



Ref: 24/402

21 Double Common
Charmouth
Dorset
DT6 6PT

Mr M Alford
Heatherlands
Bracken Lane
Storrington
West Sussex
RH20 3HS

27 March 2025

Dear Mr Alford

Toat Farm Barn, Itchingfield, West Sussex RH13 0PB

In accordance with your instructions, I visited the above property on Thursday 13th March 2025. The weather during the visit was cold and overcast.

The purpose of my survey was to give advice on the condition of the timber framed barn and adjacent car port. It is proposed that these buildings be converted to a residential unit although details of the new dwelling are not yet available.

My findings and conclusions are based upon a visual inspection without removal of any fixtures or fittings. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the buildings is free from defect.

This survey has been carried out from foot, and finishes have not been removed. It is likely that, due to the nature of the structure, once cladding is removed and work commences other defects may become apparent.

All descriptions are taken looking at the property from the house drive and considering this elevation (North East), containing the main entrance to the original barn and the car port frontage, to be the front of the buildings.

General Description of the Buildings

Original Barn

The original barn is an old 'Sussex' type barn, clad with plain roof tiles and timber external wall cladding. The Oak frame is built off of a low-level stone wall, with the foundations, where exposed, being of concrete trench fill, suggesting that the foundations, and possibly the dwarf wall, are modern replacements of older elements. At the right side, the timber framing is commenced off a plate at slab level, with no dwarf wall.

The timber frame barn is a simple rectangular structure with side end gable walls. The structure comprises rafters spanning front to back, supported on an eaves beam and mid height purlins, and propped at the ridge with a central thin ridge board. The purlins span between the gable walls and are supported at approximately third distance by simple Oak frames. These frames are either side of the front entrance opening. At the gable walls the purlins are supported on the gable timber frame. At the intermediate frames the purlins are supported via raking roof struts. The gable walls and the intermediate frames provide the only points of lateral tying of the roof.



The timber frame walls comprise main, full height corner posts. The posts at the intermediate frames are also full height, either to the dwarf wall or ground at the front opening. There are eaves height beams on top of the main posts. These beams run the full perimeter of the barn and are supported by timber studs below. Above the eaves beams at the gable ends there are further studs forming the gable triangles.

The studs of the walls below gable level are half height, with mid height beams framed into the main posts. With the exception of the front opening, further studs are between the mid height beam and the wall or slab plate. Studs tend to align vertically meaning that the majority of the eaves and mid height beams are framing members only and do not carry significant vertical loads. At the front opening, the studs below the eaves beam and the entrance head beam are modern, suggesting that the original opening was, as is common, full height.

There are small original diagonal braces at the corners, with later large bracing added to both the walls and main frames, presumably to help address the racking issues obvious in the barn. There are also metal straps and angle brackets present.

The barn has been both maintained recently and added to in the past. There are a number of modern members, including low level wall plates and studs, as well as a substantial amount of the roof structure.

The floor slab is of old brick construction to the two end bays, with the central bay having a concrete finish. This floor does not support any superstructure loading.

Modern Car Port

To the right side of the original barn and independent of it, although they are immediately next to one another, is a modern timber framed, four bay car port / storage structure. There is a left side enclosed bay, with two single open bays at the right side and an open double bay 'centrally'.

The roof is clad with plain tiles, with clad timber frame walls built off single skin brick dwarf walls to the back and right flank. A further timber wall between the enclosed left end bay and the central double bay, is also off a dwarf brick wall. At the left end there is no wall with a simple 'A' frame supporting the roof next to the original barn.

The roof comprises rafters propped at the ridge and spanning between the rear timber frame wall and front eaves beams. There are mid height purlins spanning between the end gable walls and intermediate beams, spanning front to back. The purlins are supported on the intermediate beams via raking struts. The front to back beams are supported on the rear studwork wall and the front beam / posts.

The front eaves beams, generally timber but with an additional steel plate at the double bay, are supported on timber posts with additional raking struts to shorten the spans. There are similar struts to the beams running front to back, where they meet the front posts.

The main front timber elements are hardwood, with the majority of other members being softwood. The front posts are built off small brick piers directly on the concrete floor slab. At the rear the slab appears to have a thickening but there is no down stand under the front piers. Where exposed this slab was found to be only 80mm thick.

At the rear of the car port there is a substantial brickwork buttress, added to provide restraint to the timber frame wall.



Local Geology

The Geological Survey Map 302 'Horsham', shows the likely underlying soil as the Weald Clay. Therefore, the building is potentially on a shrinkable clay where changes in moisture content can affect the volume of the soil.

Two trial holes were dug prior to our survey. Both the original barn and the car port were founded on clay, the barn on stiff light brown clay at 430mm below external ground level and the car port at 280mm below ground level on weaker dark brown clay, above the stiff light brown clay layer. At the front of the car port the foundation of the timber posts was found to be on a thin slab on made ground, consisting of discarded building materials.

Soil samples were taken from two trial holes, both in the light brown stiff clay. These samples were tested for Atterburg Limits, and hence shrinkage potential. The results of the testing was as follows:

- Trial Hole 1 (left side of original barn): Corrected Plasticity Index 39% - NHBC Medium Shrinkage Potential #
- Trial Hole 2 (rear of car port): Corrected Plasticity Index 37% - NHBC Medium Shrinkage Potential #

High shrinkage potential is at 40% Corrected Plasticity Index. Therefore, the samples are very close to being the more onerous classification.

There are large Cypress trees present around the buildings. The presence of trees can affect the moisture content of the clay and lead to subsidence or heave.

Observations

Original Barn

The original barn has been repaired and modified a number of times in the past, both to address problems with particular members but also in an attempt to provide more overall stability.

In particular, large areas of the roof and the low level walls have been replaced. The works at low level are very recent and appear well executed. Other areas of replaced members are not always apparent. There are a number of apparently modern cut timbers, but some old studs are also square cut.

At the trial hole on the left flank wall foundations are shallow in the Weald Clay. Although the presence of trees makes the foundations vulnerable to soil volumetric changes, there are no signs of significant movement in the dwarf walls at present.

Generally individual members are in a reasonable condition, especially where renewed. Where there are specific issues these are listed below:

- At the right side gable, studs and plate have suffered loss with repairs being infill mortar. Timber repairs should replace the mortar.
- Where new purlins have been installed these are obviously undersized.
- Older purlins from the right side bay cantilever, but provide poor support to new centre bay purlins.
- At the right side gable, the gable end rafter member has suffered from section loss.



- On the front elevation the original eaves beam has cracked and is supported on modern studs to a modern entry head beam. This beam is undersized and deflected.
- The modern posts at this same front opening have been cut close to ground level.
- Original main posts at this location appear good but extend below ground where checking was not possible.
- At the rear central bay the eaves beam has cracked, albeit directly above a secondary beam.
- To the right side of the centre bay, at the rear, there is a poor joint between eaves beams and a metal plate addition is corroded.
- The floor has a number of cracks and depressions, particularly at the location of drains in the left side bay. It is possible that the floor movements are due to being founded on a shrinkable clay soil.

In addition to the above localised defects, and my main concern, are distortions to the structure overall and its lateral stability. Overall the barn, and most noticeably the roof, have racked to the left. Racking has also occurred towards the back. Measured leans of walls are quite large but considering the age of the structure and, as long as measures are taken to enhance the current stability, are not excessive.

Sketches 24/402/SK01 to SK08 are included at the end of this report showing the location of defects described above.

Modern Car Port

There are numerous defects / problems associated with the car port, to such a degree that it is our opinion that the most economic solution is a complete rebuild. Below we have listed the main identified defects:

- Roof structure has racked to the left, now potentially adding lateral loading to the original barn.
- The lack of tying to the roof structure has led to eaves spread and a lean to the rear timber frame wall.
- The spread of the roof has also caused the opening of joints between beams at the front elevation.
- The front posts are built directly on a very thin, unreinforced slab, supported on made ground. Cracking and settlement have occurred.
- There is a substantial sag in the beam above the double bay. It appears the steel plate was introduced to help but it has not resolved the issue.
- The slab has numerous cracks running through it, with vertical displacement. This slab, albeit with at least a rear downstand, supports the perimeter walls.
- Large cracks are present in the perimeter walls. These cracks coincide with the cracking to the slab.
- The rear foundation is very shallow, albeit with a thickening to the slab unlike at the front, with a Cypress hedge only 3m away. The poor foundations and slab are almost certainly the cause of the substantial movement and cracking in the walls and slab.

The superstructure construction, foundations and floor slab are poor. Although it would be possible to repair the superstructure, it would be pointless doing this on the current foundations as movement is almost certainly ongoing. For that reason the only practical, and most economic, solution would be to demolish the car port structure and rebuild it on suitable foundations.



Discussion

The original barn is in reasonable condition, with repairs fairly extensive, especially at low level. There are defects present to a number of members as listed above. These can be addressed with relative ease by an Oak frame specialist.

However, it is likely that, due to the nature of the structure, once cladding is removed and work commences other defects may become apparent.

The flooring is in poor condition and will need to be replaced. As the soil is shrinkable clay and there are trees present, we would recommend a suspended floor to avoid future heave issues.

My main concern, and that of previous work on the structure is lateral stability. In the past braces have been added but with limited success. Care should be taken when removing cladding, with the roof unloaded first before wall cladding. The stability should be enhanced by connecting ply sheathing to the framework before adding external insulation and cladding.

The car port, including the floor slab, has been poorly constructed on inadequate foundations. There are a large number of defects present that make it uneconomic to repair without complete demolition.

Recommendations

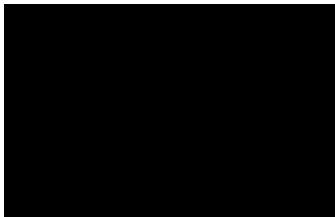
It is recommended that:

1. Sympathetic timber repairs be carried out to the areas highlighted above in the original barn.
2. The floor slab of the original barn should be replaced, preferably with a suspended structure.
3. The original barn structure should have ply sheathing added as part of the enhancements, fixed to the timber frame.
4. The modern car port structure is removed, including the foundations, and a replacement building constructed on deeper, most likely piled, foundations allowing for the clay soil and presence of trees.

It is noted that, due to the listing, works will be subject to the approval of the Conservation Officer. They will also need to be incorporated in the design of the new dwelling, once details are available.

If you have any queries or wish to discuss any items further, please do not hesitate to contact me.

Yours sincerely



David Moorey BSc CEng MICE MStructE

Encs.



ROOF RACKS
SIGNIFICANTLY



(MODERN CAR
PORT NOT SHOWN)

25mm LEAN
(OVER 900mm)



(MEASURED
INTERNALLY
AT WORST
LOCATION)

18mm LEAN
(OVER 900mm)



(MEASURED
INTERNALLY
AT WORST
LOCATION)

NEW POSTS HAVE
SECTIONS CUT OUT
(DISCONTINUOUS)

REV AMENDMENT	DRW DATE	 DESIGN AND MAINTAIN LTD Phone : 07913 604409 Email : office@designandmaintain.co.uk	CLIENT M ALFORD	PROJECT TITLE TOAT FARM BARN ITCHINGFIELD	DRAWING TITLE EXTERNAL FRONT ELEVATION (NORTH EAST)	DRAWN MAR 2025	CHECKED DNM	DATE MAR 2025	SCALE 1:50 AT A4
						JOB NUMBER 24/402	DRAWING NUMBER SK01	REVISION -	



ROOF RACKS
SIGNIFICANTLY

(MODERN CAR
PORT NOT SHOWN)

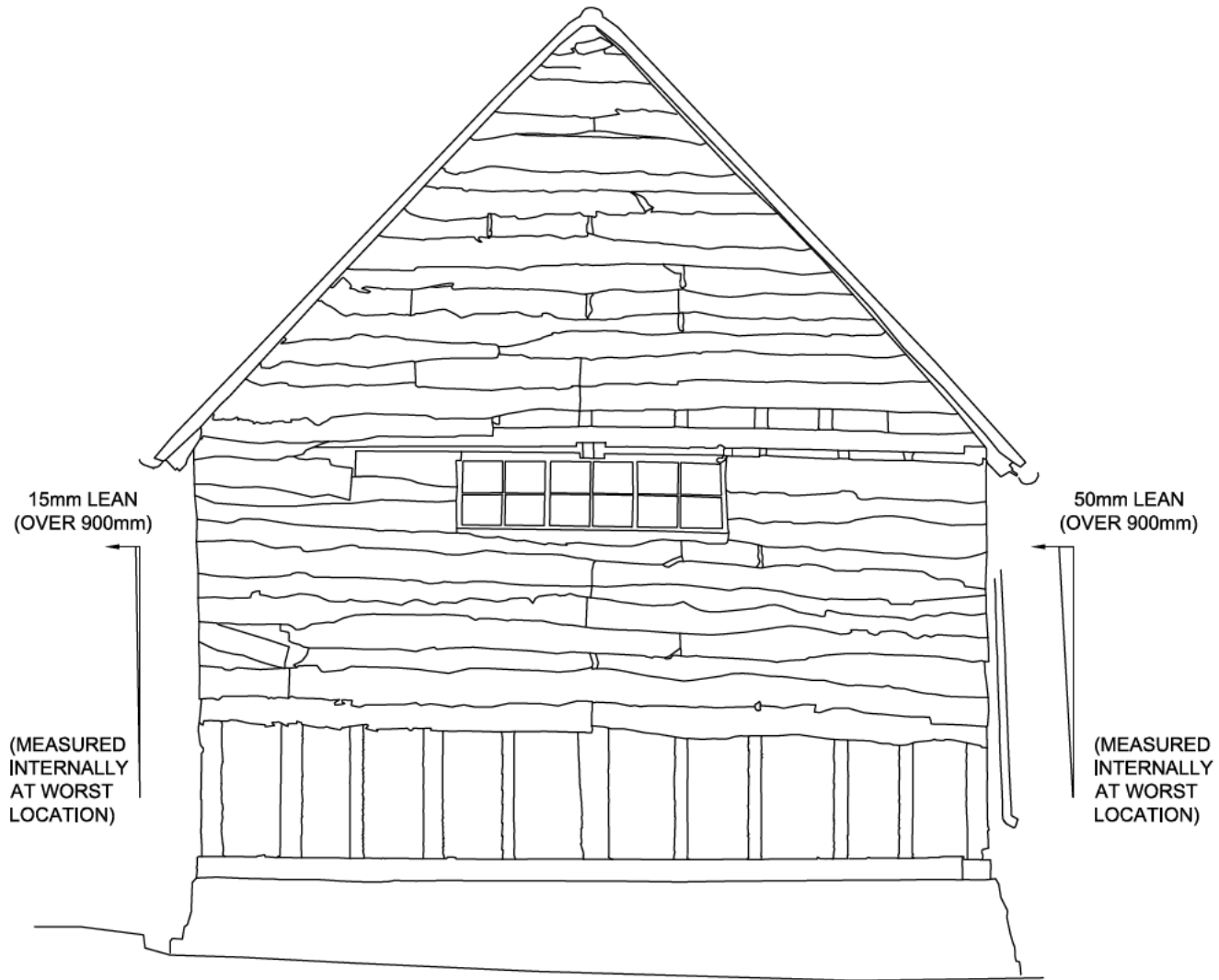
18mm LEAN
(OVER 900mm)

(MEASURED
INTERNALLY
AT WORST
LOCATION)

25mm LEAN
(OVER 900mm)

(MEASURED
INTERNALLY
AT WORST
LOCATION)

REV AMENDMENT	DRW DATE	 DESIGN AND MAINTAIN LTD Phone : 07913 604409 Email : office@designandmaintain.co.uk	CLIENT M ALFORD	PROJECT TITLE TOAT FARM BARN ITCHINGFIELD	DRAWING TITLE EXTERNAL REAR ELEVATION (SOUTH WEST)	DRAWN MAR 2025	CHECKED DNM	DATE MAR 2025	SCALE 1:50 AT A4
						JOB NUMBER 24/402	DRAWING NUMBER SK02	REVISION -	



REV	AMENDMENT	DRN	DATE



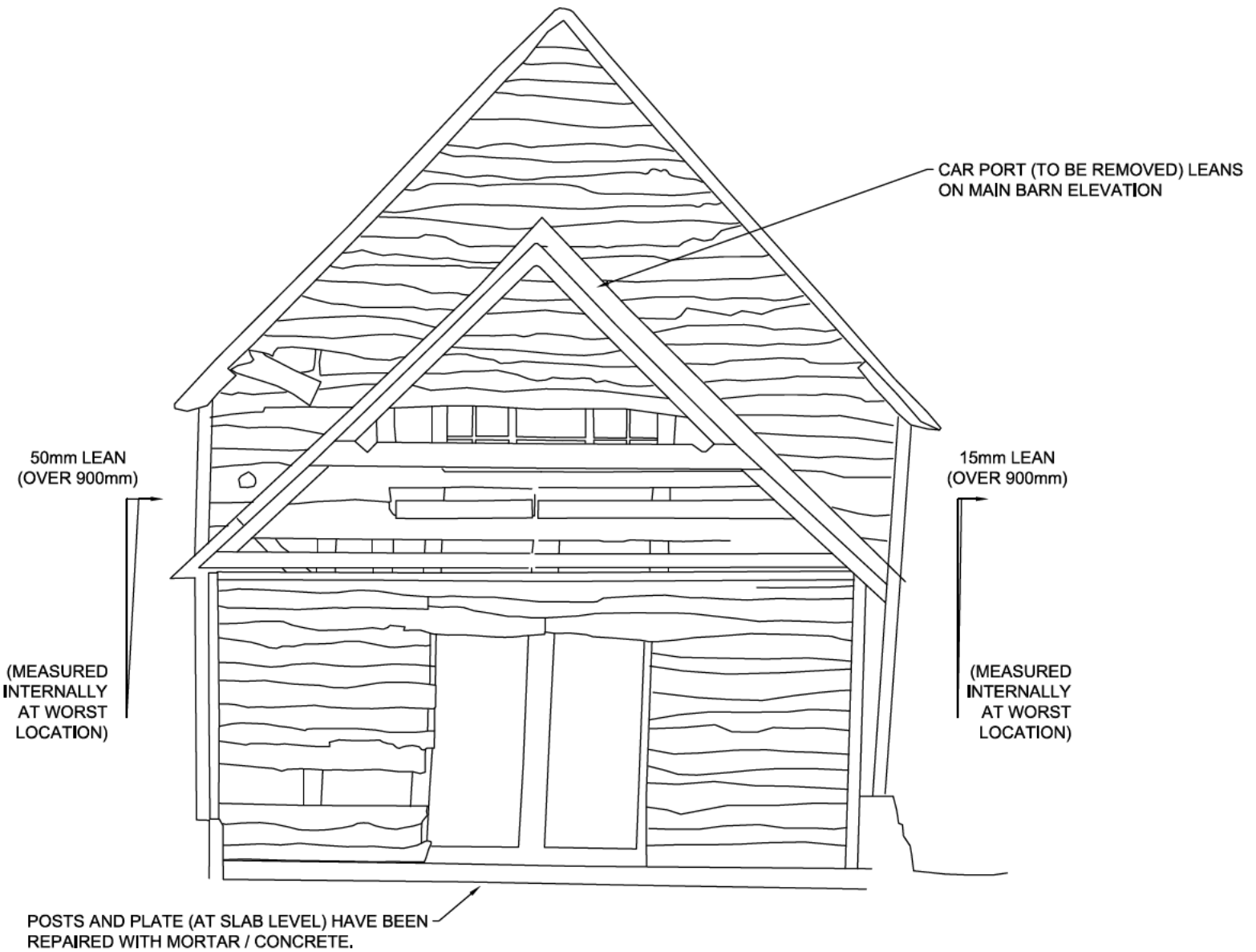
DESIGN AND MAINTAIN LTD
 Phone : 07913 604409
 Email : office@designandmaintain.co.uk

CLIENT
M ALFORD

PROJECT TITLE
**TOAT FARM BARN
 ITCHINGFIELD**

DRAWING TITLE
**EXTERNAL LEFT ELEVATION
 (SOUTH EAST)**

DRAWN	CHECKED	DATE	SCALE
MAR 2025	DNM	MAR 2025	1:50 AT A4
JOB NUMBER	DRAWING NUMBER	REVISION	
24/402	SK03	-	



REV	AMENDMENT	DRN	DATE



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PROJECT TITLE
**TOAT FARM BARN
 ITCHINGFIELD**

DRAWING TITLE
**EXTERNAL RIGHT ELEVATION
 (NORTH WEST)**

DRAWN	CHECKED	DATE	SCALE
MAR 2025	DNM	MAR 2025	1:50 AT A4
JOB NUMBER	DRAWING NUMBER	REVISION	
24/402	SK04	-	



ORIGINAL PURLIN CANTILEVERS TO SUPPORT NEW (UNDERSIZED) PURLIN. INADEQUATE SUPPORT.

MODERN PURLINS UNDERSIZED

ORIGINAL HEAD BEAM HAS FAILED AND SUPPORTED ON STUDS TO NEW LOW HEAD BEAM. BOTTOM OPENING (MODERN) HEAD BEAM UNDERSIZED.

NEW POSTS HAVE SECTIONS CUT OUT (DISCONTINUOUS)

MAIN POSTS APPEAR OK BUT CHECK BELOW GROUND (EXCAVATION REQUIRED)

REV	AMENDMENT	DRN	DATE



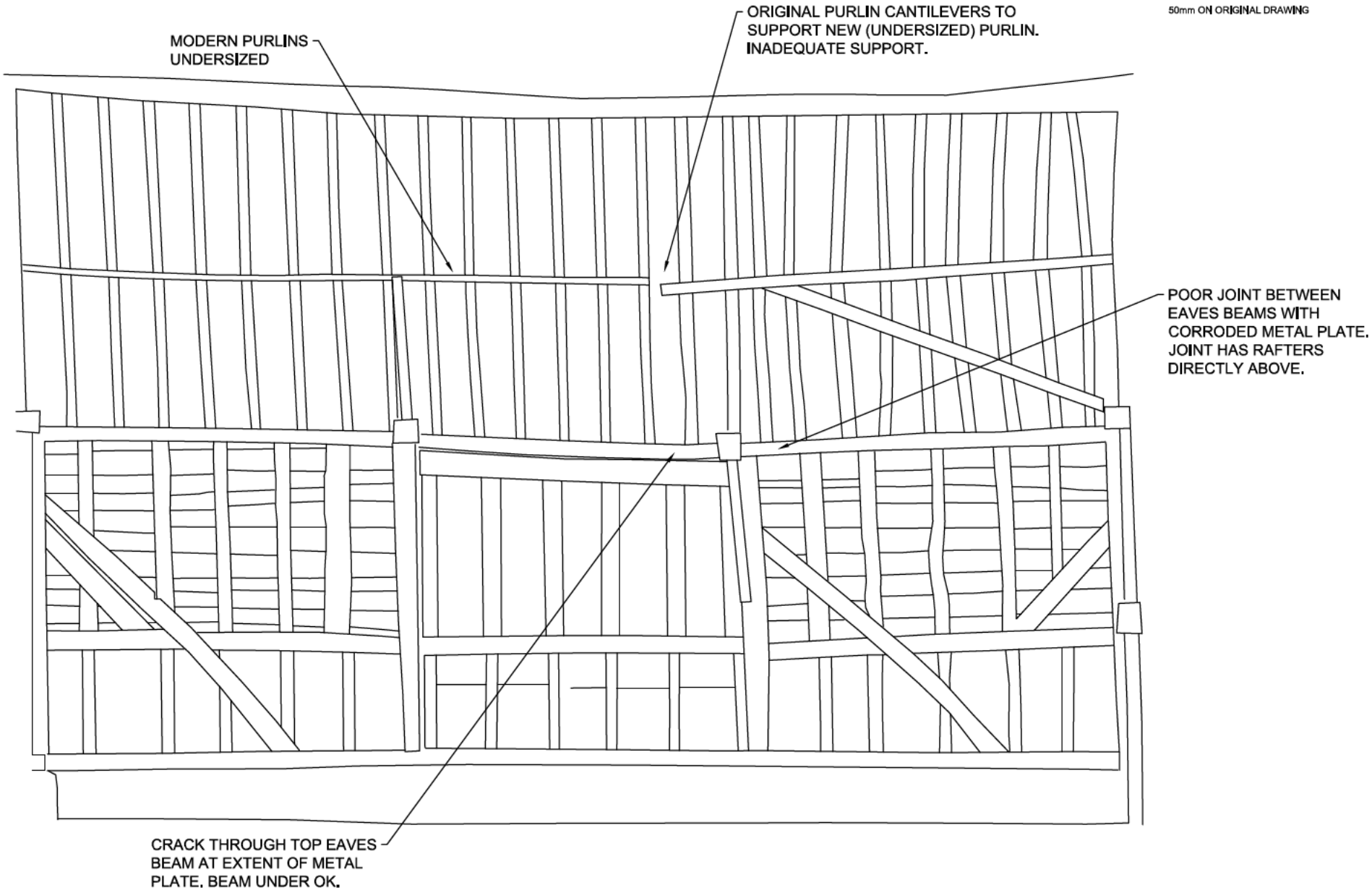
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M ALFORD

PROJECT TITLE
**TOAT FARM BARN
 ITCHINGFIELD**

DRAWING TITLE
**INTERNAL FRONT ELEVATION
 (NORTH EAST)**

DRAWN	CHECKED	DATE	SCALE
MAR 2025	DNM	MAR 2025	1:50 AT A4
JOB NUMBER	DRAWING NUMBER	REVISION	
24/402	SK05	-	



MODERN PURLINS
UNDERSIZED

ORIGINAL PURLIN CANTILEVERS TO
SUPPORT NEW (UNDERSIZED) PURLIN.
INADEQUATE SUPPORT.

POOR JOINT BETWEEN
EAVES BEAMS WITH
CORRODED METAL PLATE.
JOINT HAS RAFTERS
DIRECTLY ABOVE.

CRACK THROUGH TOP EAVES
BEAM AT EXTENT OF METAL
PLATE. BEAM UNDER OK.

REV	AMENDMENT	DRN	DATE



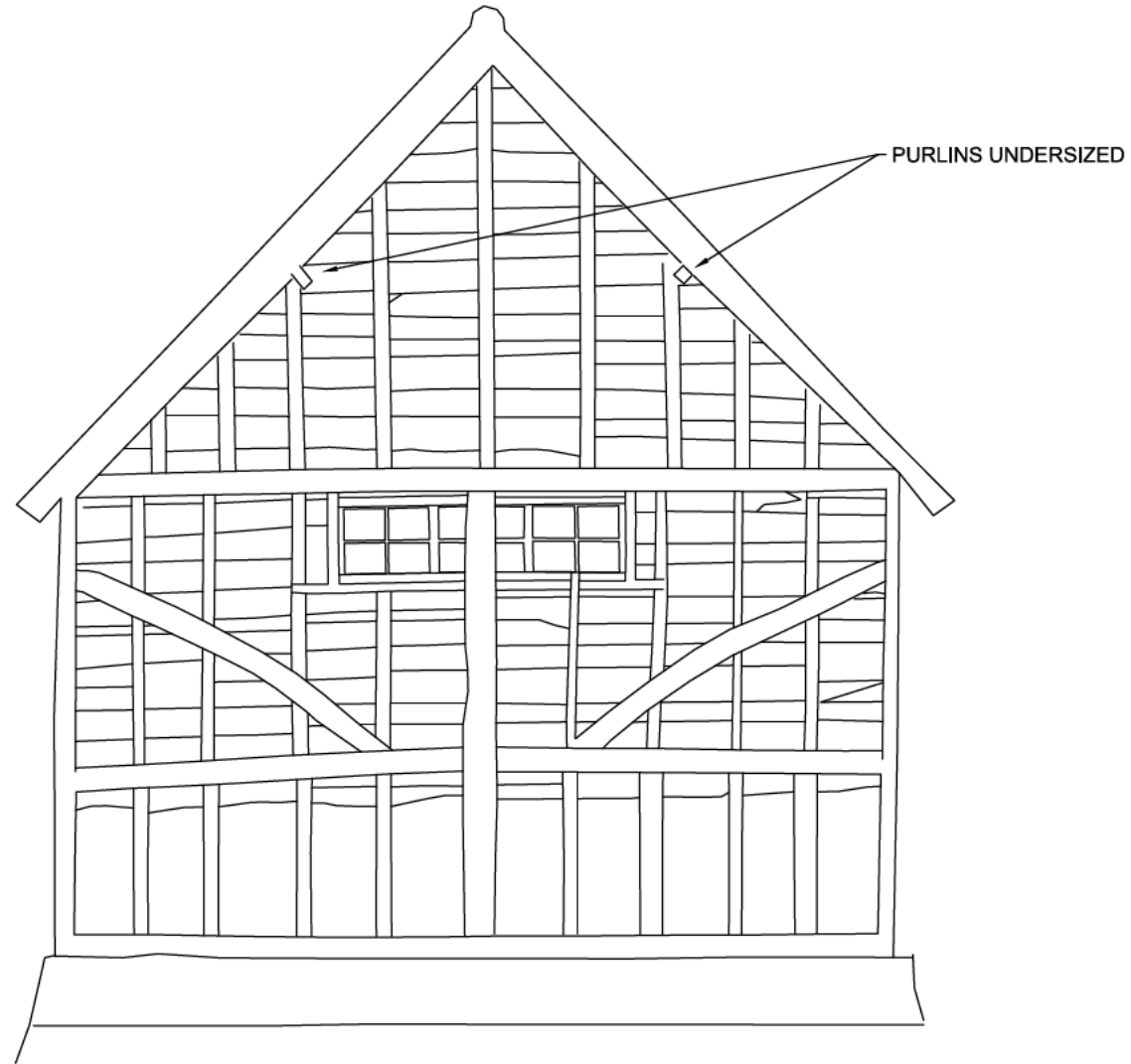
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CLIENT
M ALFORD

PROJECT TITLE
**TOAT FARM BARN
 ITCHINGFIELD**

DRAWING TITLE
**INTERNAL REAR ELEVATION
 (SOUTH WEST)**

DRAWN	CHECKED	DATE	SCALE
MAR 2025	DNM	MAR 2025	1:50 AT A4
JOB NUMBER	DRAWING NUMBER	REVISION	
24/402	SK06	-	



REV	AMENDMENT	DRN	DATE



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CLIENT
M ALFORD

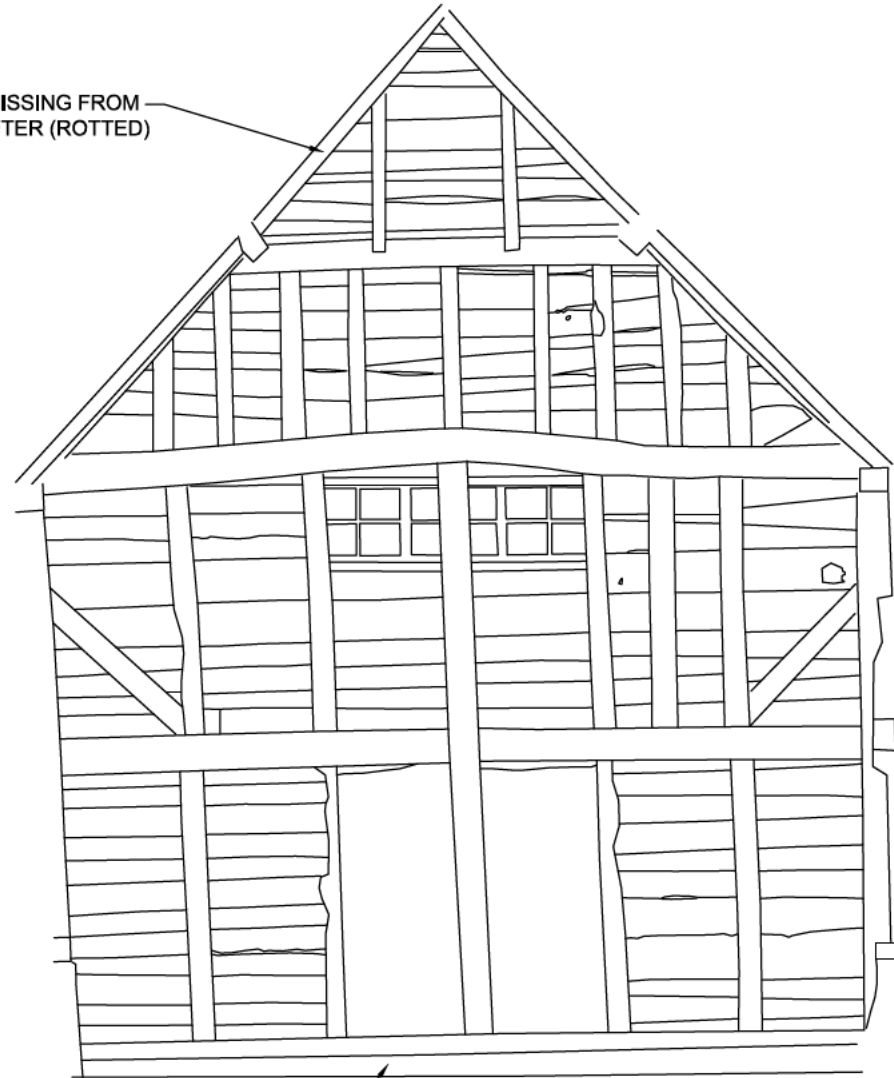
PROJECT TITLE
**TOAT FARM BARN
 ITCHINGFIELD**

DRAWING TITLE
**INTERNAL LEFT ELEVATION
 (SOUTH EAST)**

DRAWN	CHECKED	DATE	SCALE
MAR 2025	DNM	MAR 2025	1:50 AT A4
JOB NUMBER	DRAWING NUMBER	REVISION	
24/402	SK07	-	



SECTION MISSING FROM
GABLE RAFTER (ROTTED)



POSTS AND PLATE (AT SLAB LEVEL) HAVE BEEN
REPAIRED WITH MORTAR / CONCRETE.

REV	AMENDMENT	DRN	DATE



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 Email : office@designandmaintain.co.uk

CLIENT
M ALFORD

PROJECT TITLE
**TOAT FARM BARN
 ITCHINGFIELD**

DRAWING TITLE
**INTERNAL RIGHT ELEVATION
 (NORTH WEST)**

DRAWN	CHECKED	DATE	SCALE
MAR 2025	DNM	MAR 2025	1:50 AT A4
JOB NUMBER	DRAWING NUMBER	REVISION	
24/402	SK08	-	