PCA CONSULTING ENGINEERS | CIVIL STRUCTURAL CONSERVATION

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24th October 2023

Bethany Fisher
Shepherd's Cottage
4 Stradbrook
Bratton
Westbury
BA13 4SE

Dear Bethany

Re: 4 SHEPHERD'S COTTAGE, BRATTON



Further to our interesting visit to your property on Tuesday 12th September 2023, and our inspection of various elements within the house where structural repairs may be required, we apologise for the delay in writing and now report as follows, itemising the elements as noted by yourself.

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General

The Grade II Listed semi-detached two-storey property dates back to C17, with various alterations having been undertaken to it since this time, particularly in C18 and C19. The house lies on an easterly sloping hillside and includes a roof space, two bedrooms on the first floor, and kitchen, living room and bathroom on the ground floor, with a sub-floor basement accessed by a hatch within the bathroom floor on the eastern side of the building.

The house includes a slate roof covering on felt, battens and a timber cut roof structure, which has been largely reconstructed after a fire in the 1990s.



Roof structure generally replaced in 1990s after a fire.

The first floor structure primarily includes historic elm planks supported on oak floor joists, with the ground floor similarly constructed. The party wall with the adjoining building to the north includes an historic oak frame, probably C17, with clay brick and lime mortar infill. The remaining external walls to the house are generally built of solid brickwork.

Deflected joists in bathroom ceiling affecting the original floorboards above

The floor in this bedroom over the ground floor bathroom includes oak joists, nominal 50x90 @ 350c/c spanning west – east approximately 2.5m. The floor structure is therefore quite weak. Two of the joists, local to the northern party wall, have significantly deflected, with evidence of the eastern joist bearings having settled historically. We understand that a previous owner had a heavily loaded wardrobe positioned in this area, and it is quite possible that this has been a contributing factor to the distorted and deflected shape of the floor, with the joists being overloaded.

As far as we can ascertain, the eastern bearings to the joists appear to be quite reasonable, with good embedment, but this needs to be verified. Similarly, the quality of the oak is adequate, although the second joist out from the eastern party wall is showing very slight signs of a minor centre span fracture.

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Deflected bedroom floor structure over bathroom local to the eastern party wall.

With respect to repairing this floor, we would recommend that the filling between the elm planks, which appears to be resinous, is carefully taken out, and the nails securing the boards over the bathroom are either released, or cut, to facilitate the northern end of the boards to be left in place but raised. This would only apply over the area of the bathroom below.



Exposed deflected bedroom joists over the ground floor bathroom.

The proposal would then be to strengthen the oak joists by adding scribed oak furring timbers, glued and clamped to the top of the existing joists. This would then provide a more robust and level support for the elm boarding, allowing them to be

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refixed and patched where required. This would include an edge cover plank adjacent to the party wall, where there is currently a gap.
We have prepared a sketch confirming our recommendations, which is attached to this letter.

Installation of woodburner and structural condition of recess adjacent to fireplace.

The proposal to install a wood burning, or similar, stove within the fireplace recess in the lounge seems eminently sensible, but advice should be sought from a specialist firm to ensure that all recommendations and regulations relating to solid fuel appliances are considered and complied with.

It is very probable that the existing masonry flue will need to be surveyed, and a metal liner installed, with an appropriate chimney pot etc. as may be required.

The recess adjacent to the fireplace opening is lintelled with a series of timbers spanning the depth of the opening, supported on the front face with a steel bar. Although somewhat untidy, the support arrangement appears to be working adequately, but we would recommend that the steel elements are cleaned off and corrosion protected.



Steel bar supporting timber lintels over recess beside fire place.

There is a small area of loose masonry over the opening, to the left, which should be locally repointed and consolidated prior to fixing a new lining or ceiling board over the recess.

Ventilation to the roof void.

Following our cursory inspection of the roof void and the general arrangement and construction of the roof covering and structure itself, we do not feel it is essential that roof vents are installed.

The slate roof covering is quite random, with the slates in areas not being bedded completely flat, and therefore ventilation between the slates and around the felt is probably quite good. The situation should be monitored and, if condensation is a

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concern, and vents need to be installed, consideration could be given to introducing these within the west and east walls between the eaves and first floor ceiling level.

During our inspection, we did note that some slate repairs are required where they have slipped, or been displaced slightly, within the roadside west elevation and the southern hip slope.

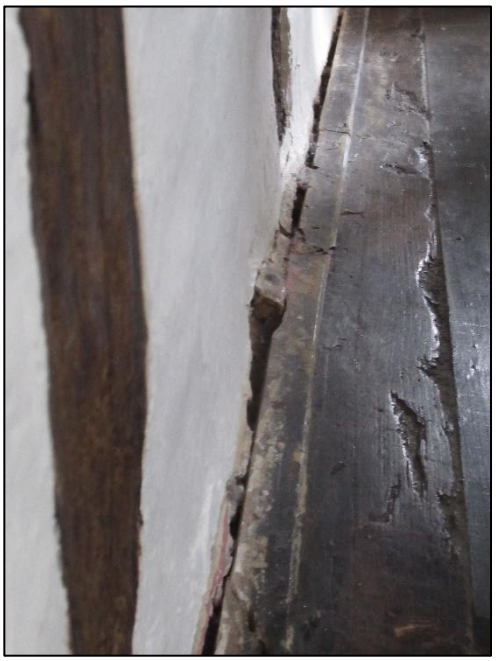


Slipped slate on southern hip slope, to be repaired.

Brickwork pointing crumbling and eroding in areas

There are a few areas where the brickwork pointing has become displaced and some of the bricks and stones are loose. These areas should be repointed and consolidated, adopting an approved soft lime mortar so that it is not too strong relative to the strength of the clay brick.

Gap between landing floor and northern party wall



Lime mortar packing between the elm boarding and the party wall within the landing area has become loose, and the interconnection of the first floor diaphragm, together with the joist bearings with the party wall construction, is not particularly good and should be enhanced.

Gap between landing floor boarding and party wall.

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We would recommend that the joist bearings are checked and that angle cleats are added, screw fixed to the party wall and to the adjoining floor joists. Some of the nailed timber packers may need to be removed, which will allow the opportunity for the bearings of the joists to be reviewed, together with additional fixings added as may be required.



Landing floor joist bearing onto bearer adjacent to northern party wall.

As previously outlined, any consolidation and repointing of the exposed brickwork between the joists should also be undertaken prior to refixing the cover boarding as appropriate. An elm board, or narrow timber, could be added on the landing between the floor and the party wall, or alternatively the lime mortar infill could be repaired.

Repairing and consolidating damaged floorboards in bathroom

An area of the elm floorboarding in the bathroom has suffered beetle attack, and as a result it is quite soft and friable.



Elm floor boarding in bathroom affected by historic beetle attack.

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A potential solution is to apply a wood hardener to the timber, following which any loose elements of board could be packed underneath and re-supported with thin oak wedges, or equal, either glued or screwed in place.

Main Bedroom floorboarding

The condition of the existing elm floorboarding in the bedroom is quite varied, with gaps between boards and occasional missing boards etc., and therefore some repairs would be prudent.



Repairs required to bedroom floor boarding.

One approach would be to carefully take up the boarding and trim the edges of the board slightly, allowing for a better fit between boards. Additional reclaimed elm could then be added as may be required.

An alternative would be to leave the fairly random condition of the boards but, prior to re-laying, screw fix 12mm ply to the top of the joists on which the elm boards could be laid and fixed. Some of the gaps between the boards could then remain, without affecting the serviceability of the floor.

Staircase

Some of the boards within the staircase are a bit loose and deflect to a degree when walked on. One approach for strengthening the stair flight without having to take it apart and remove treads etc., would be to introduce oak or softwood stiffeners of a triangular shape, glued and secured to the underside of the treads and risers.

We would recommend two stiffeners per tread across the width of the stair flight. If felt appropriate, the soffit of the stairs could be closed in, with the stiffening fillets used as bearers for the lining board.

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We hope that the above is helpful and should you have any queries or require any further assistance from ourselves, please do not hesitate to contact us.

Kind regards



Paul B Carpenter
PCA Consulting Engineers

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