

REPORT

Upon
The Structural Condition of Ancillary Building at
Harwoods, West End Lane, Henfield, BN5 9RF



E.A.R.
Sheppard
CONSULTING CIVIL AND
STRUCTURAL ENGINEERS

REPORT

UPON THE STRUCTURAL CONDITION OF
ANCILLARY BUILDING AT :

Harwoods
West End Lane
Henfield
BN5 9RF

FOR:

Jon Hazel



REF: H6344/RJB

DATE: 31 June 2025

1.00 INTRODUCTION

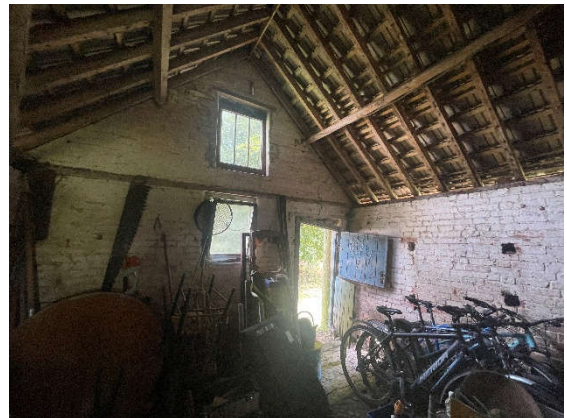
- 1.01 Instructions were received from Jon Hazel, the current owner of the property, to inspect and report upon the structural condition of the ancillary building in relation to a forthcoming Planning and Listed Building application for certain conversion works, as set out in Cerowski Architects Supporting Narrative dated May 2025 and associated drawings.
- 1.02 The primary purpose of the inspection and report was to determine whether the building is capable of conversion without the need for significant reconstruction.
- 1.03 It is understood that the principal property, Harwoods, is Grade II listed and the relationship of the ancillary building, to that property, is as described in HB Archaeology & Conservation Ltd's Heritage Statement. This report should be read in conjunction with that statement, together with Cerowski Architects' relevant drawings and supporting documentation.
- 1.04 My inspection of the building was confined to the visible areas of structure from ground level only. No intrusive investigations were carried out and I have not inspected woodwork or other parts of the structures, which were covered, unexposed or inaccessible. I am therefore unable to report that any such parts are free from defect.

2.00 MAIN ROOF STRUCTURE

- 2.01 The roof is of gable ended simple duopitch softwood (probably Baltic pine) construction. Midspan support is provided to the rafters by side purlins that run into the gable walls at each end. The purlins take intermediate support from timber struts that, in turn, are supported by two timber tie beams spanning across the width of the building at approximately third points. The ridge is of standard board construction with the rafters birdsmouthed over timber eaves plates that sit on top of the east and west walls. The plates are restrained by the tie beams referred to above.



Roof structure at South end of building



Roof structure at North end of building

- 2.02 From a structural perspective in relation to the timber sizes, the roof is relatively weak and it has suffered a degree of deflection and eaves level 'spread' under loading. I understand that the original covering was of plain clay tiles, which are heavier than the present interlocking concrete tiles and I anticipate that the majority of the roof displacement would have occurred prior to replacement of the roof covering. Movement of the roof has resulted in a certain amount of displacement of the eaves plates, which has been transferred into the walls. See further comments in External Walls below.
- 2.03 I note the intention to replace the concrete tiles with plain clay tiles, as original, which will require the roof to be strengthened in order to accept the increase load and prevent further displacement. I also note that it is proposed to incorporate a flat ceiling across the width of the building, which will allow the ceiling joists to provide the essential tie between the rafter feet on each side. This will form the mainstay of the strengthening work.

An additional measure to reduce future deflection of the rafters would be to incorporate collars, above the level of the existing purlins, between the rafter pairs on each side of the roof. One further improvement of the roof structure would be to introduce diagonal wind bracing, beneath the rafters, at each end of the building, to prevent longitudinal racking.

A couple of nominal braces have previously been installed at the south end of the building.

When it comes to Building Control stage, I anticipate that the Building Inspector will require structural calculations to prove the adequacy of the roof structure. This may require some additional strutting, which could be supported via the inserted ceiling joists. If necessary, supplementary rafters could be provided alongside the existing, subject to a more detailed inspection of individual members, following stripping of the existing tiles.

- 2.04 There is evidence of past woodworm attack to most of the timbers but I did not observe any obvious signs of active infestation and the general level of attack did not appear to be sufficiently advanced as to give major concern to the overall structural stability of the roof. That said, it would be prudent for treatment of the timbers to be incorporated into the proposed conversion works.

3.00 WEST LEAN-TO (PIGGERY) ROOF

- 3.01 This small span section of roof comprises mono pitch rafters spanning from the western eaves plate of the main building down to a low level plate carried by intermediate posts, which have rotted out at their feet.



Lean-to roof structure

- 3.02 Whilst the majority of the rafters could be retained, or possibly repurposed into stud framing beneath the plate, the posts that currently carry the plate will need to be replaced. Furthermore, the ties between the low-level plate and the main building are in a poor condition and will also need to be replaced.

4.00 EXTERNAL WALLS

- 4.01 The walls are of solid 225mm brickwork laid to Flemish garden wall bond, sometimes known as Sussex bond, in lime mortar, albeit with areas of later cementitious pointing.
- 4.02 The walls are out of plumb to varying degrees, which is particularly evident on the east wall, where there has also been some significant cracking towards its southern end.
- 4.03 From looking around the building generally, there is evidence of past subsidence of the site and typically, that could be due to cyclical shrinking and swelling of the subsoil seasonally, with changes

in moisture content. A potential aggravating factor is moisture extraction by the close proximity of a group of beech trees close to the north-east corner of the building.



Trees close to north-east corner of building



Cracking to southern end of East elevation



Cracking at centre of East elevation

- 4.04 Whether or not remedial action by way of foundation underpinning is necessary will depend upon the plasticity of the subsoil, which will require ground investigation by a geotechnical engineering company, to include a borehole and laboratory analysis of subsoil samples.
- 4.05 The geological survey map of the area indicates the primary geology to be of Lower Greensand which I would not expect to have a particularly high plasticity index. However, it is possible that there are

pockets, or layers, of clay on the site which will be more susceptible to shrinkage from loss of moisture. This will be determined from the ground investigation, along with an indication as to the degree of desiccation to provide guidance on the most appropriate course of action.

- 4.06 In a worst-case scenario, underpinning of the foundations may be required and assuming that to be of mass concrete form and taking account of the close proximity of the trees, an underpinning depth of the order of 2.25m might be expected at the north-east corner, which could possibly be stepped up to a minimum of 1.0m moving away from that corner. That said, I should reiterate that whether or not underpinning is necessary will depend upon the outcome of a detailed ground investigation.
- 4.07 Not all of the movement affecting the external walls is subsidence related and I have already referred to the effect of roof spread resulting in lateral force being applied to the tops of the east and west walls. The provision of ceiling joists across the building will ensure adequate restraint to the rafter feet and the walls are not sufficiently out of plumb to give cause for concern with regard to their overall instability.
- 4.08 I suspect that it has been the roof spread that has moved the tops of the walls enough to displace the ends of the soldier arch lintels over the north and south door openings, causing them to collapse. Once the walls are suitably restrained, then re-forming the soldier arches is all that is required.



Failed soldier arch over door in South elevation. See a narrow soldier courses as evidence of earlier window



Failed soldier arch over door in North elevation

- 4.09 The pattern of the most significant fracture in the east elevation, towards its southern end, is not entirely consistent with subsidence of the site and I cannot rule out the possibility that the wall has been subject to impact damage at some time in the past. See photo under 4.03.

That said, I could not find any evidence of scarring on the wall to suggest where any point of impact may have occurred. Notwithstanding that, whatever the cause, the southern end of the wall will need to be rebuilt and properly toothed to the rest of the wall, in order to form a decent repair.

- 4.10 Structural cracking approximately halfway across the east elevation has been poorly repaired with cementitious mortar and a couple of metal cramps. See photo under 4.03. There is evidence of further movement having occurred since that time and the fracture will require raking back each side and re-bonding with the adjoining brickwork.
- 4.11 There was once a small narrow window in the south elevation, as evidenced by the 6 brick-on-end soldier arch, which has been widened, incorporating a crude timber lintel, that has decayed. See photo under 4.08. I would suggest that reforming the window to its original weight would be the most appropriate course of action.
- 4.12 From inspection around the building there are a number of smaller fractures contained within the brick joints on each elevation that will require cutting out and making good, together with general repointing work. Any brickwork repairs should be carried out in compatible lime mortar.

- 4.13 Walls forming the boundary to the piggery yard on the western side of the building are of similar thickness brickwork and bond as those to the main building, with a half round brick coping on their tops. They have suffered from a degree of settlement, causing opening of some of the brick joints, particularly on the north and south elevations. Vegetation growing into the brickwork, together with freeze/thaw action has also exacerbated that displacement.



Typical condition of boundary wall to yard

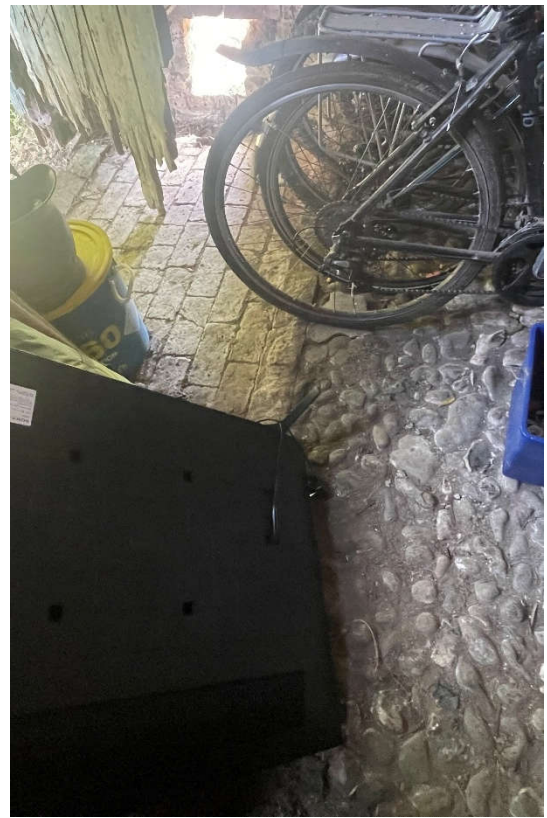
- 4.14 In my opinion, extending any underpinning (if required) from the main building would not be viable for these walls and despite the past opening of the joints, the walls remain serviceable, subject to

repair and repointing in compatible lime mortar. It would have to be accepted that future maintenance would be necessary from time to time.

- 4.15 There has been some bowing of the soldier courses to the tops of the slurry pit walls on the south side of the yard but it was not possible to make a detailed inspection within the pit due to the presence of vegetation

5.00 FLOOR

- 5.01 The present floor of the building is a mixture of concrete, brick and cobble and I suspect that there will be no meaningful subbase beneath any of these areas. Full inspection of the floor surfaces was not possible due to the presence of stored items within the building but the areas that could be seen did not reveal any significant cracking to suggest ongoing movement of the ground below, which is encouraging as far as the potential subsidence issue, previously referred to, is concerned.



Areas of brick and cobble flooring

- 5.02 Clearly, there will be a need for the floor to be insulated and I do not consider that screeding over and insulating on top of the existing surfaces would be structurally acceptable, as the integrity of the existing construction is unknown and there would be a risk of the screed cracking over time. The

present surfaces will need to be carefully lifted and, if required, could be reused as part of any external paving around the building.

5.03 Whether the new floor is a simple ground bearing limecrete slab, or some form of suspended concrete (or possibly suspended timber) construction, will depend upon the outcome of the ground investigation. If the subsoil is found to be particularly susceptible to shrinking and swelling, then there would be a higher risk of any form of ground bearing slab being affected by such movement. In which case, a suspended floor may need to be considered. However, I would not rule out the possibility of a limecrete floor on a subsoil of lower plasticity.

5.04 Whatever construction is finally decided for the floor, the intention to incorporate a stone slab finish would be feasible.

6.00 SUMMARY AND CONCLUSION

6.01 Although the building is in need of significant maintenance and repair, such work is required irrespective of any intention for conversion.

6.02 It is unlikely that a remedial project of this kind would be economically viable if the building was to remain as a garden store. An alternative use that could justify the degree of expenditure required would seem to be the only viable option to secure its future.

6.03 Despite the obvious need for repair, it is my opinion the building is ideally suited for conversion to its intended use.

