



**FORMER BARN HOTEL
WEST END ROAD
RUISLIP**

OUTLINE STRUCTURAL METHODOLOGY REPORT



Client: Chase New Homes
Jasmine House
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Prepared by: The Morton Partnership Ltd
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Rev	Comments	Engineer	Date
-	First Issue	AM	26/06/25
1	Revised to suit updated Architectural scheme	AM	18/03/26

1.0 Introduction

- 1.1 The Morton Partnership have been appointed by Chase New Homes to prepare an Outline Structural Methodology Report to cover the repairs and stabilization works necessary for the adaptive re-use of three grade ii listed buildings on the site of the former Barn Hotel.
- 1.2 Specifically, this will comprise the provision of specialist structural engineering conservation input on the condition of the existing buildings and to assess whether remedial strengthening works are required in order to enable the preservation of the existing fabric as part of the new scheme
- 1.3 The buildings to be included are the leaning barn which is a late 16th or early 17th century, timber framed structure for which the original use is listed as being a contemporary out building to the barn structure to north which is known as the Oak Room. The third building is Sherley's Farm House which is further to the north.
- 1.4 Proposed plan drawings for the Architectural scheme have been provided by Aros Architects, document references 6490 (20)100 rev I and 101 rev H.
- 1.5 The Historic England listing for the buildings is repeated below, although note that these are not always entirely accurate.

1. 5018 WEST END ROAD (East Side) RUISLIP Barn and Outbuilding to south-east of Sherley's Farmhouse (The C17 Barn Motel) TQ 08 NE 41/445 II GV 2. Late C16 or early C17 2-bay barn, timber framed with queen strut roof truss, somewhat restored. Later C17 2-bay structure to north, also timber framed, with queen post roof truss. Painted brick filling, old tiled roofs. Group value with Sherley's Farmhouse. Some modern extensions to east.

- 1.6 Its understood that the group of buildings which formed the hotel barn ceased operation in 2023 and since this time it is used on a temporary basis as social housing while planning permission is sought for the full redevelopment of the site.
- 1.7 Our survey was carried out on Wednesday May 28th at which time the weather was warm and dry. Unrestricted access was provided to the leaning barn however access to the Oak Room and Sherley's Farm House was more restricted as they were occupied by residents with the latter divided into six bedsits.

2.0 STRUCTURAL CONFIGURATION

The Leaning Barn

- 2.1 The barn has a dual pitch timber roof with rafters supported at mid span by purlins which span from the end walls to central queen post truss. Above the rafters timber sarking boards are present which are finished with clay plain tiles. The gable walls at the north and south ends also comprise queen post trusses.
- 2.2 It is entirely enclosed upon on the north, east and southern sides, and also partially to the west. It is single story, comprised of two bays and with a height to eaves of circa 3.7m and 6.3m to the ridge.
- 2.3 The proposed redevelopment sees the demolition of the modern buildings which surround the barn and the construction of a new single-story extension to the north, which together will comprise a self-contained residential unit.
- 2.4 New buttresses are shown on the proposed Architectural general arrangement drawing however they are on the west side which is the opposite to the direction in which the building is leaning.
- 2.5 Modern timber posts are present beneath each end of the central truss and are inboard of the perimeter walls. These posts are understood to have been installed in the early 21st century

- 2.6 Notches to the internal face of the central posts appear to be mortices which might have received a tennon connection from a central dividing wall within the barn which would have laterally braced the structure however these walls no longer exist
- 2.7 Without this the head plate to the eastern and western side walls is required to span the full distance between the end walls which it is unlikely to have the stiffness to do. As such the removal of these walls is likely to have contributed to the distortion which is seen, however the surrounding structures, particularly to the east currently appear to be providing sufficient compensatory restraint.
- 2.8 The absence of haunches at the heads of the posts within the side walls which support the central truss was also noted, which if present would assist in providing lateral stability to the structure.
- 2.9 It is clear that each of the four walls to the barn have undergone significant alterations but this would not be uncommon given the age of the structure and adds significantly to its character.
- 2.10 The walls all share a number of common features such as the profile, arrangement and spacing of studs, posts and bracing elements but also differ from each other in other aspects.

West wall - The one which is used as the main entrance to the barn.

- 2.11 The head of the wall leans by 400mm to the east.
- 2.12 Partial remains of cross bracing to the north of the entrance. The bottom half of the panel has masonry infill between studs, externally this is rendered with some sections found to be delaminating. Beneath this hard cement pointing to mortar joints between brickwork is evident. Above this the panel is clad with horizontal timber boarding.
- 2.13 At the base of the panel a tiled plinth can be found, its not known what this contains and as such opening up work is required to investigate.
- 2.14 A number of stud ends and one end of a bracing section are discontinuous which have been replaced with masonry infill. This has affected the robustness of the panel which has bowed to an extent that it will need to be dismantled and re-built. There is significant decay to at least two other studs which warrants replacement.
- 2.15 Timber posts are present at each end of the panel although they are obscured at the head.

North wall

- 2.16 Below the door head the wall is comprised predominantly of masonry with the partial remains of some timber framing but no bracing sections, the historic removal may have contributed to the structures distortion but the masonry panels which are now in their place appear to be providing sufficient lateral strength.
- 2.17 In each corner masonry piers can be found which project from the from the inner face of the wall.
- 2.18 From the door head to eaves the walls are predominantly timber framed with the gable clad externally with timber boarding.
- 2.19 Timber posts are present at each end of the panel although they can only really be observed externally.

East wall

- 2.20 The head of the wall leans by 500mm to the east.

- 2.21 The wall is comprised entirely of studwork with no masonry between, instead light weight cladding is present.
- 2.22 To the northern end one bracing member appears to be mostly intact, as does half of a second but with a infilled door in place of the missing end. To the southern end a short length of bracing exists above the door but will not be providing any effective restraint.
- 2.23 The pitched roof to the barn continues below eaves level and over the neighboring building to the east, a lower level ceiling is present. Both elements are likely to be assisting in bracing the structure.
- 2.24 The south east corner of the barn is also buttressed by a projecting wall which resembles form used within the barn and is likely to be included in the listing, clarification to be provided by the Heritage Consultant as the wall is not currently shown on the proposed Architectural layout.
- 2.25 The northern end of the panel is also buttressed by a projecting wall however investigation work is required to understand its form and whether or not its are comprised of significant historic fabric.

South wall

- 2.26 The south west corner of the panel has dropped some 500mm relative to the eastern corner.
- 2.27 A large non original fire place with a brick cap dominates the center of the panel which is likely contributing significantly to its overall strength. Single doors are also present each side.
- 2.28 In each corner masonry piers can be found which project from the from the inner face of the wall. Masonry is also present between vertical studwork.

The Oak Room

- 2.29 The Oak Room is a two story timber frame structure. It is enclosed upon by neighboring structures to the southern and western sides which are to be demolished as part of the proposed development works.
- 2.30 Our access was limited due to current occupation however we note that this was not the case when Building Design Consultants undertook their survey, as such we must in part be led by their findings.
- 2.31 Internally between eaves and purlin level the ceiling is vaulted and the rafters exposed. Purlins span from end walls to a central truss which has a raised bottom chord.
- 2.32 What appears to be exposed joists within the ground floor ceiling are in fact non structural sections.
- 2.33 Externally decay to some timber sections is present to the upper part of the northern gable which will require further investigation by a specialist. Aside from this no other obvious signs of distress were observed.

Sherley's Farm House

- 2.34 Sherleys Farm House is also two storey timber framed structure with a later added extension on the southern side constructed predominantly with brick masonry.
- 2.35 As with the Oak Barn internal access was restricted so we are reliant on the findings by Building Design Consultants however this building differs from the Oak Room and Leaning Barn in that its independent of any other structures and therefore full access to the external perimeter is available.

- 2.36 The eastern elevation to the original building is comprised of timber framing with white painted masonry infill between, beneath lime mortar joints are present. Most of these panels have undergone some degree of movement which has resulted in them sitting slightly proud of the timber frame work, bulge's are also present.
- 2.37 In some areas attempts have been made to reinforce the connection between masonry and timber by using face fixed plates to connect the two however this is unsightly and not that effective, as such will need to be removed and other strengthening introduced.
- 2.38 This will likely require the dismantling and reconstruction of the affected panels including the introduction of concealed ties. Decayed timber sections will also need to be replaced and any lost timber to timber connections reinstated.
- 2.39 Towards the bottom of the elevation some sections of brickwork are friable, particularly in the north east corner and the base of the timber post was found to be decayed to a depth of at least 50mm, this warrants replacement. A soil vent pipe is also present on this corner which leads us to us to believe that defective drainage is likely to be causing the decay to the structure. Ponding was also found to be evident on the path that runs along the northern elevation.
- 2.40 Sufficient decay to the require the replacement of the base of central post was also identified and the first floor level window frame.
- 2.41 Generally both masonry and timber framing to the northern elevation was found to be in a better condition. There is significant lateral and vertical distortion to the center of the elevation however this is historic. It also coincides with where the first floor landing has dropped, decay to the beam above the window was also recorded.
- 2.42 The western elevation has undergone significant historic alterations, timber framing is evident at first floor but not at ground level where lime mortar joints were found to the masonry. The south west corner is also formed in masonry with timber cladding but which is heavily decayed. At eaves level the cladding and hopper have detached from the building.
- 2.43 The southern elevation to the original building has also undergone extensive past alterations. At first floor the wall is formed entirely from masonry with face fixed timber sections in an attempt to resemble studs however some have detached. At ground floor level some timber framing is present but decayed.

3.0 RELEVANT TIMBER FRAME CONSTRUCTION HISTORY

- 3.1 The leaning barn would have been originally constructed as a timber frame and likely clad with a light weight material (timber or other) however as its use has changed masonry infill has been introduced between some of the timber framing and in place of some sections which have deteriorated through decay.
- 3.2 The resulting structure is therefore a timber and masonry hybrid with the masonry likely providing the majority of the vertical load bearing strength and the timber framing assisting in provide lateral strength and some robustness although this is dependent the presence, form and condition of connection between.
- 3.3 It would be common for the era of construction for the timber frame to have been based on a sole or cill plate which in turn would have been founded on a combination of stone plinths and pads. No sole plates can currently be observed although they may well have been concealed by surrounding floor finishes or by building up the floor over time.
- 3.4 Of course its also possible that due to their close proximity to the ground they may have decayed to the point where they are no longer serviceable and therefore were replaced, possibly with masonry.

4.0 SUMMARY

Leaning Barn

- 4.1 It is obvious that the structure has undergone significant movement however there are not any obvious signs that this is currently active and as such a state of equilibrium currently exists.
- 4.2 Clearly the adjoining structure to the east is buttressing the barn which includes restraint provided by both external and internal walls and the ceiling structure. As such the new Architectural scheme has been designed to ensure these elements are retained.
- 4.3 The northern and southern gable walls are reasonably plumb. The former will be enclosed upon by a new extension and the latter is stiffened by the chimney which is due to remain as part of the new scheme.
- 4.4 The majority of the load in the center of the building is carried by the truss and in turn the two modern support posts which are also to be retained. The east and west walls each support one quarter of the roof area.
- 4.5 Based on the findings of our survey initial repair and strengthening proposals are shown on drawings within the appendix. Once areas of the frame which are currently concealed are exposed at the beginning of the site works we will undertake a further inspection and finalize the schedule and specification of remedial works which are required.

The Oak Room

- 4.6 Generally the structural framing which was observed to this building is in a reasonable good condition.
- 4.7 Some decay was recorded externally at first floor level to the northern gable which will require the piecing in of new timber sections.
- 4.8 The proposed Architectural scheme which has been presented does not show any proposals to alter any of the structural framing.

Sherley's Farm House

- 4.9 Generally the structural framing to this building was also observed to be in a reasonably good condition.
- 4.10 Decayed elements identified during the survey as requiring strengthening or replacements works are included within the appendix to this report. As other elements of the frame are uncovered during the works additional conservation works may also be found to be necessary.
- 4.11 At ground floor level the proposed Architectural scheme reconfigures the internal layout however support to the central beam within the first floor level must be maintained as identified within the appendix. Furthermore, due to the distortion seen to the first floor to the west of the stair its likely that the partition walls beneath have become load bearing and as such strengthening works will be required to enable their removal. Opening up works will be required at a suitable to stage to enable the design to be informed.

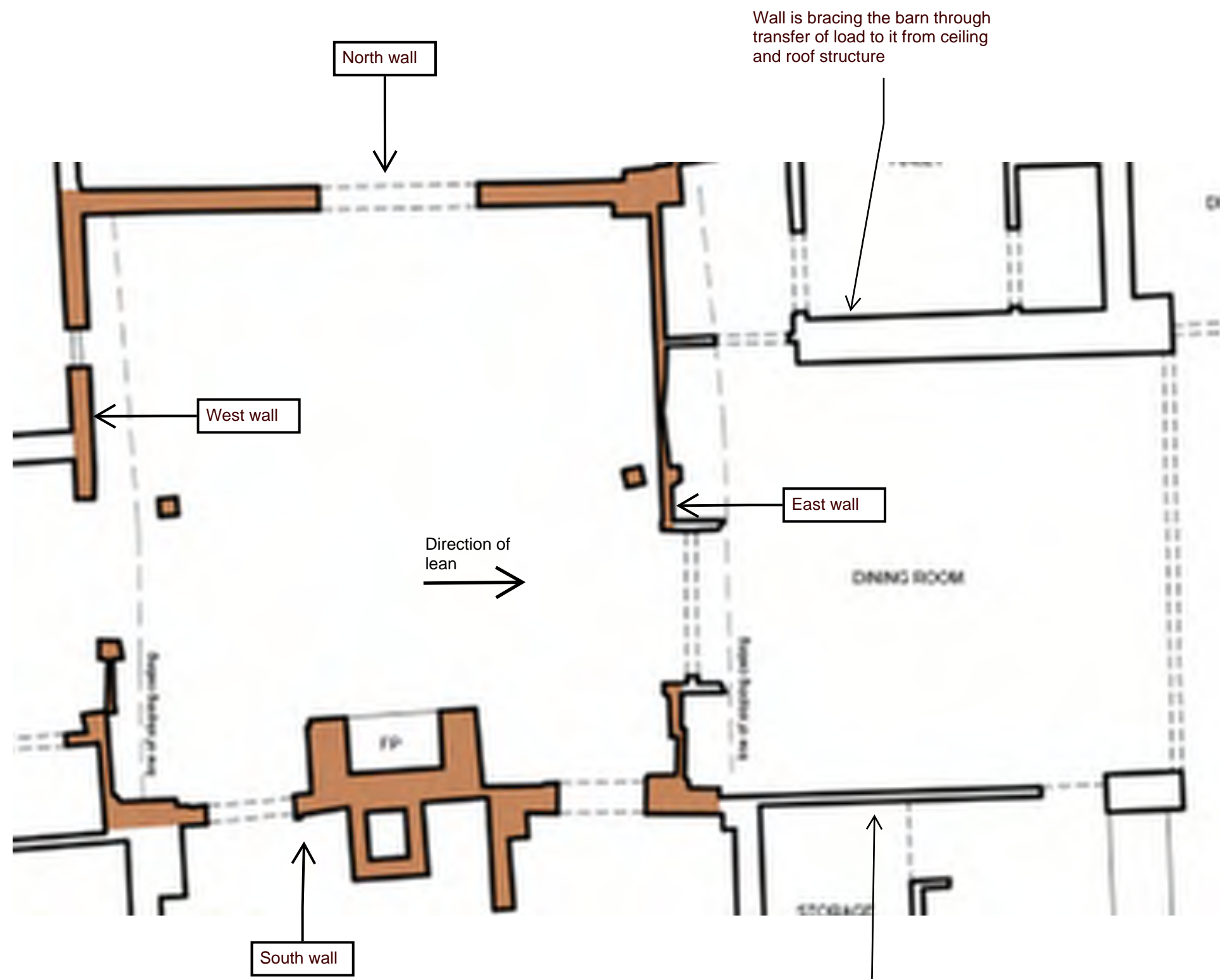
5.0 LIMITATIONS

- 5.1 It should be stated that we have not inspected woodwork or other parts of the structure unless specifically detailed in the report, which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.
- 5.2 This report has been carried out to the Client's requirements and no liability is intended or will be accepted from any third party whatsoever.
- 5.3 The limits of liability are restricted to the contents of this report. No opening up or investigation of foundations etc was carried out, the inspection being visual only.
- 5.4 No checks on load bearing capabilities have been carried out.

Appendix A

Drawings

- NOTES
1. ALL DIMENSIONS TO BE CHECKED ON SITE AND NO MEASUREMENTS TO BE SCALED OFF THIS DRAWING.
 2. IN CASE OF ANY DISCREPANCY THE ENGINEERS ARE TO BE NOTIFIED IMMEDIATELY.
 3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND SERVICES ENGINEER'S DETAILS, DRAWINGS AND SPECIFICATIONS



REV	AMENDMENT	CHK	DATE

Project
HOTEL BARN

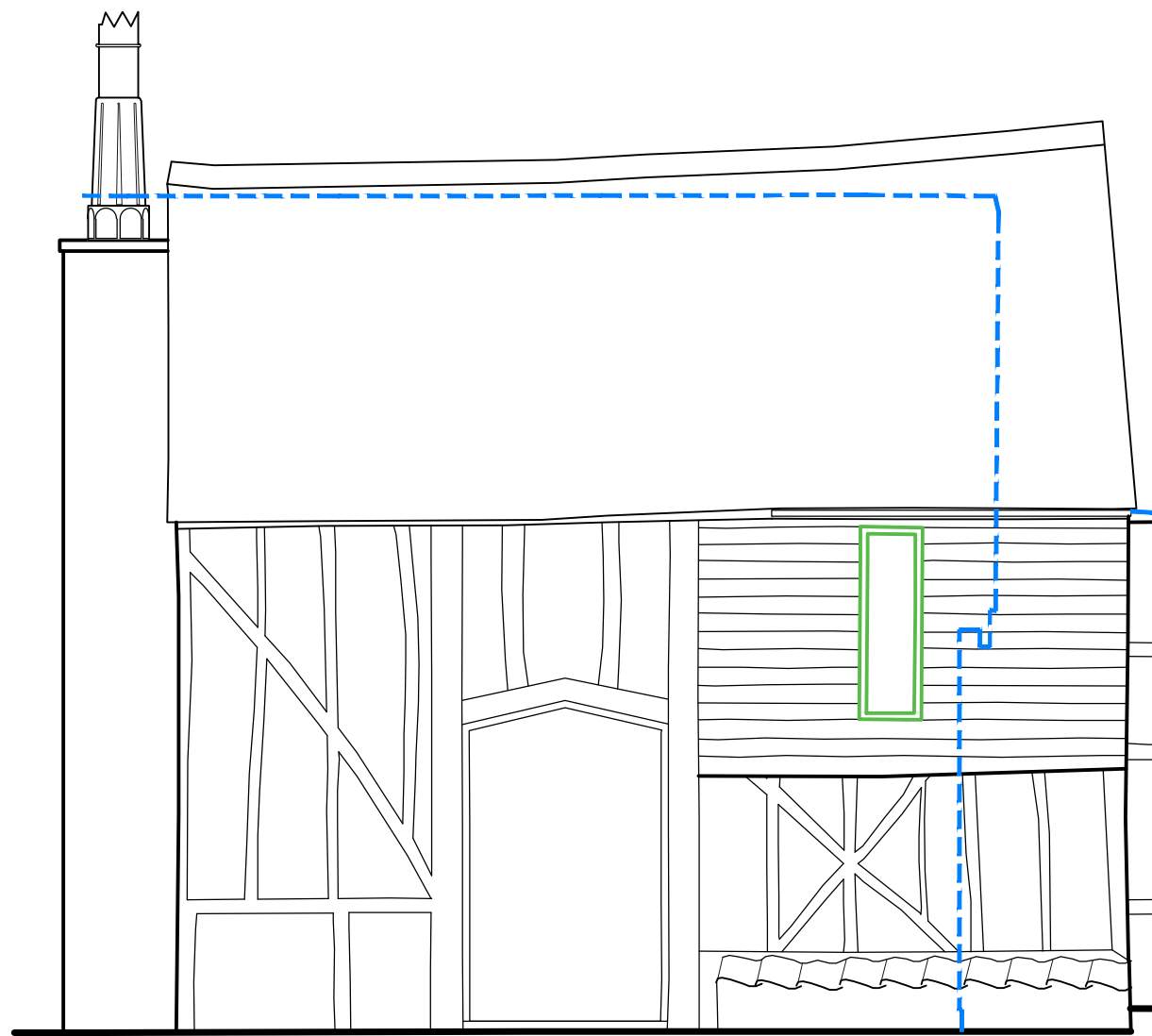
Title
LEANING BARN PLAN



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Significant distortion to panel, see external photograph below. Lower half will largely require replacement, roof structure to be propped during



Decay to base of post recorded internally

Investigation work required below plinth

Base of post severely decayed studs



End of stud and bracing appears to have been lost

NOTES

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REV	AMENDMENT	CHK	DATE

Project
HOTEL BARN

Title
LEANING BARN WEST
ELEVATION



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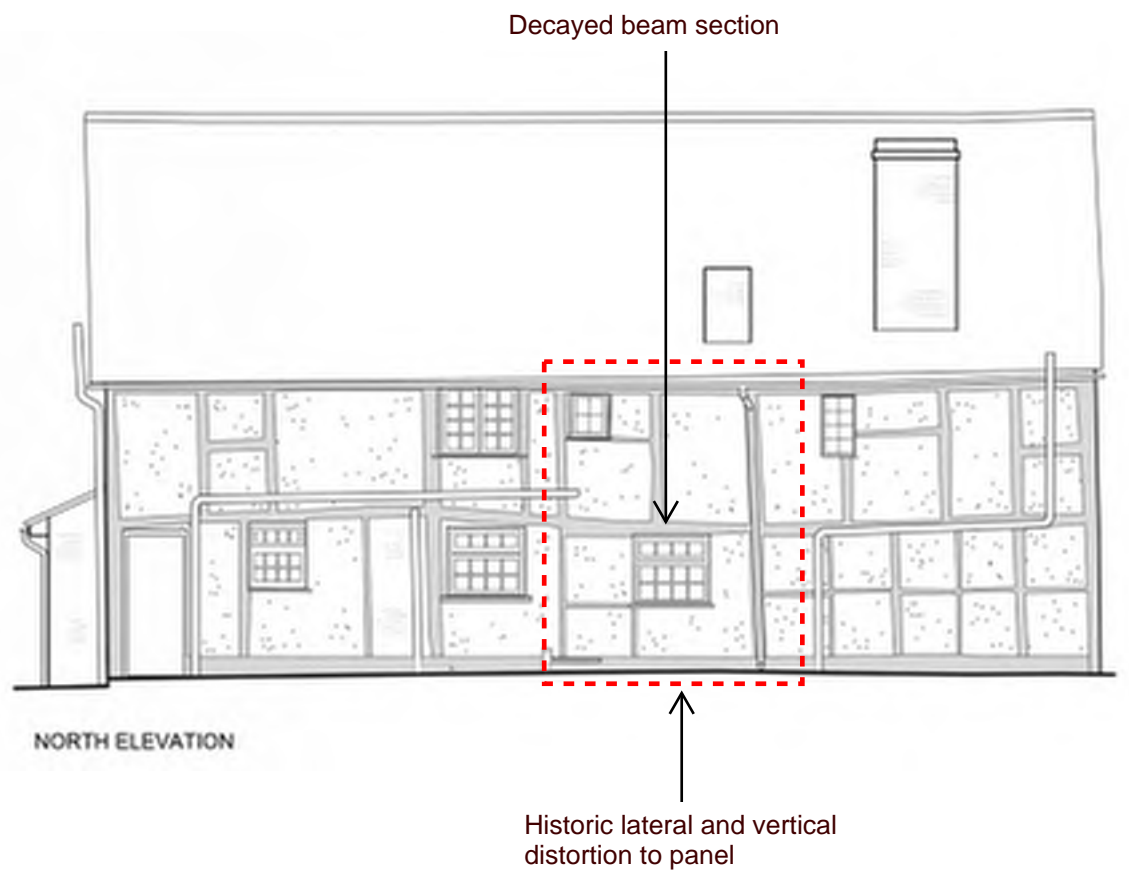
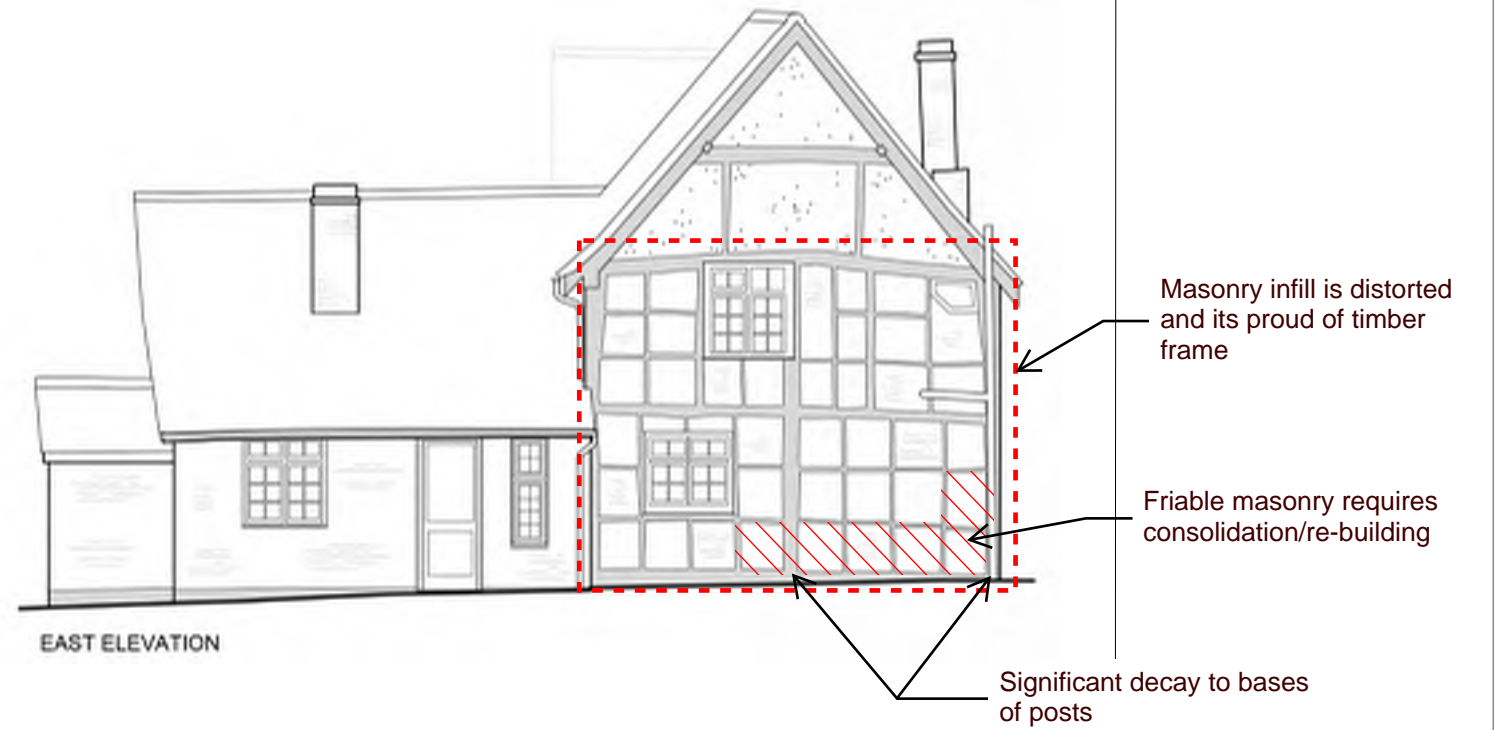
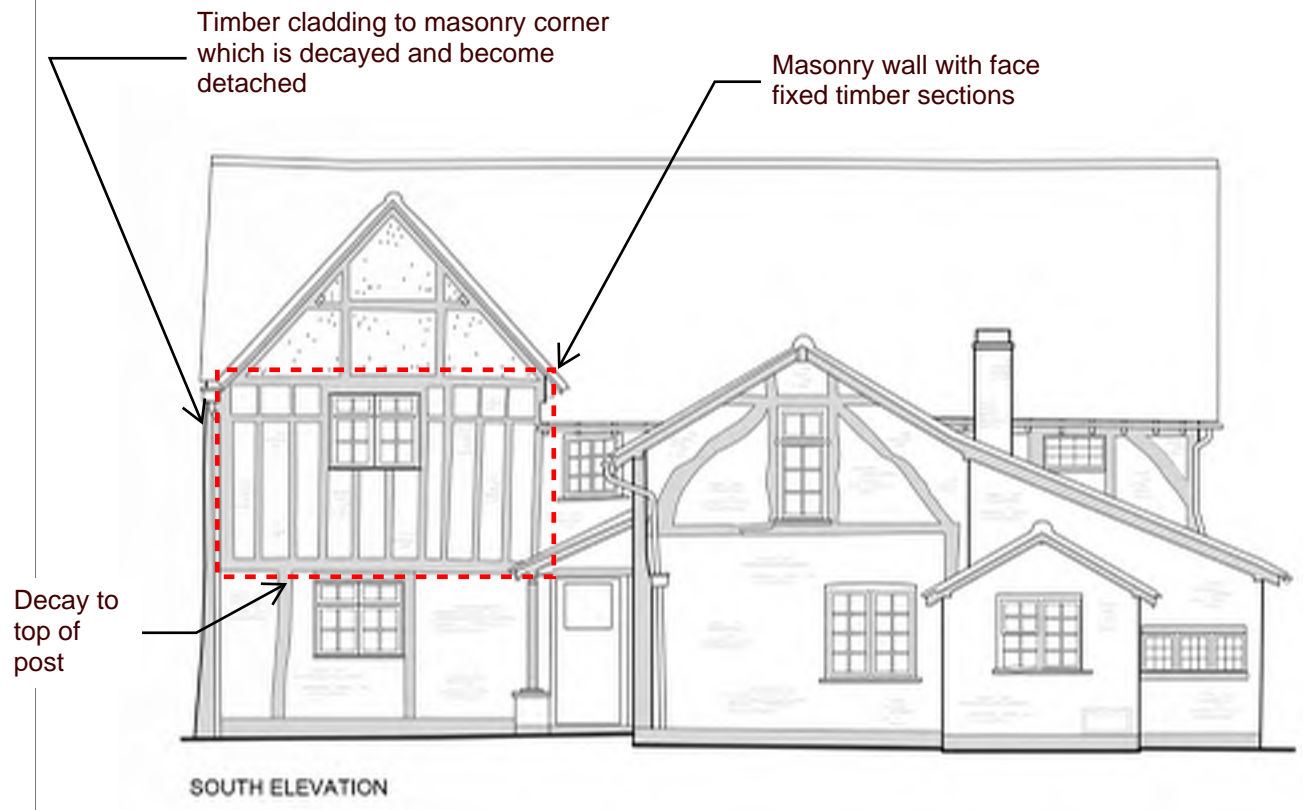
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DRG No. 23530_SK-02

- NOTES
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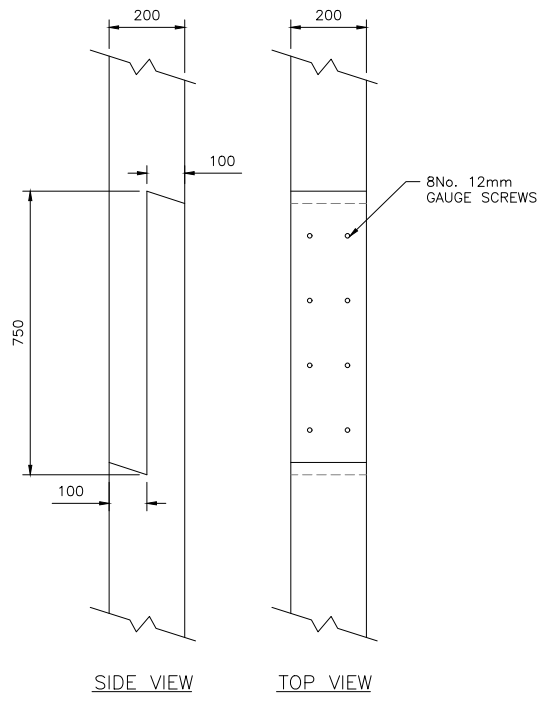
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Project
HOTEL BARN

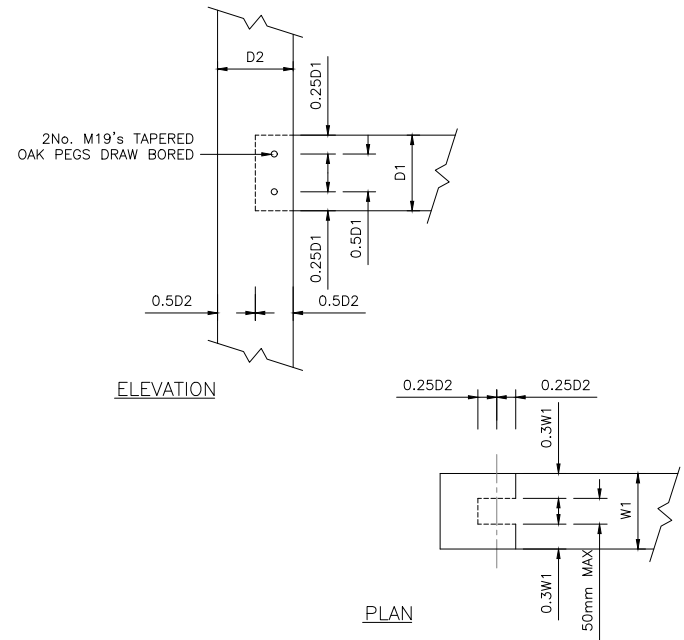
Title
SHERLEYS FARM HOUSE
ELEVATIONS
PRELIMINARY REPAIR
REQUIREMENTS

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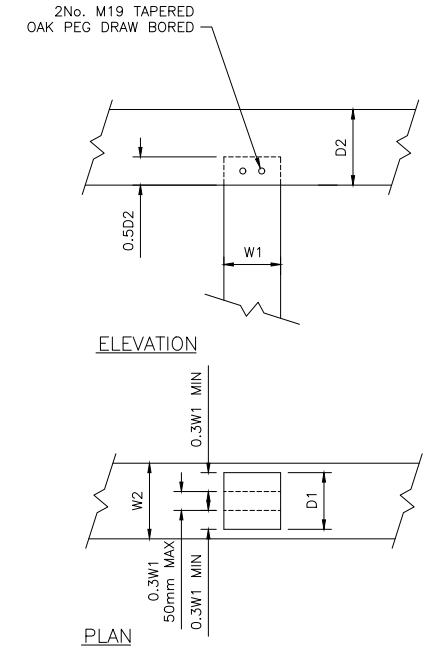
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TIMBER POST SPLICE DETAIL



COLUMN TO BEAM MORTISE & TENON JOINT



WALL & SOLE PLATE TO POST TENON JOINT CONNECTION

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REV	AMENDMENT	CHK	DATE
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Project
HOTEL BARN

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Appendix B

Photographs



Photograph 1 – East elevation



Photograph 2 – Showing distortion to lower panels



Photograph 3 – Showing distortion to upper panels



Photograph 4 – Friable masonry to north eastern corner



Photograph 5 – decayed window frame



Photograph 6 – North elevation eastern end



Photograph 7 – North elevation western end



Photograph 8 – Western elevation



Photograph 9 – Southern elevation



Photograph 10 – Dislodged cladding and hopper



Photograph 11 – Decayed base to corner cladding