

STRUCTURAL DEFECT REPORT

STROUDWOOD FARMHOUSE



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Brief

Andrew Waring Associates were engaged by Lloyd Exley of Exdell Ltd., to conduct a site visit to inspect the attic structure at Stroudwood Farmhouse, Lower Upham, SO32 1HH. The homeowner of the property had reported excessive vertical deflection in the ceiling of the bedrooms as well as displacement of the roof hips and a tilt to the chimney breast.

The purpose of the inspection was to appraise the reported rafter and ceiling joist deflection and suggest possible reasons for the defects reported as well as remedial works required.

Disclaimer

Our report concerns only the parts of the structure we that were appointed to inspect. Any other parts, adjacent structures, buildings or other areas are explicitly not considered unless deemed to pose some risk to the inspected structure.

Our inspection was visual in nature only. We did not include any intrusive investigations unless specifically noted otherwise. Where reasonably practicable we have attempted to access and inspect safely accessible areas.

Our inspection did not include any parts which were inaccessible or not visible and therefore we can provide no comment on the condition of any such uninspected parts of the structure.

We have not inspected all structural members in their entirety, but have examined a representative sample of areas that we believe offers a reliable indication of the overall structure. Localised areas with different construction types may not have been identified as a result.

All external observations of the structure are made from ground level only.

No guarantee can be given against the presence of rot, disease, beetle infestation or other defects within the timber elements of the structure.

No guarantee can be given against the presence of dampness, asbestos, harmful gases or other hazardous materials within the structure.

No testing or enquiries as to the presence of or susceptibility to pollution contamination, radiation, methane, radon and toxic mould, fungus or spore or other hazardous substances has been carried out.

Our inspection concerned structural aspects only and no comment or guarantee can be made on the condition of services, architectural finishes or decorations.

Any potential work valuations mentioned are estimated based on prior experience and should not be relied upon without consulting a professional cost consultant.

No responsibility is accepted to any third party for the whole or part of the contents of this report, which has been exclusively compiled for the use of our client.

The client should also note that liability to the client, whether in contract or tort, shall not exceed the amount as stated in the agreement, recoverable by way of indemnity insurance taken out by Andrew Waring Associates at the time we received instruction from the client.

Visit

The site was visited by Joshua Powell (Author) on Friday 28th February 2025, in the presence of the ground's keeper, Mr V Tubuitamana. During the visit, access into the loft space was provided to inspect the timber condition.

Weather conditions at the time of survey were dry, sunny and cold.

Site

The affected house is the original Grade II listed farmhouse of Stroudwood Farm, dating back to 1790 (Listing Reference: 1281382).

Structure

The affected property is a two-storey farmhouse measuring approximately 4.74m x 11.74m in plan. It comprises two rooms and a hallway on each floor. The building is constructed with solid brick masonry internal and external walls, supporting a hipped roof formed from cut timber rafters resting on timber purlins (Figures 1,2&3).

The roof structure has undergone refurbishment in recent decades, including the addition of an impermeable bitumen felt layer beneath the clay tiles. The existing rafters measure 50mm x 80mm at 330-400mm centres with a roof pitch of 42°. Ceiling joists vary in size, with dimensions of 50mm x 40mm at 500mm centres at the far ends and 55mm x 80mm at 300mm centres in the central area. At the supports the 40mm deep joists are notched 20mm and have 20mm end bearing. Only a couple of the joists were checked due to limited access.

The building appears to have initially been a single dwelling, with a secondary property later built abutting the northern side. The only sign of internal alteration is the doorways through to the conjoining property which showed no signs of damage.



Figure 1 – Front (South) elevation of Stroudwood Farmhouse



Figure 2 – Side (East) elevation of Stroudwood Farmhouse



Figure 3 – Side (West) elevation of Stroudwood Farmhouse. Chimney observed to be severely out of plumb

Inspection

The inspections were focussed on the roof structure of the original farmhouse. No other properties were inspected during the visit.

The first-floor ceilings exhibit significant sagging and linear cracking in the plasterboard, with the most pronounced deflections occurring centrally within the affected bedrooms. These issues have reportedly worsened in recent months. The centre of the bedroom ceiling is approximately 110mm lower than the hallway (Figure 4).



Figure 4 – Ceiling deflection of first floor bedroom

The loft space displayed signs of dampness, with condensation visible across most surfaces. Timber elements were found to be soft to the touch, indicating possible wet rot. Green and white mould growth was prevalent on rafters and the felt (Figure 5).



Figure 5 – Impermeable roof felt with internal condensation

Several timber joints were observed to have separated or were in the process of pulling apart (Figure 6). Purlins were deflecting at the hips, and rafters were secured with only singular nails. Woodworm damage was noted, though the activity status remains uncertain.



Figure 6 – Purlin joint deflecting

The attic space contained only rockwool insulation, which was dry at the time of the visit but showed signs of previous compression by moisture.

In many cases the purlins supporting the rafters are propped off the ceiling joists rather than dedicated load-bearing beams or walls. Additionally, no bracing struts were observed to provide horizontal support to the purlins (Figure 7 & 8).



Figures 7 & 8 – Purlins supported off ceiling joists

Cracks have formed above the doorways in the first-floor bedrooms, and the door frames showed signs of distortion (Figure 9).



Figure 9 – Cracks above first floor bedroom doorways

Discussion

The vertical displacement of the bedroom ceiling joists is the product of two issues;

- i. The lack of adequate ventilation in the loft space has created a conducive environment for dampness. The impermeable bitumen felt installed beneath the clay tiles prevents vapour from escaping, trapping moisture within the roof structure. This has led to widespread condensation, dampness, and mould growth on timber elements. Prolonged exposure to moisture has caused the timber to soften, reducing its load-bearing capacity and contributing to the deflection of ceiling joists. Additionally, the rockwool insulation, while dry at the time of inspection, has previously been saturated, adding unnecessary weight to the already compromised ceiling joists. The absence of soffit ventilation exacerbates the problem, as there is no airflow to regulate humidity levels or expel moisture. This has resulted in the deterioration of timber elements, including rafters, purlins, and joists, with visible signs of wet rot and mould growth.
- ii. The roof structure relies on purlins supported by ceiling joists rather than dedicated load-bearing walls or beams. This arrangement is inadequate for the loads imposed, particularly at the hipped ends of the roof where smaller-section joists (50mm x 40mm) are notched and have minimal end bearing (Figure 10). The notching further weakens the joists, reducing their bearing capacity and leading to excessive cracks and deflection. The purlins themselves lack sufficient vertical support. In several locations they are propped directly onto ceiling joists without intermediate struts or braces, causing point loading and further stressing the joists. Unusually, having the joists not span the same direction as the rafters has led to a roof that is trying to splay. This could explain the cause of the vertical cracking above the doorways on the first floor.



Figure 10 – Notched ceiling joists and end bearing

Recommendations

To address the identified issues and prevent further deterioration, the following remedial actions are recommended:

1. Submit a Listed Building application to obtain consent for the proposed works. Consult with the Listings Officer to ensure that all interventions are sympathetic to the building's historical character and comply with conservation guidelines.
2. Install temporary Acrow props with bearing plates beneath the affected ceiling joists to provide immediate support and prevent further deflection. This will mitigate the risk of structural failure while repairs are carried out.
3. Scaffolding should be erected to provide safe access to the roof structure. This will facilitate the removal of existing tiles, battens, and impermeable felt, as well as the installation of new materials. The existing leaning chimney will require closer inspection as to whether it will require reconstruction or additional support.
4. A detailed assessment of timber conditions should be conducted to identify elements requiring treatment or replacement. Severely decayed or damaged rafters, purlins and joists should be replaced with appropriately graded timber that matches the building's historical fabric.
5. Replace the existing impermeable bitumen felt with a breathable roofing membrane to allow vapour to escape. Install soffit vents or other ventilation systems to promote airflow within the loft space and reduce moisture levels, to the approval of listings officers.
6. New timber struts should be designed to provide adequate support to the purlins. Introduce additional load-bearing beams to support purlins and redistribute roof loads away from ceiling joists. Purlins will require steel plate reinforcement to limit deflection and any weakness at splice locations. Lateral restraint to the rafters at eaves level to be included to prevent roof splay and any damaged rafters to be replaced. The existing joists are inappropriately sized for the bearing and span and will require reinforcing with new joists.

Conclusions

The structural issues observed at Stroudwood Farm are predominantly linked to inadequate roof ventilation, timber deterioration due to prolonged exposure to moisture, and an unsuitable roof support arrangement.

In the current roof build up and structural arrangement, AWA would deem it as unsafe and require immediate remedial works.

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