

Our Ref: NG/ng/31302

17 December 2020

Oakley Wood Master Construction Ltd  
91A New Road  
East Hagbourne  
Didcot  
OX11 9LB  
FAO: Mr Clive Wheeler

Dear Sirs

**Hampden House, Hampden Road, Great Hampden, Great Missenden HP16 9RD**

Further to your recent instructions we confirm having made a visual structural inspection at Hampden House on 26 November 2020.

Services are provided in accordance with the Association for Consultancy and Engineering Agreements.

Nothing in this report confers or purports to confer on any third party, any benefit or any right to enforce any term of this report pursuant to the Contract (Rights of Third Parties) Act 1999.

Our brief was to provide structural engineers advice on apparent vertical movement of ground and first floors to the small dining room and a landing outside a first bedroom along the east elevation.

The property will no doubt be familiar to you, but by way of a brief description Hampden House is a substantial two/three storey historic house with a basement.

The oldest part of the building, the south wing, is believed to be 14<sup>th</sup> century with the greater part of the property being 17<sup>th</sup> and 18<sup>th</sup> century.

The house has rendered and crenelated elevations and is constructed in a mixture of loadbearing masonry and timber framed walls.

When viewed from the basement a timber framed loadbearing wall has deteriorated resulting in vertical deflection of a 254 mm x 175 mm timber header beam at ground floor level.

This beam is supported at approximately 765 mm c/c by 175 x 175 mm principal posts or studs. Smaller studs approximately 75 – 100 mm x 75 mm spaced at approximately 250 to 275 mm c/c infill between the principal posts to form a partition between a 1.3 m wide corridor and 4.7 m wide archive room in the basement.

Ground floor joists are approximately 50 x 200 mm and span onto the partition. The overall length of the partition including a door into an archive room is approximately 3.8 to 4 m x 2 m high.

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The floor to the corridor comprises approximately 40 mm thick tiles laid on a brown silty soil. On close inspection it is clear that a 225 mm wide x 100 mm deep hardwood sill plate at the base of the stud wall has decayed and compressed in a number of areas. Additionally, a shallow brick plinth used as a footing below the sill plate has settled. The plinth is founded approximately 270 mm below paving level and comprises just 2 courses of brick approximately 150 mm high. This detail has resulted in the timber sill plate being partially buried in the ground floor construction.

Using a taut string line as a datum, it is clear that the ground and first floors above this area have dropped by approximately 70 mm. This movement corresponds with the vertical displacement of the timber framed partition within the basement.

Two fractures can be seen in the ground floor header beam when viewed from the basement. Fractures are approximately 3 to 5 mm wide and have been caused by gradual deflection of the beam as the support stud partition and footing below have settled.

A few smaller vertical wall studs close to the end of the partition have dropped with the sill plate resulting in tenons pulling out of mortices in the underside of the header beam by approximately 40 mm. The studs are now loose causing movement and gapping to the edges of infill plaster panels.

A later plastic repair can be seen to part of the sill plate where a gap has been filled below a primary vertical stud at the end of the partition.

A downstand floor beam over the archive/store approximately 175 mm to 280 mm wide with stop chamfers, extends parallel to the loadbearing partition approximately 1.6 m away. The underside of the ground floor slopes noticeably from this beam downwards towards the partition.

At ground floor level the most significant movement is close to an internal entrance to the small dining room from the servery.

Hairline and 1 mm wide cracks can be seen in the wall over the doorway and in a vaulted ribbed ceiling over a recess to the dining room. This room has an ornate plastered ceiling with a decorative cornice. The overall height of the room is approximately 3.74 m. 0.5 to 1.0 mm wide vertical cracking was noted in the side face of a decorative column or pier between the entrance door and vaulted recess.

The ground floor typically slopes downward to this area and coincides with the position of the timber framed partition in the basement.

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Movement is reflected in the landing floor and entrance to a bedroom at first floor level above this point. Hairline cracking was noted in the door architrave and in the wall and ceiling on the right hand side of the door when viewed from the landing.

Conclusions/Recommendations

It is clear that long term decay and settlement of the brick formation to the timber partition within the basement has resulted in downward movement of the ground and first floors.

Where the sill plate is partially in contact with the basement floor, this has resulted in decay and loss of section of the timber. A narrow brick plinth or footing below the partition has settled compounding matters.

Movement has clearly been taking place over a long period of time, however further cracking to finishes indicates it is ongoing.

In order to preserve the historic fabric of the building above basement level sympathetic repairs and augmentation should be carried out to the loadbearing timber framed partition.

This work will involve carefully replacing the defective sill plate with a similar sized piece of well-seasoned hardwood or oak. In doing so the existing brick plinth or footing should be rebuilt on a suitable mass concrete footing onto competent subsoil below the existing basement floor. When reinstating the basement floor finishes, ideally levels should be augmented to ensure the replacement sill plate is not in contact with the floor construction and can breathe to avoid future decay.

Existing principal timber studs can be adjusted locally to accommodate the new sill plate and incorporate a suitable anchorage plate or slip tenon if possible, to locate the stud. Where smaller studs have dropped out of existing tenons in the header beam they should be reinstated and spliced at the bottom, if required, to ensure they are the correct length.

Prior to any work the appropriate consents should be obtained and where possible a trial hole dug to determine the depth of competent soil below basement floor level.

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Trying to jack up the ground floor during future work should be avoided as this could compromise existing joints in the structure.

We trust you find the above and enclosed satisfactory however should you have any queries please do not hesitate to call us.

Yours faithfully

Neil Grinham CEng MStructE  
for ARCHIBALD SHAW

Enc: Photographs



Photo 1 – Timber partition in basement



Photo 2 – Decay of sill plate



Photo 3 – Compression of decayed timber



Photo 4 – Threshold dropped exposing tenon



Photo 5 – Archive, note sloping floor (over)



Photo 6 – Fractured header beam



Photo 7 – Historic repair to sill



Photo 8 – Vertical stud dropped





Photo 9 – Small dining room (ground floor)

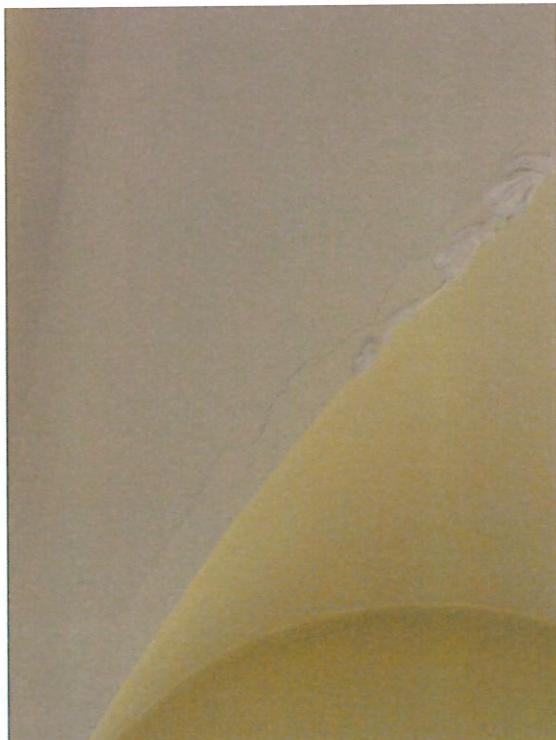


Photo 10 – Arch rib, plaster cracked



Photo 11 – Floor dropped and slight rotation of wall/pier



Photo 12 – Crack (vertical) adjacent decorative pier



Photo 13 – Crack adjacent door head



Photo 14 – Ramped floor to servery



Photo 15 – First floor landing



Photo 16 – View on entrance to first floor bedroom from landing



Photo 17 – Diagonal crack over architrave

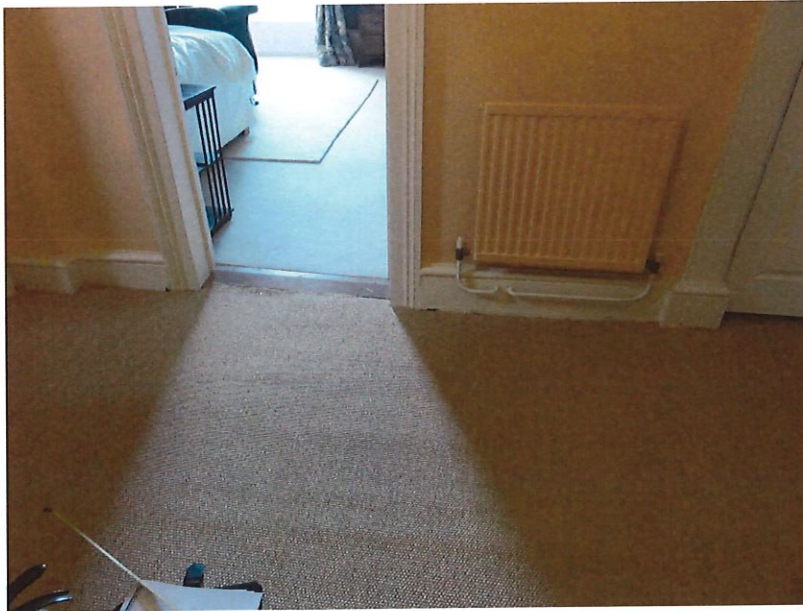


Photo 18 – Sloping floor at threshold (down from left to right)



Photo 19 – Ceiling cracks over small dining room.