EurIng ***Allan Pearce*** *BscEng ACGI CEng MICE MIStructE*

Consulting Civil and Structural Engineer

N / 102484 / F

Your ref:

My ref: ACP/08191

12 October 2010

John Hall

New Bungalow

Nunnington

Hereford HR1 3NJ

Dear John

North Barn at Lower House, Hillhampton, Ocle Pychard, Hereford

Thank you for your instructions, given on behalf of Mr C Simcock, which were for me to inspect and report upon the structure of the north barn at Lower House, Hillhampton. I gather that it is intended to convert the barn into holiday accommodation and that a structural appraisal is required as part of the Planning approval process. As you are aware, I inspected the structure today. I have pleasure in reporting as follows:-

The inspection was carried out from ground level only and was limited to the visible load bearing elements of structure: no attempt was made to open up the building fabric and therefore no comment is made on the condition of unseen elements except by inference from observations. I have not inspected woodwork or other parts of the structure that are covered or inaccessible and I am therefore unable to report that any such part of the property is free from defect.

I have received a copy of your drawings which show the proposed conversion of the barn: the orientation and frame references shown on those drawings have been adopted for the purposes of this report.

1.0 GENERAL DESCRIPTION

1.1 The structure is a timber framed five bay threshing barn, the long axis of which runs north-south. Parts of the framing have been altered and adapted from an earlier frame and so the age of the structure in its present form is difficult to estimate.

Lower Hazle Farmhouse, Durlow, Tarrington, Hereford HR1 4JQ

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However the older parts of the frame are estimated to be about 350 years old and the king-post roof trusses are likely to be about 250 years old: this latter estimate may represent the date of the reconstruction or major re-modelling of the structure.

1.2 The structure generally consists of traditional heavy timber framing (roughly square-panelled post and beam construction) with some of the original wattle infill panels remaining: in part the frame is now clad in weatherboarding. The original structure was founded on stonework plinth walls, some of which are dilapidated now, and the plinths walls each side of the threshing bay are of brickwork. The roof of the main body of the barn is covered in corrugated iron sheeting, but must originally have been slated or tiled.

1.3 There is a lean-to addition at the north end, consisting of timber rafters and tie-beams spanning from the gable frame of the barn onto a stone wall: the roof is covered in profiled asbestos-cement sheeting. There are also more modern additions to the west and east sides of the barn but I gather that these are to be removed and hence no further comment is made upon these elements in this report.

1.4 The ground on the west side of the barn is lower than the internal floor level and hence the stone plinth wall to the west side frame acts as a retaining wall, retaining about 1.2m depth of soil. Otherwise, the external surface is reasonably level, but there is a step down into the north end lean-to. There is a small Elder tree growing near the north west corner of the barn, but it is assumed that this will be removed.

2.0 OBSERVATIONS

2.1 North lean-to

2.1.1 The stone wall is reasonably straight and true and the masonry is generally sound. However, there are occasional open joints and part of the wall appears to have been constructed with soil rather than mortar and this soil is very soft and weathered.

2.1.2 The timber wall-plate shows signs of decay in places. The rafters are suitable only for sheeting rather than the proposed slate roof covering and will need to be replaced.

2.2 **North gable (frame 6 as shown on J Hall's drawing)**

2.2.1 The plinth wall is dilapidated – the west part of the stonework has collapsed and the timber sill-plate is unsupported here.

2.2.2 The frame is roughly square-panelled up to the tie-beam of the roof truss, above which the truss has diagonal internal struts forming an attractive diamond pattern.

2.2.3 The sill-plate has decayed severely where a water trough has been leaking but the framing above the sill-plate appeared generally to be sound (exceptions are noted below).

2.2.4 The part of the frame exposed above the lean-to roof is covered with weather-boarding externally, which may conceal defects, but internally there were only occasional signs of decay having affected the diamond struts and lower rails. The dropping of the western part of the sill plate has caused the joints between the top of the studs and the tie-beam to fail.

2.3 **South gable (frame 1)**

2.3.1 The plinth again is dilapidated and the sill-plate decayed.

2.3.2 This gable frame is traditionally framed, with a collared roof truss plus diagonal struts. Part is weather-boarded.

2.3.3 The eastern part of the frame is severely distorted, leaning outwards, and near the middle of the frame two hop-poles have been added in an attempt to stiffen it. The majority of the framing is intact, but five of the intermediate rails are missing.

2.4 **East side frame**

2.4.1 For much of its length, the plinth wall has failed almost completely, the exception being the north end bay.

2.4.2 *Frame between 1 and 2:* The framing here has failed: the sill-plate is displaced, the studs severely inclined and the wall-plate has rotted away in tow places.

2.4.3 *Frame 2 – 3:* The sill-plate is displaced and severely decayed. There is also severe decay of the wall-plate and the rail beneath it. The north end stud has ruptured and the upper part is missing, as is the adjacent rail.

2.4.4 *Frame 3 – 4:* The sill-plate is again decayed but the frame above it in this bay remains intact and apparently serviceable.

2.4.5 *Frame 4 – 5 (i.e. the open threshing bay):* This bay has been altered in the past, any original framing having been removed and a door frame added with raised head beam to from a taller opening and "cat-slide" roof. The south side door post is missing and the head beam unsupported as a result: the head beam itself is severely decayed and remains hanging tenuously in place. The base of the north side door post is decayed and has no plinth – at present it is merely hanging from the tenon at the top.

2.4.6 *Frame 5 – 6:* The centre stud and the lower rails each side have been cut out to form a doorway but otherwise the frame in this bay is intact and serviceable.

2.5 West side frame

2.5.1 The stone plinth/retaining wall is damp and green with moss growth, but is reasonably straight and true and appears to be fulfilling its function. Part of the wall alongside the south side of the threshing bay has been rebuilt in brickwork. The timber sill-plate has a "tide-mark" of dampness but appears to have been little affected by decay.

2.5.2 *Frame between 1 and 2:* This bay has been re-worked: the north stud is missing and there are no mid-rails; a diagonal brace has been added.

2.5.3 *Frame 2 – 3:* The wall-plate is in poor condition and there is a badly jointed scarf over the south stud. Again this bay has been re-worked using smaller studs with no mid-rails but with the addition of two diagonal braces.

2.5.4 *Frame 3 – 4:* Part of the wall-plate is missing. As noted above this bay has also been altered: there is a diagonal brace, smaller studs and no mid-rails.

2.5.5 *Frame 4 – 5 (threshing bay):* As on the east side, there is an added door frame with raised wall-plate. The south side post is unsupported at its base.

2.5.6 *Frame 5 – 6:* The original framing remains largely intact and sound, but the lower rail at the south end is missing.

2.6 Internal transverse frames

2.6.1 The internal transverse frames have been sketched and observations noted thereon – see sketches 1 – 2 attached.

2.7 **Roof**

2.7.1 The rafters in general appeared to be oak and of good quality and condition. However, particularly in the cat-slide roof to the threshing bay and in the southernmost bay, several of the rafters are missing, there are some lower quality replacements and at least one of the existing rafters is ruptured and occasional rafters showed signs of decay.

2.7.2 The ridge beam appeared to be much affected by decay, but the purlins in general appeared generally to be serviceable (although their adequacy for the proposed roof covering will need to be checked).

3.0 DISCUSSION/RECOMMENDATIONS

3.1 The original stone plinth walls of the north, east and south frames are dilapidated and are unsuitable for the converted barn. In addition, the internal brickwork walls each side of the threshing bay have failed and are also unsuitable as foundations for the converted structure. I therefore recommend that allowance be made for replacing these plinth walls on new foundations: This may be achieved by:-

- removing the existing cladding, boarding and sheeting and all other extraneous items
- supporting the timber framing temporarily on a grillage of scaffolding (which will also allow the frame to be jacked up and re-levelled and re-aligned as necessary)
- removing the existing plinth walls (setting aside any stone and bricks suitable for re-use), excavating to the required depth and constructing new strip footings.
- where necessary a new oak sill-plate may be inserted, jointed into the feet of the existing posts and studs, and temporarily supported in place while the new plinth walls are built up and pinned up beneath it.

3.2 The various parts of the existing framing that are missing or defective may be reinstated or renewed, presumably in similar form to the original, and those parts of the existing framing that have decayed should be repaired locally using traditional carpentry methods i.e. by suitably jointing new pieces of timber into the existing members. In particular, the missing bracing should be reinstated to provide adequate

stiffness and stability to the structure. It is recommended that all joints be checked and re-pegged as necessary.

3.3 As noted above the roof structure was not inspected at close quarters, but some of the rafters are missing or ruptured and others replaced with sections of unsuitable timber. It is assumed that the rafters will be appraised in more detail when suitable access is available and where necessary renewed as part of the conversion works. The ridge beams appeared to be poor and decayed at least in part and it is recommended that allowance be made for renewing the ridge beams. The purlins appeared to be sound but will need to be checked for strength in relation to the proposed roof covering. The roof is well braced at present and the bracing should be retained to provide stability to the converted structure.

3.4 The defective jointing of the north wall of the north lean-to should be raked out and repointed using lime mortar. The wall-plate should be renewed and the rafters replaced with section sizes suitable for the proposed slate roof covering.

In conclusion, I consider that the structure is suitable for the proposed conversion, subject to appropriate in-situ repair works in line with the recommendations made above.

I trust that you will find these comments and recommendations to be clear, but please do not hesitate to let me know if you have any queries or require any further information or advice: in the meantime please find enclosed my fee account for services to date.

Yours sincerely

Allan Pearce

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Job no. 08191
Sheet SK 1
Date 12.10.10
By ACP

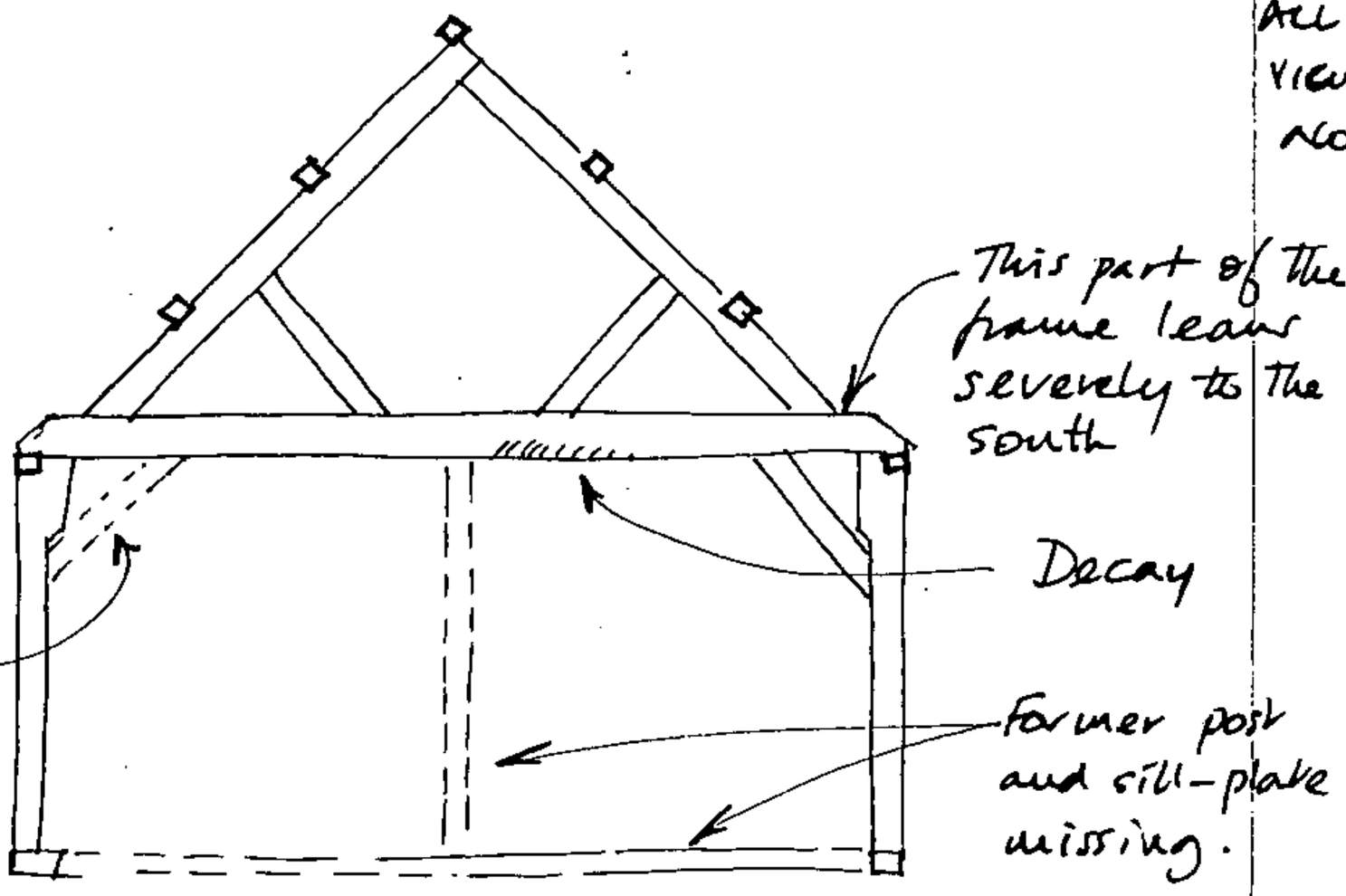
SKETCH

Project NORTH BARN. LOWER HOUSE OCLE PYCHARD.

Subject TRANSVERSE FRAMES.

Remarks NOT TO SCALE. ALL FRAMES VIEWED LOOKING NORTH.

FRAME 1.



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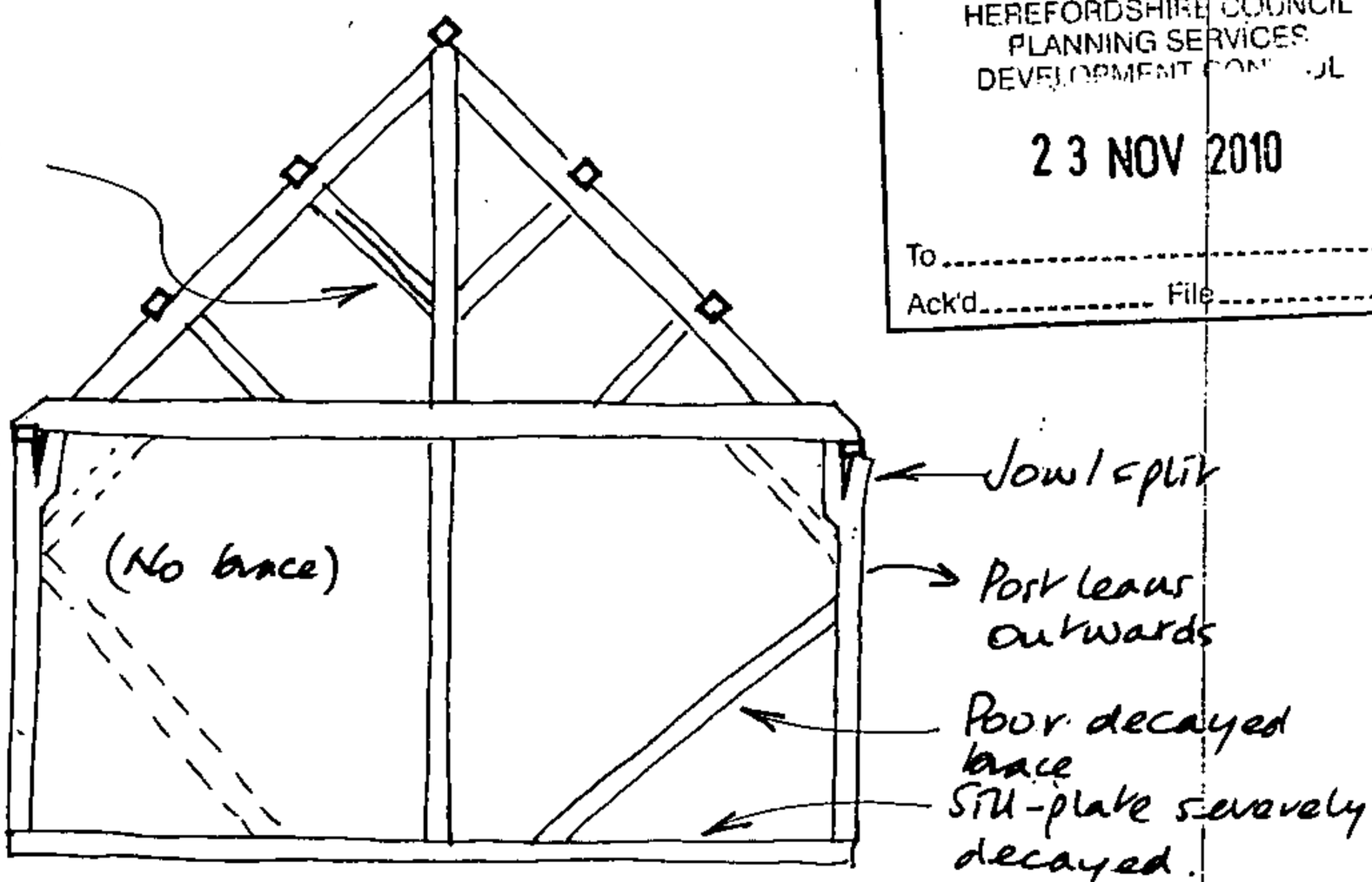

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Frame has been re-worked – mortices in parts suggest former knee-braces and down-brace missing.

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Job no. 08191
Sheet Sk 2
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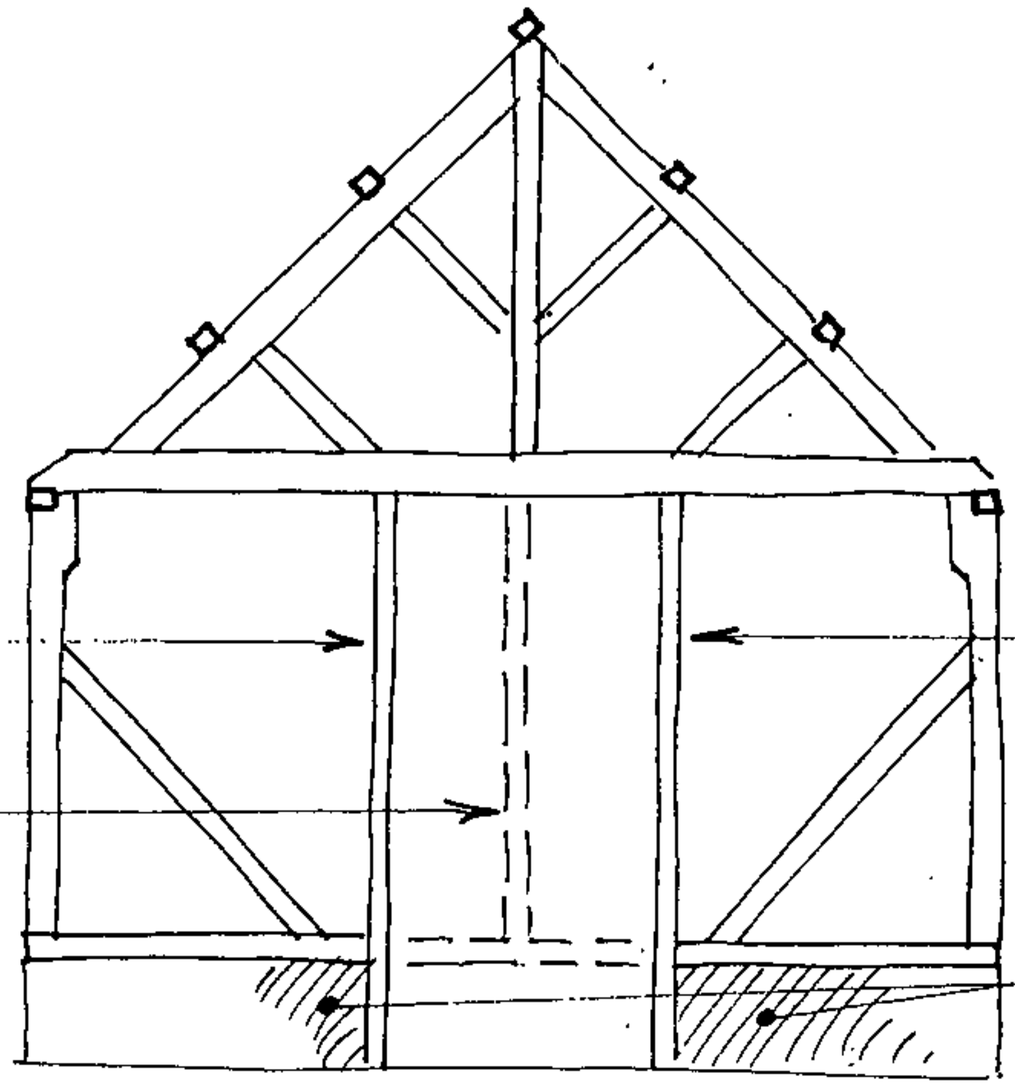
Remarks

SKETCH

Project NORTH BARN. LOWER HOUSE OCLE PYCHARD.
Subject TRANSVERSE FRAMES

FRAME 4.



FRAME 5.