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REPORT

on:

Barns

Manor House Farm, Broadgate, Station Road, Gedney, PE12 0DE

for:

Mr & Mrs Doubleday-Collishaw

Manor House Farm
Broadgate
Station Road
Gedney
PE12 0DE

Report prepared by: Rob Panter CEng MStructE

Date of Inspection:

Date of Report: 19 September 2012

CCL Ref: 201549/RP/pmb

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CONTENTS

DRAFT

Section 1	-	Overview
Section 2	-	Brief
Section 3	-	Limitations
Section 4	-	Observations, Discussion & Recommendations
Section 5	-	Summary

Appendices

Appendix A	-	Photographs
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1 Overview

- 1.1 Please read this report in conjunction with the accompanying report concerning The Farmhouse building.
- 1.2 This report relates to The Barns. The barn structures are conveniently described as 'The West Barns', 'The North Barns', 'The East Range' and 'The East Barn'. Each structure will be discussed separately.

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2. Brief

- 2.1 We have been instructed by Mr & Mrs Doubleday-Collishaw to consider the structural condition of the Barns. Our inspection and report is intended to support a Planning Application and will form part of the consultation process directed by the Project Architect, David Aldridge. Our appointment and the Scope of our work has been discussed at length with the Architects.

3. Limitations

- 3.1 We have not inspected areas which are covered, unexposed or inaccessible; hence we are unable to confirm if such areas are free from defect or otherwise.
- 3.2 This report has been produced to accompany and support Planning Application. No guarantee can be placed upon securing Planning Permission based upon this report.
- 3.3 This report is based upon a visual inspection. We have not (unless stated) undertaken investigative exploration, and as such a degree of caution must be considered. This report is a summative text based upon our observations purely for the purpose of the Planning Application and the early stage feasibility of the project.

4. Observations, Discussions & Recommendations

4.1 The West Barns

- 4.1.1 Refer to photographs 14 to 21, appended to this report.

The barns comprise traditionally constructed roofs, with a slate covering supported by timber rafters and a typical barn type roof structure. The roof comprises longitudinal purlins which are supported by tie beams, which also serve the purpose of tying the wall plates together.

The walls are solid brickwork, and continue to what we assume is a traditional brick foundation. We have not inspected the foundations or ground conditions.

The ground floor varies to the west barns. In the southernmost bay, no obvious floor structure is present. A concrete slab is present in places, as is a brick tiled floor.

- 4.1.2 The roof structure is generally in a condition one would expect considering the age and lack of maintenance for many years. Inevitably there will be a requirement to replace and repair structural timbers.

The true condition of the roof structure can only be established once the roof is stripped and a full inspection is undertaken. We would expect the wall plate to require a degree of attention, and the eaves support to the open east elevation will require replacement, as will the posts. As a general assessment, we would suggest an allowance of 30% of the structural timbers will require replacement.

The roof structure is shown on P16 and 19.

Depending upon the final architectural proposals, some strengthening will be required to ensure that the roof structure accords with current requirements and the Building Regulations. This will be established following the detailed design stage and further to exhaustive elemental inspections.

- 4.1.3 The west wall is a long elevation occasionally broken by an aperture. Refer to P2. Some evidence of historic movement to this elevation is present, both in terms of vertical movement and lateral distortion.

The corners represent foundation movement and an indication of the slight rotation to the west wall. This is evidenced on P15, with a severe vertical and diagonal crack. Some evidence of brickwork deterioration is present, for example this is shown on P14. We would suspect that the deterioration has been encouraged by the lack of rainwater goods.

- 4.1.4 The West Barn is divided into a series of smaller units. The separating walls are constructed of solid brickwork which extends full height to the roof. Access between the rooms is provided by a door opening adjacent to the west wall. This opening position has encouraged the rotation and separation between the internal dividing walls and the west wall, resulting in movement to the brickwork above the doors, further compromised by what we foresee as inadequate lintels.

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This is shown on P18.

- 4.1.5 The brickwork condition to the West Barn is generally good, although there are areas of deterioration which one would expect for a structure of this type, age and previous usage. Refer to P21. We would suggest that a degree of foundation enhancement / possible underpinning will be required, particularly to the corners. Depending on the findings of future ground investigations some underpinning to the west and east walls may also be required.
- 4.1.6 We would suggest that a degree of masonry repair / reconstruction will be required. This may also be supplemented and enhanced by the introduction of masonry reinforcement. It would be advisable to incorporate a degree of lateral robustness to the Architectural proposals, in terms of dividing walls and framing to stabilise the west wall.
- 4.1.7 We would suggest that lintels should be replaced and strengthened where appropriate. The floor slab to the barns should be reconstructed throughout.

4.2 The North Barns

- 4.2.1 The barns comprise a two storey main barn to the centre, with two smaller single storey structures which are adjacent to the main building.
- 4.2.2 The central main barn is in very good order. Recent improvement works have substantially improved the condition of the barn. Refer to P9, 10 and 11. In general, the improvement works have included a complete re-roofing programme, together with roof timber repairs as necessary. Brickwork repairs have been undertaken in places.
- 4.2.3 The roof structure has been enhanced with the addition of new tie beams, to connect the wall plates together. This is shown on P10. We have no knowledge as to the precise manner of fixity, however we are aware of the Contractor and have confidence that a robust construction method would have been utilised.
- 4.2.4 The brickwork at eaves level has been repaired and reconstructed in places. Refer to P11. We also understand that the eaves beam / wall plate has been strengthened and repaired in places.
- 4.2.5 We would recommend that the gable walls are tied back to the main roof structure. This can be sympathetically achieved with the aid of steel pattress plates, which are connected to the purlins internally. This was discussed on site with the Contractor.

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- 4.2.6 Very little evidence of foundation movement was noted to the main barn. The brickwork appeared in good order, and the recently completed roofing works will only enhance the buildings' long term performance and condition.
- 4.2.7 Depending upon the long term proposals, it may be a requirement to enhance and strengthen the existing beams and lintels. This can be advised following receipt of detailed proposals.
- 4.2.8 The smaller barn structures to the west and east of the main barn are in a lesser condition than to the main barn. The west addition which is linked to the west barns is in a similar condition to the west barns, and the same comments and recommendations will apply.
- 4.2.9 The east addition to the main barn is presently in poor condition. The roof timbers are exposed, with no slate covering to the roof. We suspect that the barn has been in this state for many years. The brickwork and structural elements have therefore been exposed to the elements which will only encourage their deterioration.
- 4.2.10 In the temporary condition, the roof structure to the east addition is helping to provide temporary support and stability to the remaining structure. We would therefore suggest that the roof skeleton is retained until such a point as the proposals can be implemented. It is likely that at some point in the near future, further temporary works will be required to ensure stability.
- 4.2.11 In terms of permanent repair, we would suggest that the roof structure to the east addition will need to be entirely reconstructed. In addition to this, brickwork repairs and strengthening will inevitably be required.

4.3 The East Range

- 4.3.1 This range of barn structures is presently a series of remaining walls, as can be seen by photographs P22 to P24.
- 4.3.2 The condition of the remaining walls is reasonable given their exposed nature, however inevitably a significant degree of repair and reconstruction will be required to enable the existing walls to be incorporated into any proposals.
- 4.3.3 We would recommend that the original (mostly demolished) internal walls are slightly enhanced to provide an increased buttress. This will provide additional buttressing to the long east wall,

and prolong the walls in their current condition. Some temporary works will be required in time, depending upon the programme for repair.

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4.4 The East Barn

4.4.1 Refer to photographs P25 to P30. The barn is a detached structure, with traditional materials and constructed in a manner typical of similar barn structures.

4.4.2 The roof structure is generally in reasonable condition. There are areas of deterioration, as one would expect. A degree of repair and strengthening will be required to the roof structure, particularly concerning the eaves member and posts (which will require replacement), together with we expect, the wall plates. We would also suggest that in the order of 20% of the common rafters will require replacement.

4.4.3 The rear (east) wall has significantly rotated. This is evidenced by the serious cracking which has occurred to the corners, and the lack of position and fit to the roof trusses internally. Refer to P26 and P27. The cause of this rotation is likely to be a combination of roof forces, wind pressure to a relatively exposed barn and foundation movement.

4.4.4 We would suggest that a comprehensive repair strategy be employed to the East Barn. This should involve the following:

- a) Roof works, as mentioned above.
- b) Investigations to determine the foundation profiles and ground conditions.
- c) Underpinning of the existing walls as required by b).
- d) The construction of external buttresses, to stabilise the rear wall and provide enhanced robustness.
- e) The construction of an internal slab, tied to the base of the walls.

5. Summary

5.1 In general terms the barn structures' present an opportunity for restoration and enhancement. Certainly the present and remaining structural elements can be incorporated with the proposals, and will be enhanced by the additional structure which will be required.

5.2 The West Barn and the East Barn will be similar in terms of their requirements; significant repair will be required however the general body of the barns, we suggest, can remain and be enhanced by the proposals.

- 5.3 The East Range is effectively a series of remaining walls in differing condition and state of repair. The precise nature of the walls and the manner in which they can be incorporated into the proposals will only be established once work commences, however we suggest that the walls can be repaired and incorporated subject to the appropriate repair and necessary strengthening.
- 5.4 The Main Barn is in good order as discussed, and would require minimal repair and strengthening.

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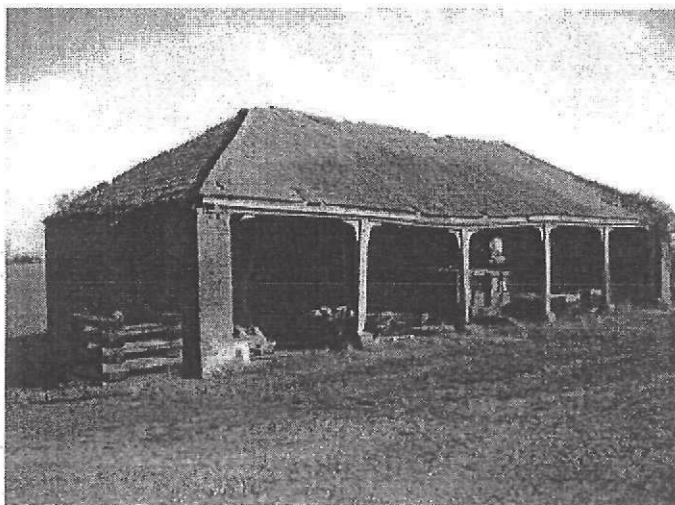


Rob Panter CEng MStructE
Principal Structural Engineer

Appendix A Photographs

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Photographs 1 to 8 (General views of The Barns).



1. The East Barn. General view of front elevation.

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2. The West Barn. General view of courtyard area, looking north.



3. The West Barn. General view of west wall, looking north.



4. The West and North Barns.
General view looking north.

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5. North Barns. General view
looking north.

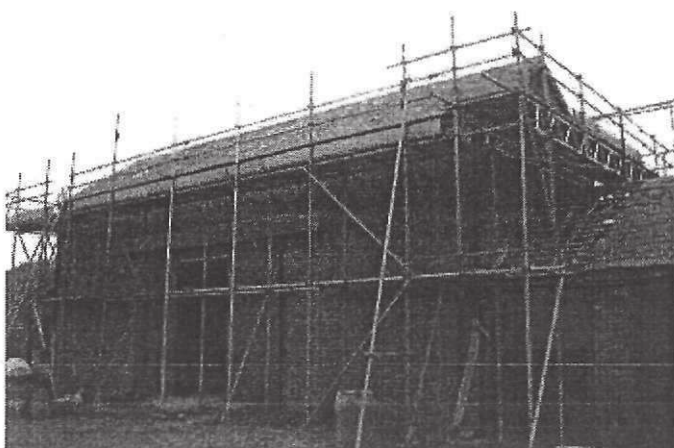


6. The East Range. General
view looking east.



7. The North Barns. General view looking west.

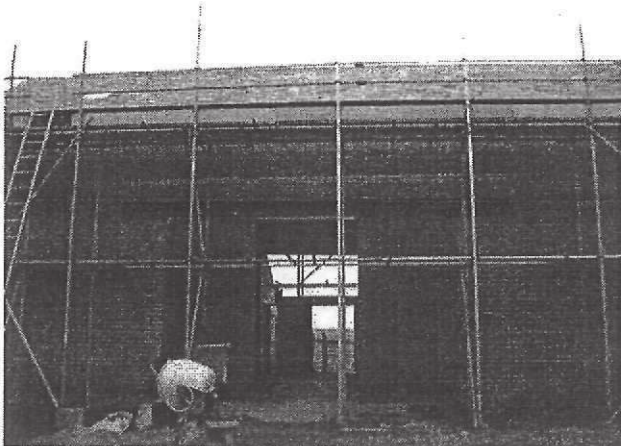
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8. The North Barns. General view looking south.

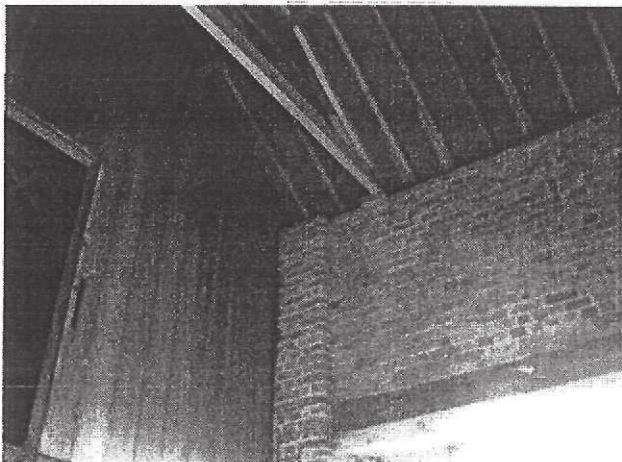
Photographs 9 to 13 (The North Barns).

9. The front opening.

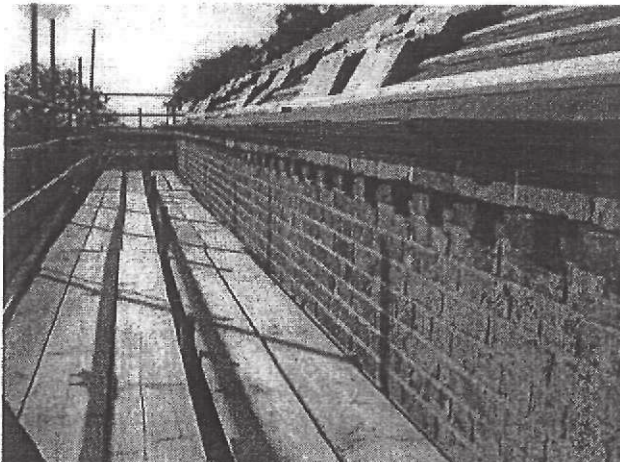


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10. Roof construction to the North Barn. Note the remedial strengthening works undertaken, with the addition of a tie member.



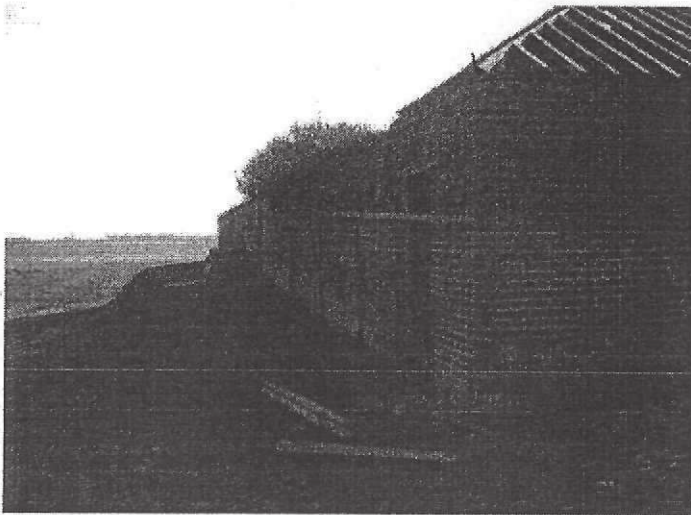
11. The south wall of the main barn. Note the masonry repairs undertaken adjacent to eaves level.





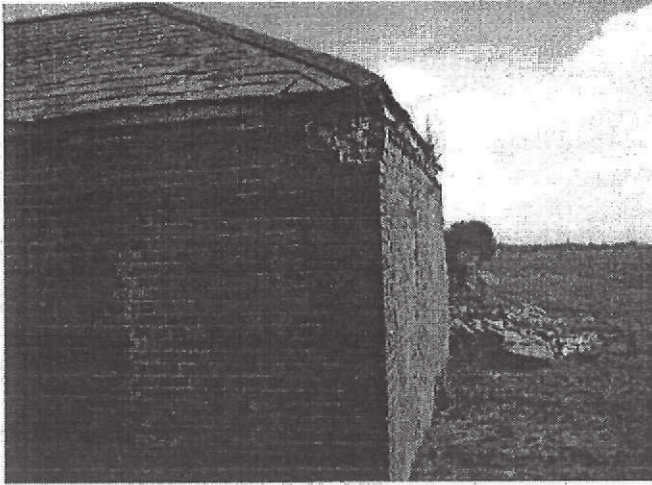
12. North wall of the main barn and North wing. Note the remaining rafters to the wing, which act as props to the remaining masonry.

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13. The corner of the north barns and East Range.

Photographs 14 to 21 (The West Barns).

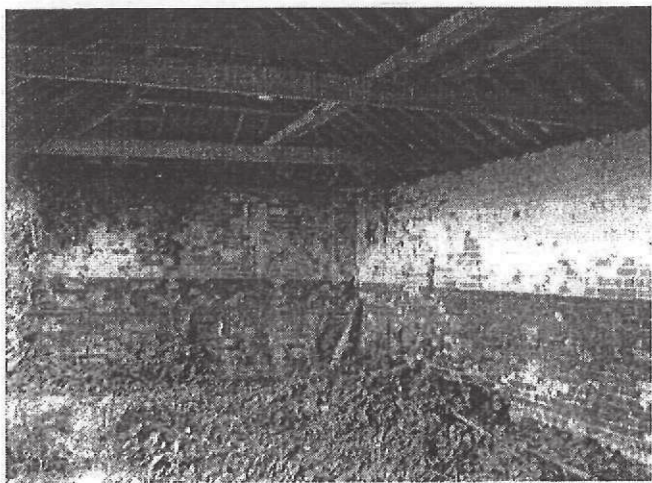


14. The north corner of the west barns. Note the high level damage to the brickwork and the lack of appropriate rainwater pipes or gutters.

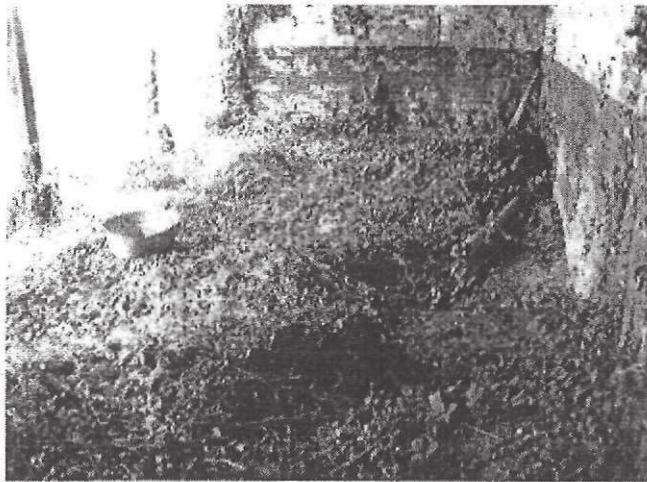
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15. The south wall to the west barn. Note the vertical crack, indicating rotational movement to the west wall.

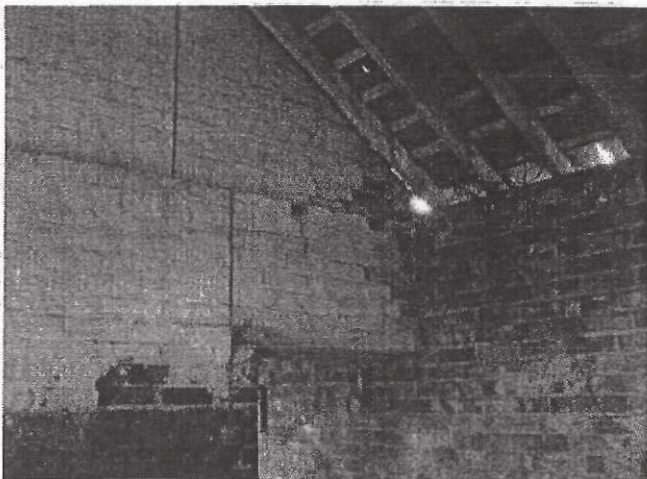


16. Internal view of the south wall of the west barn. The aforementioned crack is also depicted internally.

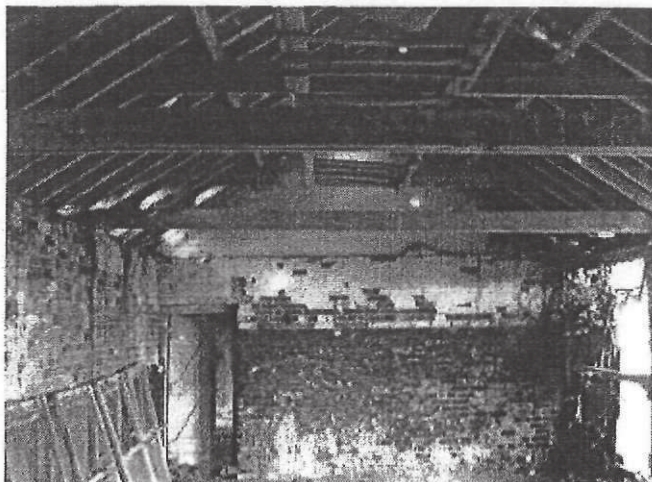


17. Note the ground / floor construction to the south bay of the west barn.

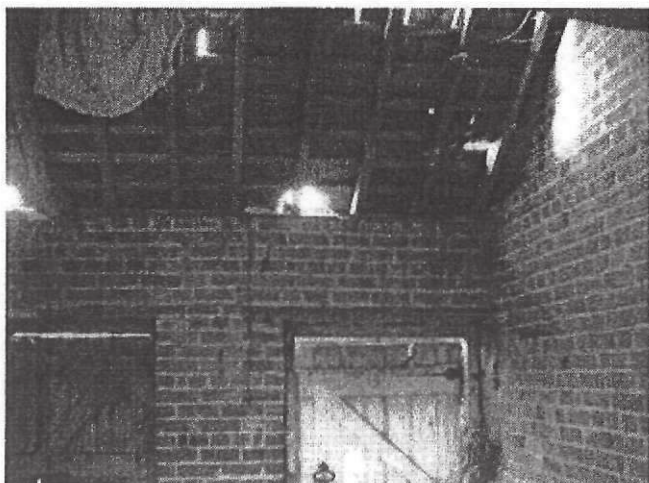
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18. Door opening between bays to the west barn. All door openings are positioned adjacent to the west wall; this has resulted in a removal of robustness which has encouraged the rotation. The result is the cracking and separation shown.

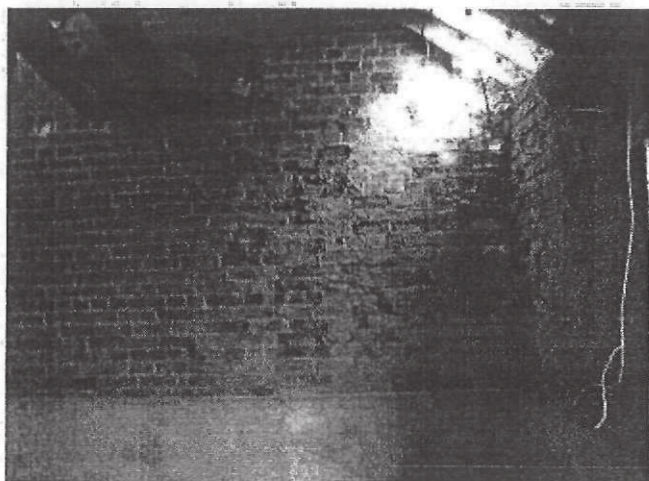


19. General view of the west barn, looking north. Note the tied roof construction, with tie members at regular centres.



20. The northernmost bay of the west barn.

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21. The northernmost bay of the west barn. Note the significant brickwork deterioration.

Photographs 22 to 24 (The East Range).

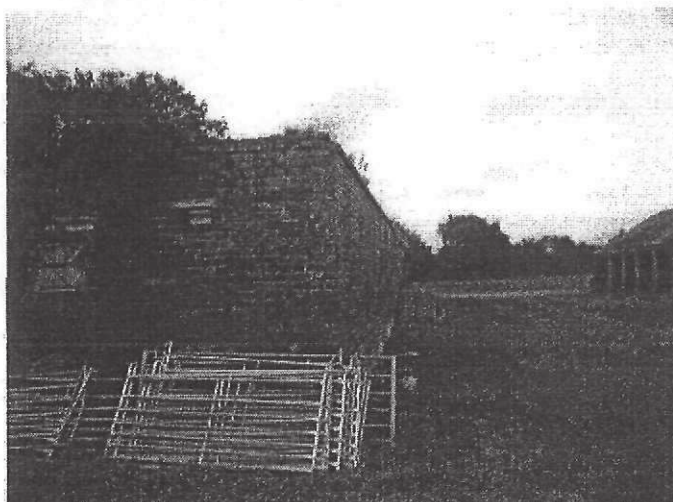


22. General view looking east.
Note the remaining internal wall which is providing stability by virtue of acting as a buttress.

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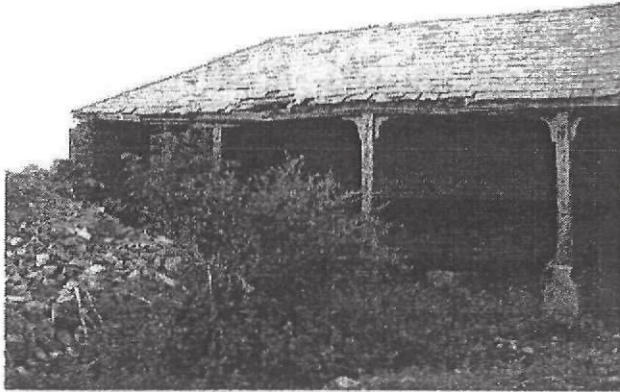


23. Continuation of P22.
Remaining internal walls acting as buttresses.



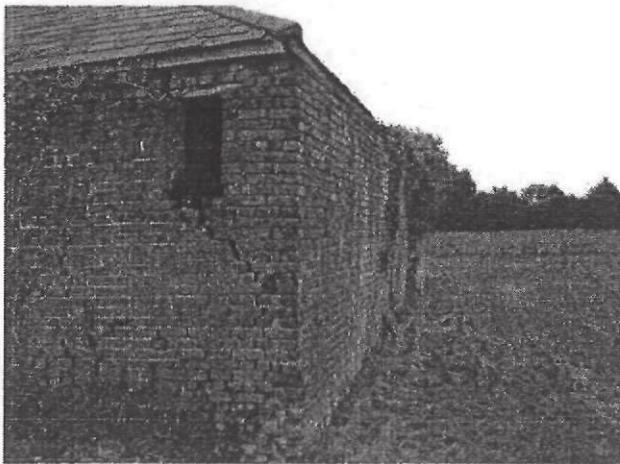
24. View of east wall looking north.
Note minimal rotation.

Photographs 25 to 30 (The East Barn).

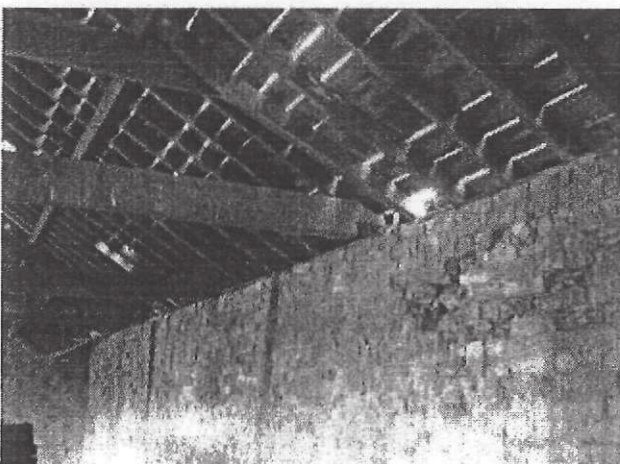


25. General view looking east.
Note the obvious distortion at
eaves level and the
deterioration of the roof slates.

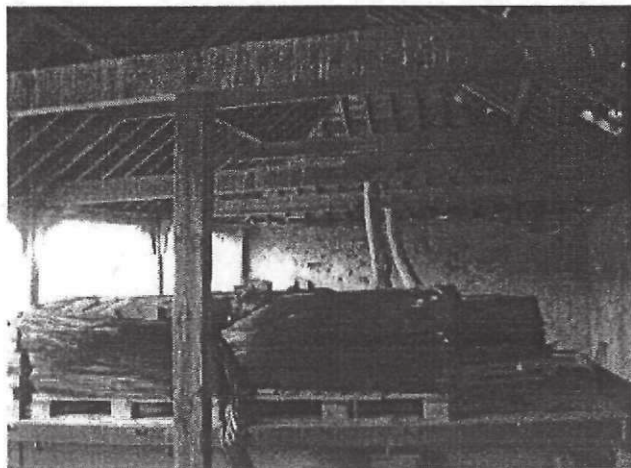
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26. View looking north, of the
south east corner. Note the
diagonal cracking and rotation
of the rear wall.



27. Internal view, of east wall.
Note the rotation of the rear
wall, evidenced by the position
of the tie member in relation to
the top of the wall.

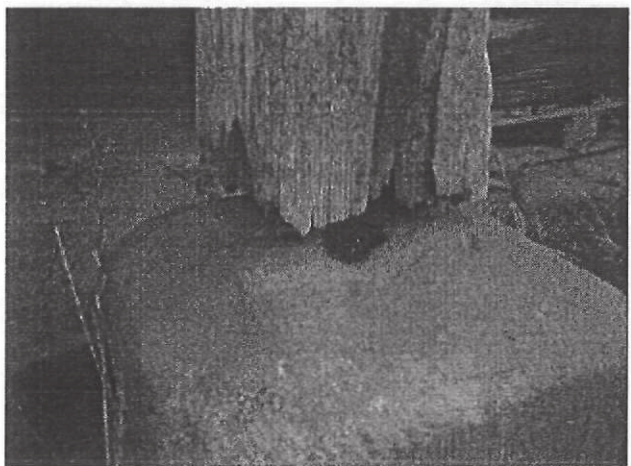


28. Internal view, looking north.

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29. Roof construction, comprising common rafters, purlins and ties.



30. The base of the primary posts and the interface with the saddle stone. Note the severe deterioration of the base of the post.