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Our Ref: CL2592/SBS/sbs

Date: 12.12.2021

For the attention of Mary Jacques
The Old Forge
Park street.
Market Bosworth

Dear Mary

Re: Structural Report on the Old Forge, Park Street, Market Bosworth.



Further to our site visit to inspect the existing building we confirm our observations below:

Brief

Our brief is to inspect the existing building and to note defects, with a view to conversion to a hotel or multi occupancy building. During conversion, several walls are to be removed and/or modified.

Observations

The building is a 3 storey (plus cellar) domestic property with attached former 'Forge' workshop, constructed during the late 18th century, with several later extensions (assumed 1950's to 1960's onwards).

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It has traditional ridged tiled roof, with full height end gables.

Walls for original building are constructed from solid brickwork. Walls for alter extensions are likely to be cavity wall construction (which are likely to have been constructed after approximately 1950).

A cellar is present below ground floor with water well. A second well is present in the rear courtyard, with glass cover.

References

For all room reference notation see plans in appendix A

Basement

Staircase from ground floor kitchen leads down solid steps to basement.

Basement is very damp with water seeping through walls. Otherwise brickwork in good condition, no specific cracks noted.

Existing pipe, possibly storm water appears to drain into well, though well itself appeared fairly dry at bottom.

Ground Floor

Entrance leads into Kitchen/Diner referenced area G1. Bay Windows appear to be more modern later (to original build) alterations or extensions, and are of structural timber framed construction. Generally walls and ceiling are in reasonable condition. Minor crack present in wall near sink. Exposed Oak timber beam over supporting first floor has minor splitting.

Rear rooms off Kitchen/Diner referenced G2, splitting present in Oak beams over supporting first floor. First floor/ceiling joists over are not level and slope to down one side. The wall by fire place of out plumb up to 30mm over 1.2m height.

Front entrance Hallway entrance reference G3, Walls and ceiling in good condition.

W.C. reference G4, walls and ceiling appear to be in good condition as do adjacent room G5.

Ground Floor Forge Building/workshop including Mezzanine, Reference G6, this building is constructed of solid brick walls, and is attached to main house, though no door is present directly between the two. Ground floor walls are generally in poor condition, with areas of cracked brickwork, lateral movement of the brickwork, bulging brickwork, particularly to rear wall and over front entrance. Several steel tie rods have previously been installed which is likely an attempt to prevent lateral movement of the brickwork.

Machinery has been attached to front wall, which is likely to have increased the bulging of the wall.

Brickwork to internal corners to external side wall is in particularly poor condition

Eaves brickwork to front wall under timber wall plate has moved outwards. A steep timber stair is present to mezzanine. Mezzanine joists appear to be in good condition. Underside of roof appears old but reasonable condition.

Existing timber truss has steel straps to timber wall plate, but wall plate is not strapped to wall.

Chimney is in reasonable, used condition.

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Deflection is present in timber purlin
Cracks are present in front wall by truss bearing.
A steel tie rod is present to top of wall by chimney.

No bird-mouthing is present of rafters onto timber purlins, and no nails could be seen (but may be present)

Ground Floor Area Next to Forge, Reference G7, area in good condition, with mono pitch roof and 2 purlins, possible encased steelwork. Looks to be possibly an infill between two buildings.

Ground floor Room/Workshop with wide Sliding Door and Mezzanine, Reference G8, masonry constructed building (solid 225mm brick walls) with steel roof trusses and steel purlins. Large entrance door.

Existing pier construction does not appear to support beam over.

Cracks at corner at ground floor level. Existing timber lintel over large opening.

Large steel beam over supports timber mezzanine floor. Limited access available by domestic ladder.

Roof, walls and mezzanine floor generally in good condition.

First Floor

Staircase from rear entrance kitchen leads up to first floor landing and corridor leading to first floor rooms. Reference F2. This landing has considerable slope across it, (which is reflected in the kitchen ceiling under below. Slope of around 50mm for a length of 1.2m. this floor in particular slopes local to staircase area. Generally no cracks noted in walls, but small diagonal crack to corner of window. Vertical crack noted above timber beam near top of staircase.

Timber beam appears to have previous or ongoing woodworm issues.

Room reference F1, finishes in reasonable condition. Timber floor has been renewed previously with T+G board finish. No cracks noted at corner of windows, however minor crack noted in ceiling.

Room reference F3, it was noted that floor slopes considerably, however no gap under skirting board (indicating skirting boards added after floor movement has taken place). Walls in good condition.

Room reference F4, slope to timber floor, small window present into old chimney.

Minor crack present in wall near cupboard under staircase soffit.

A steel beam is present in cupboard under staircase soffit which supports chimney over.

Room reference F5, Walls generally good condition but minor diagonal crack from top of door to ceiling. Minor crack left side corner of window to ceiling. Minor crack below middle of window. Slope is present to timber floor, however no gaps are present under skirting board.

Second Floor

Room reference S1, original timber purlins appear in reasonable condition.

Minor diagonal cracks are present in corner. A new opening has already been cut in existing masonry wall. Floor consists of timber floor joists with concrete topping on timber. Cracks are present throughout concrete topping.

Room reference S2, concrete topped floor slopes by entrance to room S4. A large amount of cracks are present in concrete floor topping. Front wall is out of plumb and leans outwards from timber floor to top by up to 40mm. Minor cracks are present in walls.

Exposed timber purlins over are split.

Room reference S3, numerous minor cracks are present in walls. Minor slope to floor. Floor finish is in poor condition. Front elevation wall leans out by 30 to 40mm from floor to top of wall.

Minor cracks present in ceiling.

Room reference S4, this room is generally in good condition and end wall is blockwork indicating modern cavity wall construction.

Structural timber props are present supporting roof over.(possibly props are part of a roof truss)

Elevations

Front elevation-Main House

The Front elevation has suffered from some vertical and lateral movement, with several minor cracks present. It does appear that there has been much movement mainly to the front wall of the property, evidence can be seen by the various cracks and bulging brickwork.

Majority of Solder course over to window heads have some movement

There has been previous mortar repointing that appears to have been carried out with sand/cement mortar rather than normal lime mortar. This can have a detrimental effect on the existing lime mortar.

There are cracks present below bottom 3 windows. Crack to top right corner of front door.

Poor weathered brickwork and mortar joints are present below dpc.

Front elevation-Forge

Extensive movement to front wall, with bulging and cracked brickwork. The whole wall in places appears to have deflected outwards, and has moved from its bed-joints.

Brick soldier course lintel over door opening is shallow.

Some of the mortar joints appear weathered.

No access was possible to the left side elevation of the forge, so condition of outer wall when viewed externally could not be determined.

Side Elevation (closest to courtyard)

This elevations appears to be in reasonable condition with no specific cracks noted, part rendered though much is covered by Ivy and hence could not be viewed.

Chimney appears to be in good condition.

Rear Elevation and Courtyard

The main house rear elevation being more a later extension appears to be in good order, it should be noted that bay windows appear to incorporate a structural frame, hence any replacement of windows would require the structural frame to be considered.

Again Ivy is present preventing a full examination. Slight bulge in masonry over rear door. Slight crack near rear door at corner.

Rear Forge Wall

Previous repointing of cracks noted. Upper access door leads into the mezzanine, assumed for loading.

Small cracks are present over rear window to forge.

Wall to workshop

Wide access doors. This elevation/wall is in Reasonable condition

Conclusions

The building considering its age is in reasonable condition, however there is evidence of historic movement, along with possibly ongoing movement.

It is likely at some time in the past the front wall has subsided and possibly the original building rear wall (now internal wall after extension), hence moved downwards with the resulting sloping first floors present, and out of plumb walls.

The movement appears to have been quite considerable, with the internal first floor measured slope of 40mm over 1.2m spirit level.

However there is no gap present at skirting board level, which indicates that movement has not occurred further after fitting skirting boards at first floor. It is not possible to date when skirting boards were fitted, and likely during a previous refurbishment.

The front elevation wall to main building, has bulged outwards and has several cracks along its length. Refer to photos. The wall appears to bulge over window openings, again possibly historic.

The masonry and mortar below dpc level is in poor condition, likely from splashing of rainwater on the pavement, water freeze/thaw action and possibly caused by the use of cement based mortar over lime mortar.

The mortar generally to the original building appears to be lime based, and re-pointing has been carried out with cement based mortar. This can have negative effect on the brickwork and should be rectified when possible.

Walls generally to original 18th century building are out of plumb with minor cracks present internally and externally.

The first floor has a wider joint between boards on the landing area, again indicating some lateral movement of the 'old' part of the house.

The second floor presently has a concrete topping to the timber. This concrete topping or screed has de-bonded and is breaking up in many places, a patch had been removed at time of inspection.

The remainder of the buildings, apart from the Forge appear reasonable condition, as they are later additions to the 18th century original building, which appears to have suffered the majority of movement.

The Forge building is in poor condition with cracked and bulging front and rear walls. Steel rods are present tying the front and rear walls. The existing steel tie rods appear not to have prevented movement of the front and rear. Cracks are present local to roof truss end bearings, there is masonry movement at the roof truss bearings, and little tying in of roof timbers to brickwork. The front wall has disjointed bed joints,

Internally the one end of the forge, the bonding of masonry is particularly poor with a large, wide vertical crack in the corner junction, which effectively de-bonds the two masonry walls at right angles to each other.

In summary, and with reference to the cracks present throughout the property, in particular the 18th century original building historic movement of the buildings foundations is likely which has resulted in the cracks and out of level floors internally. It is difficult to establish if movement is ongoing. Due to the buildings age, a little ongoing movement can be expected, however where cracks can be seen clearly, then it can indicate that greater movement is occurring, particularly where repairs have been carried out previously.

It is likely with this building that there is little tying together of the structure, such as floor timbers to walls, roof timbers to walls, and roof trusses to wall plates, as this was not common practice.

Such tying of structure helps to reduce bulging and outward movement of masonry, although would have little benefit in reducing any foundation settlement.

Recommendations

It is understood that the building is to be converted to Hotel/multi occupancy type accommodation, hence the following recommendations are to be considered:

- Carry out drainage survey (if not already done). Repair any defects
- Consider removing any cement based mortar that has been used over existing lime based mortar, and replace with lime based mortar, in order to prevent further brick damage. This needs to be carried out by a masonry restoration specialist, in order to not damage any further existing brickwork.
- All poor mortar bed-joints must be re-pointed. Where original wall contains lime base mortar, then lime based mortar must be used for re-pointing. It should be noted the later extended area is more likely to be constructed using cement based mortar.
- The masonry walls have moved to Forge building. It is assumed that in order to maintain the character of the building, rebuilding of any masonry cannot be considered, hence to stabilise the masonry in the front and rear walls of the Forge, the roof structure needs to be fully tied to walls. Therefore it is recommended that the wall plate is to be fully strapped down to walls at maximum 1.0m centres, and the rafters fully fixed to the wall plate, with galvanised nail/angle plates. These straps to have 900mm legs, and the quantity increased where the bulging and offset masonry is worst. In addition any gable ends must also be tied to wall with steel straps or similar. All cracks internal and external need to be repointed, with a similar mortar used when originally built.
- Internal corners of the forge walls have poor tying together and this must be corrected, use 30x5 galvanised straps at 900 vertical centres with 750 legs across corners. If this room is to have exposed brickwork and hence modern straps unsightly, then an alternative would be to use wrought iron effect banding or corner plate to tie walls together. A similar bespoke fabricated wrought iron could also be used to tie down wall plate.
- All heavy weights hanging from Forge walls should be removed.
- It should be noted that out of level floors and masonry cannot be recovered. The second floor screed needs to be removed in its entirety and replaced with a correct thickness timber floor covering, to span between floor joists.
- The general movement over door and window heads to front elevation is more difficult to eliminate. It is suggested that a good tying in of the floors to walls would reduce movement, and hence prior to re-pointing brickwork, Helifix Bow Tie HD gable tie bars can be installed which are drilled through bed joints, into internal timbers, then resin bonded to wall, and pointed over.
- The poor condition of masonry below the damp proof brick course to front elevation requires repair, to prevent deterioration. Remove any cement base mortar (that is over lime based mortar), re-point with lime based mortar, consider replacing bricks that are too badly damaged. Consider specialist waterproofing coating for bricks up to damp proof course.

- It is understood that the proposal is to remove selected walls during conversion of the property to Hotel type accommodation. This should present no particular difficulties, however a competent Engineer will be required to design adequate support.
- Once work has been carried out to the building and cracks infilled, it would be advisable to monitor the property, to record any further movement, and carry out any further repairs as deemed necessary by a competent Engineer.

Please note all Health and Safety requirements during all of the works must be adhered to.

We trust the above is self explanatory, however should you have any queries please do not hesitate to contact us.

Yours Sincerely

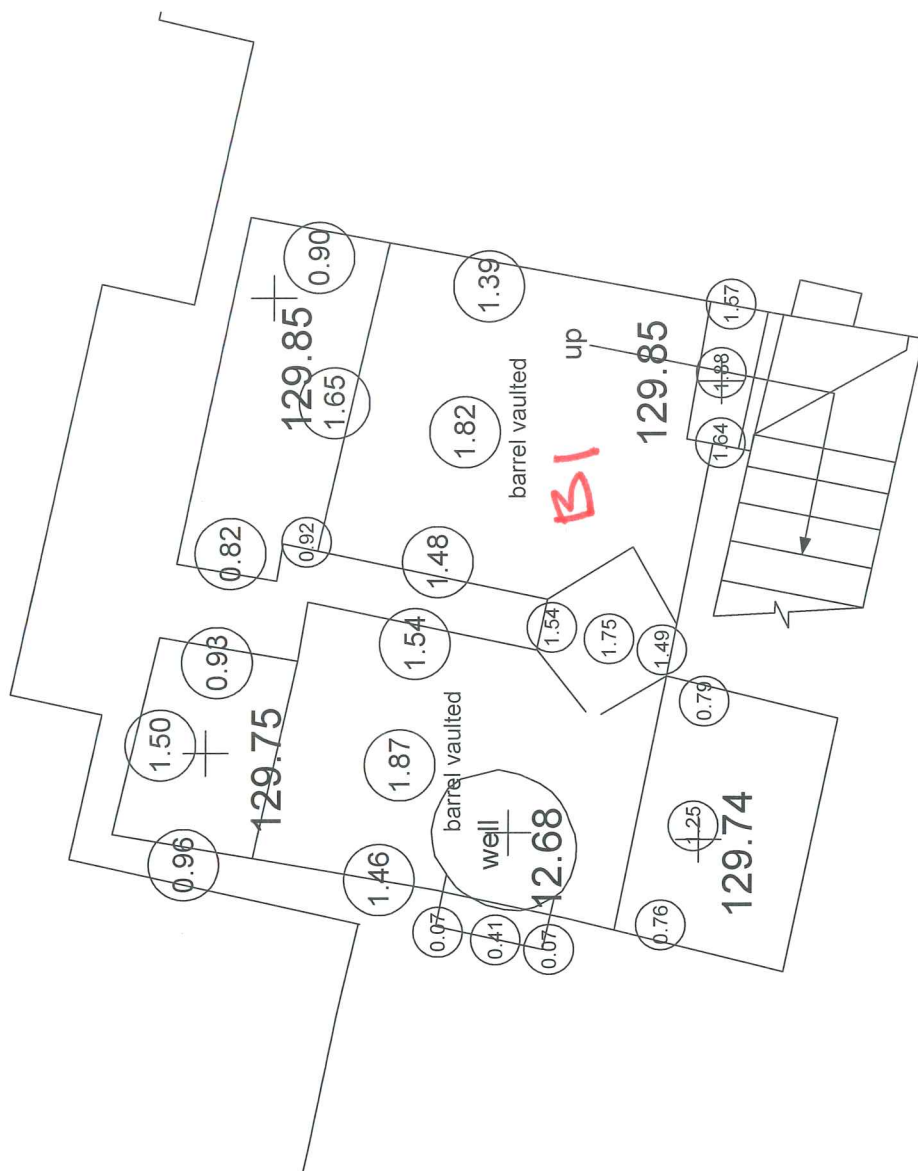
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APPENDIX A

EXISTING PLANS FOR REFERENCE



Basement/cellar Plan

Elevation 3

Ground Floor Plan.

Elevation 5

Elevation 4

Elevation 6

Elevation 7





APPENDIX B

PHOTOS

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Photo 1 Main House Front Elevation



Photo 2 Forge Front Elevation



Photo 3 Side Elevation



Photo 4 Rear Elevation



Photo 5 Rear Workshop Building Side
Elevation



Photo 6 Well in Basement-Note drain pipe
into Well



Photo 7 Timber Beams in Kitchen



Photo 8 Structural Timber Framing to Bay Windows



Photo 9 Split Timber Beam in Kitchen



Photo 10 Damage to Wall in Kitchen



Photo 11 Sloping Ceiling in Kitchen



Photo 12 First Floor Split Arch Over



Photo 13 First Floor Crack Near Landing Window



Photo 14 First Floor Opening of Floor Board Joints



Photo 15 First Floor Minor Cracks in Wall



Photo 16 Second Floor Alterations Started



Photo 17 Damage to Floor-Note Unusual
Concrete Topping



Photo 18 Second Floor Existing Timber Posts



Photo 19 Internal View of Old Forge



Photo 20 Old Forge Poor Brickwork Generally



Photo 21 Old Forge Movement at Both Eaves



Photo 22 Old Forge Poor Brickwork to End Wall



Photo 23 Old Forge Large Crack in Masonry to Internal Corner



Photo 24 Old Forge Movement in Masonry



Photo 25 Room Next to Old Forge Minor Cracks



Photo 26 End Workshop with Mezzanine-Good Condition

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Photo 27 Front Elevation, Main House



Photo 28 Front Elevation , Forge

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Photo 29 Forge Tie Rod and Hanging Machinery Tie Plates



Photo 30 Bulging Masonry to Soldier Course Over Front Windows



Photo 31 Movement in Masonry Over Front Windows



Photo 32 Previous Repointing carried out with Sand/Cement Mortar over Lime Based Mortar



Photo 33 Previous Repointing of Front Wall



Photo 34 Poor Condition Masonry and Mortar Below DPC Level to Front Wall



Photo 35 Exposed Structural Timber Framing at Rear