spalling was noted to the brick faces and weathering to the mortar joints.

5.0 REAR ELEVATION – SOUTH WEST

5.1 This elevation has four window openings equally spaced along the elevation all with concrete lintels over and concrete sills at their base.

5.2 The stability of the masonry panel appears uncompromised and is generally straight and plumb.

5.3 Areas of spalling is noted to the brick faces throughout and also weathering to the mortar joints.

5.4 Vertical fracturing is noted central within the concrete windowsill below the three left hand side windows. This damage appears to continue through into the brickwork directly below, down alongside the air-vents and beyond to DPC level where they appear to terminate.

5.5 A vertical crack is noted within the brickwork from the right-hand corner of the windowsill to the far right hand window opening progressing down and terminating at DPC level.

5.6 A minor vertical fracture is also noted below DPC level, located beneath the far right hand side window position. This fracturing appears to terminate four courses from ground level.

5.7 Rainwater goods, gutters and downpipe are present; however, these appear to be in poor condition and require attention.

5.8 The corrugated asbestos sheet roof appears to be in poor condition with undulation and distortion noted along its length.

6.0 GABLE – NORTH WEST ELEVATION

6.1 This elevation has a single door opening located to left of centre.

6.2 The masonry panel appears to be in reasonable order and is straight and plumb.

6.3 Only very minor weathering has occurred to this elevation, the brick faces and mortar joints appear to have been largely unaffected.

7.0 INTERNAL

7.1 Internally the space is split into two areas with the smaller room, currently used as a workshop located at the southern end of the building. The larger area is referred to as the former cowshed.

8.0 WORKSHOP

8.1 This area has a concrete slab on solid floor with the roof covering supported by timber purlins spanning between external and internal partition walls.

8.2 Evidence of slight rotation is noted to the head of the wall at eaves level to both front and rear elevations.

8.3 Horizontal cracking is noted to the rear elevation extending outwards from either side of the concrete lintel bearings.

8.4 Further cracking can be seen at the intersection of the partition wall with the external walls at high level to both front and rear elevations. This damage appears to be as a result of the rotation of the top three-four courses of masonry.

9.0 COWSHED

9.1 The floor is of a concrete slab on solid nature with a central raised concrete plinth housing six feeding troughs across the length of the building.

9.2 The walls have a cement render finish up to mid-height above which they are exposed brickwork.

9.3 There are two timber trusses in this area supported off masonry piers within the main wall construction. The central timber truss indicates significant wet rot to the top cord and central post as a result of water ingress through defective roof finishes.

9.4 Wet rot is also noted to the truss adjacent to the external gable wall at its bearing on the front wall.

9.5 The timber purlins are in poor condition and indicate signs of damp and rot throughout.

9.6 Large areas of damp are noted to the internal walls, particularly the rear elevation where rainwater is noted running down the walls as a result of damaged roof coverings.

9.7 Horizontal fracturing is noted at three – four courses below eaves level throughout the building to both front and rear elevations.

9.8 Vertical fracturing is noted to either side of several of the concrete lintel supports extending up to eaves level.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 From the observations made it would appear that the barn is in reasonable order with no evidence of any ongoing settlement or subsidence noted

10.2 In general, the damage noted was confined to the super structure and was caused by a variety of reasons.

10.3 These encompassing, weathering, mechanical damage, thermal and differential movement coupled with the various alterations that have been made to the building. We understand that the building is to be converted to form a domestic residence.

10.4 We would, however, recommend that a formalised regime of repairs is drawn up which encompasses such items as the following.

10.5 Formation of new ground bearing concrete slabs with mesh reinforced edge thickenings around the perimeter. Care should be taken when carrying out this operation not to undermine the existing walls. The trial pits did indicate existing foundations are at a depth where it is considered unlikely this will cause a concern.

10.6 Introduction of damp proof course.

10.7 The formation of new insulated internal wall coverings.

10.8 Evidence of roof spread is noted at eaves level to both front and rear elevations. Roof spread occurs when the downward pressure from the weight of the roof thrusts the roof timbers outwards which in situations where there are no ceilings present can result in rotation of the wall plate and the head of the wall been pushed outwards. The roof structure and finishes should be completely overhauled and replaced with a suitably designed structure to support both vertical and horizontal forces.

10.9 Formalisations of lintels above all apertures. Removal of timber lintels and other timber elements within the wall structure where applicable.

10.10 External masonry in the main requires re-pointing with areas of weathered/spalled brickwork being made good. Any fractured bricks should be removed and replaced with the necessary crack repairs being undertaken.

10.11 Not withstanding the points above, the building is of substantial construction. C2C Consulting are satisfied that the structure is sufficiently robust and entirely suitable for conversion with only limited amounts of remedial works required.

Yours Sincerely

Tim Wright
Associate Director
BEng.(Hons) IEng AMIStructE
For and on behalf of C2C Consulting Engineers Ltd

Standard Scope and Limitations

This report has been prepared to provide guidance on the structural condition of the property.

We have only inspected and reported upon the defects within the property, as instructed by the client.

The report is based upon a visual inspection of those areas of the property that were readily accessible at the time of the inspection. It is not normal practice to remove internal finishes, lift carpets or move furniture etc. As such, comments cannot be made on those parts of the structure that were inaccessible or hidden from view at the time of the inspection.

We have limited our report to the most important aspects as stated in the text. The report does not provide a checklist of all repairs and improvements that might be desirable.

Our inspection did not include:-

1. The excavations of any trial holes to establish the depth of foundations and bearing strata.

2. Inspection of non-structural items such as doors, door frames, windows, floor, wall and ceiling finishes, other than where they are relevant to structural movement.

3. We have not inspected any services such as electric, gas, water and drainage.

4. We have not inspected those parts of the structure, which were covered, unexposed or inaccessible and we are therefore unable to report that such parts of the property are free from defect.

This report is for the private and confidential use of the client for whom it is prepared.