

Structural Inspection of Existing Barn (Non-Intrusive)

Client: Kennet Property

Address: Oak House, 4 Douglas, Hurst, Reading, RG10 0TT

STRUCTURAL CALCULATIONS

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Document Control Sheet

This document has been issued and amended as follows:

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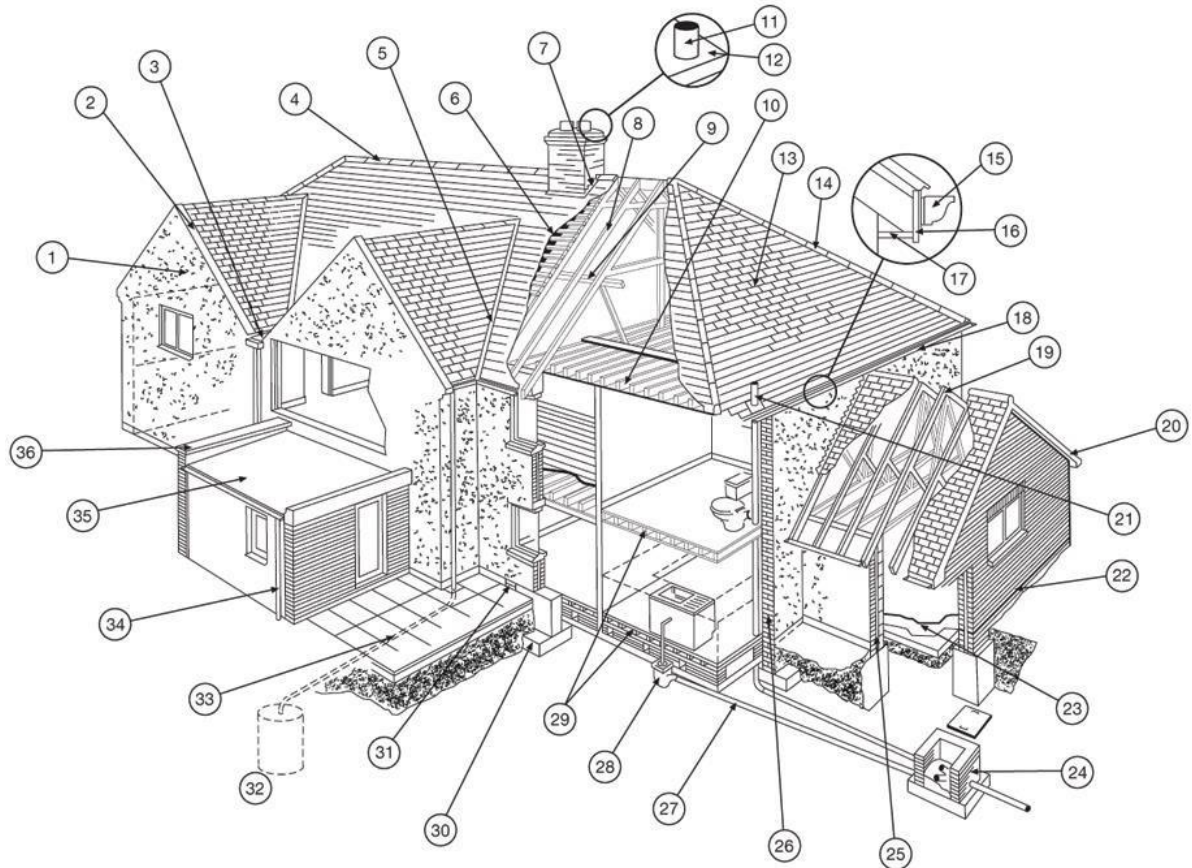
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Traditional House Construction



KEY

1 Gable end wall
2 Verge
3 Valley gutter
4 Ridge tile
5 Valley
6 Roofing felt.
7 Flashing
8 Rafter
9 Purlin
10 Ceiling joist
11 Pot
12 Cement

13 Hip roof.
14 Hip tile.
15 Gutter
16 Fascia
17 Soffit
18 Eaves
19 Roof truss
20 Barge board
21 Soil-and-vent pipe
22 Damp-proof course (DPC)
23 Damp-proof membrane (DPM)
24 Inspection chamber

25 Cavity wall
26 Solid Wall
27 Foul drain
28 Gulley
29 Floor joists
30 Foundation
31 Airbrick
32 Soakaway
33 Surface water drain
34 Downpipe.
35 Flat roof
36 Parapet

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1.0 Introduction

- Kennet Properties instructed Vector Structures to conduct a site visit at Oak House, 4 Douglas Grange, Hurst Reading, RG10 0TT. The purpose of the visit was to examine the suitability of converting an existing barn structure into a new dwelling.
- Vector Structures conducted the site visit on the 16th of January at 11.00am. The weather was overcast. The duration of the site visit was approximately one and half hours.

2.0 Limitation & Exclusions

- We have reported on obvious health and safety hazards only to the extent that they were apparent from elements of the property considered as part of the inspection. We have not commented or advised on any matter the significance of which in relation to the property was not apparent at the time of inspection from the inspection itself.
- We have not undertaken any structural or other calculations.
- We have inspected as much of the internal and external surface area of the building as was practical and relevant to the survey but have not inspect those areas which are covered, unexposed or not reasonably accessible from within the site or adjacent public areas.
- External inspections were carried out from ground level.
- We will have not moved any obstruction to inspection including, but not limited to, furniture, fixtures, fittings, or equipment. We carefully and thoroughly inspect the property using our best endeavours to see as much of it as is physically accessible. Where this is not possible an explanation will be provided.
- If we are concerned about parts of the property that the inspection cannot cover, the report will state any further investigations that might be required.
- The report that we provide is not a warranty.
- This is a specialist's report, limited to the above structural matters. It does not constitute a general building survey report of the whole property as would be conducted by a Building Surveyor.
- The conclusion/recommendation expressed in this report represent our opinion, based on an experienced assessment of visible features in areas of the building having reasonable access and where clear visual inspection was possible.
- The report is for the exclusive use of our client and his/her agents. Although we have no objection to it being shown to others, we do not accept any responsibility to third parties. No investigation into the design of the building or services, or the nature of the foundation have been conducted as part of the inspection.

Hazardous Materials

This report cannot be relied upon to confirm the presence or otherwise of asbestos or asbestos containing materials. If the client is unaware of the presence of such materials, a suitably qualified specialist should carry out a specific asbestos survey.

Unless otherwise expressly stated in the report, we have assumed that no deleterious or hazardous materials or techniques have been used in the construction of the property. However, we have advised in the body of the report if, in our view, there is a likelihood that a deleterious material has been used in the construction and specific enquiries should then be made or tests carried out by a specialist.

3.0 Methodology

The following methodology was followed to carry out the assessment:

- Identify the arrangement and condition of the existing structure and the size of the key structural elements.
- Comment on suitability of converting the existing structure into a domestic structure and support any domestic loading safely.

4.0 Observations and Findings

4.1: The barn was situated on a flat portion of land near the boundary of the site, flanked by trees of various species and of mature height. The barn structure consisted of four timber frames with the rightmost frame (photo 1) being enclosed to form an internal space. The roof and walls were formed using metal corrugated sheets. Timber purlins and ring beams provided support for the roof and walls. The roof overhangs at the front by 800mm. The left-hand side enclosed storage structure was constructed from a combination of timber and scaffolding.



Photo 1 – A photo showing the front elevation of the barn.



*Photo 2 – A Site Plan showing the location of the barn.
The barn is circled in red.*

4.2: On the front elevation of the barn, four timber posts support a timber beam over to form three timber frames. The frames were braced with gallows struts. The roof beam cantilevers over the post by 800mm. The roof beams were also braced by timber struts running back to front. The corrugated sheet roof is supported by three timber purlins running between the frames. The wall cladding is also supported by timber side rails. The concrete ground floor slab is of unknown thickness. No trial pits were dug to record the depth and construction of the existing footings.



Photo 3 – Front elevation of the barn



150 x 47mm wide timber
side rails

150 x 75mm wide timber
side rails

Photo 4 – Front elevation showing the timber ring beams



4.3: The timbers overall seem in satisfactory condition, however, one of the posts contains a knot hole of moderate size. One of the timber eaves beam showed signs of local rotting/knot holes. The outer timbers show signs of greater weather and discoloration.

Local knotting of post

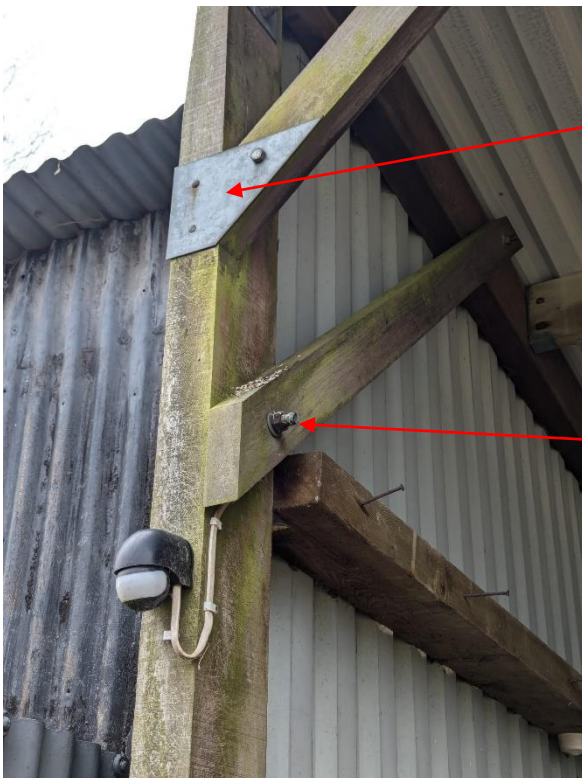
Photo 5 – Knotting of one of the timber posts



Local knotting/rotting of one of the timber beams

Photo 6 – Knotting/rotting of one of the timber edge beams

4.4: The timber members were connected using a combination galvanised bolts, plates and hangers. The main connections are shown below.



Inclined strut is fixed to post using two 6mm coach screws and one M10

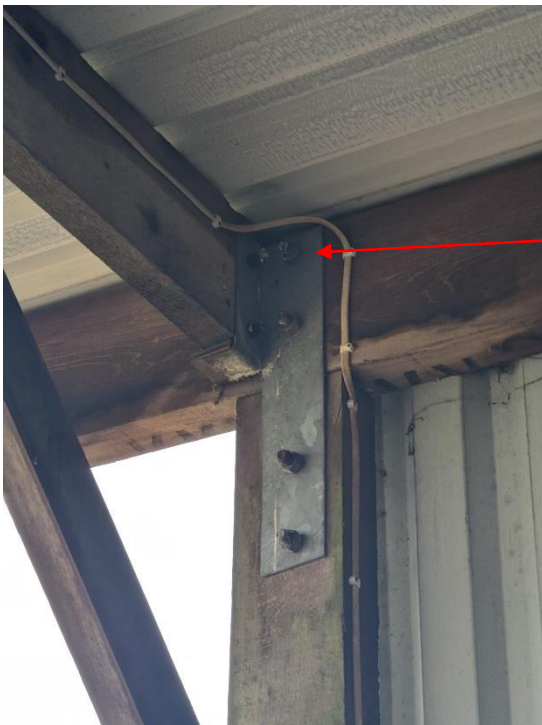
Inclined strut is fixed to post using one M12 bolt

Photo 7 – Connection of the timber post to both inclined struts



Timber ring beam fixed to post using a metal angle and M8 bolts

Photo 8 – Connection of the timber ring beam to post



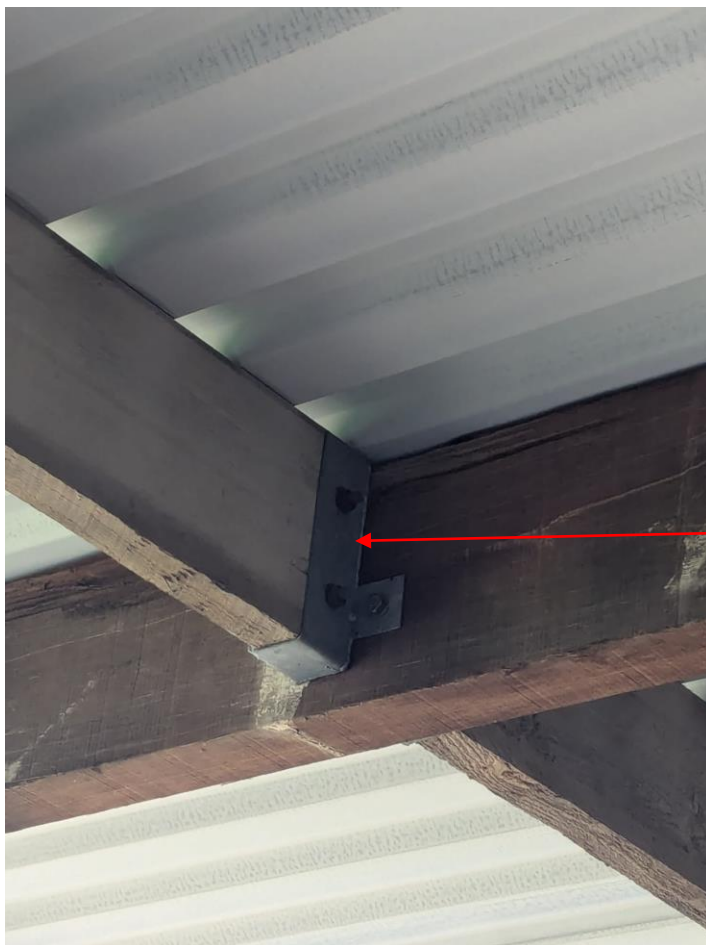
Timber eaves beam fixed to post using steel plate with four M10 bolts and fixed to cantilevered beam using two M8 bolts

Photo 9 – connection of timber eaves beams to post and cantilevered beam



Inclined strut fixed to eaves beam using 2No, M10 bolts

Photo 10 – Inclined strut to eaves beam



Saddle hangers fixed to the cantilevered timbers using one number m12 bolt and fixed to purlin using two number M10 bolt

Photo 11 – Purlin to cantilevered timber



Cantilevered timber fixed to rear post using steel plate with four M12 bolts and fixed to rear eaves beam using two M10 bolts

Timber ring beam fixed to post using two M8 bolts

Photo 12 – Timber ring beam and cantilevered beam to rear timber post

4.5: The structure of the smaller storage unit at the left-hand side of the barn was constructed using a combination of timber beams, scaffold boards and 50mm dia scaffolding. The scaffolding is fixed together using clamps. The front door is framed by a 47 x 100mm timber frame, the roof is supported by a timber eaves beams and two internal timber purlins. Eight scaffold props support the structure in total



Timber and scaffold structure

Photo 13 – Front elevation showing the storage structure constructed from timber and scaffolding



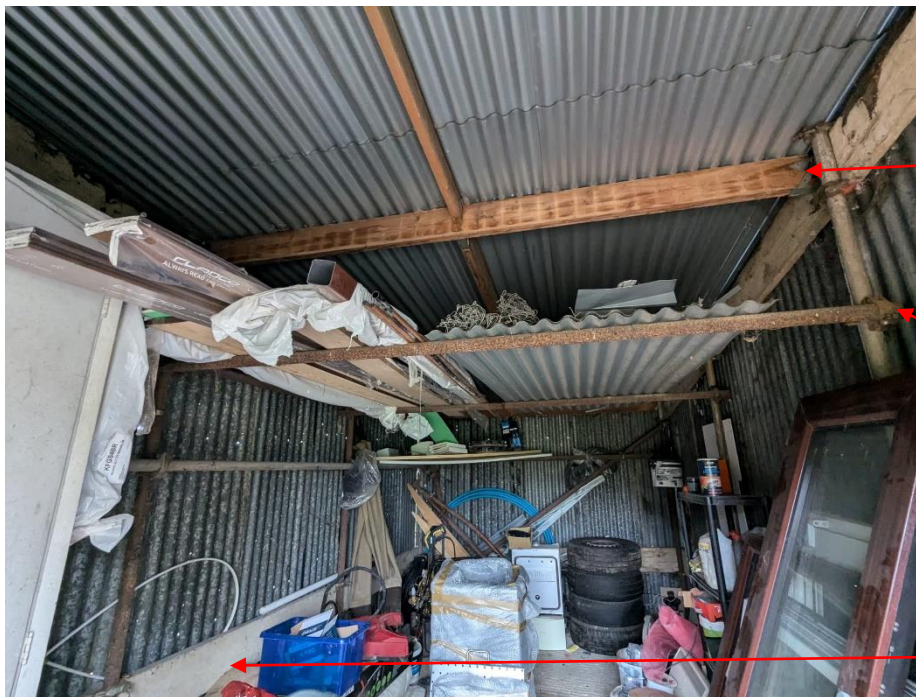
47 x 100mm timber eaves beam

38 x 225mm deep scaffold board

47 x 100mm timber post reinforcing
a 50mm dia scaffold post

47 x 100mm timber beam acting as a
door lintel. Reinforced with a 50mm
dia scaffold section

Photo 14 – Inside view showing the door structure and a vertical and horizontal scaffold prop.



47 x 100mm timber purlins
fixed to scaffold board edge
beam using nailed joist hanger

Horizontal scaffold brace
clamped to 50mm scaffold
post

Horizontal scaffold brace
clamped to 50mm scaffold
post

Photo 15 – photograph showing the scaffold structure within the storage area



Inclined braces are fixed to vertical props using clamps

Photo 16 – Inclined scaffold brace at the rear of the structure.

5.0 Conclusions and Recommendations

- The **main barn** structure depicted in photos 1 through 12 appears to be suitable for conversion into a residential accommodation.
- Lateral stability is considered satisfactory as the barn is proposed to be changed from an open to an enclosed mono-pitch structure, which would reduce wind loading.
- Concrete ground slab, originally designed to accommodate garage loading of 2.5 kN/m^2 is now proposed as domestic usage would reduce the load requirement by 0.5 kN/m^2 . Therefore, conversion is considered satisfactory.
- New internal loadbearing walls can be introduced to support insulation and ceiling loads.
- Lightweight materials could be used for cladding and insulating the structure.
- The **scaffold storage structure** shown in photos 13 to 16 is not considered suitable for conversion into a residential accommodation due to poor upkeep and built material used. This should remain a storage or garage structure.
- Chartered Structural engineer to review the proposed scheme before any construction works.

END OF REPORT