

Structural Appraisal

of

Leaches Farm

for

Mr J Farrell

Ref: Z48

May 2023

Blackett-Ord Conservation Engineering

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**Structural Appraisal
Leaches Farm**

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1. Introduction

Leaches Farm is a traditional farm steading thought to date back to the 17th century and is located off Ashworth Road in Lancashire. It is approximately 6 miles west of Rochdale and 5.5 miles east of Bury. During the previous sale of the farm, the steading was divided and sold as two Lots. Lot 1 includes the farmhouse, attached barn and farmland and Lot 2 includes a detached two storey barn to the north of the site. Leaches farm is not Grade Listed.

This report focuses on the detached barn, sold as Lot 2, and has been commissioned to assess the structural elements of the building, their current condition and provides recommendations for any relevant repairs.

2. Inspection

The barn was inspected on Thursday 4th May 2023 by Charles Blackett-Ord and Amy Rooke. It was a clear and sunny day with moderate wind.

Prior to the inspection the Client had removed the roof coverings following a collapse of a section of the roof structure. All areas of the building were accessible for inspection but roof structures were assessed visually due to lack of safe high level access following loss of the first floor structures.

3. General Description

The barn is a two-storey barn orientated east-west and features a small single-storey lean-to extension to the north of bay 3. The building is generally constructed of solid rubble stone walls of varied thickness, generally 500 – 600mm thick, including the load bearing internal crosswalls. The exception is the north and south elevations of bays 1 & bay 2 which have been reconstructed using red brick. The west gable remains rubble stone construction and shows evidence of a lower roof line.

The first floor structures comprised primary timber beams which provide support to timber floor joists, although at the time of the inspection the first floors were largely lost.

The duo-pitched roof structure is constructed of 4No timber king post trusses that support timber purlins and common rafters. The stone flag roof covering had been completely stripped prior to the inspection following a collapse of a section of the roof. The single-storey lean-to roof is a continuation of the duo-pitched structure with purlins providing support to the common rafters. The roof over bay 3 also features sarking boards which are supported by the common rafters.

4. Structural Defects

The following defects are outlined on the accompanying drawings, Z48/100 – Z48/102.

4.1 Foundations

No trial pits or foundation excavations were carried out at the time of the inspection. There were no sign of settlement. However, along the north elevation, particularly around the lean-to extension, the shallow stone foundations and clay below have been exposed to a level below the base of the footing. It is likely that this is the cause of the localised collapse of masonry in the lean-to and cracking in the opposing corner. The concern is the potential for further collapse or masonry movement as the exposed clay below continues to dry out over the coming months. Alternatively, any surface water run-off has the potential to wash out the clay and undermine the foundations.

The foundations along the east gable elevation have been previously reinforced with a concrete skirt.

4.2 Loadbearing Walls

Overall the masonry is in good condition with few localised defects.

There has been a collapse of masonry in the north elevation in Bay 5 between first floor and eaves level. This is likely a result of roof spread as the remaining masonry either side of the collapse has twisted and leans outward. There has also been a collapse of a section of masonry on the lean-to extension and vertical cracking in the northwest corner which is a result of the exposed foundations, as discussed in section 4.1.

The north elevation of the lean-to extension also features some rough, unconsolidated masonry at lower level which is of poorer quality when compared to the upper courses. This provides a good indication of the original ground level before the foundations were exposed as this masonry would likely have been below external ground level where external appearance would not be critical.

There are two further isolated areas of missing masonry in the south elevation. There is a small section of masonry that is missing between a ground floor and a first floor window opening. There has also been a loss of the outer skin of masonry over the door opening into Bay 5. This is likely due to the failing timber lintels over this door opening.

Moving east along the south elevation, there is a rotten timber lintel over a mullioned window. It is thought that the timber mullions have replaced stone mullions as seen in other window openings in the building. There is a full width stone lintel over the adjacent door opening which is cracking. East of this is a window opening which has been

previously blocked up. Both the inner timber lintel and outer stone lintel have inadequate bearing onto the masonry at the east end.

The timber lintel over the cart entrance is suffering from decay and the outer skin of brickwork over has become dislodged with some units missing. A vertical crack was noted adjacent to the west jamb of the cart entrance where the quoins are not adequately tied in.

At the south end of the crosswall between Bay 5 and Bay 6 is a vertical crack which suggests the crosswall is not adequately tied into the external masonry.

During the inspection, in the south elevation at approximately first floor level, it was noted that there were two isolated areas of bulging in the magnitude of 55mm and 140mm before returning to plumb. It is thought that this is historic movement which is not ongoing as there was no signs of disturbance of the adjacent masonry or cracking. Therefore, at present it is not a structural concern.

4.3 First Floors

At the time of the inspection the first floors were largely lost with the primary beams and few timber floor joists remaining.

Previously, the building would have featured first floors throughout. Pockets in the masonry in the crosswall between Bay 3 and Bay 4 indicate where primary floor beams are missing. The remaining primary beams are generally in poor condition, 4No beams are suffering from significant decay and 1No has split. In Bay 3 the remaining primary beam is severely decayed, has lost its end bearing due and is now supported on acrow props.

The primary beam in Bay 1 is in reasonable condition and is supported at the midspan by a timber post but does not provide adequate head clearance below the beam, considering the intention to convert the building for domestic use.

The remaining floor joists throughout the barn are in poor condition and will require full renewal.

4.4 Roof

Overall the roof structure is in poor condition. There has been a collapse of the roof structure in Bay 5, including Truss No.4. Truss No.3 remains in situ but shows signs of decay due to water ingress along the tie beam. The purlins and ridge in Bay 3 also show signs of decay and there has been a loss of section where they bear onto the crosswall. The remaining common rafters in Bay 3 are in poor condition and require full replacement.

In Bay 6 the ridge beam has decayed and the common rafters are in poor condition. The ridge beam in Bay 3 has also decayed where missing sarking boards have facilitated water ingress. A visual inspection of the common rafters in Bay 1 – Bay 3 from ground level revealed no obvious defects but this could be confirmed by inspection from a scaffold once works on site commence.

4.5 Drainage

At the time of the inspection there were no above ground drainage goods present. It is unknown when the gutters and downpipes were lost but iron brackets at eaves level confirm the presence of gutters previously.

5. Repair Recommendations

Overall the barn is in reasonable condition and would lend itself well to conversion to a domestic dwelling following a scheme of repairs.

The lean-to extension should be carefully taken down and rebuilt on new concrete footings. The north elevation of the barn will require underpinning where the foundations and clay below has been exposed.

The collapsed section of masonry in the north elevation should be rebuilt. This may require careful dismantling of adjacent sections of masonry to facilitate.

It should be ensured that the masonry crosswalls are adequately tied into the external masonry. This could be achieved with the provision of steel corner straps. The crosswalls are integral in providing lateral restraint to the building. The initial proposals for conversion have been made available prior to the inspection and include the removal of the crosswall between Bays 5 & Bay 6 and replacement with a stud partition. We would recommend amending layouts to retain the masonry crosswalls.

Localised repairs are required to the cart entrance in the south elevation. The vertical cracking up the western jamb should be remedied by stitching or localised rebuilding. The rotten timber lintel should be replaced and brickwork over consolidated. The other 2No isolated areas of missing masonry in the south elevation should be reinstated, any rotten timber lintels replaced and the cracked stone lintel should be repaired using stainless steel dowels.

The first floor structures require complete replacement. There is 1No primary timber beam that could be reused but would need to be raised to allow adequate head clearance at ground floor level.

The roof structure to Bay 5 requires full replacement, including a new truss. The truss could be designed to replicate Truss No.3. It should also be allowed for replacing the purlins and ridge beam in Bay 4. A high level inspection will be required to confirm the condition and determine the section size at the bearings where section loss has occurred. Considering the weight of the natural stone flag roof covering that is to be reinstated, it may be that the purlins and ridge beam need end repairs to ensure adequate strength.

The decaying ridge beams over Bay 3 and Bay 6 should be replaced and the common rafters in Bays 4 – 6 should be renewed in entirety. A high level inspection of the common rafters in Bays 1 – 3 would confirm the requirement for any replacements or rafter end repairs.

The building would also benefit from the provision of a formal drainage scheme, reinstating the gutters and downpipes. We would recommend any above ground drainage goods are connected into a below ground drainage scheme to reduce surface run-off directly adjacent to the base of the external walls.

6. Conclusions

Overall the building is in reasonable condition and following a scheme of repairs will lend itself well to conversion to a domestic dwelling.

The lean-to extension should be taken down and rebuilt on new concrete footings and the north elevation underpinned along its full length where foundations have been exposed.

The collapsed section of masonry should be rebuilt and isolated areas of masonry repairs undertaken as needed, including ensuring the existing masonry crosswalls are adequately tied in.

The first floor structures should be renewed in entirety and a new roof structure provided over Bay 5 where the existing roof has collapsed. The remaining sections of roof structure require isolated timber repairs, such as replacement of decayed ridge beams.

7. List of Photos

Photo 1: North Elevation

Photo 2: South Elevation

Photo 3: West Elevation

Photo 4: East Elevation

Photo 5: Lean-To Extension – Collapsed Masonry

Photo 6: Lean-To Extension – Foundations Exposed

Photo 7: Lean-To Extension – Vertical Cracking

Photo 8: Collapsed Masonry

Photo 9: Cart Entrance - Decayed Lintel & Unconsolidated Masonry

Photo 10: Cart Entrance - Vertical Cracking

Photo 11: Failing Timber Lintels

Photo 12: Missing Outer Facing Over Failing Timber Lintels

Photo 13: Roof Structure (Bay 1 & Bay 2)

Photo 14: Bay 3 - Roof Structure & Missing First Floor

Photo 15: Roof Structure (Bay 4)

Photo 16: Bay 5 - Collapsed Roof & First Floor Structure

Photo 17: Bay 6 - Roof & First Floor Structure in Poor Condition



Photo 1: North Elevation



Photo 2: South Elevation



Photo 3: West Elevation



Photo 4: East Elevation



Photo 5: Lean-To Extension – Collapsed Masonry



Photo 6: Lean-To Extension – Foundations Exposed



Photo 7: Lean-To Extension – Vertical Cracking



Photo 8: Collapsed Masonry



Photo 9: Cart Entrance - Decayed Lintel & Unconsolidated Masonry



Photo 10: Cart Entrance - Vertical Cracking



Photo 11: Failing Timber Lintels



Photo 12: Missing Outer Facing Over Failing Timber Lintels



Photo 13: Roof Structure (Bay 1 & Bay 2)



Photo 14: Bay 3 - Roof Structure & Missing First Floor



Photo 15: Roof Structure (Bay 4)



Photo 16: Bay 5 - Collapsed Roof & First Floor Structure



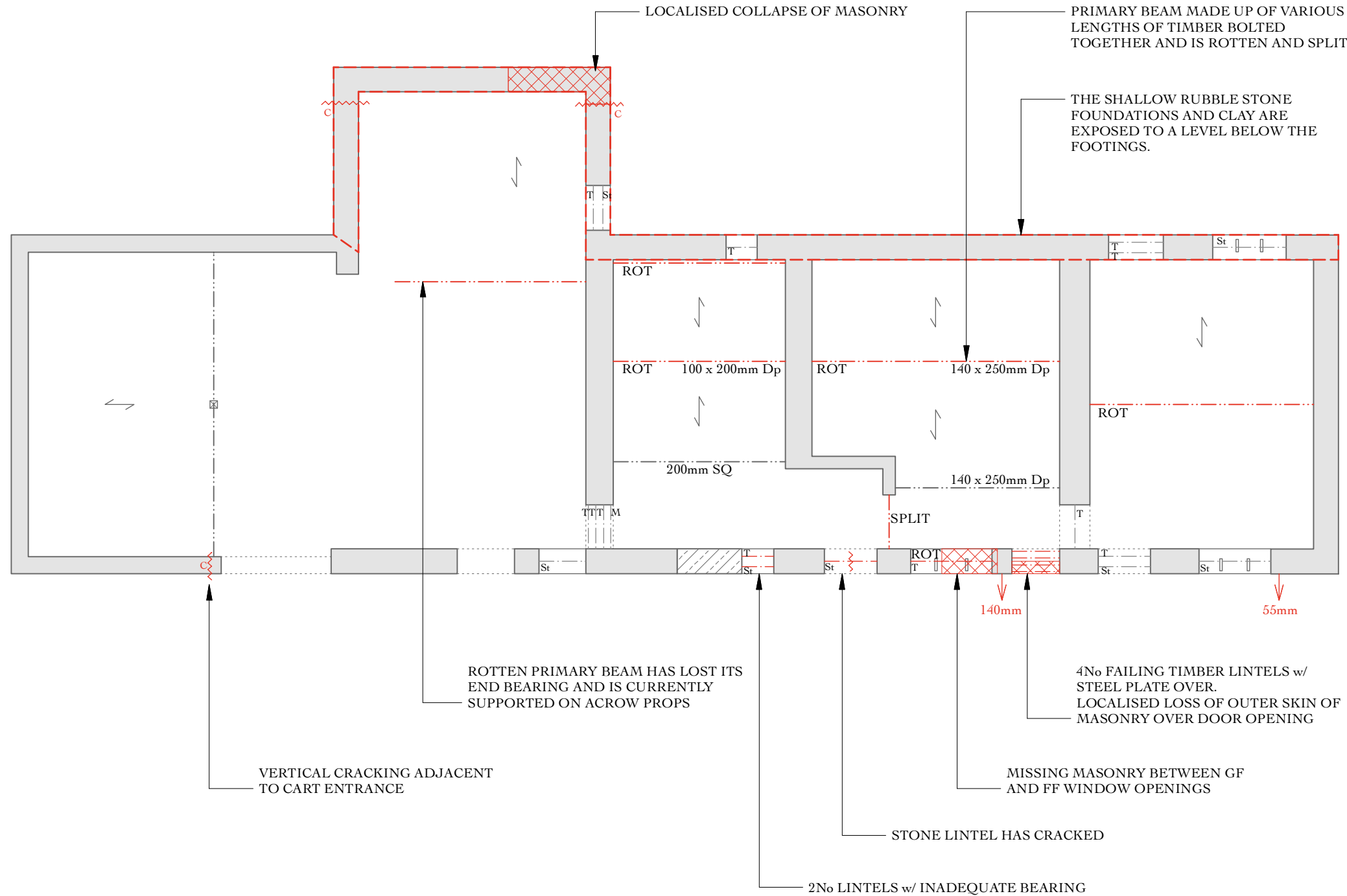
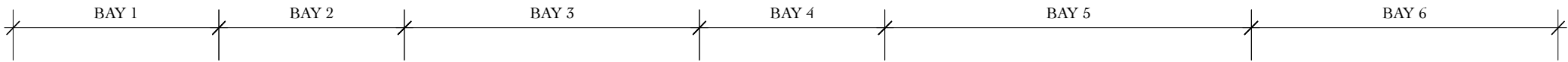
Photo 17: Bay 6 - Roof & First Floor Structure in Poor Condition

8. List of Drawings

100 Ground Floor Plan

101 First Floor Plan

102 Elevations



GENERAL NOTES

1. Do not scale from this drawing. Use figured dimensions only. Unless otherwise stated all drawing units are in millimetres. Levels are in meters.
2. This drawing to be read in conjunction with all other relevant consultant/specialist drawings and specifications.
3. Check levels/dimensions quoted on drawing against those on site before finalising.
4. For setting out dimensions, see Architect's drawings (uno).
5. Report any discrepancies before affected work commences.
6. We are not the Principal Designer for the construction works, unless a separate formal appointment has been agreed.
7. This drawing remains copyright of Blackett-Ord Conservation Ltd. Copy/distribute only with consent of the Author.

SURVEY

1. This drawing has been produced from base drawings provided by CBD Architecture.

KEY

- Masonry Defect
- Cracking
- Primary Timber Beam
- Lintels:
 - St Stone
 - T Timber
 - M Steel
- Blocked Former Opening

Condition Survey



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Leaches Farm
for Mr J Farrell

Ground Floor Plan

Drawing No: Z48/100	Rev: -	Scale: 1:100 @ A3
Date: May 2023	Drawn by: AR	Checked by: CB-O



GENERAL NOTES

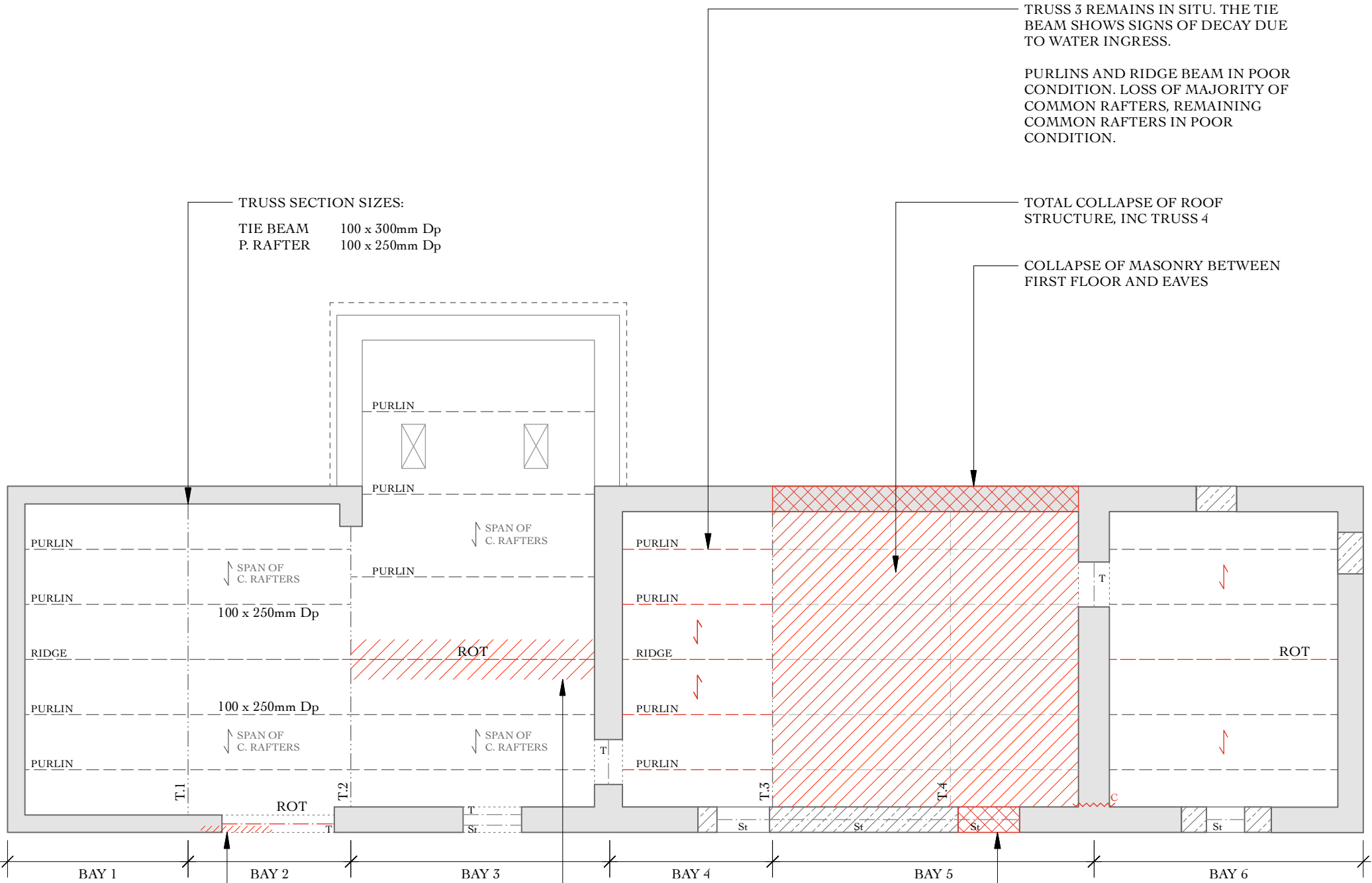
1. Do not scale from this drawing. Use figured dimensions only. Unless otherwise stated all drawing units are in millimetres. Levels are in meters.
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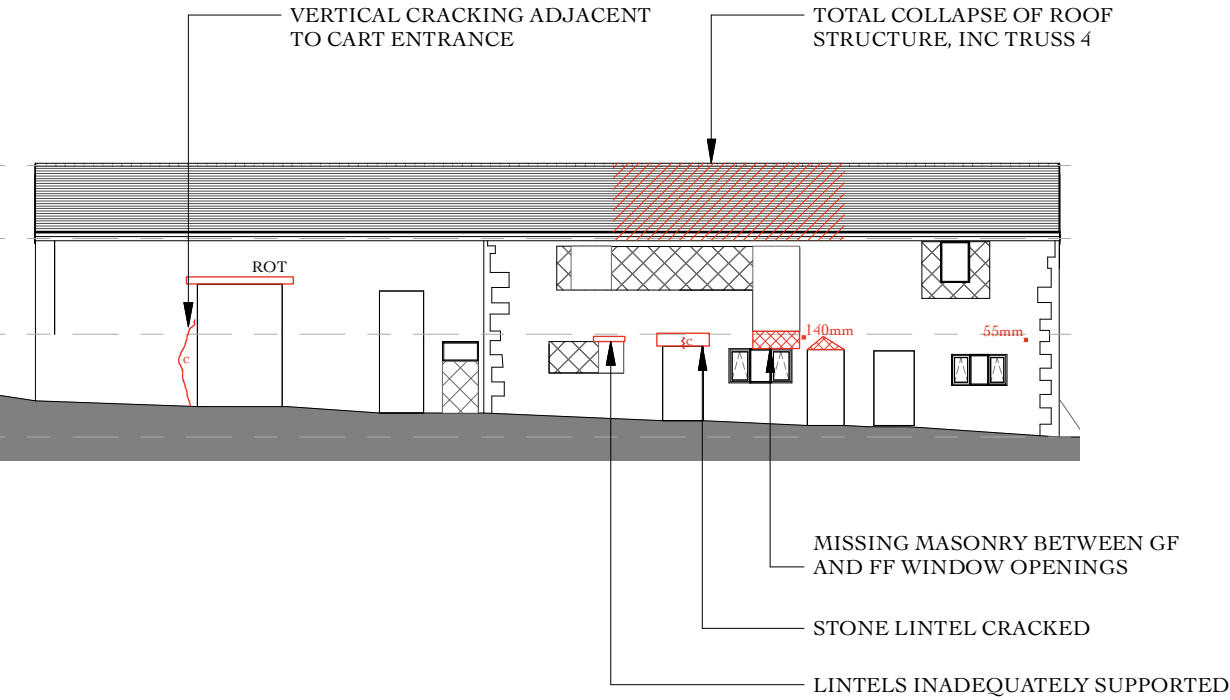


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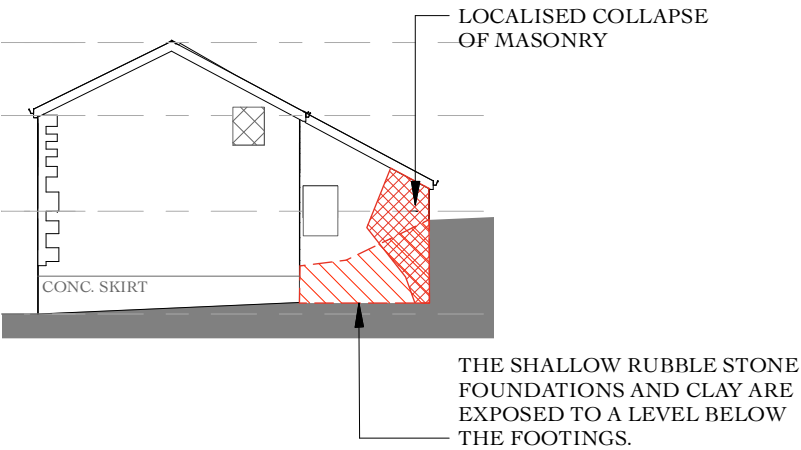
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First Floor Plan

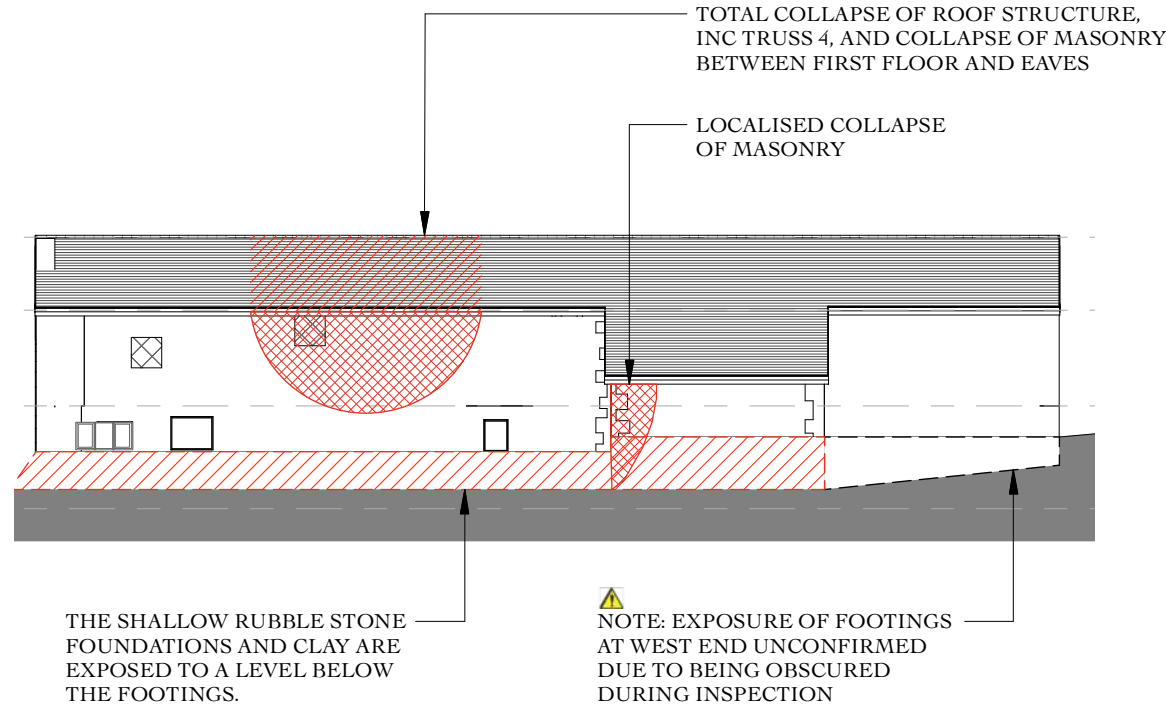
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Date: May 2023	Drawn by: AR	Checked by: CB-O



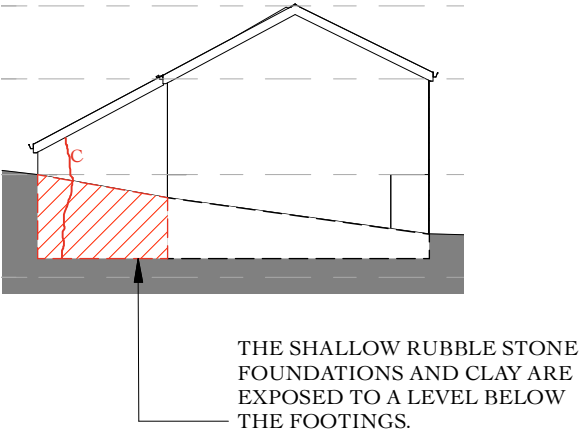
SOUTH ELEVATION



EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION

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- | | |
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Condition Survey

**Blackett-Ord Conservation
ENGINEERING**

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Elevations

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