



MAGPIES FARM MEYSEY HAMPTON

Structural Inspection Report

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Barsby Structural Consultants Ltd
Mike Barsby M.Eng (Hons), CEng, MStructE

Contents

Introduction	2
Observations	2
Analysis and Conclusions	5

Appendices

Appendix A – Record Photographs

Appendix B – Site Notes

The contents of this document are intended solely for Mr Ed Robinson use in relation to Magpies Farm, Meysey Hampton. The issue of this document to third parties not involved in the proposed development of Magpies Farm, Meysey Hampton is not permitted without prior written consent from Barsby Structural Consultants Ltd. Barsby Structural Consultant assumes no responsibility to any other party in respect of or arising out of or in connection with this document and its contents.

For enquiries please contact:

Barsby Structural Consultants Ltd, 4 Elizabeth Gardens, Meysey Hampton, Gloucestershire GL7 5LP | 07787 322 633

Introduction

Barsby Structural Consultants have been appointed by Ed Robinson to carry out a structural inspection of Magpies Farm, Meysey Hampton and provide a report of observations made and recommendations of further work if needed.

An inspection of the property was made on the 4th May 2021, the weather during the inspection was overcast but dry.

The inspection was visual only; as a result, any part of the building fabric concealed by finishes or inaccessible cannot be determined free of defect.

Observations

A visual inspection of the property was made, and the following observations were recorded during the inspection.

- The property is located directly south of the A417 between Meysey Hampton and Fairford. The property is in a dip in the land, encompassed to the south by open farmland and to the north by the road.
- The original property is understood to be Grade II listed and believed to have been constructed in 1830. It is built from Cotswold stone, using a traditional random rubble stone in two skins with hearting infill to create a solid wall which is typical of the area. Windows are formed using hardwood lintels to the inner side and brick splayed arch lintels to the outer face. The original part of the building supports timber first and second floor structures, with stone slate clad cut roof over supported on hardwood purlins and mid span trusses with raised collars. The ground floor is believed to be concrete or flagstone construction and is ground bearing. The layout of the original part of the building is of two rooms flanking a central stairwell, with masonry spine walls either side of the stairwell providing support up through to roof level. The original part of the property features brick chimney stacks to each gable.
- The rear of the property appears to have been extended in the past using traditional rubble walls supporting a mono-pitched, partially hipped stone tiled roof over, with a timber first floor and timber roof formed from common rafters cut into the original rear elevation of the property. A large chimney is present in the eastern end of this extension with brick stack above roof level.
- Two further single storey extensions appear to have been added onto this larger extension, using a mix of traditional stone walling and modern brick/blockwork construction. The roof construction of these extensions is a mix of asphalt covered flat roof construction and pitched roof supporting slate tiles. A brick chimney is present to the western most rear extension, which appears to be serving a kitchen stove within.
- Further extensions have been added in a western direction including a two-storey farm store, with timber first floor structure and duo-pitched roof over. A further single storey duo-pitched extension flanks the western end of the farm store, with another smaller single storey extension supporting a corrugated roof over believed to be kennels.

The original 1830 building.

- An inspection of the original part of the building revealed the stone construction to be in a sound condition with no cracking noted to the outside of the building and only what appeared to be cracked finishes to the inside where the plaster had blown.
- The first-floor joists were concealed at the time of inspection, however, there did not appear to be any excessive movement of the floorboards or joists underfoot other than that expected of a property of this age. There was no sign of damp to this floor, however the most likely location for damp to be an issue is where these joists bear into the external walls.

- The second-floor joists were in a similar condition to the first floor. A loose board in the landing was lifted and the joists below appeared to be in a sound condition with no signs of deterioration or attack.
- The underside of the roof had recently been over boarded and skimmed with plaster and as such the condition of the common rafters could not be ascertained. The roof was supported on a traditional set of raised collar trusses at mid span supporting hardwood purlins to each roof pitch. The supporting trusses appeared in a sound condition without excessive deflection, however two of the purlins did appear to sound hollow and had visible signs of wood borne beetle attack which will require further investigation during the refurbishment and possible replacement/ treatment.
- It was noted that the eastern roof structure included collars between the common rafters forming a ceiling, yet the western half appeared to have these collars removed creating a fully vaulted roof structure. Cracking was noted to the spine wall on the western side of the stairwell, located at the junction between the roof and wall, along with some cracking above the small section of masonry over the door lintel.
- Most of the lintels to the northern elevation on the ground and first floors appeared to be of sound condition on the inside face of the wall, other than the lintels over the main hall entrance where the finishes had dropped from the lintel above suggesting some damp/water ingress. A lintel over the second-floor eastern window appeared to have rotten near its bearing. The lintels to the middle of the wall were not accessible and could not be determined defect free.
- The internal wall to the western end of the property at ground floor appeared hollow to the lower half, suggesting either the finishes had blown, or there was an infilled opening concealed behind the finishes. The opening would have served the barrel store in the room directly behind and may have been an old bar.
- There was an oak beam within the Utility Rooms western gable which appeared hollow when knocked. It was not clear what this beam was supporting.
- Extensive frost damage was noted to the brickwork feature reveals surrounding the windows. This had resulted in spalling of the brick face. Cracking was also noted over the ground floor window lintels suggestive lintel failure. The lintels here are splayed brick arches, which are common weak points.

Two storey mono-pitched extension.

- An inspection of the two-storey extension immediately to the rear of the original property revealed some cracking up the junction between the original part of the building and that of the extension in the centre of the building. The cracking was only noted to the upper floor level and was marginally wider at the top of the wall.
- No further masonry defects were noted as being visible during the inspection.
- Inspection of the mono-pitched roof revealed some movement of the upper rafters, where they abutted the original part of the 1830 property. This movement had allowed the rafters to drop down the face of the wall, with the worst movement at the western end corresponding to the location of hipped section of the roof structure.
- An extensive section of roof tiles had been removed from the eastern end of this extension at eaves level of the roof. Water ingress was noted as a result through to ground floor level and as such it is possible some degradation of the first-floor structure and roof rafters may have occurred. Indeed, some damp staining was noted to the rafter feet over the bathroom.
- The first-floor timber structure appeared in a sound condition at the time of inspection.
- This part of the property contained external hardwood lintels over the first-floor window openings, however access was not possible to ascertain their condition.
- Significant dampness was noted at ground floor level under the missing roof tiles. This is likely to be attributable to extensive water ingress through the hole in the roof.
- An existing chimney breast was present to the eastern gable of this part of the property, supported on foundations at ground floor level. This chimney appeared in a sound condition.

Rear single storey extensions.

- These extensions to the property appeared to be of poor construction, with a mix of stone, brick and blockwork.
- The condition of this parts of the property was not recorded during the inspection as the client revealed plans to demolish these structures and replace with a modern extension backing onto the original two storey mono-pitched part of the property.

Two Storey Farm Store.

- The condition of the masonry to the farm store appeared in a sound condition, with no obvious signs of cracking or movement.
- The first-floor joists had deflected causing a significant bow in the first-floor structure. These joists were supported on a central hardwood chamber beam spanning from north to south through the centre of the ground floor and supported on the external walls. The condition of the chamber beam was good; however, the joists had some signs of rot, with a few of the joist's bearings completely rotten away.

Single Storey Farm Store.

- The condition of masonry to the single storey farm store was sound, however the roof had significantly deteriorated and needed repair/replacement as part of the refurbishment.

Analysis and Conclusions

Original building.

The condition of the masonry to this part of the structure was in a sound condition, other than cracking observed to the second-floor spine wall, to the eastern side of the stairwell. This wall was directly adjacent the roof with missing ceiling collars and the cracking pattern appeared to be attributable to minor roof spread as a result of the missing tying restraint which would have been afforded by the ceiling collars. It is recommended that the collars to the eastern room be reinstated and the cracks over the door lintel be stitched with Helifix Helibars or similar to prevent cracking re-occurring at the weak junction. The cracking to the skirting to wall junction should be repaired as appropriate.

There were two roof purlins as highlighted on the site notes, which appeared to have been attacked by wood borne beetle. These purlins had a hollow note when tapped suggesting the wood inside may have deteriorated. A more detailed inspection should be made during the refurbishment, to ascertain the extent of deterioration and replacement or treatment of the timber by a specialist should be made if required.

The rotten lintels to the second floor should be replaced on a like for like basis using a suitable hardwood. Further inspection of those lintels to this and other floors which were not accessible should be made and replacements carried out as appropriate during the refurbishment. Particular attention should be made to the lintels over the main entrance given the dropped finishes.

The condition of all the floor structures appeared to be sound, however it is possible due to the age of the property for deterioration of the joists to have occurred. During the refurbishment, an inspection of the joists should be made, with particular attention to the bearing locations of the floor joists into external walls.

The hollow wall between the Sitting Room and Utility should be investigated further by removing the finishes. Any lintels should be inspected during the refurbishment.

Whilst the frost damage to the brick reveals and lintels is not of immediate concern, it does appear to have progressed sufficiently to allow the stone above to drop creating cracks. This is likely to deteriorate further if no intervention is made. Given the building is listed, any remedial measures should be sympathetic to the original construction and therefore the Listed Building Officer should be consulted on remedial measures. Painting of the brick arches with a suitable paint (as previously attempted) or hydrophobic coating will protect the bricks from further frost damage, however this may not resolve the cracked stone above due to the brick arch lintel failure. It would be more permanent to carefully prop and take down the brick arch, then re-build using reclaimed masonry units to form a new brick arch similar to the original construction. A relieving lintel could be installed to the stone above using either a single leaf lintel concealed in the wall or using Helibars.

Two storey mono-pitched extension

The cracking to the joint between the original part of the building and this extension is characteristic of the eaves line of the extension moving laterally relative to the original 1830's building, creating a crack at the weak joint. This could be the result of one of two potential issues.

1. The roof structure of the mono-pitched roof was not adequately support at ridge level back onto the original part of the property allowing the rafters to slide down the face of the wall, resulting in a lateral thrust at the lower eaves plate and thus tension on the joint between the extension and the original building masonry.
2. The extension has seen minor settlement, which has allowed the structure to overturn and pull away from the original part of the property. This has allowed the rafters of the mono-pitched roof to settle and top of the rafter to slide down the face of the original rear wall of the 1830 section of the building.

It was not possible to ascertain the cause during the inspection and further investigation would be required to rule out settlement of the extension. Given the aspect ratio of the extension height to depth, a minor settlement would have resulted in an amplified movement at the roof level laterally. Therefore, the amplitude of the cracking noted would suggest any settlement would not currently be considered extensive and in need of immediate attention. It would be prudent however to carry out a trial hole to the extension during the refurbishment to rule out poor foundation construction, prior to carrying out expensive re-decoration.

It should also be noted that no cracking was observed to the end walls of the extension, and therefore if settlement is an issue, it would be localised to the centre section of this two-storey extension. This also supports conclusion 1 above being more likely, whereby the lateral movement as a result of roof thrust would be worst at the centre of the extension, where restraint is weakest.

Once a trial hole has been completed, the cracking should be stitched using Helifix crack stitching details for rubble filled walls. The rafters should also be adequately supported at the higher end using a timber wall plate resin anchored to the original rear wall of the 1830's building to prevent the rafter slipping further.

The missing roof tiles will clearly need to be addressed as part of the refurbishment. Inspection of the roof and floor structures immediately below the opening should also be made during the refurbishment and replacement joists and rafters installed where the originals have rotten. Indeed, some damp staining was noted to the rafter feet during the inspection which may have deteriorated these elements of the building. The floor structure appeared sound during the inspection.

The oak beam in the Utility should also be intrusively inspected during the renovation and replaced if it has deteriorated.

Rear Single Storey Extension

This part of the property is of poor construction and not in keeping with the original building fabric. The client has earmarked this part of the property for demolition and replacement with a suitable modern extension; this appears appropriate given the condition of this element of the building.

Two Storey Farm Store.

This part of the property has masonry construction in a sound condition, however attention to the timber first floor will be required during the refurbishment, including replacement of rotten timbers with new wood. The chamber beam to the first floor appeared in a sound condition and should be retained as part of the works, to be sympathetic to the original construction.

Single Storey Farm Store

The roof was significantly damaged and in need of replacement.

Note:

All works are subject to relevant planning permissions and listed building consent prior to carrying out.

Appendix A - Record Photographs



Figure 1 - Cracking over internal door lintel at second floor spine wall of the original property



Figure 2 - Ceiling present to western half of original roof

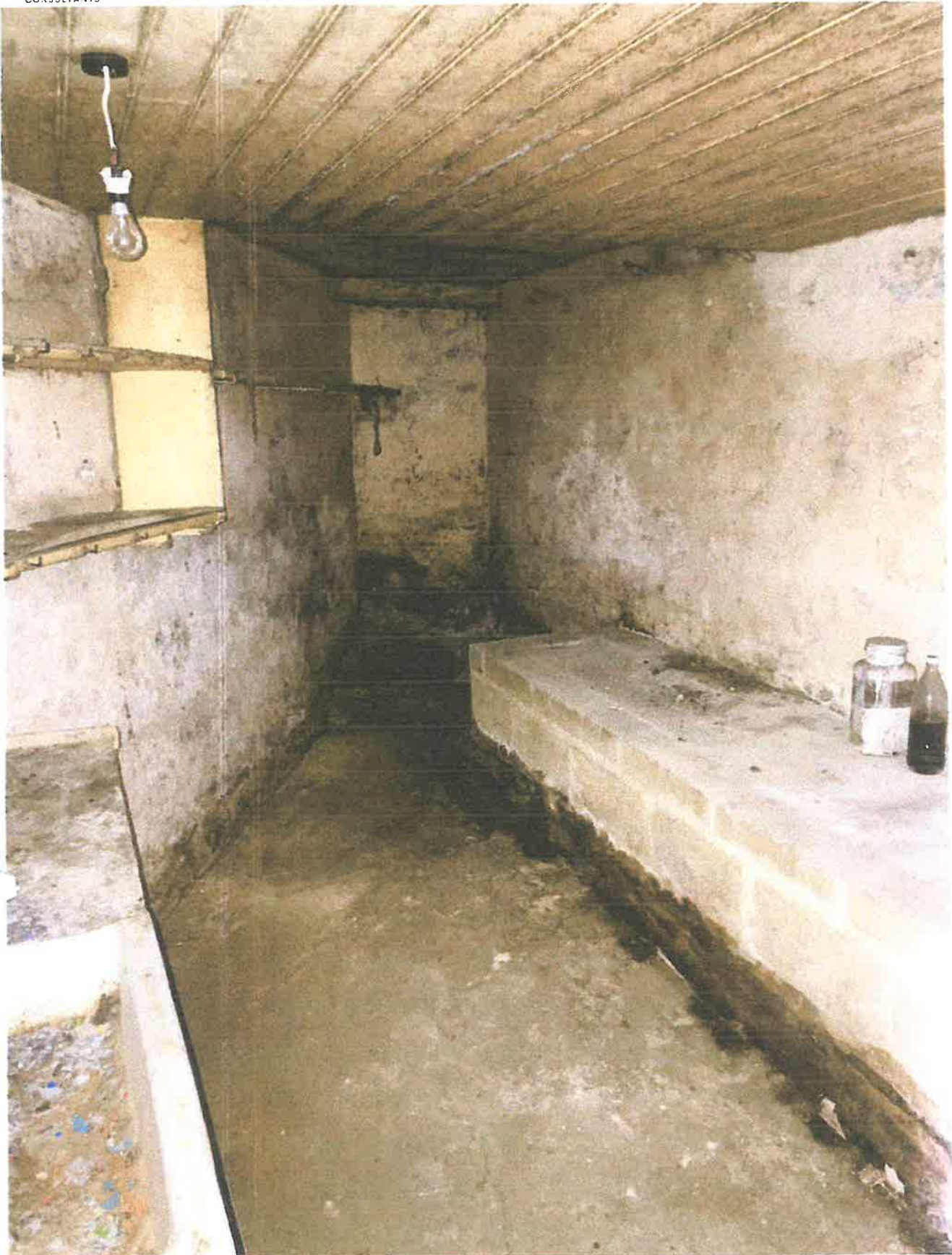


Figure 3 - Utility room showing barrel storage rack and oak lintel to room end in need of further inspection.

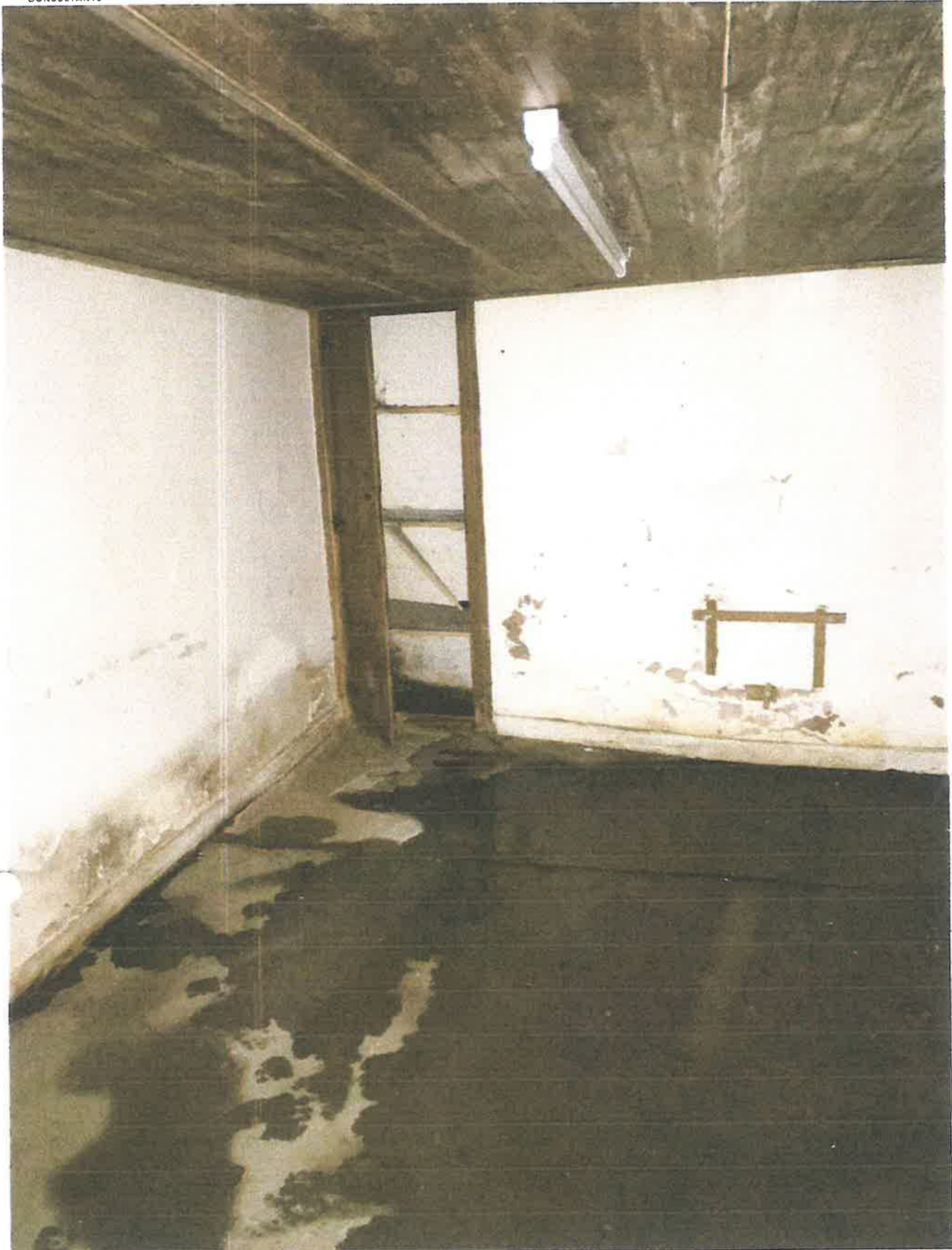


Figure 4 - Damage to area under missing roof tiles.



Figure 5 - Rear elevation showing poorly constructed single storey extensions and missing roof tiles.

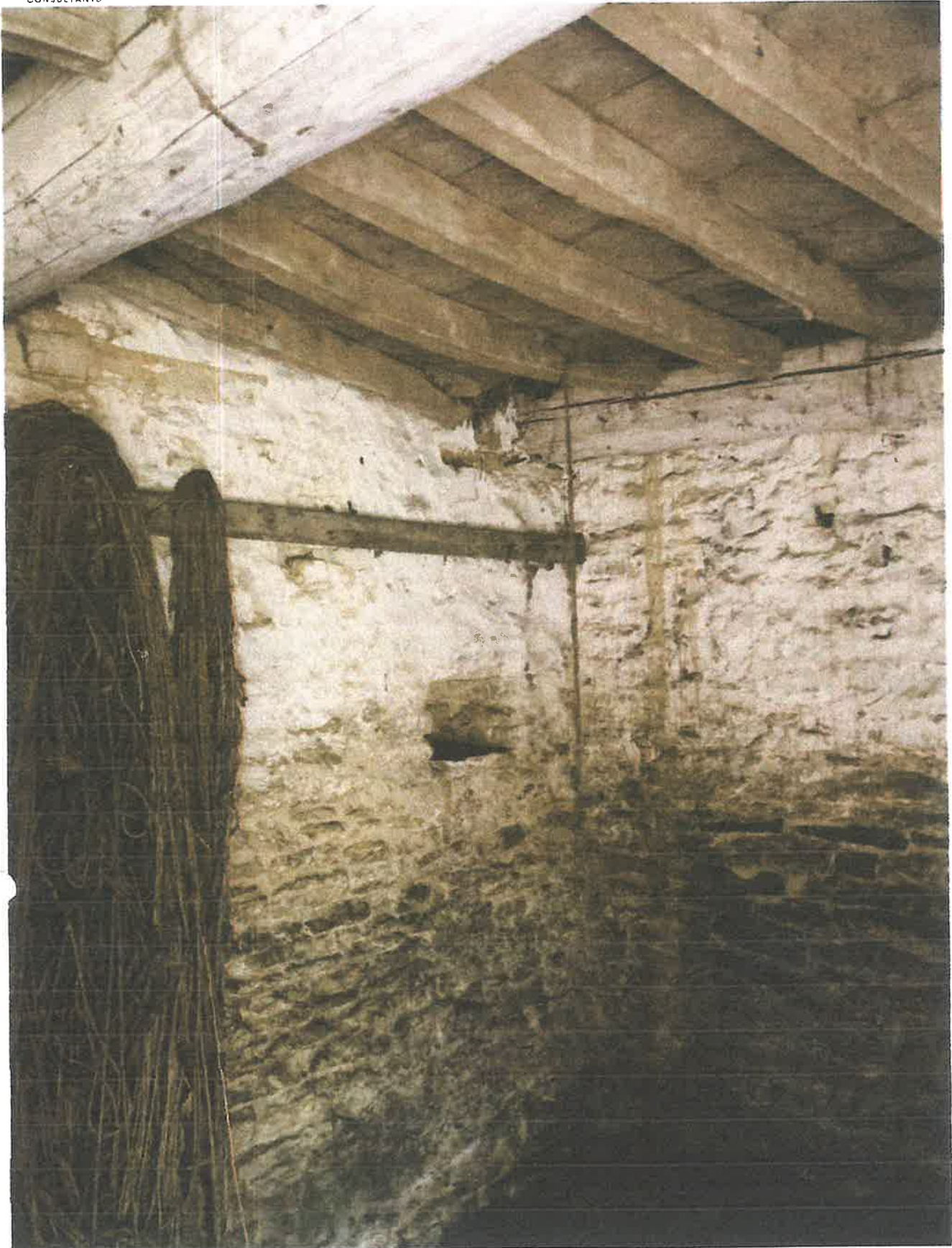


Figure 6 - Farm store showing chamber beam and sagging joists, noting rotten and split joists.



Figure 7 - Frost damage to brickwork feature limb and revealed, along with cracking to stone above limb.



Figure 8 - Rafter junction of two storey mono-pitched roof to original building showing vertical slip of rafters down the face of the wall.

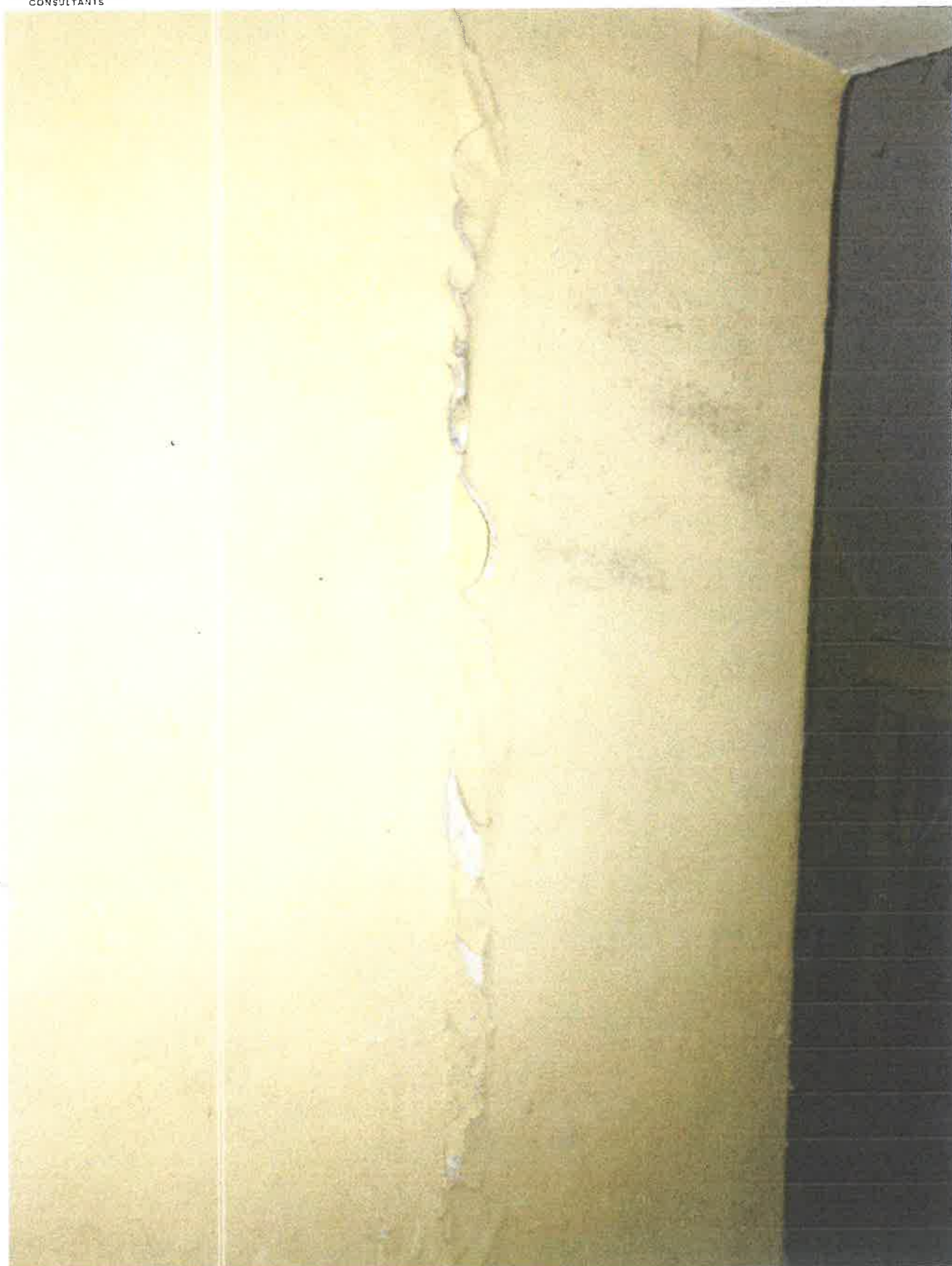


Figure 9 – crack down junction between original and two storey extension.



Figure 10 - Eastern half of main roof showing truss and missing ceiling collars.



Figure 11 - Cracking down junction of walls and skeling of second floor.

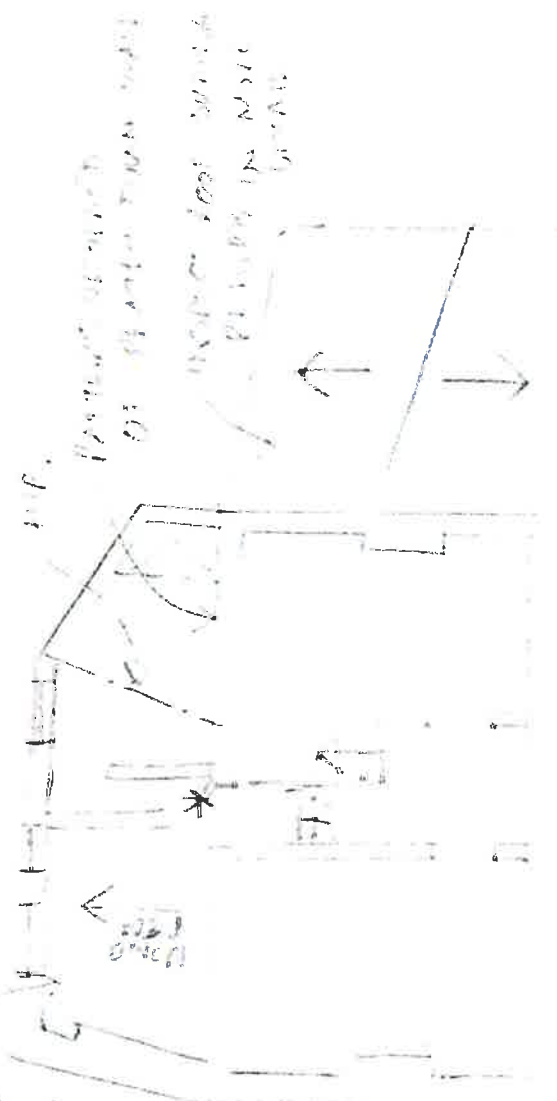
Appendix B - Site notes

Fire zone, (not)

* Check for...
of...

THIS... OVER

* SUM
LAMP...
RAFTERS
(insert)



6/20/2020

