STRUCTURAL ENGINEERS REPORT

Subject	Cropwell Bishop Memorial Hall Nottingham Road Cropwell Bishop Nottingham NG12 3BA
Client	Cropwell Bishop Memorial Hall Committee
Our Ref.	P20055
Your Ref.	M Beesley
Inspection Date	26 August 2020
Report Date	8 September 2020
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Version History

	Date	Reason	By
1.0	08/09/2020	First issue	RWT

Contents

Summary

Purpose of the report: To investigate the structural stability of the property.

Areas of concern: Bowing/distortion to the front gable, localised timber beam decay. Drainage damage.

Recommended actions:

- lateral restraint strapping should be installed to the front and rear main hall gables. The purlin bearings should be exposed and checked. Repairs to the gable flaunching.
- Installation of new roof support beam.
- Drainage repairs

Conclusion: There has been continued deterioration to the structure since the time of our last inspection (in 2005), however, there is no indication of any significant recent movement. The comments made in the previous report are still relevant.

The more recent inspection of the roof void has revealed evidence of water ingress to the hall and timber decay to one hall roof member. It has also revealed that there is limited lateral restraint to the gables above eaves level. It is recommended that the level of restraint to both the front and rear main gables is improved by the installation of lateral restraint strapping and that the external flaunching cracking is repaired to prevent future

water ingress. The purlin bearings should also be checked due to the level of movement.

In one area there has been substantial decay to a roof support beam, which is now propped by acrows. This needs replacement by a new designed beam.

Drainage defects have been noted which require repair to prevent future damage to the structure.

Whilst we have seen nothing to suggest that a rapid failure of the structure is likely and in general only slight continued deterioration has occurred, we recommend that the roofing works are undertaken as soon as possible. We can therefore offer no objections to the continued usage of the hall, however, it is important that you remain vigilant until the strengthening works have been undertaken.

1. General/Background

1.1 We refer to your recent instructions in respect of the above and confirm having attended the property on 26 August 2020 to carry out a structural inspection and in particular gain access to the main hall roof void.

1.2 We can confirm having carried out a previous inspection of the property. Our report dated 1 November 2005 covers that inspection and should be read in conjunction with this later report. The comments made in the previous report still apply.

1.3 In describing the property, all references to the front, rear, left and right assume that it is viewed from Nottingham Road.

1.4 The property is a detached building, the original section of which is believed to be approximately 90 – 100 years old. It is single-storey and comprises the main hall, kitchen, toilets and additional general usage rooms. On the right-hand side there is an external lean-to store.

1.5 The main hall is constructed with masonry external walls (part rendered) and has a pitched asbestos tiled roof. It currently has a ceiling, this appears to be a more recent addition and will be referred to later in the report.

1.6 The structures attached to the main hall have a mixture of flat and pitched roofs. A proportion of the pitched roofs are constructed with interlocking tiles (presumably concrete). It appears that some of the flat roofs have been covered over with profiled steel sheet, relatively recently.

1.7 Several small areas to the structure were not viewed internally, however this has not affected our overall appraisal.

2. Topography/Geology

2.1 The site slopes downwards predominantly from the rear to the front, however the slope is not considered sufficient to lead to instability in the foundations and there are no other relevant topographical features in the vicinity.

2.2 The data provided by the British Geological Survey confirms that the bedrock should be the Branscombe Mudstone Formation. Whilst this material is shrinkable, there is nothing to indicate that the vegetation in the vicinity is currently adversely affecting the structure.

3. Inspection

3.1 Externally, to the main hall front elevation there are endplates to tie bars present on the left and right-hand corners. The wall leans outwards by up to approximately 1 in 43. The wall bows outwards at approximately

eaves level and at ridge level leans inwards very slightly. There is a raking crack repair beneath the left-hand window. There has been slight lateral movement at damp proof course level on the right-hand side.

3.2 To the front elevation of the left-hand flat roofed section there is vertical cracking approximately 2mm wide. The wall leans towards the front. There is a shattered drain gulley directly adjacent to the wall.

3.3 The main hall rear elevation gable can only be viewed from distance, this has a visible lean outwards near to the ridge. There is also bowing visible near to ridge level on the left-hand side. To the full width rear projection there is fine cracking above one door. To the lean-to right-hand store there is considerable brickwork decay at a high level.

3.4 The left-hand side wall to the main hall is constructed generally with rendered 4½“ thick masonry with external piers (not rendered). There is an external tie bar. The masonry piers and the infill panels lean outwards. There is fine cracking to the rendered panels.

3.5 At the side of two of the piers there is vertical cracking up to approximately 6mm wide. There has been lateral movement at the base of all of the piers, in some areas the movement is towards both the front and the left-hand side. At these positions, the upper brickwork projects over the lower brickwork by approximately 18 mm (although slightly higher in some areas).

3.6 At the junction of the main hall left hand elevation roof slope with the front gable there is a wide band of flaunching which has shrinkage cracking. There are uneven asbestos tiles.

3.7 To the left-hand rear projection left-hand side wall there is fine cracking beneath one window and towards the rear the wall leans outwards slightly. On the rear corner the gully was blocked and overflowing. We understand there has been water ingress internally in this area. It should be noted that the ground level adjacent to the rear wall is marginally higher than the internal ground level

3.8 The main hall right-hand side wall is constructed the same as the left-hand side wall, again there is a tie bar visible. Both the masonry piers and the infill rendered panels lean outwards and again there has been lateral movement at the bottom of the piers. There is flaunching at the junction of the roof with the front gable, the cracking to this is more pronounced at a low level. There is distortion/bowing to the upstanding gable brickwork/parapet. There are uneven asbestos tiles and broken asbestos to the dormer end.

3.9 To the right-hand projection at the junction of the pitched roofed kitchen area with the flat roofed area there is stepped cracking up to 2mm wide. The brick courses to the flat roofed section slope towards the front. There is further cracking with some repointing to the projections towards the rear and in general these have a slight lean outwards. There is considerable decay to the lean-to rear store brickwork on the rear corner.

3.10 Internally in the main hall there has been decay at the junction of a roof raking member with the front gable. The internal support posts to the main hall roof on the left-hand side have slight leans towards the left-hand side wall and on the right-hand side slight leans towards the right-hand side wall. Several also have a slight lean towards the front. The external wall leans are mirrored internally, there are further tie bars present to the side walls.

3.11 The roof void to the main hall was accessed. The original roof slopes are tongue and groove boarded/underdrawn. There are two purlins to each slope above the more recent ceiling level. Internally at the junction of the lower left-hand purlin with the main gable there has been approximately 60mm of movement, with the gable moving outwards leaving a gap between the boarding and the gable. There is slightly lesser movement in other areas. There is water staining visible to the purlins, however, at the time of our visit they were dry and there was no evidence of any timber decay to the exposed sections. The newer ceiling joists span left to right and appear to be supported at their ends by original timber members/purlins spanning front to rear, supported by the gables and the internal timber roof trusses.

3.12 Due to the lack of ceiling boarding and the step up to the ceiling adjacent to the stage, there was no safe access to view the rear gable. The images taken from distance due however confirm water staining similar to the front purlins.

3.13 At the rear of the main hall in the left-hand side hallway/corridor there is considerable decay to the roof support beam, which now has temporary Acrows in place. To the other rooms at ground floor level there are occasional fine cracks.

3.14 The above is not intended to be a schedule of every crack/distortion. A selection of photographs of the general layout and damage/ distortion are appended at the end of this report

4. Site Investigation

4.1 At the time of our visit a single trial hole was excavated on the front left-hand corner of the main hall. This revealed a concrete strip foundation, with 180mm of spread from the face of the wall, bearing at 380mm below ground level. The subsoils consisted of firm, dry, red clay, no tree roots were visible.

5. Discussion/Recommendations

5.1 The recent inspection has not revealed any significant signs of further movement since our original visit during 2005, however, the comments contained in that report are still relevant. There does however appear to have been some deterioration and repairs are required.

5.2 The inspection of the front gable has revealed that the very substantial panel has suffered from significant past movement and there is also evidence of water ingress internally. Whilst localised decay has only been

noted to one raking member (supported on the front gable) there is water staining to the purlins spanning onto both the front and the rear gables. Externally there has been past repairs with flaunching adopted between the asbestos tiles and the masonry gable. There are varying degrees of cracking, which could let water in.

5.3 There is very limited restraint to the masonry gables above eaves level from the roof structure, with only four upper purlin bearings and the ceiling beam/purlin bearings providing localised support.

5.4 The external trial hole has not revealed any adverse ground conditions, the subsoils encountered are assumed to be the natural clay rather than fill (which could potentially be present due to the slight slope towards the front). The foundations at 380mm deep are very shallow by current standards, if constructed now we would expect the foundation depth to be approximately 900mm to 1000mm as a minimum. As such the front gable (and also presumably the rear gable) will always be susceptible to seasonal movement. The side wall foundations will most likely also be of a similar depth. The numerous end plates and tie bars will have been provided to increase the restraint below eaves level.

5.5 Given the above, we recommend that proprietary lateral restraint straps (1200mm long) are adopted to each roof slope of each gable, fixed between the masonry and the boarded underside of the original rafters, to improve the level of restraint. They should be screwed to the boarding and chemically anchored to the

brickwork. We recommend that the straps are adopted at 1m centres. In addition, lateral restraint straps and timber noggins should be adopted between the new ceiling joists and the gables, again at 1m centres.

5.6 The external flaunching at the junction of the roof covering with the gables should be repaired and maintained in the future, to prevent water ingress. The decayed raking timber member attached to the gable below ceiling level should be fully exposed and either repaired or replaced, dependent on the amount of decay present once it has been exposed. Where the existing purlins are built into the walls, they should be locally exposed by a builder to ensure that they have not decayed where they are embedded and that there is still a reasonable bearing length. This is particularly relevant for the front gable where it has moved out pronouncedly.

5.7 An additional beam should be installed where there is the extensive decay on the left-hand side of the property in the corridor (where the acrows are currently in place).

5.8 The damaged external gully should be replaced. The gully on the rear left-hand corner cleaned out to ensure there is no overspill in this area in the future.

5.9 Uneven tiles have been noted to the main hall roof slopes in several areas, however there is no indication of water ingress other than at the gables. It should be borne in mind that the roof is lined, which may obscure

any water to a certain extent. Ongoing repairs will be required to the roof covering as part of the normal maintenance for the structure.

5.10 In general, we have only therefore seen localised deterioration since the time of our last inspection (2005). Whilst we have seen nothing to indicate any rapid movement and the property is still considered to be stable, it is important that the recommendations given above are followed. In particular, we recommend that those in respect of the strapping to the gable walls, the checking of the decayed timber member and the exposing of the purlin bearings, are undertaken as soon as possible. Given the overall condition of the roof there will be a need for continued maintenance.

5.11 Given the above, with the lack of evidence of any significant recent movement, we can offer no objections to the continued usage of the building. However, it is important that you remain vigilant, until the strengthening works have been undertaken.

1.– Left-hand side wall

2.– Right-hand side wall

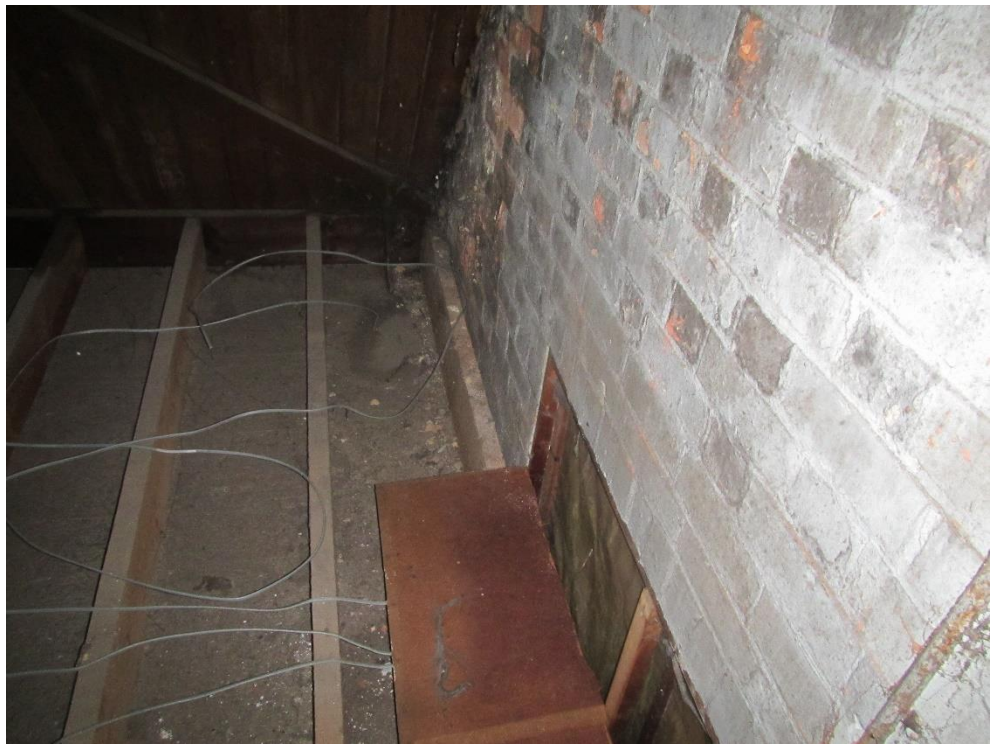
3.– Rear elevation

4.– Past repairs to front gable

5.– Mortar flauching at the junction of the roof with the front gable

6.– Typical movement at the bottom of the main hall external piers

7.– Front gable – Water staining at the purlin ends



8.– Front gable (internal)