

Ms Kim Fowler
Great Barn
Rabley Heath Road
Welwyn
Hertfordshire
AL6 9UA

2nd June 2023
Ref: 111651/CA

Visual Structural Assessment Report for Proposed Conversion of Outbuilding

Dear Ms Fowler

Thank you for your instructions to undertake a visual structural appraisal of the the existing out-building currently used partly as a garage and mainly for storage.

We visited the property on Thursday 1st June 2023, our observations and conclusions/recommendations are as follows:

1. Perimeter Brickwork Wall Observations

- The back elevation comprises a 1 brick (215mm) thick wall reaching an approximate height of 2950mm
- The side elevations are also of 1 brick thick construction but taper down from the rear elevation towards the front elevation to an approximate height of 1000mm
- On plan the three walls form a "c – shape"
- The back elevation wall forms the boundary with the adjoining neighbour and perhaps is a party wall. This would need to be established.
- The back elevation wall is approximately 12000mm in length and has a small brick pier on the inside at approximately 4250mm from the left hand elevation
- There is a blockwork wall partition approximately 3850mm from the small brick pier that separates the main outbuilding from the garage area
- Either side of the small brick pier at half distance between the left hand elevation and blockwork wall partition there is a timber post tight to the back wall that is supporting the timber roof structure
- The rear wall has a slight out of vertical alignment towards the top section in places and a slight bow in the horizontal plane between the small central pier and left hand return wall

- The pointing between bricks to the “c – shape” wall is worn and erroded
- The back elevation wall in particular exhibits signs of mould and algea from water penetration
- Sections of the back elevation wall appear to have had historical repairs such that foreign materials such as concrete, timber and different bricks have been used
- There is no sign of crack patterns to the either of the walls
- The back wall abuts a dense area of vegetation on the adjoining neighbour’s land
- We took the liberty to excavate a little trial hole adjacent to the rear wall on the neighbour’s land with a spade. Due to the restriction in using a spade, we were only able to dig down approximately 300mm, however, there was a continuation of the wall, however, we were unable to prove the bottom level of the wall and hence its foundation
- The brick wall has no evidence of a damp proof course hence the presence of algea and mould

2. Infill Structure (Roof, Supporting Structure and Ground Slab) Observations

- The concrete slab in the main outbuilding area is uneven and exhibits signs of cracking
- The concrete slab in the garage area appears to be a more recent addition as it appears to be more even and does not exhibit and signs of distress in the form of cracking
- The perimeter wall to the garage and the rear kitchen have newish facing brickwork, with a vertical expansion joint at the interface of the garage and kitchen
- The edge of the concrete slab by the left hand front corner was measure with a tape as approximately 100mm. however, it is unknown whether this is consistent across the entire outbuilding
- Although a damp proof membrane under the slab was not able to be seen
- The roof comprises of corrugated metal sheeting supported on timber purlins at approximate 1300mm centres, which span approximately 3800mm
- The timber purlins appear to typically be 50 x 100 sections, which exhibit signs of warping and twisting
- The timber purlins are in turn supported by timber beams and posts

3.0 Conclusion and Recommendations

- The rear brick wall forming the rear elevation we suspect was perhaps a boundary/party wall originally that was braced by tapering walls at each and possibly internally
- This form of structure may originally have been used in part to store manure against the back wall
- Nevertheless, the three brickwork walls that form a “c – shape” are currently part of an enclosure that is currently used for storage and as a garage
- Cosmetically, the three brick walls are in need of the following:
 - Repointing most likely with lime mortar
 - Repair and replacement of brickwork where required
 - Cleaning of brickwork to repair algae and mould
 - Consideration to the installation of a damp proof course
- From a structural perspective the lateral stability of the rear wall needs addressing as is evidenced by the the out of vertical alignment and horizontal bowing. Neither are significant to warrant concern in the short term
- The rear brickwall does not benefit from lateral restraint from the existing roof structure or indeed the small internal pier, albeit however the internal block partition wall does offer an element of restraint
- The proposals for the conversion of the existing outbuilding comprise a new structure inside the three walls. This has a beneficial impact on the rear brick wall in so far as the proposed internal structure will offer lateral restarint to the rear brick wall.
- We would recommend further investigations post the planning stage at the outset of detailed design stage. These investigations would comprise:
 - Trial holes to confirm the depth and profile of the brick wall foundations
 - Core holes through the existing slab to confirm its thickness and if a damp proof membrane exists
- “The British Geological Maps” of the immediate area indiacte that the ground conditions to be expected are Chalk, which is the bedrock soil. There is no reference to the the superficial ground conditions, which is the layer of soil above the Chalk. Our knowledge of Welwyn informs us that there are out crops of Clay above the Chalk.
- The ground conditions are important in the assessment of the viability of re-use of the three brick walls and the proposed enclosure structure, in so far as the influence of trees in close proximity to the rear of the wall in Clay ground conditions. The impact is on the depth of existing and proposed foundations.
- Depending on the findings of the trial holes it may be that the existing wall may need to be underpinned either in part or its entirety or indeed the trees/vegetation behind the wall removed in order not to influence the existing and proposed foundations significantly in terms of founding depth

- The existing concrete floor slab based on the observations of our site visit, we would recommend is replaced with a slab laid flat and with the appropriate damp proof membrane and insulation to comply with the Building Regulations in force at the time
- The timber frame structure forming the roof ie purlins and posts are not fit for purpose as they exhibit signs of twisting/warping and therefore as part of the proposals should be demolished and replaced with a new structure.

So in summary, we would suggest that retention and subsequent repair of the existing three brick walls is a viable proposal subject to the findings of the trial/s:

- ***Confirmation of the prevailing ground conditions***
- ***Confirmation of the foundation profile/width and depth***

Notwithstanding the above, the erection of an independent structure to the proposed enclosure, will offer the rear brick wall in particular the benefit of lateral restraint.

Yours sincerely,

A black rectangular box used to redact the signature of the engineer.

Cem Ahmet BEng (Hons) CEng MStructE
Chartered Structural Engineer



Appendix – Site Visit Photographs

Photo – 1: Front Elevation



Photo – 2: Rear Wall Internally with Small Pier



Photo – 3: Rear Wall Internally with Existing Corrugated Roof



Photo – 4: Side Wall



Photo – 5: Rear Wall Externally



Photo – 5: Rear Wall Externally – Near Ground Level



Photo – 6: Rear Wall Externally – Below Ground Level



Photo – 7: Internal Concrete Slab



Photo – 8: Twisted & Warped Timber Roof Purlins



Photo – 8: Internal Blockwork Partition Wall

