

**Project:** Save The Children Refit, Lymington  
**Prepared By:** JB  
**Present:** JB

**Project No:** 03134  
**Date:** 17<sup>th</sup> March 2023  
**Weather:** Sunny and dry

## Purpose of the Inspection:

1. Inspection of first floor joists during refit works due to concern raised about their poor condition.

## Background:

1. 18 High Street is Grade II listed with the following text:

### Details

1. 5235 HIGH STREET (South Side) ----- Nos 16 to 18 (consec) SZ3295 1/6

### II GV

2. C18. Stucco with tiled roofs. No 16, 3 storeys, Nos 17 and 18, 2 storeys and 2 attic dormers. 5 windows. No 16 has 4 light canted bay on 1st and 2nd floor with dentil cornice round top. All sashes without glazing bars (vertical glazing bars only to those of No 17) C19 shop fronts, No 16 with twisted pilasters. No 18 with arched lights. with twisted pilasters. No

Nos 11 (building of local interest) to 18 (consec) form a group with the raised pavement and railing in front and with Elgar Court (building of local interest) at the rear of No 18.

Listing NGR: SZ3254195537



Figure 1 - Site location plan with 18 High Street outlined in red



Figure 2 - Street view of 18 High Street

2. The building houses the 'Save The Children' charity shop, with the ground floor used as the shop, first floor for offices and some storage and second floor and basement for further storage.

## Inspections:

1. At the time of inspection, the ground floor ceiling had been removed with the joists exposed to the side and underside. The first floor boards (which generally appeared original) remained in place. Primary timber beams spanning across the property and supporting the joists were mostly covered with paint and timber mouldings, limiting their view.
2. The first floor structure is split into four bays of joists through the length of the building. These are indicated on the annotated Figure 3 below. The bays have been labelled a-d, with joists numbered 1-11 from left to right. Primary beams are labelled A-F.

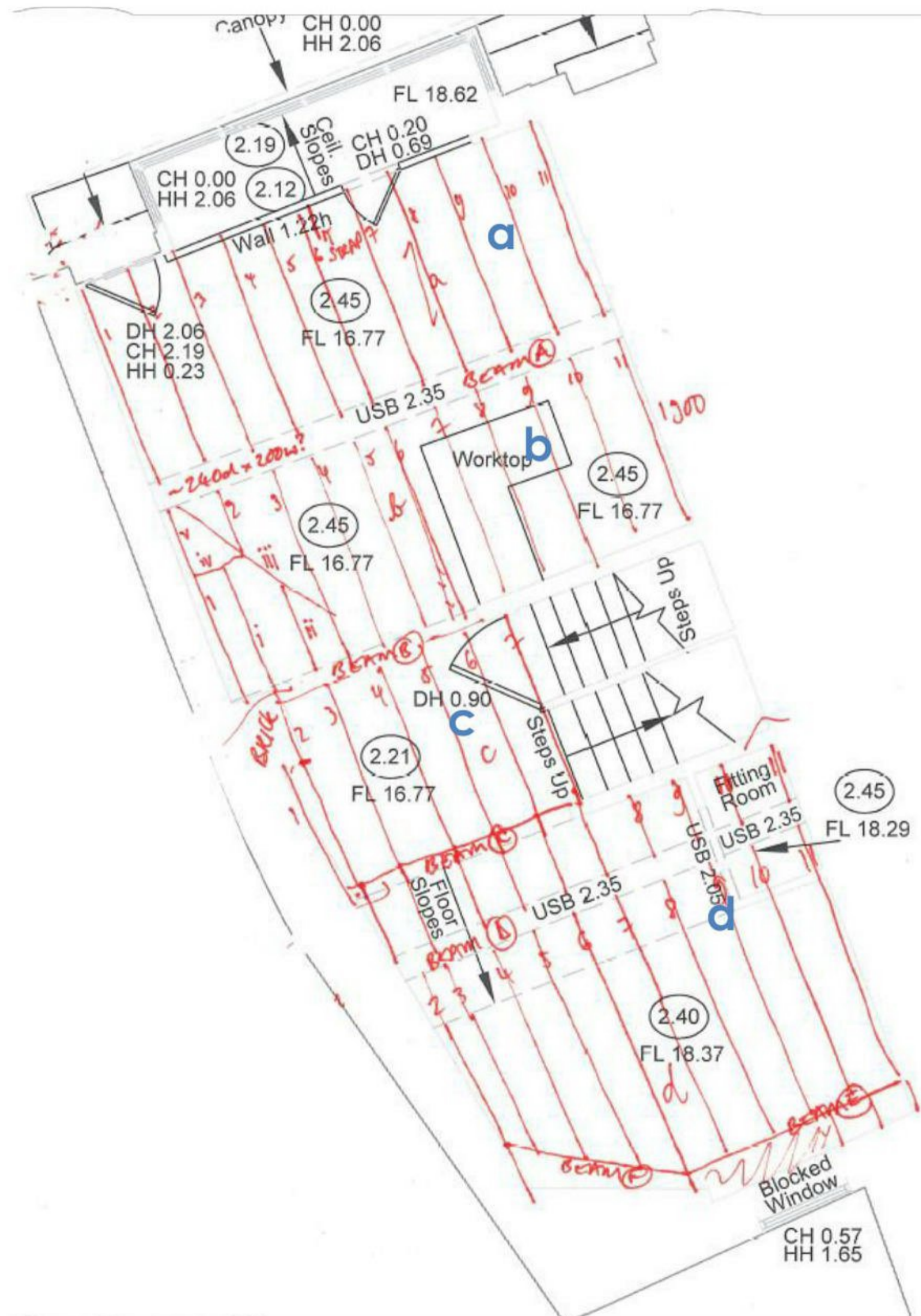


Figure 3 - Ground floor plan showing first floor structure above.  
High Street entrance and north orientation at top of plan

3. Throughout the first floor, the joists typically measure 120mm deep x 75mm wide and are spaced at 430-460mm centres.
4. The joists are typically connected to primary beams with traditional mortice and tenon joints. These may also be pegged from above, but this was not visible due to the boards being in place.
5. At the front of the shop (north end on plan) there must be a significant beam supporting the first floor masonry. The details of the beam were not visible, but the joists here are notched over a more modern timber batten.



Figure 4 - View of joists a:3-7, joists notched over timber batten. Note metal strap to side of wider joist 6.



Figure 5 - Typical joist notching into primary beam A, some flight holes in side of beam

6. Primary beams A and D measure about 250mm deep x 200mm wide, although this is a best estimate since some finishes and mouldings remain. Beams B and C are narrower (75-100mm) to suit the thickness of the internal walls around the staircase.



Figure 6 - View looking west of bays a and b



Figure 7 - View looking south of bays c and d

7. The joists broadly align with each other through the length of the building, but have staggered bearings over beam B. Joists span continuously over beam C.



Figure 8 - View of joists a:1-4, note material loss to underside of 3 & 4



Figure 9 - View looking north from bay b to a, beam A with decorative mouldings in place.

8. The joists have suffered considerable beetle attack to their undersides and sides. This appears to be limited to the sap wood of the joist faces, with the remaining timber feeling solid. The extent varies between joists but the majority have at least some holes to the sides to a depth of about 5mm. Many have more significant material loss to the underside, between a quarter and a third of the joist depth.



Figure 10 – Joist b 4, loss of material to  $\frac{1}{2}$  joist depth



Figure 11 – Joists b 10 & 11, south bearings. Significant loss to joist 10.

9. No evidence of live specimens was seen and therefore the damage is believed to be historic. It is common for the beetles or larvae to be present at the time of, or soon following construction when the timber has a higher moisture content, and it is likely that the damage was suffered many years ago.



Figure 12 – Joist b 4, loss of material to ½ joist depth

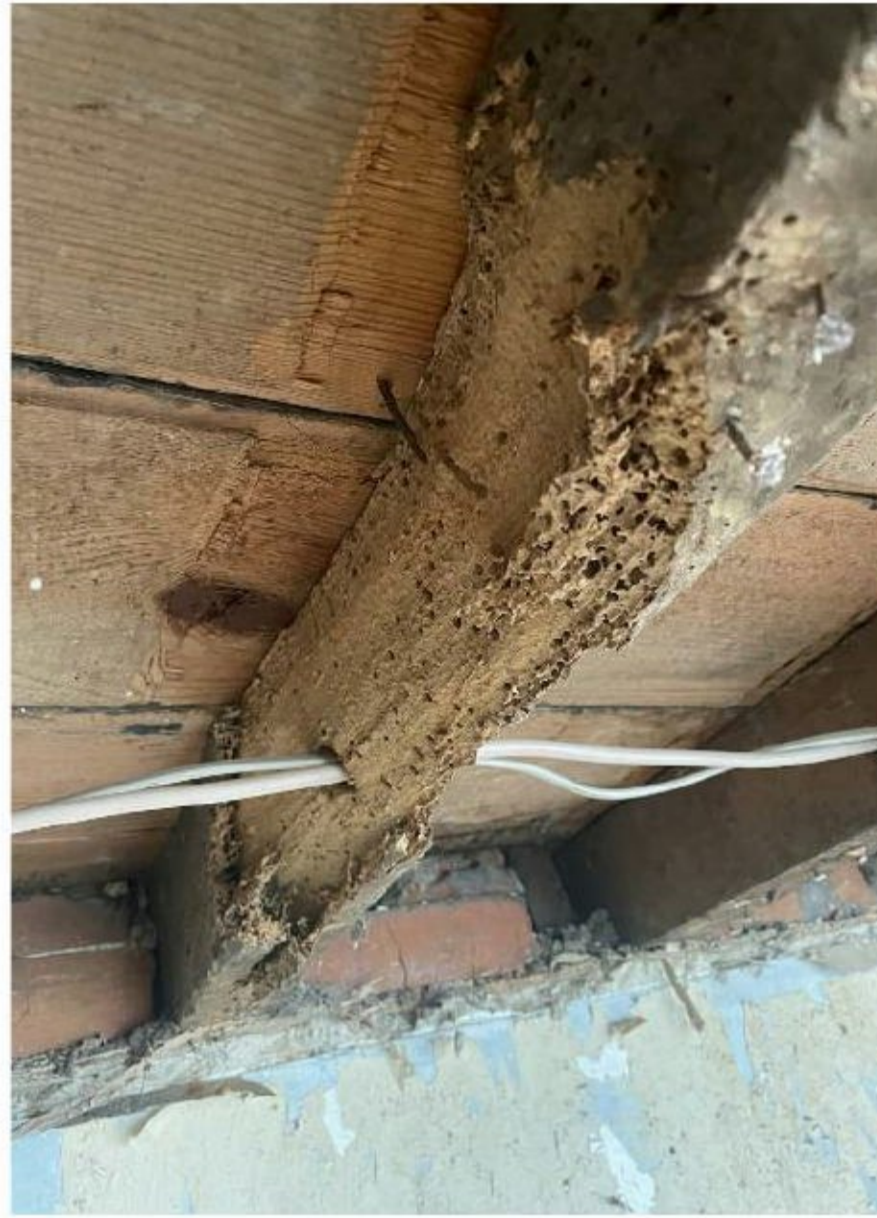


Figure 13 – Joists b 10, south bearing. Loss of sap wood.

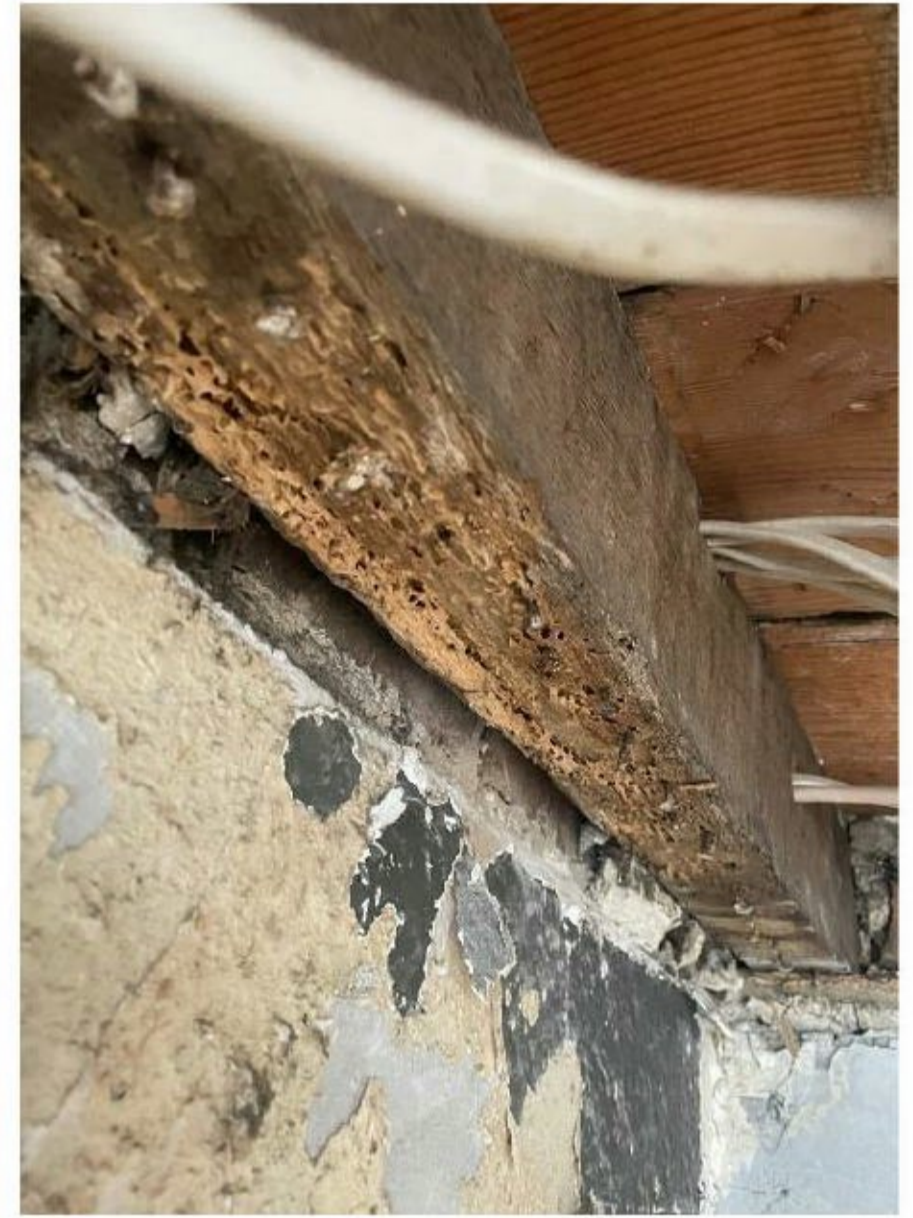


Figure 14 - Joist b 11, loss of material to underside

10. The joist conditions are summarised in the table below. Joists are numbered from left to right, with references to north (N) or south (S) ends in the orientation of the plan in Figure 3.



Figure 15 – Joist d 8, significant loss of material to north end west side



Figure 16 – Joist d 9, significant loss to central underside to 1/3 depth

Joists		
Bay	No.	Notes on Condition
<b>a</b>	1	Ok, notched to 65mm deep for hearth above for 600mm at S end.
	2	Ok, notched to 90mm deep for hearth above for 470 at S end.
	<b>3</b>	Major beetle attack to central u/s, to 1/4 depth
	<b>4</b>	Major beetle attack to central u/s edge and N bearing
	5	Ok, some minor beetle attack to u/s and N bearing
	6	130d x 100-130w, strap to NE side. Beetle attack to S bearing, 1/5 depth
	<b>7</b>	Major beetle attack to S bearing u/s to 1/2 depth
	<b>8</b>	Major beetle attack to central u/s to 1/2 depth
	<b>9</b>	Major beetle attack to central u/s to 1/3 depth, N bearing loss and side board repair
	<b>10</b>	Major beetle attack to central u/s and S bearing to 1/2 depth, N bearing loss and board repair
	<b>11</b>	Beetle attack to bearings 1/3 depth
<b>b</b>	i	Modern 120d x 50w
	ii	Modern 120d x 50w
	iii	Ok, diagonal
	iv	Ok
	v	Ok, 80d x 30w, loose
	1	Modern 120d x 50w
	2	Ok, minor beetle attack at diagonal connection
	3	Ok, minor beetle attack to sides
	<b>4</b>	Major beetle attack to N bearing to 1/2 depth
	<b>5</b>	Major beetle attack to N bearing to 1/2 depth
	6	Minor beetle attack to u/s, ~5mm
7	Ok, surface holes	
8	Ok	
9	Ok	
<b>10</b>	Major beetle attack to S end, u/s and E face	
<b>11</b>	Major beetle attack to S bearing E side, depth to 1/4	
<b>c</b>	1	Ok
	2	Ok
	<b>3</b>	Beetle attack to u/s to 1/3 depth
	4	Minor beetle attack to u/s and side ~5mm
	5	Minor beetle attack to u/s and side ~5mm
	6	Ok
	<b>7</b>	Beetle attack to W side and u/s, and N bearing
	8	Ok
	9	Ok
	10	Ok
	11	Ok
<b>d</b>	2	Ok
	3	Ok
	4	Minor beetle attack to N bearing ~5mm
	5	Ok
	<b>6</b>	Ok, some beetle attack E side, S bearing up to 1/4 depth
	7	Ok
	<b>8</b>	Major beetle attack to NW side with loss of bottom corner

	<b>9</b>	Major beetle attack to central u/s to 1/3 depth
	<b>10</b>	Major beetle attack to central u/s to 1/4 depth
	11	Minor beetle attack to W side ~5mm

11. The primary beams also display some evidence of beetle attack with flight holes visible above the retained mouldings. These beams feel firm but there could be further damage behind the retained finishes.

Beams		
#	Dim (mm) d x w	Notes on Condition
<b>A</b>	240 x 200	Some minor beetle attack on upper N side, u/s concealed
<b>B</b>	215 x 100	Ok, concealed by plasterboard
<b>C</b>	200 x 75	Ok, concealed by plasterboard
<b>D</b>	260 x 200	Ok, u/s concealed
<b>E</b>	120 x 95	Ok
<b>F</b>	130 x 65	Ok

12. The internal walls adjacent to the staircase appear to be timber framed construction with infill of bricks laid on their side. The bricks measure 110mm high x 60 thick x 230 long. The southern wall below the quarter landing has suffered some collapse and will need to be repaired.



Figure 17 – Internal timber frame arrangements around staircase



Figure 18 – Southern wall with unstable masonry panel



Figure 19 - Southern wall with unstable masonry panel

13. The basement was briefly inspected and it was noted that the majority of the ground floor joists had been replaced at some point in the past, with modern 125 x 100 oak joists, traditionally jointed into either original or replacement oak primary beams.



Figure 20 – Basement – modern joists supported on original beam



Figure 21 – Basement – modern joists supported on modern beam



## Conclusions and recommendations:

1. Whilst the joists have suffered beetle attack and in places significant loss of material, the remaining timber does appear solid. The attack appears to be historic and probably occurred soon after construction. Beetles feed on the softer sap wood and are normally unlikely to return once this is exhausted. Therefore, there is little benefit in treating timber in these circumstances.
2. Preliminary calculations have been carried out to check the capacity of the joists to support the proposed loadings. The first floor rear room is used for offices and the front room for storage. In both rooms the furniture is shown around the perimeter of the room which will minimise the actual loading in the centre of the rooms.
3. The applicable Eurocode imposed loadings for offices are a uniformly distributed load of 2.5kN/m<sup>2</sup> (~250kg/m<sup>2</sup>) and a point load of 2.7kN (~270kg).
4. Generally, the joist size is acceptable for the span and proposed loading. However, in bay d where the span is longer than the others the joists would be slightly over deflected with the proposed loading. This is not a significant concern as the calculated deflection is less than 10% over the modern design limit, and the stresses applied to the timber are within design limits.
5. Where minor defects are recorded, e.g. ~5mm affected to sides or underside then these joists are considered satisfactory. Where the joists are worse affected then it is recommended that these should either be partnered or replaced. These joists are highlighted in the above table in **red**.
6. Depending on the view of the conservation officer, partnering could be achieved with modern C24 softwood timbers (120mm deep x 50mm wide) either bolted alongside the existing with M10 at 300mm c/c, or otherwise spanning new joists in between the existing and fixings to the supports with face fix joist hangers. If joists are to be replaced then these should be like for like with connections matching the existing.
7. The existing primary beams have been checked for loading and these are slightly over deflected with the proposed loading but within limits for stresses. It was not possible to inspect the undersides of these beams due to retained finishes. These should be removed locally to ensure the beams are in satisfactory condition.
8. The proposals show storage bins against the wall on first floor. The joists should be doubled in these areas to provide additional support.



Josh Bargh

**For and on behalf of Marbas Consulting Engineers**

Distribution: Ross Byford, Projects and Buildings Manager, Save the Children