

Our Ref: 210886/LD/ad

**Enquiries to: Laura Dombrovsk**  
**Mobile: 07552 310908**  
**Email: ldombrovsk@smitherspurslow.com**

8 April 2022

Criterion Adjusters Ltd  
Suite 3, River House  
Broadford Business Park  
Shalford  
Guildford  
Surrey  
GU4 8EP

**by email only: [justin@criterionadjusters.com](mailto:justin@criterionadjusters.com)**

Dear Sirs

**Re: ROSE COTTAGE, CHURCH LANE, THWAITE, EYE, SUFFOLK IP23 7EJ**

Thank you for your instructions to carry out a structural appraisal of the above property. We can confirm that the property was inspected by our Ms Laura Dombrovsk and Mr Connor Tovée-Galey on Tuesday, 1 February 2022.

This report is based on a visual inspection only with no opening up or exploratory works carried out within the property and is limited to the nature of instruction.

All references to left and right-hand sides are as facing the front elevation from the road.

## **1.0 GENERAL DESCRIPTION**

- 1.1 The subject property has suffered extensive fire damage to the thatch roof structure.
- 1.2 The property is a detached, timber frame, Grade II listed, thatched dormer cottage with infill panels of cob construction with lime render external walls. Internally, ceilings are a combination of lath and plaster and plasterboard whilst walls are a combination of lime render and plasterboard.

## **2.0 SITE VISIT**

- 2.1 At the time of the inspection the weather was overcast and windy.
- 2.2 Access to the damaged roof structure was provided by the scaffold tower with a tin hat on. The chimney stacks were also braced by the existing scaffold as part of the temporary works.

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## **2.0 SITE VISIT**

- 2.3 It took some time for the tin hat to be installed, and we were informed by our colleague that the building had been left unprotected against the weather.

## **3.0 OBSERVATIONS**

### **Roof – Overall Observations**

- 3.1 Overall, the roof will require complete replacement as all rafters have been either burnt by fire, sustained rot damage or have been subject to insect attack. Due to the extent of the damage, no existing roof timbers can be reused as part of the roof reinstatement.
- 3.2 The roof timbers are very old, hence, the section sizes are not uniform in size or shape and not what we would expect in a modern roof construction.
- 3.3 There is insect damage to roof timbers which was observed in the form of small holes. The oak roof members have become soft, brittle and 'porous' like on the inside, meaning that the overall density of the timbers has reduced. The strength of wood decreases as its density decreases and considering the age of the oak members, it is most likely that the strength of the original oak members has significantly decreased over time.
- 3.4 It appears that some roof members have also developed some rot issues, however, it is unclear whether that is historic or due to recent long-term exposure to the weather. Some vegetation was also growing within the roof, but this is likely due to continuous exposure to weather prior to the tin hat being installed.
- 3.5 The main roof structure can be divided into three separate parts. The higher level right-hand side roof, middle roof and left-hand side lower roof.
- 3.6 There are 2 No large chimney stacks within the building. Both chimneys appear to be stable and with no immediate issues noted, but the left one appears to be slightly leaning/twisting.
- 3.7 All timbers are hardwood oak members. The feet of the rafters are notched into the wall plate and fixed with timber pegs approximately 20-25mm diameter. Sprockets are attached to the rafters to carry the roof overhang.
- 3.8 Some rot was also noted on the oak members internally. Some structural timbers have been heavily notched to accommodate some internal alterations such as stair rail. (Plates 1 and 2)

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### **3.0 OBSERVATIONS**

#### **Roof 1 – Lower Left-Hand Side Roof**

- 3.9 The roof is a cut roof with rafters and 2No purlins at higher level with a tie across them to accommodate a reasonable head height. (Plate 3)
- 3.10 Rafters are of various sizes ranging between 60-77mm width and 100-110mm in depth at 430 – 500mm c/c. Purlins are approximately 50x100mm sections and the high-level collar is approximately 30x130mm.
- 3.11 The approximate roof pitch is 45-50 degrees. Instead of modern battens, cut tree branches were fixed to the rafters with steel/iron nails. (Plate 4)
- 3.12 Four out of five rafters have collapsed – all badly burnt, rotten and have sustained insect attack over a long period of time.
- 3.13 An internal propping structure is evident around the chimney base in the form of diagonal struts, with a cross member just below them attached to the rafters. (Plate 5)
- 3.14 A gap between the chimney and internal gable wall is infilled with larger size rafters. The chimney has some soot residue visible. (Plate 6)
- 3.15 The rafters at the back of the roof have been affected by the fire significantly and are in a very poor condition overall. They have sustained significant water damage which has led to rot damage. They also have historic insect damage which most likely has significantly reduced overall structural capacity of the rafters. (Plates 7 and 8)

#### **Roof 2 – Middle Roof**

- 3.16 The cut roof is supported by a 2-dimensional oak frame. The main frame, perpendicular to the front elevation, consists of 2No oak columns (200x200mm) supporting a large oak tie beam (200x200mm) of inconsistent width/depth with gallows brackets (60x200mm) between the columns and tie beams. A timber post (150x150mm) sits at the middle of the beam and together with additional gallows brackets supports the beam at raised ceiling level. (Plate 9)
- 3.17 The tie beam is sitting on top of the columns and has a steel pin going through and the column ends appear to be chamfered. The gallows brackets are slotted into the columns and beams. (Plates 10 and 11)

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### **3.0 OBSERVATIONS**

#### **Roof 2 – Middle Roof Cont'd.../**

- 3.18 The frame parallel to the front elevation includes the middle post on top of the tie beam and two additional posts sitting on top of the gable oak wall plates with all three connected via ceiling beam and gallows brackets. (Plate 12)
- 3.19 Both gable walls are timber framed with cob wall infill panels in between the timbers. (Plate 13)
- 3.20 It is assumed that there is a higher-level tie between the rafters which the ceiling is attached to.
- 3.21 All rafters are 90x140-160mm @approx. 425mm c/c. The rafters are notched into the wall plate and have sprockets nailed to them to carry the roof overhang.
- 3.22 The rafters on the left-hand side of this roof have fully collapsed but some rafters on the right-hand side of the roof remain in place, however, are burnt at the ridge location. There is evidence of insect damage and extensive rot damage from long exposure to the weather to both roof timbers and the wall plate. (Plate 14)

#### **Roof 3 – Higher Right-Hand Side Roof**

- 3.23 The roof is constructed as a close coupled truss with a raised tie which acts as an attic room floor and a high-level tie for raised ceiling support. The rafters are 90x150 @450mm c/c. (Plate 15)
- 3.24 It appears that there may have been a purlin affixed to the outside of the rafters.
- 3.25 The wall plate on the right gable wall sits on top of the one that spans across the front wall and are 180x180mm. The wall plates at the front and rear walls carry over the edge of the wall. The wall plates have also been fire damaged. (Plate 16)
- 3.26 All rafters in this roof area remain in place, however, have been significantly damaged by the fire. At the back of the roof, there is evidence of vegetation growth due to long term water exposure to the roof which has also exacerbated the rot damage and historic insect attack. (Plate 17)

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### **3.0 OBSERVATIONS**

#### **Roof 3 – Higher Right-Hand Side Roof**

- 3.27 The room below has a sloping soffit to accommodate the attic room. It is evident the high-level collar has been raised to allow for adequate head height in the attic room. This could potentially not be in accordance with the current building regulations. The lath and plaster ceiling in the attic room was more modern compared to the rest of the roof which suggests that the attic space was converted more recently. (Plate 18)
- 3.28 Some of the timbers within the gable wall have also collapsed/burnt though. (Plate 19)
- 3.29 The chimney stack appears to have only sustained some smoke staining and overall, is in good condition. (Plate 20)

### **4.0 SUMMARY AND RECOMMENDATIONS**

- 4.1 It is recommended that a cob wall specialist is appointed to carry out the assessment of the external and internal walls as it is believed they may have suffered some damage due to being exposed to weather for a long period of time and some cracking was noted externally. (Plate 21)
- 4.2 The existing roof members have some historic insect damage which had already weakened the roof timbers. The exposure to weather over a course of eight months has also contributed to reduced structural capacity of the oak roof members.
- 4.3 In addition to the above, all timbers have sustained some damage from the fire, including roof members, wall plates and internal and external timber framed walls.
- 4.4 We believe that no roof members can be retained for reuse as part of the reinstatement works due to reasons mentioned above. All roof timbers, including wall plates will require replacing.
- 4.5 The internal and external timber frame walls will also require partial replacement.
- 4.6 Since it is a full rebuild of the roof, approval from Building Regulations will be required, however, it is believed that the existing attic room head height will not meet the current standards.

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Should you have any queries in connection with any of the above or our comments, please do not hesitate to contact the writer, who will be happy to help.

Yours sincerely

**SMITHERS PURSLOW**



LAURA DOMBROVSKA BEng (Hons)  
Graduate Engineer

Enc Photographic Plates