HBC&R

Historic Building Conservation and Repair Ltd

Condition Report of the Historic Timbers

Of

Church Farmhouse

Bepton

Midhurst

GU29 0HX

Prepared By

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HBC&R Ltd

October 2018

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Executive Summary

This Condition Report has been prepared on behalf of Mr Simon Clark of MEA and Mr David Wyatt of Cowdry Park Estate.

Although Church Farm House, Bepton, has specific heritage significance and historic value attached to it at a local and national level, it is not a listed building and therefore although a historic record and description may be available, it is not known to the author of this report at the time of writing.

Authority

HBC&R were asked to provide this condition report at the request of Mr Simon Clark of MES and David Wyatt through a string of email communications. Authority to carry out the report was provided in an email of 24th September 2018 and the site visit carried out on 11th and 12th October 2018 by Roland Locke and Tom Skinner.

Limitations

Using many years of experience and post graduate education we have assessed the condition of the timbers contained within the 2 historic bays. Because decay is often hidden beneath camouflaging materials and because we have no means to assess the internal body of each timber, this survey cannot be 100% relied upon. It is possible that when work starts the condition of timbers may be different from what we have indicated in this report. Only demolition or exposure work can enable the revelation of concealed timbers and their condition to be fully determined with any certainty, and this destroys the historic fabric intended of conservation. No such technique can be 100% reliable, but deductions can be made about the most probable condition of the fabric at the time of examination in assessing the extent of decay. Structures and timbers were not examined in detail except where described in this report, and no liability can be accepted for defects that may exist in other parts of the building. The condition of any concealed timbers may be deduced from the general condition of other timbers and the structure in general. We have not inspected timbers or other parts of the structure that are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect or in the event that such part of the property is not free from defect it will not contaminate and/or affect any other part of the property. No formal investigation of moisture distribution was made.
Absolute identification of timber species is only really possible by end grain analysis, this analysis should be carried at the remedial action stage and the appropriate timbers procured.

Survey methodology employed

The assessment of the timbers included in this report was primarily visual; however, a four-inch-long metal probe was employed to assess the depth of decay where found. Where possible timbers were tested from both the inside and outside of the building and the position and depth of identified decay plotted on a photograph to compile a thorough depiction of the pattern of decay.
A linen tester was employed to assess the size and shape of insect flight holes for determination of species and identification of fungal infestation was by visual examination.

Terminology and Glossary

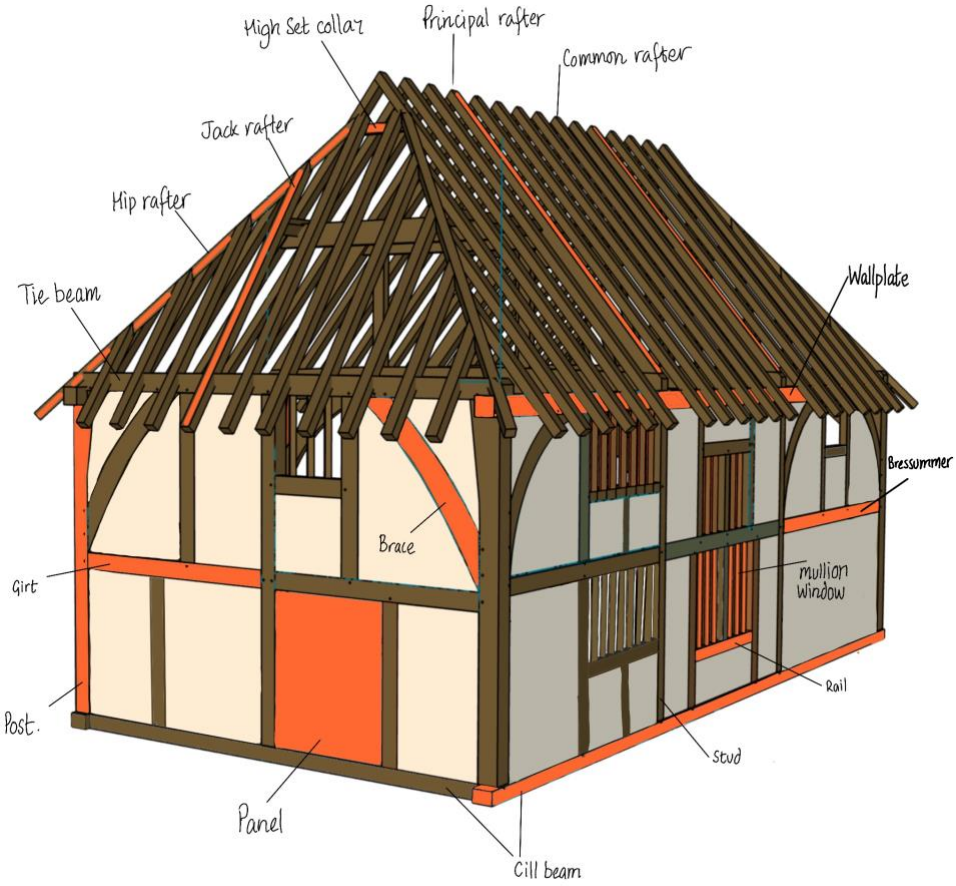

Figure 3, Glossary of components.

The drawing above gives the names of components and their location within the elevation, frame and building.

Bay
A portion of a framed building between principal supporting timbers and used a means of describing the length of a building.

Brace
A subsidiary timber, curved or straight, normally running between vertical and horizontal members in a frame. May be further distinguished by its direction in relation to a post, e.g. Downward brace, Upward brace.

Bressummer
A principal horizontal member set approximately mid-way in the elevation connecting two vertical timbers. May be further distinguished by its use, e.g. as in forming the base of a jetty projection; Jetty bressummer. It may additionally be a beam over a hearth.

Cill Beam
Sometimes spelt Sill. A horizontal timber at the base of a framed wall into which the vertical timbers (posts and studs) are connected.

Common Rafter
An inclined timber of relatively uniform section, which is regularly spaced, usually in pairs along the length of the roof, often between principal rafters and which supports the laths under the roof covering.

Girt
Sometimes known as a transverse or girding beam
A horizontal timber which spans the width of the building at the level of a floor.

High Set Collar
A horizontal timber set in transverse direction near to the apex of the roof that connects a pair of singlars and a crown jack rafter.

Hip rafter
An inclined timber set at the corner of a hipped roof to take the upper ends of the jack rafters.

Jack Rafter
An inclined shortened common rafter set between the wall plate and the hip or ridge and valley.

Post
A vertical timber usually of substantial size and connecting the cill beam with a wall plate.

Principal Rafter
An inclined timber forming part of a roof truss which supports a purlin.

Rail
A horizontal timber set within the wall frame and between vertical timbers.

Stud
A subsidiary vertical timber set in a wall frame or partition.

Tie Beam
The main transverse timber connecting wall plates intended to resist the spread of the wall plates.

Wall Plate
A horizontal longitudinal timber set at the top of a wall to which the rafters are connected above and studs and posts below.

Other features

Mullion windows
A window opening formed of vertical timbers often of square section set at 45 degrees.

Panels

The space formed between the timbers in a wall frame which may be filled with a variety of differing materials to form the walls.

For more information on this see 'Recording Timber Framed Buildings: An illustrated glossary' N W Alcock, M W Barley, P W Dixon and R A Meeson. 1996

Introduction

It is unclear what form Church Farm House may have taken when first built. The farm house has been much altered since its original foundations were laid down and as you will see in the following pages what is now the oldest part is unlikely to have been the original form of the house. Large additions and alterations, together with the removal of large portions of historic timbers carried out to meet the needs and aspirations of the owners have altered the building beyond recognition which has completely enclosing the earliest surviving part of the building.

Cross and wall frames

The earliest surviving part of Church Farm is formed of two bays. However, these two bays do not appear to be one frame, but two single bays placed together at a principal cross wall. Evidence for this can be found in the 'butt' jointed wall plates of different section size, carpentry style and roof construction.
Additionally, it is noted that the two frames are set against one another in such a way as the butting cross wall frames face the same direction.
When frames are constructed the timbers have a 'fair face' and a rough side. In the finished building, the fair face is always placed to the outside and in cross wall frames the fair faces are set to the main or 'upper end'. In this building both faces are set towards what is now the kitchen. This may indicate that one building was in some way damaged and the damaged section replaced by inserting a re-used frame from another building in place of the damaged section. Or it may be that the building was made up of two re-used frames from the start. Either way it is very clear that this early timber framed building is two comprised of two incomplete frames.
In both frames, the tie beam and posts enclose the wall plates with a jowl in traditional normal assembly.

For the remainder of this report we will refer to the frames as Building 'A' and Building 'B'.

Both buildings are made up of unusually large timbers for a vernacular building. The style, position and type of chamfers on all wall frames suggest high status carpentry.

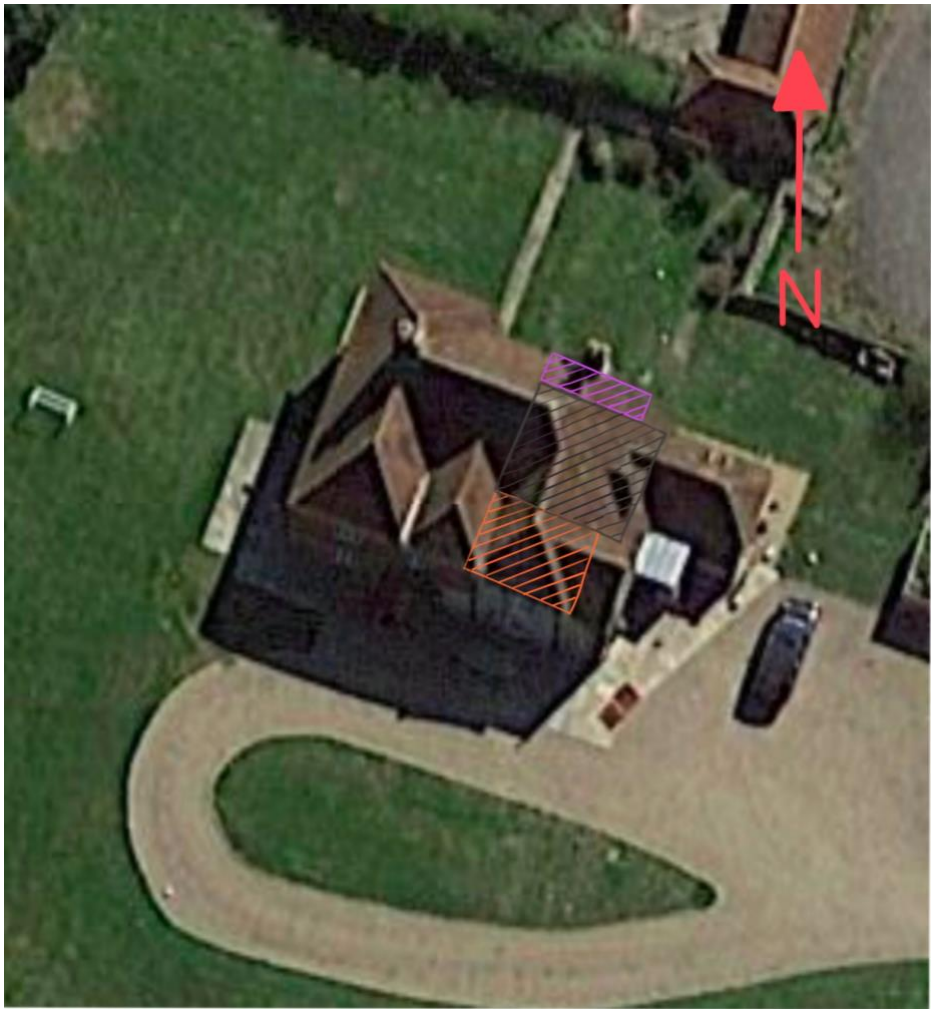

Figure 1, Arial Image showing position of the Historic Frame within the building as a whole. (google 2018) overlay by Author.

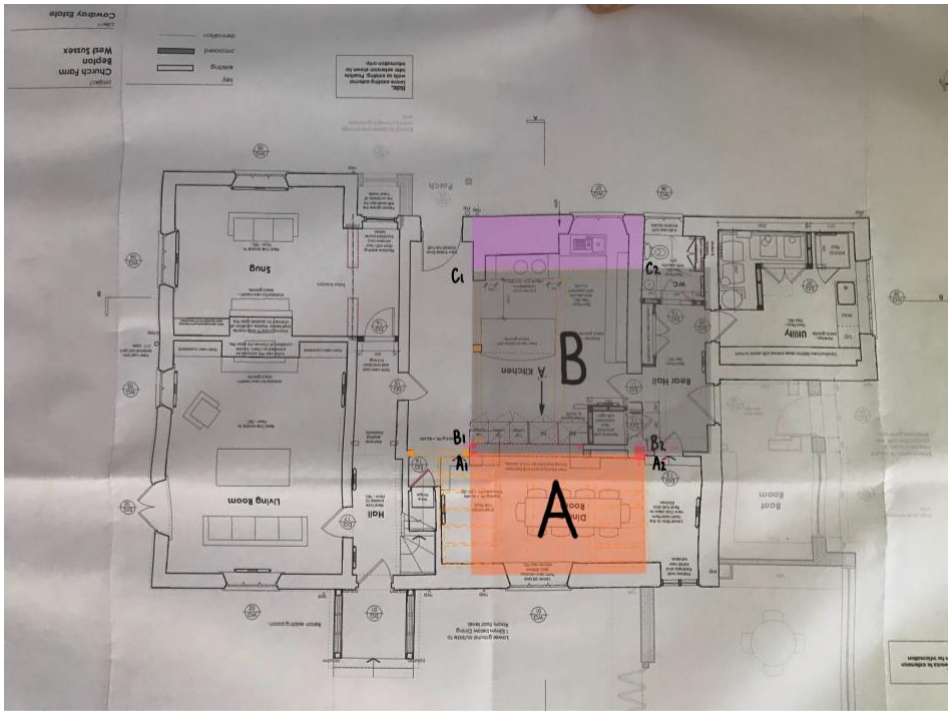

Figure 2, Architects drawing with coloured overlay showing intended layout with over lay of historic area of discussion in this report.

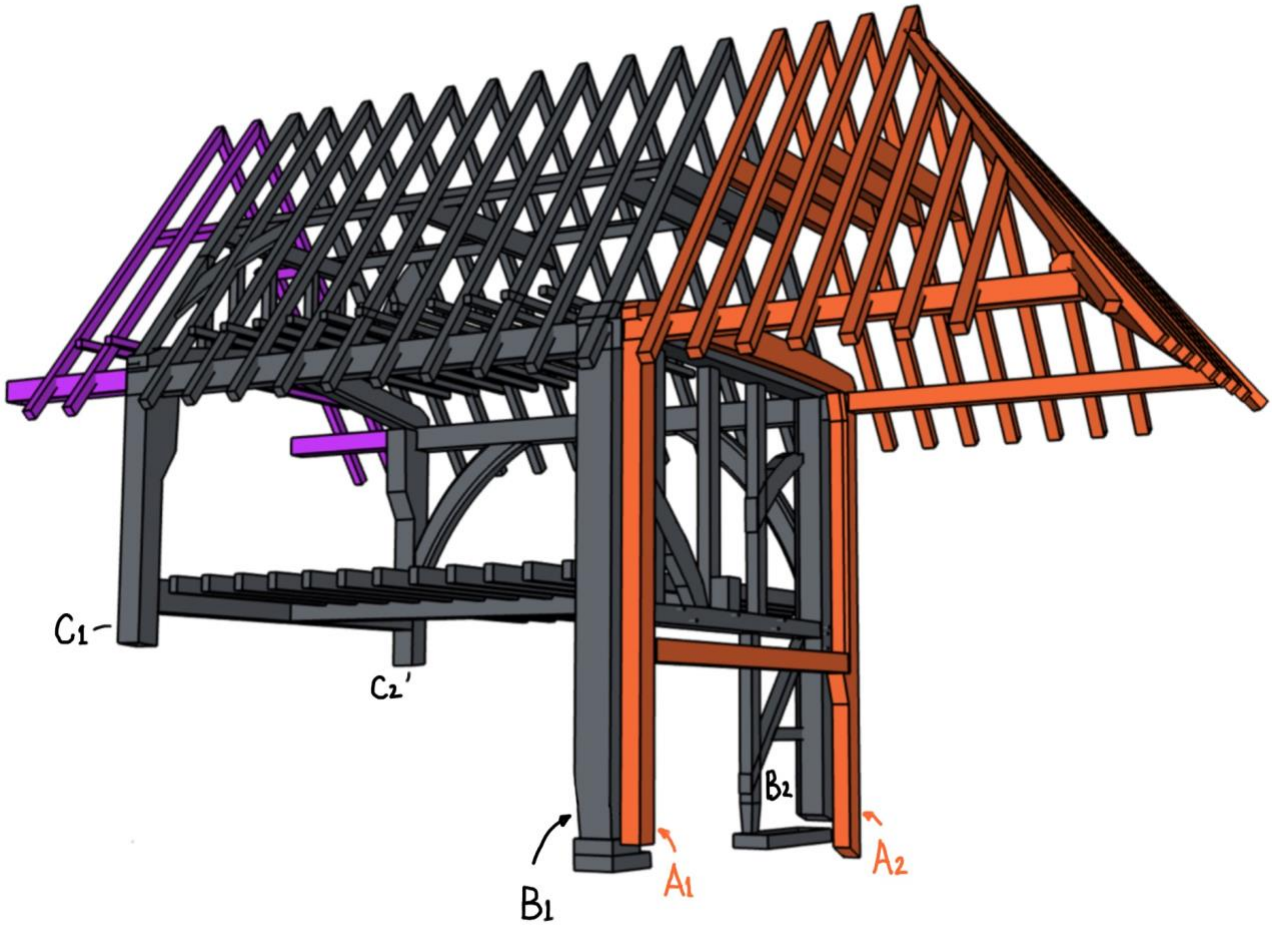

Figure 3, Two different buildings.

Building A (indicated in orange)

Comprises of two principal jowled posts (A-A), one of which is jowled at both ground floor and first floor level (A2). The other at first floor only (A1). The jowls are chamfered on the fair face. We could not see if the tie beam is chamfered as it is covered with plasterboard. The tie beam is slightly 'hogged', that is to say that rises up in the middle which is a common feature of historic timber buildings. There is a girding beam set approximately 79 inches (2M) above the current floor height, which is the only other extant timber within this cross-frame. There is no evidence that frame 'A' was originally floored, however, all of the wall frames for this part of the building are now enclosed in later fabrics which may be hiding the necessary evidence. There is no evidence that the tie-beam formed part of a roof truss, which suggests that this frame always had a common rafter roof.
We will discuss the roof later in the section entitled 'Roof'.

Building 'B' (indicated in grey)

Of the two frames (buildings) Building 'B' is likely to be the later but the higher status and of possible ecclesiastic origin. This is evidenced by the cross fame (C-C), where there is evidence of an arched braced cross frame. Here the tie-beam has been shaped to give a 12-inch (300mm) rise in the middle and braces would have risen up from what is now the floor height to the centre of the soffit of the tie-beam forming an arch. Additionally, there are patches in the inner faces of the jowl which may indicate that there was a spandrel. (for an indication of how this may have looked see below, the timbers indicated in brown are now removed).
All the timbers in this frame are heavily chamfered on the two visible ariss' indicating that all sides where designed to be seen in the original building and thus; a much larger building.

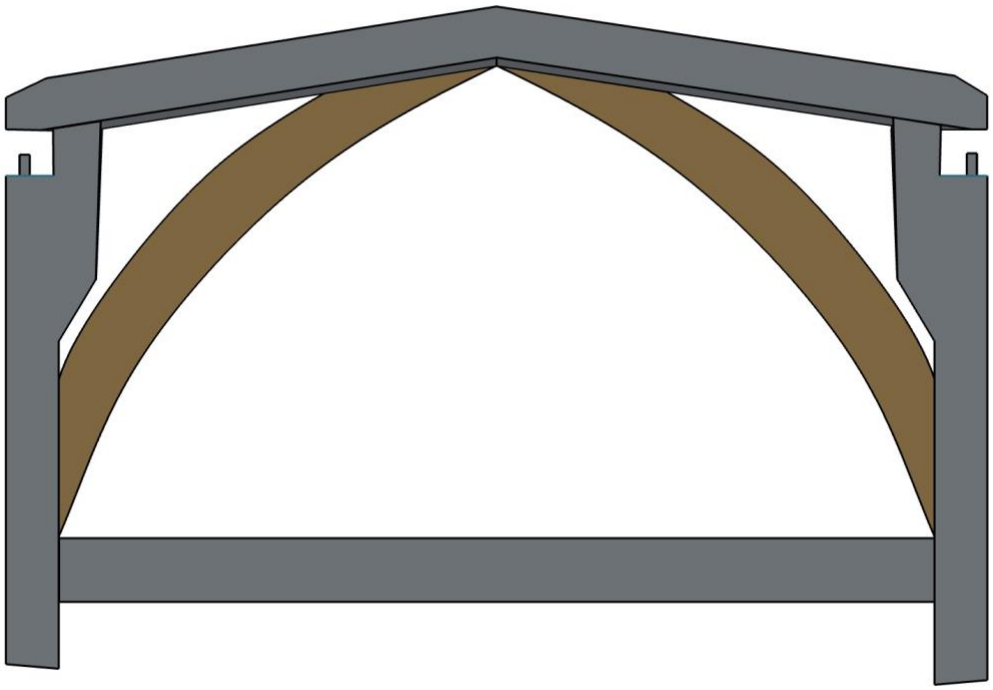

Figure 4, Image indicating how the End Frame (C–C) may have appeared originally (author 2018).

The southern cross wall (B-B) is the most complete wall frame in Church Farm House (see Figure 11).
This frame comprises of two jowled posts set on fragments of sole plate and a slightly 'hogged' girding beam set approximately 92 inches (2.33m) above the existing concrete floor. Within frame (B-B) at ground floor level, one stud and one straight brace exists. Within the first-floor section there are three studs and two truncated braces which have been cut to provide openings for doorways between Building 'A' and Building 'B' at previous times and in various layouts. It would appear that the spine-beam (B-C) carrying the floor joists is a later insertion, as its connection with frame (B-B) is clumsy, sitting to one side of the almost central stud. Where it simply rests upon the girding beam and a large notch has been made in the stud to accommodate the end.

Roof

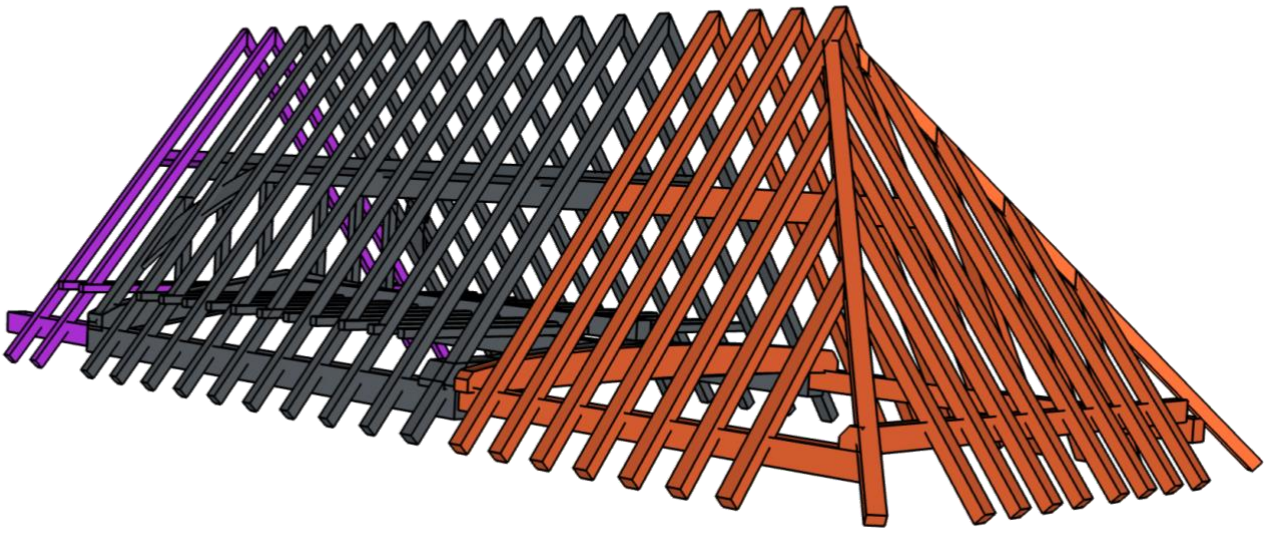

Figure 5, Three different roofs.

Roof ‘A” (indicated in orange in the illustration) Fully hipped, sans purlin with collar.
Roof ‘B’ (indicated in grey in the illustration) clasped side purlin with wind braces at the East end of this section.
Roof ‘C’ (indicated in purple in the illustration) later addition. Evidence for this is the poor scarfed on purlin extension and the but jointed wall plates.

The high-status carpentry in the wall frames is not reflected in any of the roof timbers, which are relatively small in section size and more vernacular in their arrangement.
The roof appears to be of three distinct periods and two types, however, the entire roof appears to have been dismantled and re assembled at some time, as carpenter’s assembly marks are not always paired or in sequence.
All rafters appear to be slightly tapering and not reduced in section size above the purlin (which is sometimes the case) and are jointed at the apex by half lapped joints which are pegged.

It is generally accepted that roof terminal shapes evolved from ‘sans purlin roofs, that is; common rafters paired without any purlin or collar but using fully hipped ends to provide resistance to racking. Then these commons became collard, followed by either clasped side purlin or crown post depending on many factors including the buildings’ function, status and the region the building was constructed.
In Church Farm roof ‘A’ is a collard common rafter roof, roof section ‘B’ and ‘C’ are clasped side purlin roofs, “C’ being a later addition, possibly an infill section after the end chimney was built replacing a hipped end. This would suggest that the Roof ‘A’ is the earliest in design, however, the condition of all rafters appears contemporary.

Roof ‘A’ does not appear to have carpenter’s assembly marks. Roofs ‘B’ and ‘C’ appear to have the same style and number range but are not in sequence and in some instances are not even paired e.g. one of the VII rafter pair, is paired with an VIII and although there are a pair of II’s, they are both paired with un numbered rafters.
There is some smoke blackening of random timbers was noted within roof ‘A’ again giving evidence of the earlier roof.

Condition of historic timbers

Introduction

Due to the complexity of timber framed buildings and the need to be able to present information about its condition clearly in this report, for discussion we have divided the building in to its two constituent frames and then the walls into the 2-dimensional frames that make up the 3-dimensional building. We have also separated the roof into rafters and other roof timbers (Purlins, Collars, Wall-plates).

To keep things simple, we have only described timbers where we have identified a problem. This means that timbers that could not be assessed due to their inaccessibility, or those without observed concerns, have not been discussed further.

The main cause of concern in timber framed buildings is decay due to the ingress of moisture which creates an environment suitable for decay organisms to flourish. These decay organisms are Fungi and wood boring Beetle.

The main wood boring beetle are:

Powder Post Beetle (Lyctidae Bostrychidae)
Is a cell content feeder which live mostly on starch and free sugars, they are therefore restricted to fresh sapwood and their colonisation will cease as the carbohydrate levels drops in time. They do not possess the enzymes required to attack hemi-celluloses or cellulose. the larvae are essentially restricted to sapwood which when consumed will perish. This results in the production of a very pale coloured finely textured powder that was once the sapwood which will over many years continue to fall away and look as though the beetle is still active when in fact it has long since gone. Additionally, it gives the timbers the appearance of severe decay when in fact the damage will have occurred within a few short years of the timbers felling.

Furniture Beetle (Anobium Punctatum)
Often referred to as “woodworm” it is found in both hard and softwood timbers preferring the sapwood but will attack heartwood when modified by fungi.

Death Watch Beetle (Xestobium rufovillosum)
Closely related to the Furniture Beetle it name comes from the noise it creates during courtship when the beetles tap with their heads on the timber. This beetle prefers the sapwood of hardwoods but occasionally some softwoods if already active in hardwoods in the same building.

Fungi
Like any other plant Fungi require nutrients, water and air to survive. In timber moisture levels can be as low as 17.5 percent for the plants to exist but will flourish in timbers with greater levels. Once timbers have been attacked by fungi and the cellulose structure modified then Beetles have a greater chance of thriving.
There are a great many different types and species of fungi which the scope of this report will not allow. However, it is now well recognised that if moisture levels are kept below 17.5 percentage then they cannot survive, irrespective of species.

Other weaknesses often found are fractures which can have occurred because of inherent natural features in the timber when constructed or created when too great a stress has been placed on a timber due to either failure of another timber or part of the building or poorly considered changes to the frame.

Assessment of the timbers

Introduction

As stated above, the historic frame has been broken down into frames for clarity and ease of discussion. Each frame has been drawn so that we can indicated in the areas of concern in RED. The severity of concern is indicated by the density of red. To gauge the strength of a timber member, we have then indicated by a percentage, the extent by which a timbers section size and consequently its strength has been reduced.

Roof

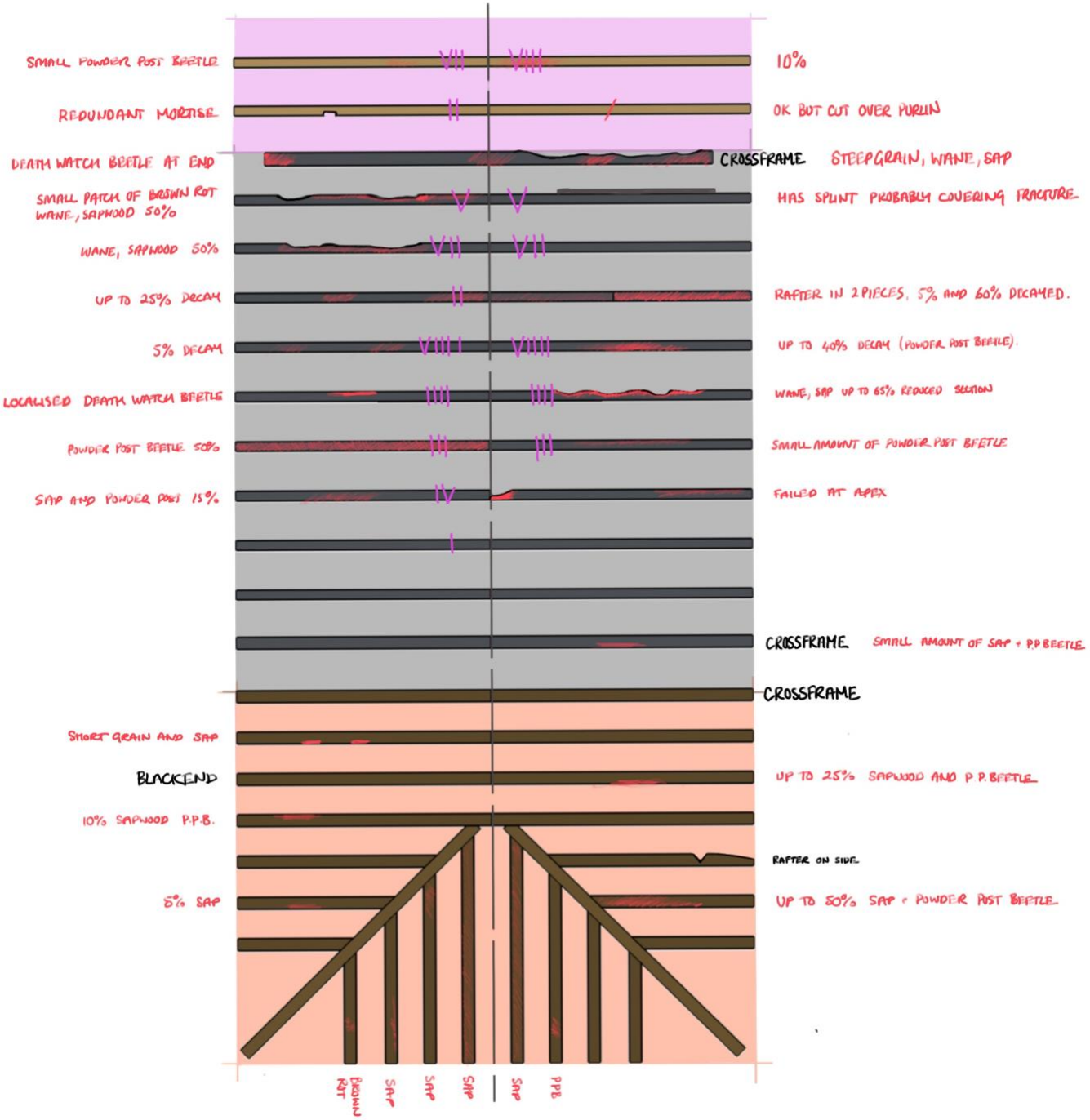

Figure 6, Plan of Rafters.

Rafters

Generally, Powder Post Beetle was found to be widespread within the roof space, but pockets of both Furniture Beetle and Death Watch beetle were observed. Additionally, there was a couple of very localised pockets of brown rot found.

There is only one timber that causes immediate concern and that is an un-numbered timber paired with an IV where it has decayed at the apex. As the roof space is not a habitable space, we suggest that a triangle of 19mm ply cut to fit the apex and screwed to the side of the rafter pair.
The strength of some timbers has been greatly reduced by the Powder Post Beetle, but, as this damage is likely to have occurred within a few years of the timber being put into service, which was many centuries ago, we can assume that in the current arrangement and loadings the timbers are adequate.
One rafter has a ‘splint’ fixed to the side. This splint may have been applied to carry the ends of battens, but it is likely that it was applied because of an apparent concern for the integrity of the rafter. This should be investigated, and an appropriate remedy devised and applied.

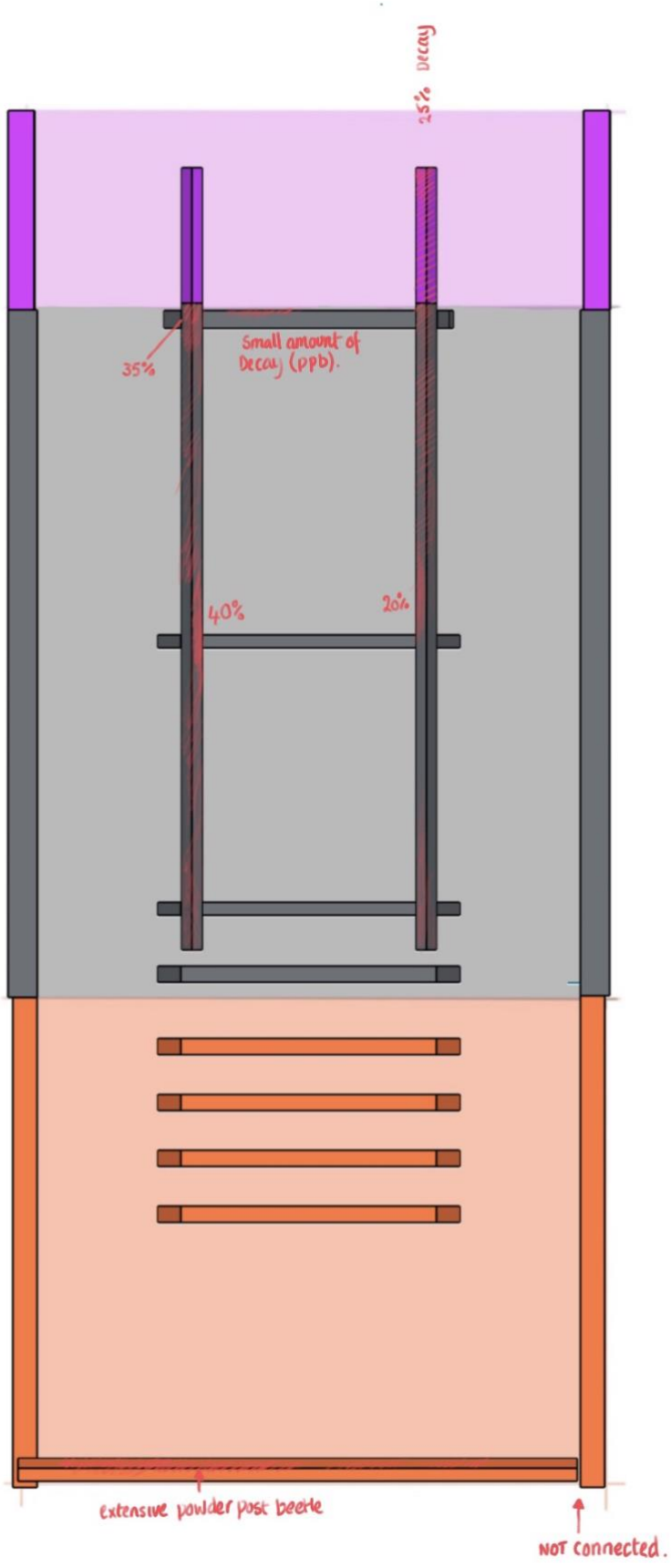

Figure 7, Plan of Purlins, Collars and Wall-Plates.

Collars

There a total of eight collars. Two contained within the cross-frames and the remainder as collars to common rafter pairs. Apart from a very small area of Power Post Beetle on the collar nearest the end chimney all other collars are in good condition.

Purlins

There are two small scantling purlins. Both have extensive wane, sap and the resultant Powder Post Beetle which has reduced the section size by as much as 40%. However, as with the rafters these timbers have been in service for great many years and have not failed. And as such can be assumed that in their current arrangement are adequate.

Wall plates

It was only possible to view and assess very small portions of these timbers. The only thing of note was that the wall plate/Tie-beam in the hipped end has extensive wane, sap and powder post beetle which has reduced the timbers section and strength significantly, however, as this timber is resting upon a brick wall it is providing a fixing for the rafter feet only there is little stress upon it other than the security of the rafter feet. Additionally, this timber is not connected to the wall plate at its Eastern end. A steel bracket could be made up to re-connect the timbers.

First floor ceiling joists and spine beam

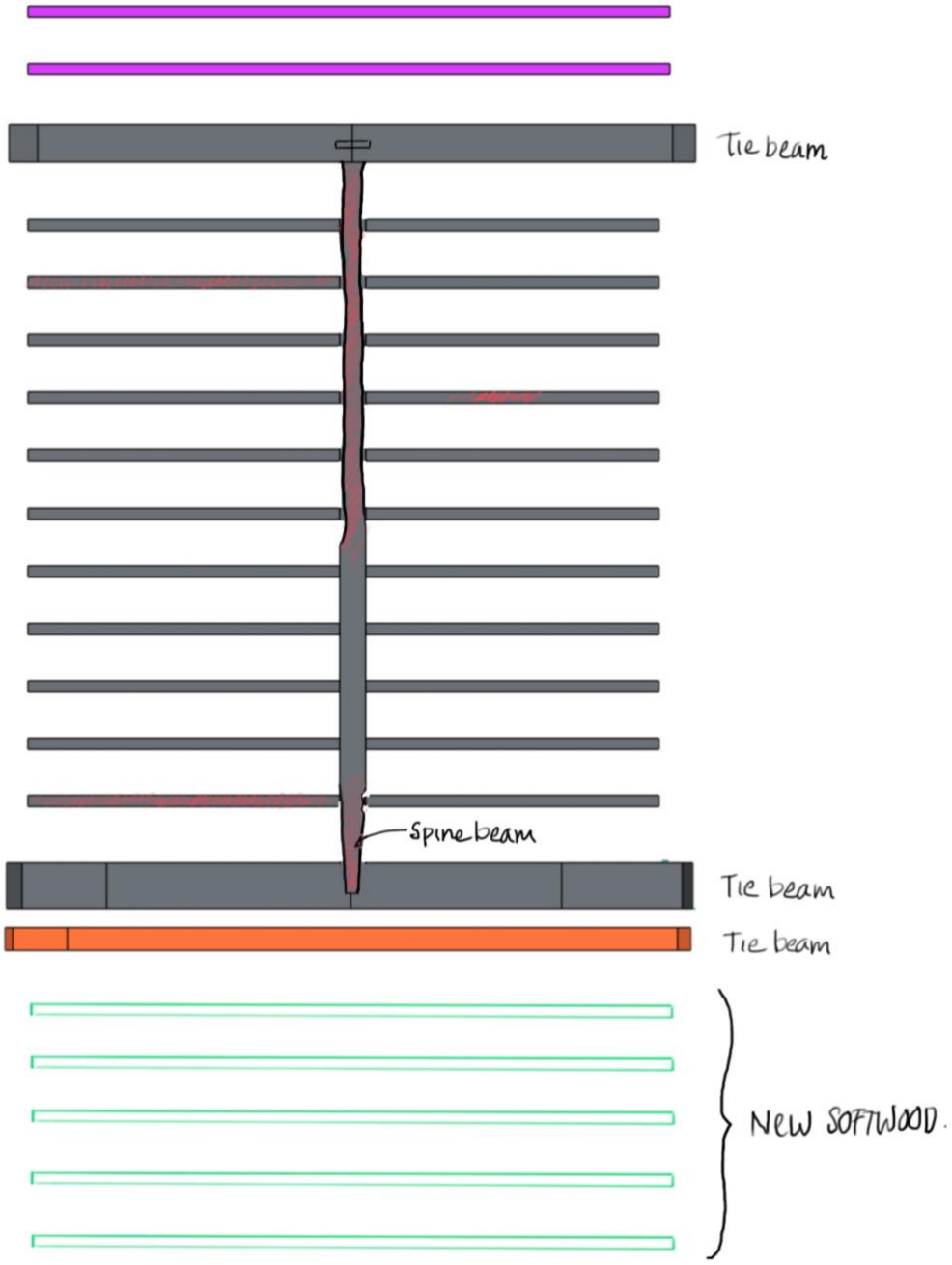

Figure 8, Plan of Joists at First Floor.

Within building 'A' all joists at this level are new tantalised softwood and are not covered by this report. The first-floor ceiling joists within building 'B' are very poor-quality, small scantling timbers with extensive wane, sap and resultant Powder Post Beetle damage. This is also the case with the spine beam which is particularly reduced in section at its connection with the tie beam at its South Western end (B1-B2). These timbers are adequate to carry the loadings imposed by the current ceilings but will not take a floor and it is recommended that when work is carried out in this area crawl boards are used to prevent severe deflection and resultant cracking of plaster ceilings.

Floor Joists in Building ‘B’

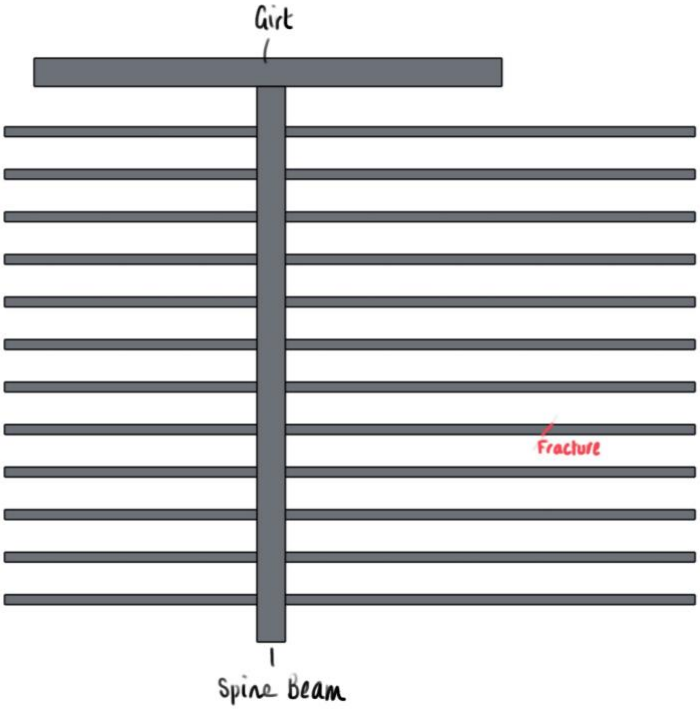

Figure 9, Joists in Frame 'B'.

The joists are mostly covered by boards above and a ceiling below.
However, at the time of our visit there were a couple of boards lifted that allowed us to ascertain the size of the timbers (assuming they are all the same) and there is a space at the side under the catslide roof where one can see the joists emerging from the floor area and over to the wall plate.
There is at least one area of concern and that is the 5th joist in from (B-B) which has fractured over the bressummer.

Cross-wall frame 'A1 – A2'

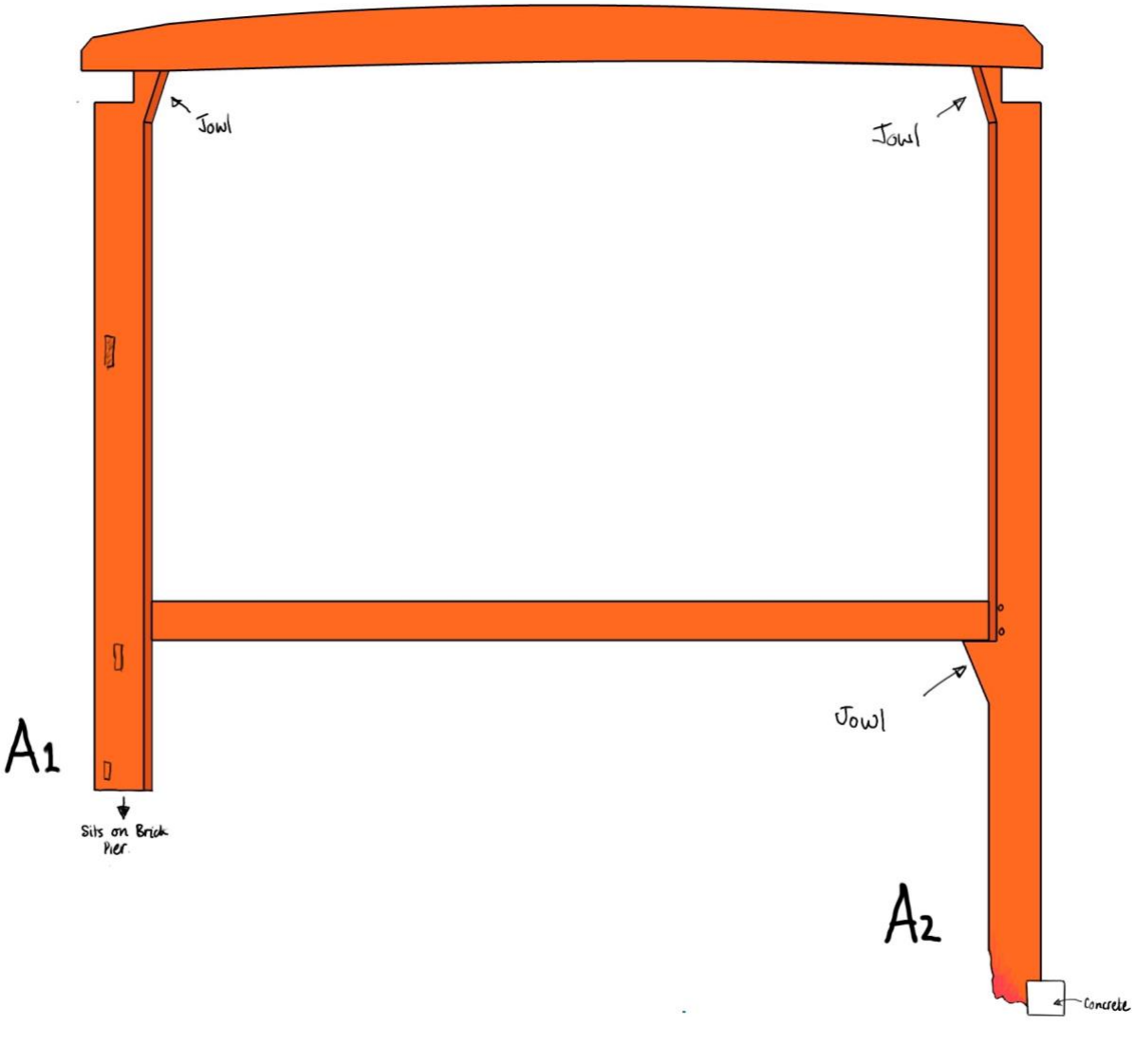

Figure 10, Cross-wall Frame 'A"

Post A1 has been cut and now sits upon a brick pier. Post A2 is decayed at the base with both fungal and beetle infestation, however, the base of this post is covered by a cementitious 'skirting' that may be hiding more decay.

Given that this frame has been underbuilt in concrete block it is unlikely to prove to present a problem, however, as a precaution the concrete should be removed, the base of the post cut level and back to sound timber and brick or other solid surface should be provided at the base.

Cross frame ‘B1-B2’

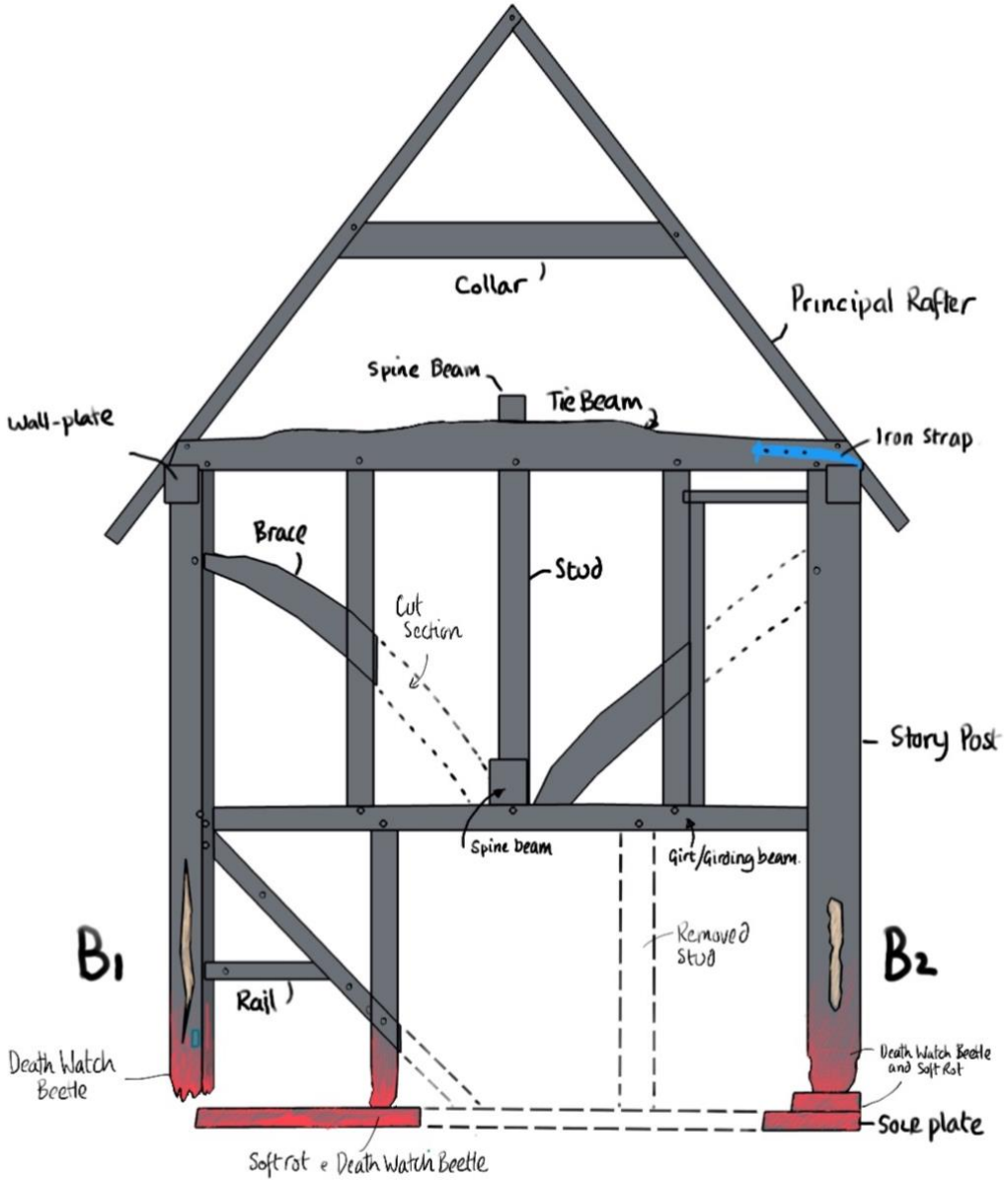

Figure 11, Cross-wall Frame 'B'.

The base of all vertical timbers and the fragments of sole plate suffer from extensive soft rot and Death watch beetle infestation. However, the posts are of such massive section approx. 13 x 13” (325 x 325mm) The same treatment should be provided as for cross-frame ‘A’.

Cross-frame 'C1-C2'

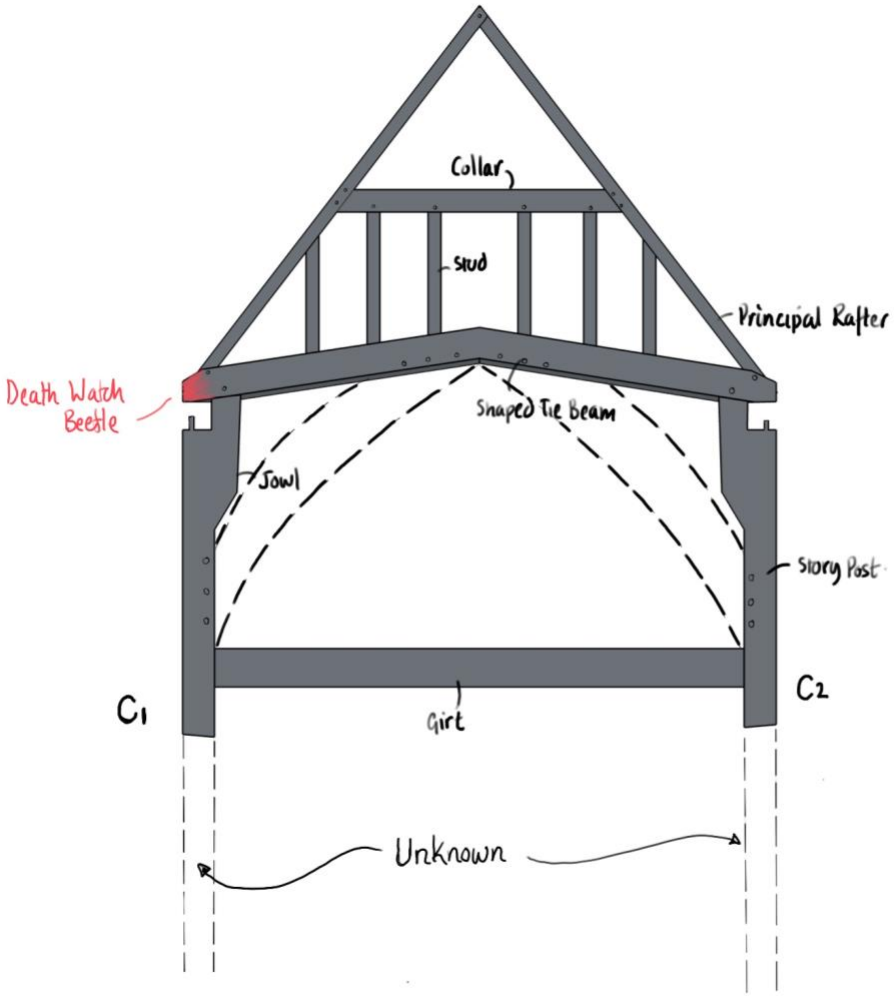

Figure 12, Cross-Wall frame 'C'.

The western end (C1) of the tie beam has suffered historic infestation of Furniture and Death Watch beetle.
As the area is now dry and there are no signs of active beetle, no remedial action is necessary at present.
It is not known how much of the story posts (C1 and C2) extend below the girt.

If you require any more information, please do not hesitate to contact me.

Kind regards

Roland Locke MSc