Address: Newhill Farm, Tick Hill Lane, Dilhorne, Staffordshire

Job Number: AC4140
Date: 4th May 2017

Structural Inspection of Barn Buildings

at: **New Hill Farm,**
Tickhill Lane,
Dilhorne,
Staffordshire

Client: **Mr Neil Potts**
New Hill Farm,
Tick Hill Lane,
Dilhorne,
Staffordshire
ST10 2PL

Aspin Consulting Ltd.
Suite F13
Genesis Centre
North Staffs Business Park
Innovation Way
Stoke on Trent
ST6 4BF

Tel: 01782 366100
Fax: 01782 366104
Email: info@aspingroup.com

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Contents:

1.0 INTRODUCTION

1.1 Aspin Consulting were instructed by Forefront Development Consulting to carry out a structural inspection of the sandstone built barn structure at New Hill Farm, Tickhill Lane, Dilhorne, Staffordshire. Our Engineer visited the site on Wednesday 26th April 2017 to carry out this inspection.

1.2 The inspection comprised a general visual examination of the exposed accessible surfaces and areas of the building, we have not examined the woodwork, foundations, various surfaces and other parts of the building 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 barn unit is a detached building constructed of a combination of original 450mm thick sandstone walls and other areas where 100mm low density blockwork has been constructed to form a new inner leaf with the external leaf being clad in sandstone. A duo pitched tiled roof covers approximately half of the building. The roof structure to the adjacent side has long since collapsed with the roof support and finishes in this area having been removed and stored elsewhere.

2.2 The barn is accessed along a short dirt track set back from the main highway.

2.3 The barn structure has a rectangular footprint and is predominantly single storey, however, a timber mezzanine area is noted within the internal space alongside the western gable elevation.

2.4 The remaining roof structure is duo pitched with the finishes supported off a system of timber rafters on timber purlins which span between external and internal walls of the barn itself.

2.5 The topography local to the plot indicates a steady rise in levels across the length of the building in an easterly direction. The externals are set to a mixture of concrete hardstanding and soft landscaping.

2.6 Two semi-mature conifer trees are noted less than 5m from the north west corner of the barn.

3.0 SOUTH ELEVATION (FACING COURTYARD)

3.1 This elevation has three personnel door openings located within, a single window opening to the far left hand side and a much larger opening to the far right hand side of the building.

3.2 The window opening has a timber lintel over with the door directly adjacent having a cut stone lintel over. The central personnel door opening has a timber lintel over which has failed and partially collapsed and has a prop in position to support the masonry over. The two further openings to the right have no support structure above, as this is within the section of the building where the roof structure has collapsed, along with the masonry above doorhead height.

3.3 A new 215mm hollow block internal wall has been constructed to the left of the central personnel door which forms the boundary for which to the right hand side the roof has been removed.

3.4 The stonework along this elevation appears to be in reasonable order, however, there is some undulation noted along its length and areas of damaged/weathered and open mortar joints are noted, particularly to the right hand side areas.

3.5 A vertical fracture is noted to the stone panel to the right of the central personnel door, running between ground level and terminating at the head of the masonry. A further vertical fracture is noted central over the timber lintel to the window opening to the far left hand side running to eaves level.

3.6 Where the roof is existing, this appears to be in reasonable order, however, some distortion is noted along its length and several damaged or missing tiles were noted.

3.7 Significant vegetation growth is noted along the base of the wall at ground level, with some growth noted higher up in the brickwork.

3.8 There were no rainwater goods noted along this elevation.

4.0 GABLE ELEVATION (WEST)

4.1 This elevation has three window openings at ground floor level, all with cut stone lintels over. The central opening is a much smaller opening compared to the adjacent identical sized apertures.

4.2 A single window opening is noted centrally at first floor level with a timber lintel over.

4.3 Two steel pattress plates are located above each of the side ground floor windows.

4.4 The stonework generally appears relatively straight and plum. However, a slight lean inward is noted above first floor level.

4.5 There is significant vegetation covering the lower metre of masonry which prevented a detailed inspection of this area.

5.0 NORTH ELEVATION (FACING ACCESS ROAD)

5.1 This elevation has 4no. window openings within. The far right hand side opening has a cut stone lintel over, the two openings to its left have more recent concrete lintels over with the far left hand side opening having no lintel support.

5.2 As with the opposite elevation, the building has no roof structure beyond the line of the recently formed exposed internal wall located here to the left of the farthest right window opening.

5.3 A large area of damp is noted to the wall to the right hand side. The roof tiles above this area do not overhang the eaves and water appears to have been discharging down the face of the wall.

5.4 Damp ingress is noted generally along this elevation with moss growth seen covering large areas of the masonry walls.

5.5 Significant undulation and bulging is noted along the length of the masonry panel, particularly towards the right hand side of this elevation.

5.6 The condition of the masonry appears to get worse towards the left hand side, where there is a general deterioration of the stone work and more weathering noted.

5.7 There were no rainwater goods noted along this elevation.

6.0 GABLE ELEVATION (EAST)

6.1 There is only a small section of masonry along this elevation which still remains.

6.2 A former access door opening appears to have been located to the left hand side which now has no support or masonry above.

6.3 The remaining masonry is in a poor condition with significant signs of weathering is noted to the stonework and mortar joints.

6.4 Significant moss growth and vegetation is noted throughout this masonry panel.

6.5 A vertical fracture is noted approximately half way along this panel running between ground level and to the head of the masonry, corresponding to the much more pronounced fracture noted on the internal side.

7.0 INTERNAL – ROOM ADJACENT WEST GABLE.

7.1 This area has a concrete slab on solid floor. The internal leaf of the external perimeter wall is constructed in lightweight modern blockwork supporting a more recently constructed traditional timber roof formed of a single purlin to each pitch supporting jack rafters.

7.2 A partially constructed mezzanine platform has been formed across this span, with several timber joists spanning between gable wall and the original internal stonewall.

7.3 All window openings have timber lintels on the internal face supporting the masonry above.

7.4 A vertical fracture is noted in the internal partition stone wall, located approximately 200-300mm inside of the perimeter wall, following the perpend joints between ground and eaves level.

7.5 The floor slab steps up approximately 100mm into the adjacent internal space.

8.0 CENTRAL ROOM

8.1 This area has a concrete slab on solid floor. The roof structure is supported by a single purlin along the north pitch, with rafters spanning between ridge and wall plate to the southern pitch. This area of roof appears to have been rebuilt in more recent times.

8.2 Fracturing is noted to the internal stone partition wall directly alongside the perimeter wall and appears to correspond to that noted in the adjacent room.

8.3 The more recently constructed 215mm hollow block partition wall appears to be constructed butting up to the front and rear walls with no evidence of any ties into the adjacent masonry walls.

9.0 INTERNAL AREAS – AREAS ADJACENT TO EAST ELEVATION

9.1 The roof structure over these areas no longer exists, however, the former timber support purlins are noted propped up against the internal side walls. The purlins are in very poor condition.

9.2 These areas appear to have concrete slab on solid floor, which have several steps to various floor levels. Raised concrete plinths are noted along the north elevation wall with former cattle feeding bays and concrete formed troughs.

9.3 The floor is covered in vegetation and moss growth. Areas of internal masonry also indicate signs of vegetation growth within their mortar joints.

9.4 Part of the internal leaf to the north elevation has been reconstructed in traditional blockwork some time in the more recent past.

9.5 Areas of the remaining internal partition and perimeter walls are becoming unstable, given the lack of restraint and as weathering is loosening the stonework around the mortar joints.

10.0 CONCLUSIONS / RECOMMENDATIONS

10.1 From the observations made it would appear that no ongoing settlement or subsidence was noted to the building.

10.2 In general the damage noted was confined to the superstructure and was caused by a variety of reasons. The most obvious damage being that part of the roof structures have collapsed into the building and have long since been removed and as a result has left these areas exposed to the elements for some time.

10.3 Furthermore, minor damage noted to the structure can be attributed to 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 2no. holiday cottages.

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. Care should be taken when carrying out this operation not to undermine any existing walls which may require underpinning, should the proposed formation level be lower than the existing foundation level. We would advise that a trial hole is carried out to each elevation to establish the depth of the existing foundations to given an early indication of any potential works that may be required.

10.6 Introduction of damp proof course.

10.7 The formation of new insulated internal wall coverings.

10.8 With regard to the roof structure confirmation will be required that the timbers installed over the area that has been re-roofed are adequate to support the increased loadings from any installation and finishes. A king post truss was noted on the floor in the barn, it is considered that this structural element would not be adequate to support a new roof structure over the existing areas and that thought should be given to the formation of an appropriate roof structure across this location.

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 stonework requires limited rebuilding where collapsed along the front, rear and east gable elevations. Significant areas of the masonry require repointing, particularly to the eastern areas with some localised sections of weathered/spalled stone having to be replaced.

10.11 The introduction of new rainwater goods and formalisations of drainage on site.

10.12 Notwithstanding the points above, the building is of substantial construction. Aspin Consulting are satisfied that this structure is sufficiently robust and entirely suitable for conversion with only moderate amounts of work required.

Prepared by:

TIM WRIGHT BEng.(Hons) IEng AMIStructE

Associate

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For and on behalf of Aspin Consulting

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.