

Meadow Cottage
18, Primrose Lane
Winnersh
Wokingham
RG41 5UR

Structural Inspection
of the rear chimney stack

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1. Introduction

1.1 Appointment and Brief

Clive Hudson Associates Ltd were commissioned by Mr & Mrs Amara (the owners) to undertake a structural inspection of the chimney stack at the rear of their property, Meadow Cottage (Fig. 1), Primrose Lane, Winnersh, with a view to supporting a listed building consent application for its removal, reference PP/14581349.



Figure 1. Partial view of the front elevation of Meadow Cottage.

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Please note this does not constitute a full structural inspection of the property.

2. The Site

2.1 Location

Meadow Cottage is located on the east side of Primrose Lane on the northern edge of the village. Winnersh is a large suburban village located approximately 2 miles to the north-west of Wokingham and 4 miles to the south-east of Reading (National Grid Reference SU 78369 71456) (Figs. 2 & 3).

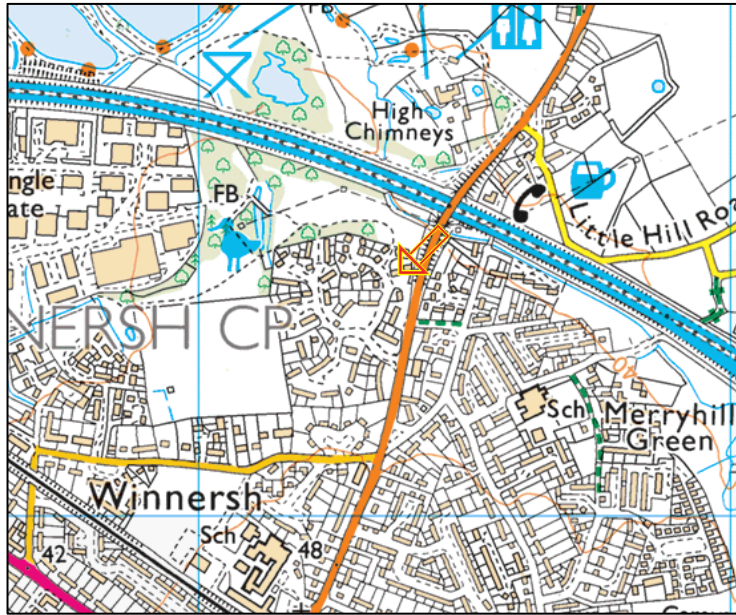


Figure 2.
Site location in relation
to the village
(Extracted from
www.streetmap.co.uk)



Figure 3.
Site location
(Extracted from
www.google.co.uk/maps)

2.3 Brief Description & Background

Meadow Cottage is a Grade II-listed (L.E.N. 1118102) residential property, understood to date back to the late 16th century. The property is oriented on an approximate east-west axis, with the principal elevation facing south. The earliest section of the property is timber-framed, while the extensions at the rear, at the north-west corner and towards the middle of the elevation are of brick construction. Although we are not architectural historians, these brick accretions probably date to the 19th century/turn of the 20th century.

While historically surrounded by open countryside, Meadow Cottage is now encircled by 20th-century residential development.

The chimney stack inspected is located on the east elevation of the two-storey rear extension, on the north-west corner of the property (Fig. 4).



Figure 4. View of the chimney stack at the rear of the property.

For reference, the listing description describes the property as:

Cottage. Late C16 altered and extended C20. Timber framed, painted brick infilling. Old tile gabled roof. U-plan with 4 framed bays in front section and irregular small extensions at rear. 2 storeys. C17 chimney on ridge left of centre, C20 2 and 3-light leaded casements irregularly spaced within framing; those on ground floor with small tiled pent hoods. C20 gabled, closed entrance porch on south front, projecting from second bay from left. Interior:- Most of timber frame visible on both floors with straight braces. Ground floor joists and principal beams have chamfers and stopped ends; old 4-light diamond mullioned window on former external wall on first floor at north east. Large inglenook fireplace.

The fireplace on the ground floor has been removed at some point before our client's ownership, leaving the stack to run from the first-floor/flat-roof level up to the chimney pot. At present, the sole purpose of the stack is to vent the aga in the kitchen.



Figure 5. View of the chimney stack at the rear of the property.

The stack is of brick construction and projects above the eaves by approximately 2.7m. Above the eaves, the stack is 2 bricks wide x 2 bricks deep. Below the eaves, the stack is 2 bricks wide x 1 ½ bricks deep with two inspection hatches on its east face.

Below the eaves, the bricks have generally been painted with an impermeable masonry, with localised evidence that the bricks were historically lime-washed. The stack is generally constructed using a lime-based mortar, except at the top, where the upper section has been rebuilt with a cementitious mortar and probably 20th-century brickwork.

The stack appears to be supported by a combination of a 6" $\frac{1}{2}$ ' deep x 10" $\frac{1}{2}$ ' wide timber beam that spans north and south, and provides support to:

- the external brick wall on the first floor,
- the first floor,
- a proportion of the flat roof, and
- we assume a proportion of the duo-pitched roof.

And a 3" deep x 4" wide timber that spans parallel to the main timber beam, which supports the east face of the stack (Fig. 6).

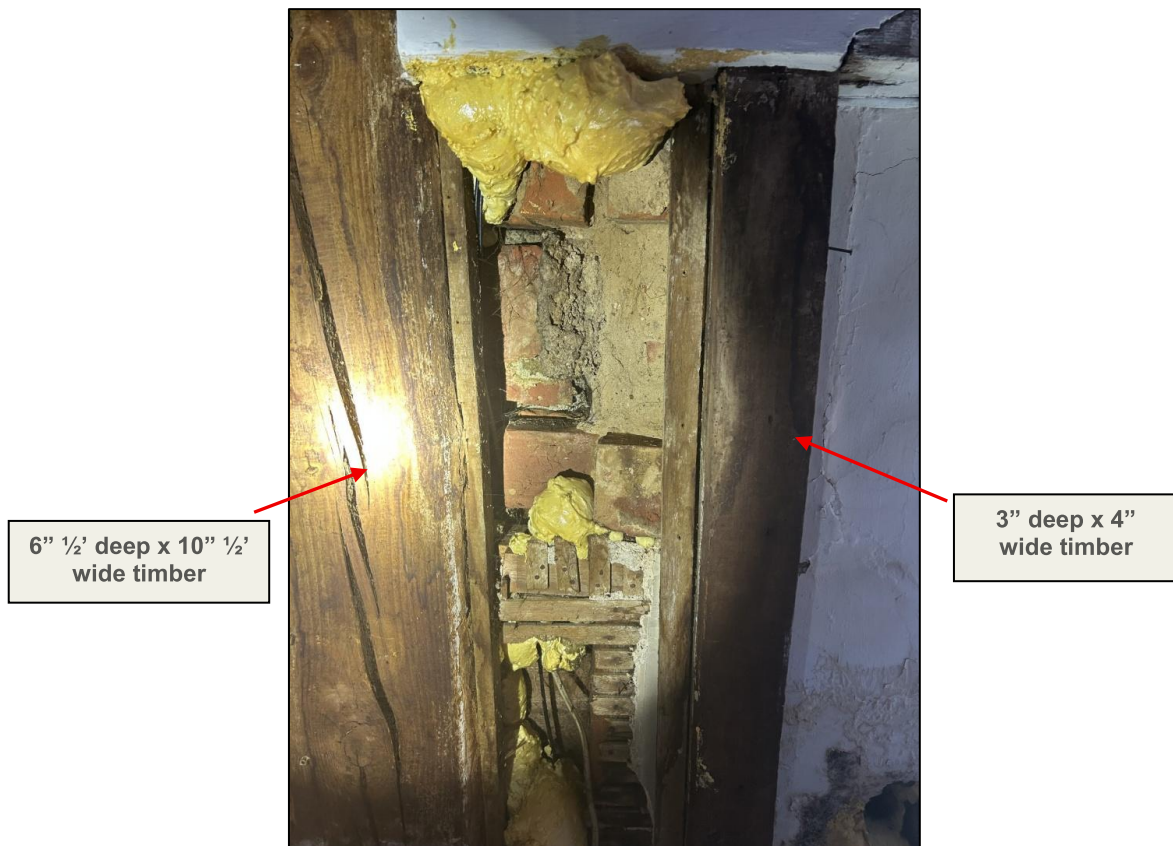


Figure 6. Obscured view of the soffit of the stack with the two supports indicated.



Figure 7.
View of the east face of the
stack above the eaves.



Figure 8.
View of the east face of the
stack below the eaves.

Clive Hudson Associates Ltd were instructed following concerns raised by the Conservation Officer regarding the listed building consent's application to remove the stack.

3. Existing Structural Condition

3.1 Introduction

The visual inspection was carried out by David Evans on Wednesday, 22nd April, in dry and bright conditions.

Externally, the stack was inspected from the ground and from the flat roof over the single-storey extension. Internally, the inspection was limited to what could be viewed from the kitchen and from the small first-floor study.

No detailed tests/analyses were performed on the construction materials used, other than the limited removal of delaminated masonry paint on the north face of the stack; no opening-up works were undertaken. Once all structural elements are fully exposed and accessible, further structural observations may come to light.

It should be documented:

- Most historic buildings do move/distort to a degree during their life, but this movement may not be a problem. It is only when the movement is ongoing and progressive and threatens the structural integrity of the building that one should be seriously concerned.
- Traditional buildings and their materials were built to be 'breathable' – allowing moisture to penetrate the fabric and then evaporate when the conditions were appropriate. The application of non-porous, cement-rich mortars and modern impermeable masonry paints to historically 'breathable'/porous surfaces can cause moisture to become trapped, which in turn can cause decay to the underlying material.

Digital photographs were taken to record areas of interest and are included in the report for reference.

Please note: any references to the "left" and "right" are taken when facing the elevation / structural element being described.

The following is therefore an opinion based on our experience of buildings of a similar age and construction.

3.2 Observations & Recommendations



Figure 9. Cracks in the east wall .

- i. Although not directly related to the chimney stack, slight-to-moderate diagonal cracks were noted in the external brickwork and the internal plaster on the first floor, with cracks of up to 10mm in width recorded externally to the north of the stack (Figs. 9-12).



Figure 10.
View of the crack to the
north of the stack.



Figure 11.
Close-up view of the crack
to the north of the stack,
with a crack gauge rule
measuring the width of the
crack.



Figure 12.
View of the cracks in the
plaster in the 1st-floor
study.

- ii. From the inspection undertaken, this movement is consistent with the deflection of the timber beam in this location. Although the chimney stack represents a relatively small proportion of the overall load, it is nevertheless contributing to the beam's deflection. While outside our scope, we would recommend that either the stiffness of the beam is improved, the load on the beam is reduced, or that supplementary supports are introduced as part of the proposed package of work.

- iii. As previously documented, the chimney breast has been removed from the ground floor. While we recognise that British Standards and other specifications and codes of practice should not be applied unthinkingly, in the context of building conservation, we do have reservations regarding the ratio of the unrestrained height (above the eaves) to the amount of retained brickwork on the first floor.

A general rule of thumb is that the amount of restrained/bonded brickwork below the eaves should be at least double the height of the unrestrained brickwork. As the stack projects approximately 2.7m above the eaves, this is not the case at Meadow Cottage, where there seems to be more brickwork unrestrained than restrained.

The situation is exacerbated, as the localised removal of detached sections of modern masonry paint revealed that at least 4 continuous courses on the north face of the stack are not bonded or coursed into the east wall (Fig. 13). This absence of interlocking masonry significantly reduces the lateral restraint normally provided at this junction, diminishing the effectiveness of the first-floor brickwork as a reliable point of support.



Figure 13.
Straight joints within the
brickwork at the junction of the
north face of the stack and the
east wall.

It should be noted that no opening-up works were undertaken on the south side of the stack to confirm whether the south face is bonded to the wall, as the paint remained well adhered to the brickwork.

- iv. Although it does not warrant immediate structural concern, the top of the stack does lean in a northerly direction.
- v. Localised degradation, spalling and cracked bricks were noted (Fig. 14-16). If the stack were to be retained, then we would recommend that localised repairs are undertaken.



Figure 14.
Spalling/degradation of the
brickwork towards the top
of the stack.



Figure 15.
Cracked bricks just above
the lead flashing/eaves.



Figure 16.
Spalling/degradation of a
brick on the north-east
corner.



Figure 17.
View of the low-level
inspection hatch filled with
mortar dust and brick
fragments.

- vi. Above the eaves, the mortar is set back (recessed) from the face of the brickwork which, while it is not a structural defect in itself, is a poor detail as it exposes the brick arises and the mortar to rain, frost, and wind-driven moisture. Although a detailed inspection of the masonry above the eaves was not possible, limited access from the flat roof indicated sections of the mortar were very friable, and the low-level inspection hatch was found to contain loose mortar dust and brick

fragments (Fig.17). This indicates ongoing weathering and deterioration of the stack, consistent with the vulnerability created by the recessed joints and the inappropriate use of modern masonry paints below the eaves. If the stack were to be retained, then we would recommend that repairs are undertaken. Subject to a more detailed inspection of the bed joints above the eaves, it is likely that it would be necessary to dismantle the stack first before rebuilding it if it were to be retained.

- vii. Corrosion and expansion of the metal work were noted in both inspection hatches. The deterioration of the upper hatch has caused cracks to develop in the adjacent brickwork (Fig. 18). If the stack were to be retained, then we would recommend that localised repairs are undertaken.



Figure 18.
Corrosion and expansion of
the metal inspection hatch,
with localised cracks
developing in the brickwork.

- viii. The aga flue penetrates the north-east corner of the stack just above the flat roof, with cementitious mortar observed between the top of the pipe and the underside of the brickwork (Fig. 19). Given the proximity of the pipe to the low-level inspection hatch, we would question whether the pipe is, in fact, supporting the brickwork above, which in opinion is a poor detail.



Figure 19.
View of the flue penetrating
the north-east corner of the
stack.



Figure 20. Panoramic view of the south face of the east-west beam with noticeable gaps between the ceiling and the beam, and signs of cracking/fractures within the beam.

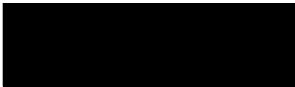
- ix. While outside of our scope, potential fractures and signs of movement were noted in the (painted) timber beam supporting the flat roof and the east face of the stack (Fig. 20). Assuming this beam will be retained as part of the application, we would recommend that a provisional sum is set aside for repairs/strengthening work. Subject to discussions with our clients to establish whether the gaps between the ceiling and the beam are recent or long-standing, it may be prudent to install some temporary props to support both the painted beam and the main north-south timber beam in the intermediate term.

4. Conclusion

From the inspection undertaken, the condition of the stack and its lack of restraint warrant structural concern. Although we recognise that older buildings that have stood the test of time require judgment in their conservation, we cannot provide assurance regarding the future stability of the stack in its current condition. While remedial works could be undertaken to secure its long-term future, the scale and extent of the works required would, in our opinion, appear disproportionate to the historical or heritage significance of Meadow Cottage. Subject to discussions with the Conservation Officer, we would recommend that the stack is either recorded and carefully dismantled, or the stack is dismantled to eaves level with a representative section of brickwork retained within the proposed new first-floor study.

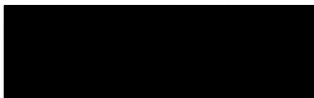
If you have any questions, please get in touch.

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