Structural Appraisal

of

Listed Barn & Outbuildings

Home Farm, Chatburn Road, Downham

for

Sunderland Peacock & Associates Ltd

Ref: B79

October 2025

Blackett-Ord Conservation Engineering
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Table of Contents

	Written By:	Checked By:	Date:
First Issue	AR	EC	13.10.25

1. Introduction

Blackett-Ord Conservation Engineering have been commissioned to undertake a structural survey of the listed aisled barn and adjacent outbuildings at Home Farm, Chatburn Road, Downham. The buildings are currently used for limited storage but it is proposed to convert the buildings to commercial office use following a scheme of repairs.

This appraisal report summarises the structural condition of the buildings at present and provides recommendations for repair in general terms.

This report has been prepared for the sole use of Sunderland Peacock & Associates Ltd, their client - the building owner and statutory authorities. It is not to be relied upon by any third party and shall not be distributed to other parties, other than statutory authorities or insurers, without the consent of Blackett-Ord Conservation Ltd.

2. Inspection

The buildings were inspected on Tuesday 2nd September 2025 by Amy Rooke and Emma Cochrane. It was a clear, dry and sunny day. All buildings were open or made accessible for inspection by the owner.

We have not inspected woodwork or other parts of the structure which are covered unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

3. General Description

Home Farm is a compact former farmyard located off Chatburn Road, Downham, approximately 5km north east of Clitheroe in Lancashire. The village of Downham is located at the foot of Pendle Hill within the Forest of Bowland Natural Landscape.

The site comprises the Grade II listed aisled barn, thought to have been constructed in the 17th century, a 19th century cart shed, and a piggery and adjoining outbuilding.

The aisled barn is constructed of limestone random rubble walls, approximately 550mm thick. The building comprises the aisled barn, a double height space with 6No timber trusses supported on aisle posts and mezzanine floors each end, and an adjoining two-storey outbuilding, with a suspended timber first floor and a single queen post truss. There is also later single storey lean to additions which are thought to be 19th century. The roof covering is natural stone slate supported on common rafters and timber purlins.

The cart shed is a two-storey building constructed of coursed rubble walls, approximately 400mm thick. At ground floor there are 3No openings formed using a reinforced concrete lintel over stone columns, one has been previously infilled to form a separate store. The

first floor construction is timber joists which span between the gable walls and primary steel beams. The roof covering is natural stone slate, supported on 3No raised collar trusses with a single purlin on each slope.

The outbuilding is a simple single storey structure with an adjoining piggery. The piggery is not the subject of this report. The outbuilding is constructed of random rubble masonry, approximately 450mm thick. The roof is natural stone slate supported on 2No shallow-pitch, softwood, raised collar trusses, with timber purlins and common rafters.

4. Structural Defects

The following defects are outlined on the accompanying drawings B79/100 to B79/104.

4.1 Foundations Generally

No trial pits or foundation investigations were carried out at the time of inspection. There were no signs of recent settlement or foundation failure.

4.2 Aisled Barn

The main defects noted are a result of previous repairs and poor workmanship. New softwood trusses (T.2 & T.5) or principal rafters (T.3 & T.4) have been provided to strengthen the existing frames but these have been mechanically fixed to the existing with no adequate connection to the frame post. In some cases the principal rafter is supported on the purlin using a birds mouth joint. On Frame No.2, inadequate lightweight steel restraint straps have been used as a fixing in this location. Trusses No.1 and No.5 have been previously replaced in softwood.

There are additional timbers fixed to the main structural framework, particularly at the top of the timber posts, which conceal the condition and adequacy of the connections.

On truss no.3 the upper collar on the original truss is too slender. A tie rod has been inserted between frame posts on truss no.2. Their purpose is unclear. A small outward lean was noted on the south elevation masonry but this does not appear to be ongoing nor a structural concern.

All of the purlins have been previously replaced in softwood. In most bays, the older lower purlins have been retained in situ with new softwood supported above. Some of the older purlins are not adequately fixed where they are spliced. In bay 3 the purlin has dropped at the splice and is sagging. In bay 2 the southern lower purlin has become twisted and is also splitting at the notch for the diagonal brace. The diagonal braces are pulling out of their fixing to the post in this location.

There are a number of diagonal braces that are missing. On the south side of frame no. 5 & no.6, the longitudinal braces have been previously replaced with softwood, they are poorly detailed and inadequately fixed.

In the location of the rooflights, the purlins show sign of water ingress although decay does not appear significant from our visual inspection.

The northern timber post of frame 3 has a large vertical shake. The post has also split at the top where the truss and lower purlin connect. All frame posts suffer from decay due to woodworm. The largest loss of section recorded was approximately 25mm.

The posts are supported on stone plinths of varying height. These have become unconsolidated and one has split.

The current mezzanines are not adequate for use as a floor. The joists are too widely spaced for the boarding and are supported on the stable stall posts.

In the workshop there is 1No joist that has split. It also does not span full length into the wall and is inadequately supported by a cantilevered timber trimmer.

There is some vertical cracking in the masonry but in all cases this is not apparent on the external. There are 2No. stone lintels that have cracked and 3No localised areas of wash out of the mortar joints.

The wash out of the mortar can be attributed to the lack of rainwater goods. The majority are missing and there is no adequate below ground drainage provision.

4.3 Cart Shed

The Cart Shed is in reasonable condition and the only significant defect noted was the exposed corroding reinforcement in the concrete lintel over the central of the three openings. Cracking was also noted in the southernmost concrete lintel which suggests the corroding reinforcement may not be a localised issue.

4.4 Outbuilding

No defects noted.

5. Repair Recommendations

<u>Aisled Barn</u>

The additional timbers fixed to the main structural members should be removed to facilitate full inspection of the condition of the timber and allow the development of a full scope of works. The proposed repairs would be based on traditional repair details to allow

the retention of as much original material. Any new timber should be an air dried European oak, which is a more appropriate material than the softwood previously used.

The connections at the top of the frame posts should be reviewed once the additional timbers have been removed and high level access made available. Where new truss members have been fixed to the existing, the detail should be revised to ensure connection of the new rafters or truss to the frame posts. The post that has split should be replaced.

The stone plinths that support the timber frames should be consolidated as required. The split plinth stone may be repairable using stainless steel dowels.

The missing diagonal braces should be replaced. The 2No braces that are pulling out at their connection to the frame post should be refixed. The softwood braces on frames no.5 and no.6 should be replaced, profiled to match the original, and adequately fixed to the frame posts. Repairs may be required to the frame posts to ensure an adequate connection is possible following removal.

A new collar should be provided on truss no.3 to make the existing slender collar redundant. This could be achieved by fixing a new collar between the softwood rafters that are bolt fixed to the existing truss.

The lower purlins that are inadequately spliced should be mechanically fixed together using steel plates, allowing the original timbers to be retained. The one purlin that has dropped may be able to be jacked back into place, otherwise timber packers provided between the upper and lower purlin. The purlin that has become twisted and is splitting should be replaced.

The current mezzanine structures are inadequate for reuse as a floor. New structures would be required consisting of structural posts on a concrete foundation with an edge beam. The joists that are in good condition may be reusable but new joists would be required to ensure adequate joist spacing.

In the workshop to the east, the split joist should be replaced to span into the external masonry to ensure adequate support.

The cracking in the masonry should be packed out using slate and repointed using lime mortar. The cracked stone lintels should be repaired by pinning using stainless steel dowels set in resin or replaced on a like-for-like basis. The open joints in the masonry where water has caused wash out should be repointed using lime mortar.

New gutters and downpipes are required. Consideration should be given to increasing the sizes or number of downpipes to ensure adequate capacity for the scale of the building. An adequate below ground drainage system should also be provided.

Cart Shed

The concrete lintel should be locally repaired where the concrete has spalled and reinforcement is exposed and corroding. The reinforcement should be wire brushed and coated with an anticorrosion paint system. The beam should be checked for other areas of cracking or spalling and treated appropriately using proprietary methods.

6. Conclusions

Overall the buildings are in reasonable condition requiring localised repairs.

The main framework in the aisled barn is in reasonable condition but would benefit from improvements to the connections, particularly at the tops of the frame posts, where previous repairs have compromised structural integrity.

We can confirm the building is capable for reuse as the proposed commercial office space.

7. List of Photos

Photo 1: Front Elevation

Photo 2: Rear Elevation

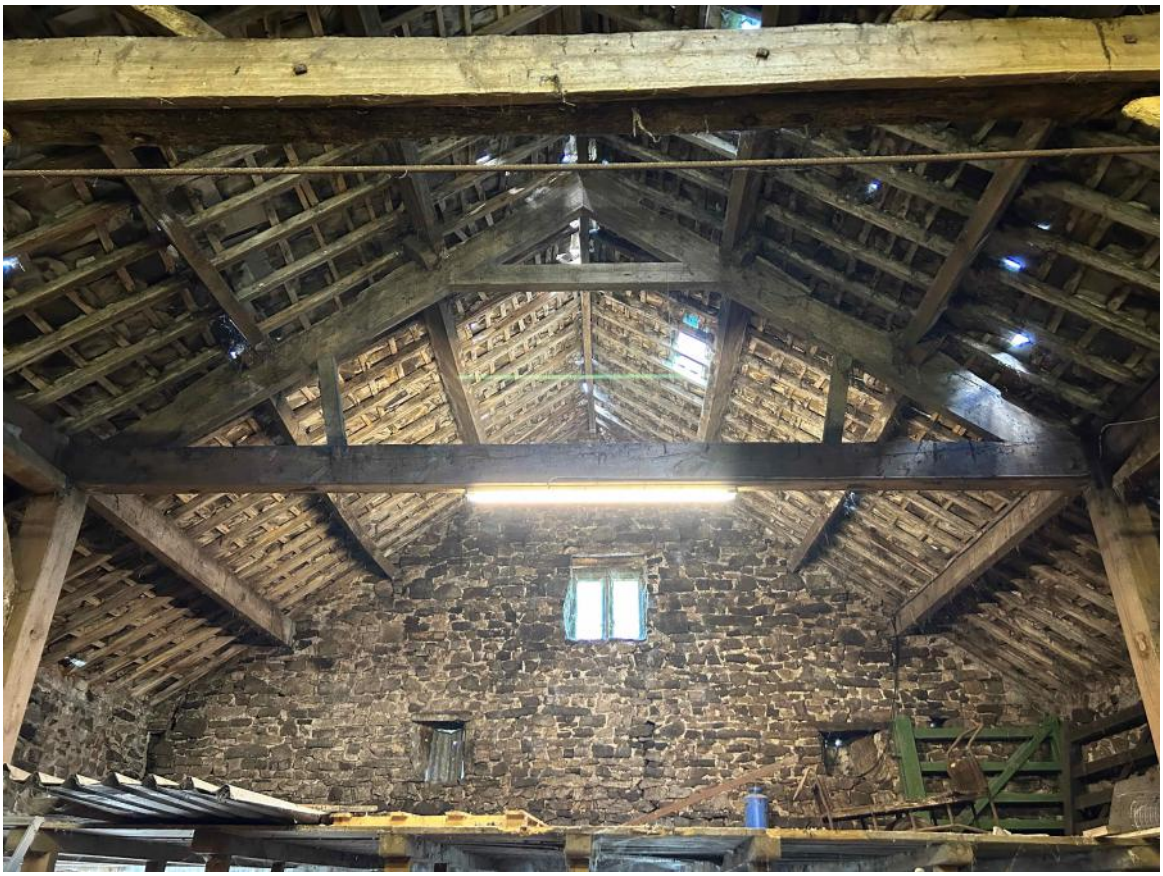


Photo 3: Frame No.1

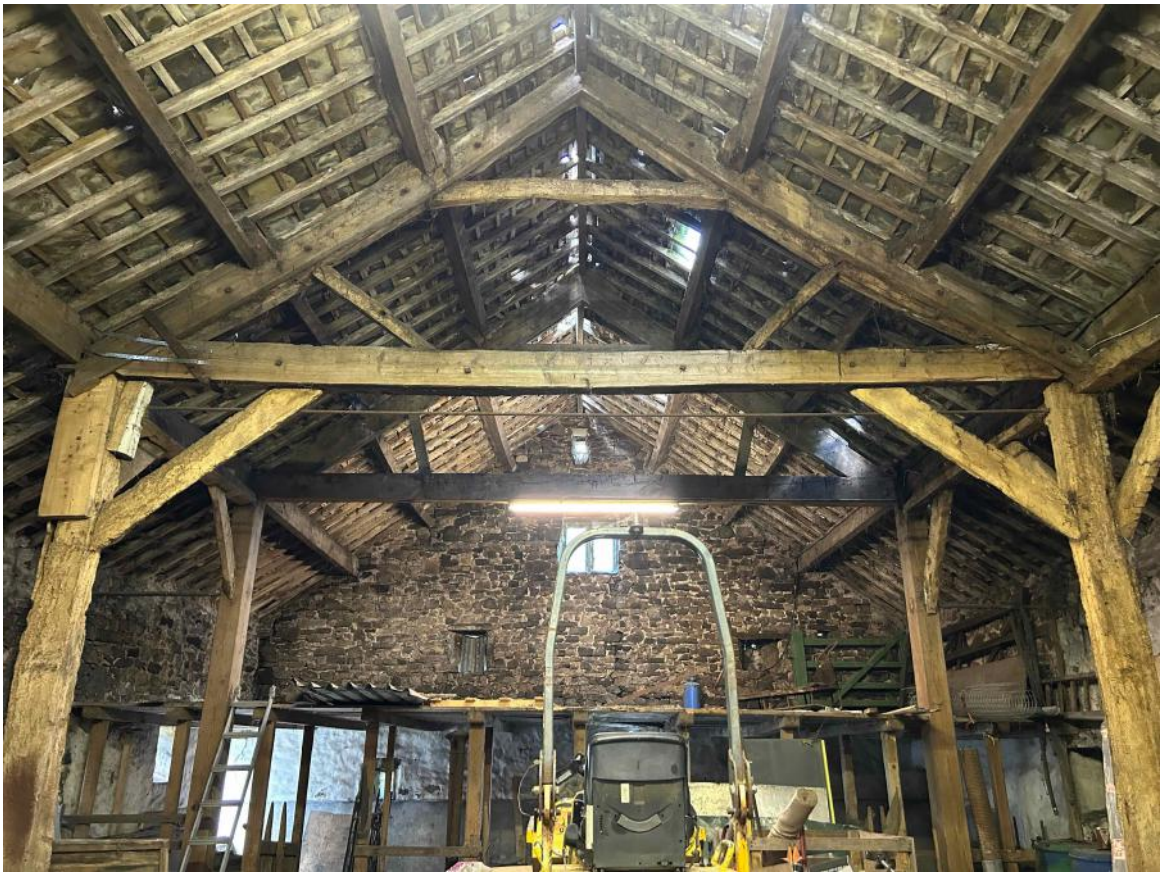


Photo 4: Frame No.2

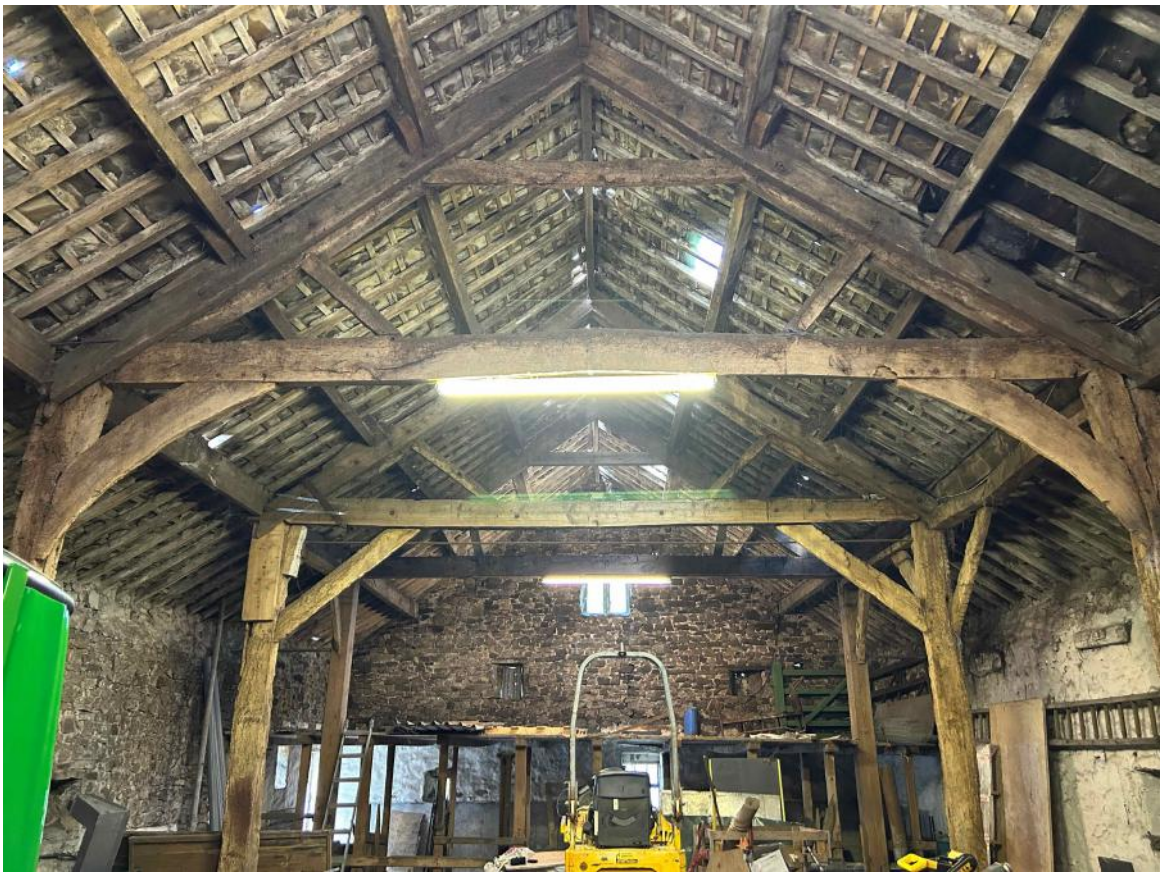


Photo 5: Frame No.3

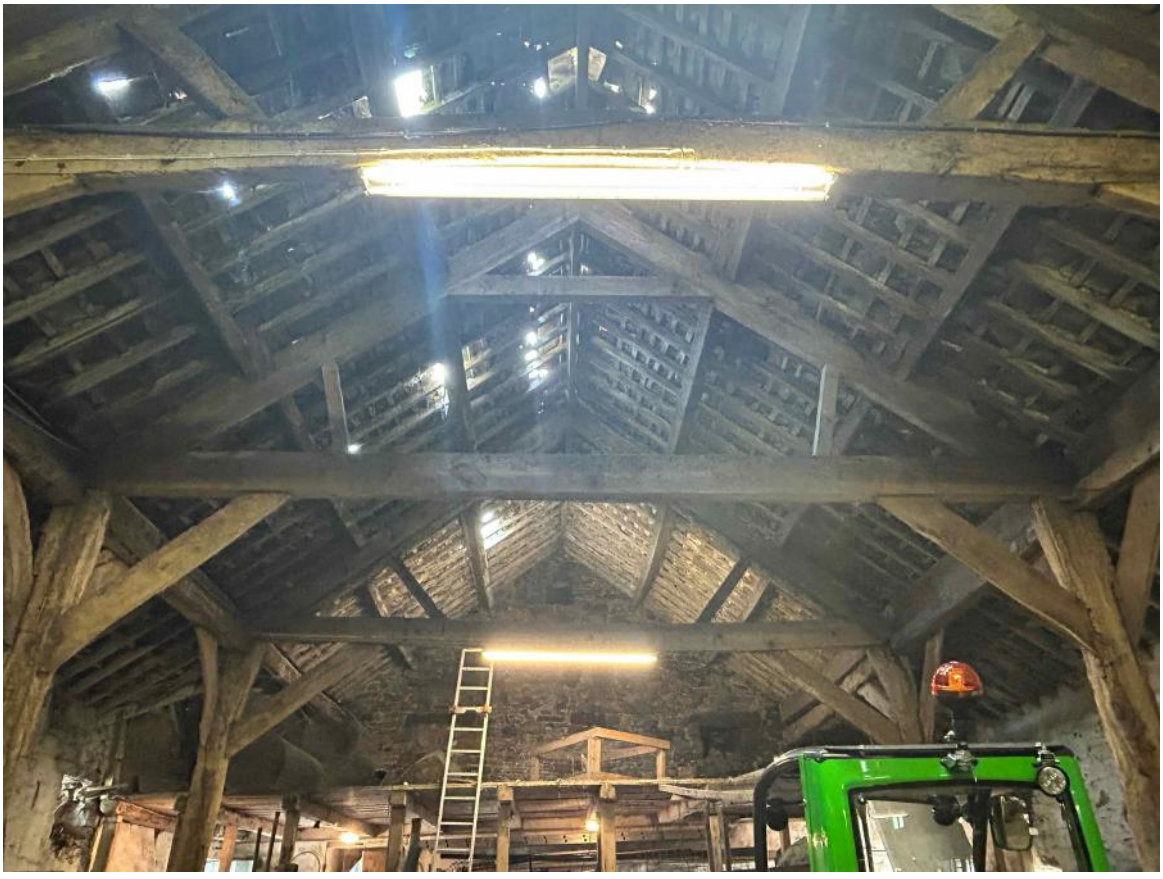


Photo 6: Frame No.5 & No.6

Photo 7: Bay 2 (South)
Upper Purlin Not Connected, Lower Twisted & Braces Pulling Out

Photo 8: Frame No.3 - Split in Post

Photo 9: Frame No.3 - Vertical Shake in Post

Photo 10: New Rafters Not Adequately Supported

Photo 11: Bays 5 & 6 (South) - Lower Purlin Not Connected

Photo 12: Existing Mezzanine Structure Inadequate for Access

Photo 13: Workshop Joist Split & Inadequately Supported

Photo 14: Queen Post Truss Over Workshop
(Note: Only 300mm Between Tie Beam & Floor Level)

Photo 15: Front Elevation

Photo 16: Spalled Concrete Lintel - Reinforcement Exposed & Corroding

Photo 17: General External

Photo 18: General Internal

8. List of Drawings

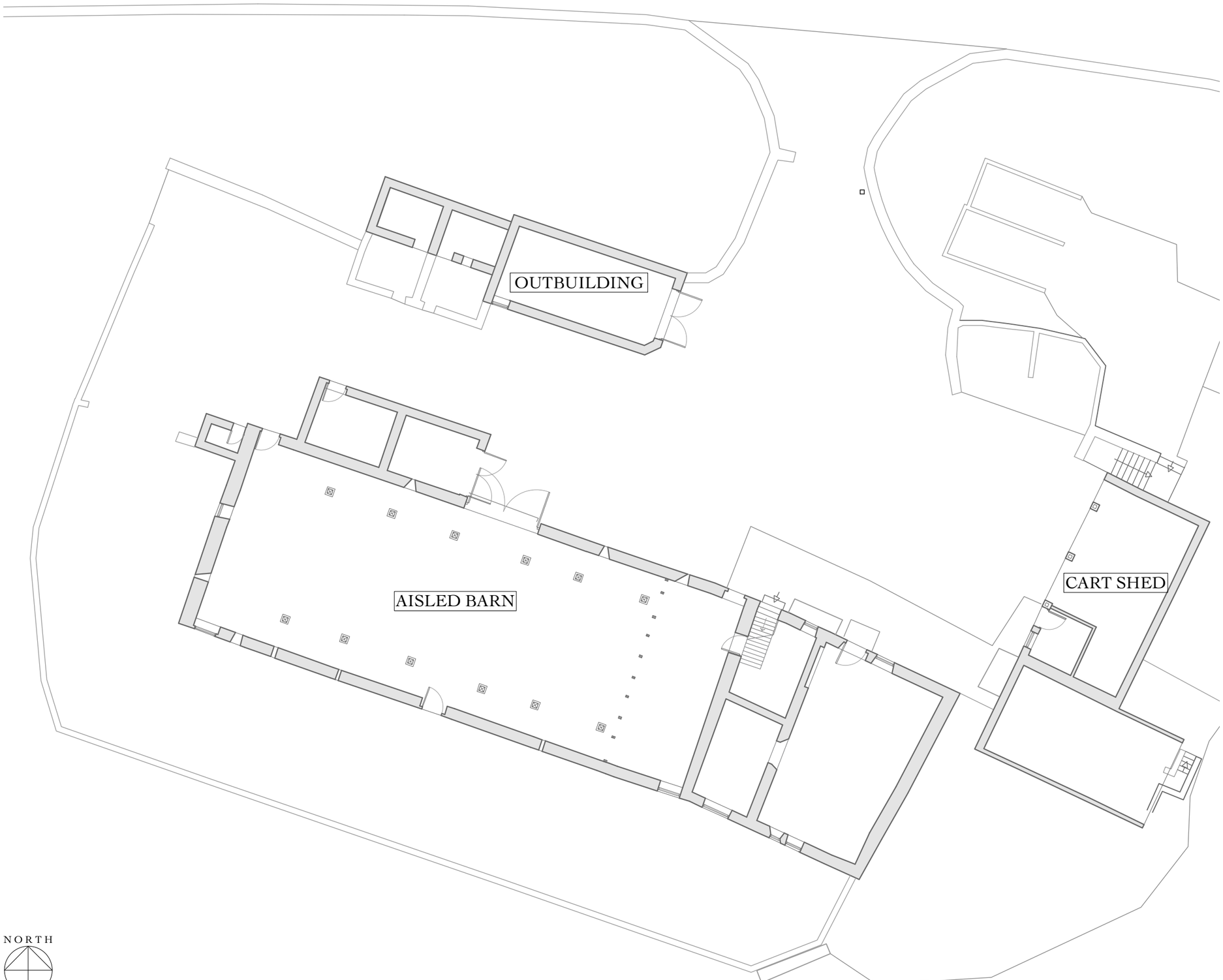
100 Site Plan

101 Aisled Barn: Plans

102 Aisled Barn: Section

103 Cart Shed: Plans

104 Outbuilding: Plan



NORTH

0 1m 2m 3m 4m 5m 10m 15m

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 measured survey drawings provided by Sunderland Peacock & Associates Ltd.

CONDITION SURVEY

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ENGINEERING

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Home Farm, Downham
for Sunderland Peacock & Associates Ltd

Site Plan

Drawing No:	Rev:	Scale:
B79/100	-	1:200 @ A3
Date:	Drawn by:	Checked by:
October 2025	AR	EC

NORTH

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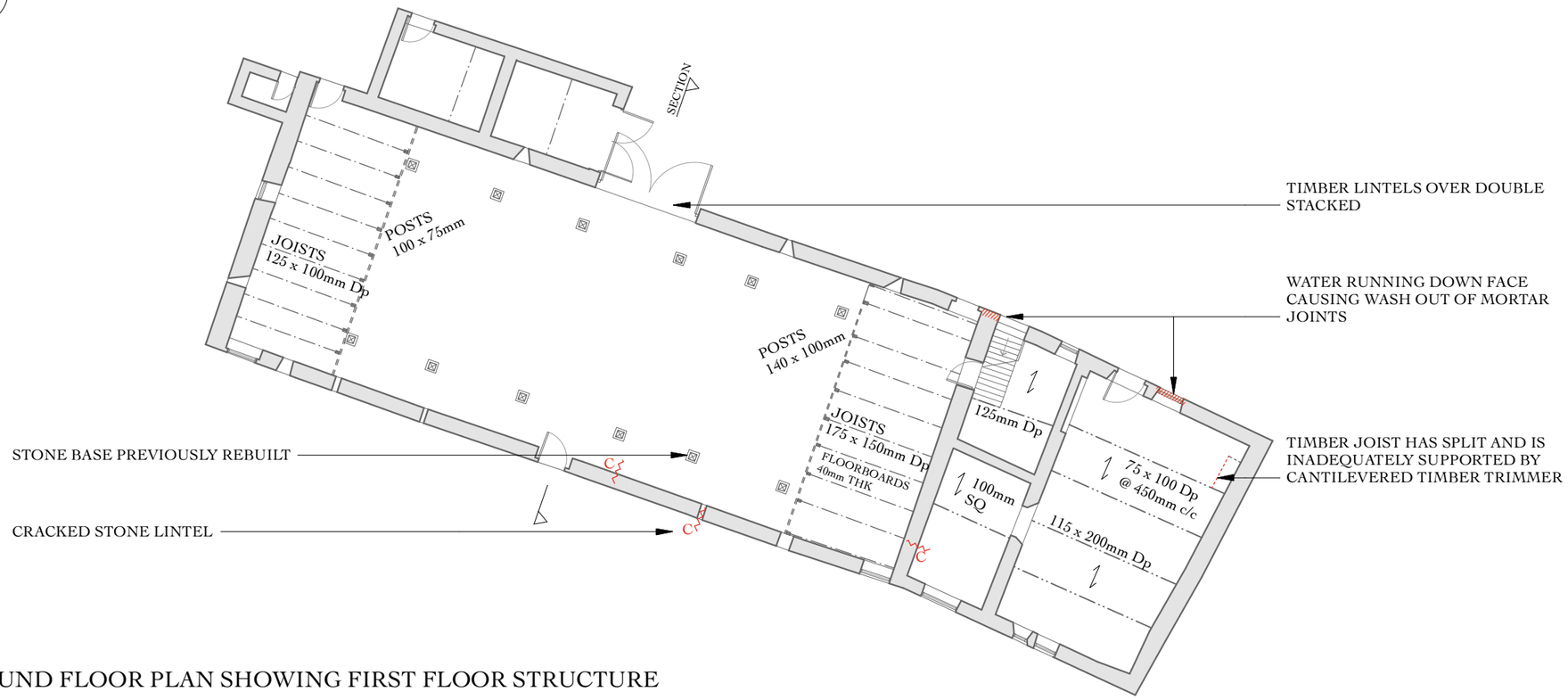
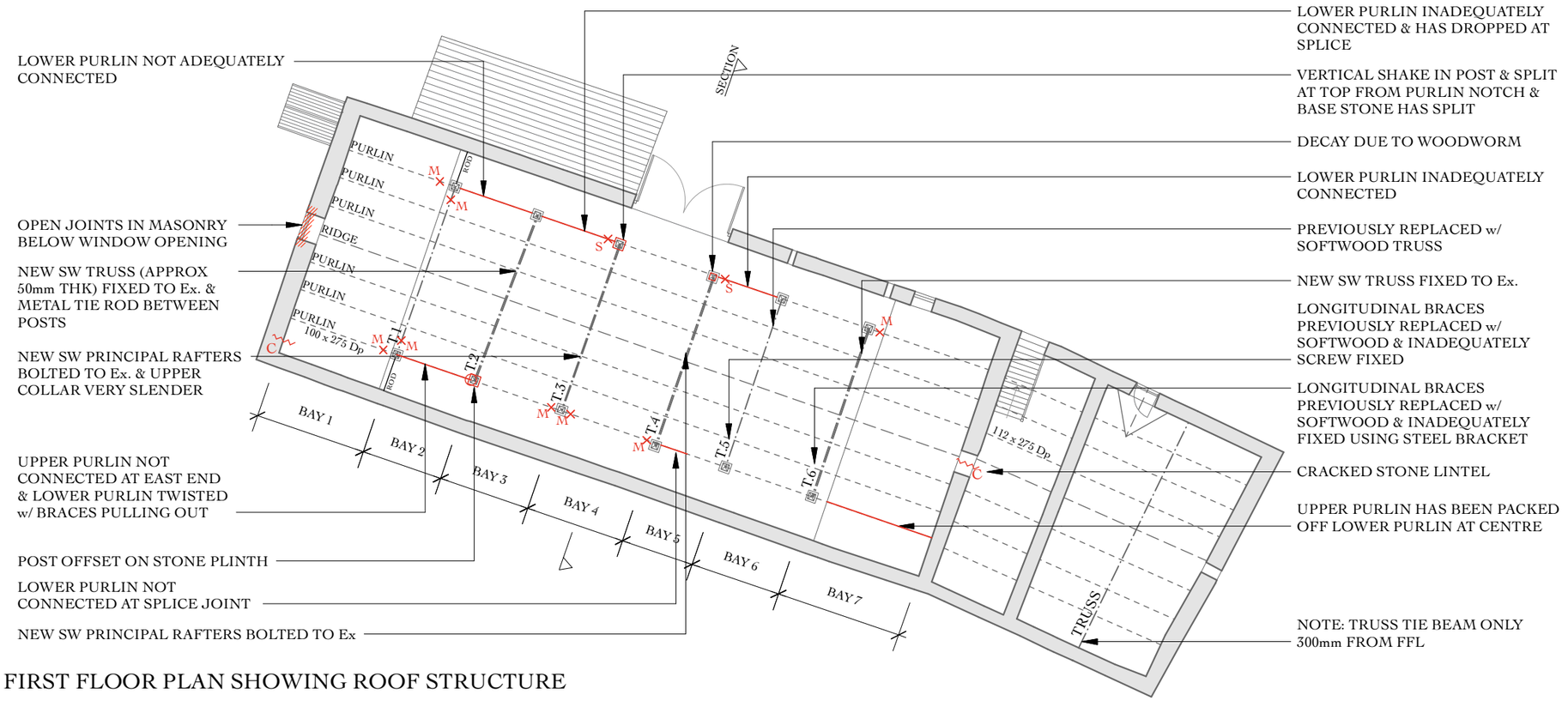


GROUND FLOOR PLAN SHOWING FIRST FLOOR STRUCTURE



FIRST FLOOR PLAN SHOWING ROOF STRUCTURE

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KEY

C Cracking

Open Joints in the Masonry

Diagonal Brace Defects

M Brace Missing

S Section Loss

GENERAL DEFECTS:

1. Additional pieces of timber fixed at top of the frame posts. Condition underneath unknown.
2. Original purlins have previously been replaced with softwood. Lower purlins are double stacked - single purlins only in bays 1, 3 & 4 south side, and bays 1 & 7 north side.
3. Evidence of historic woodworm decay in timber posts, approximate 25mm loss of section.
4. Water ingress on upper purlins under roof lights
5. Majority of rainwater goods are missing.
6. No below ground drainage provision.

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Home Farm, Downham
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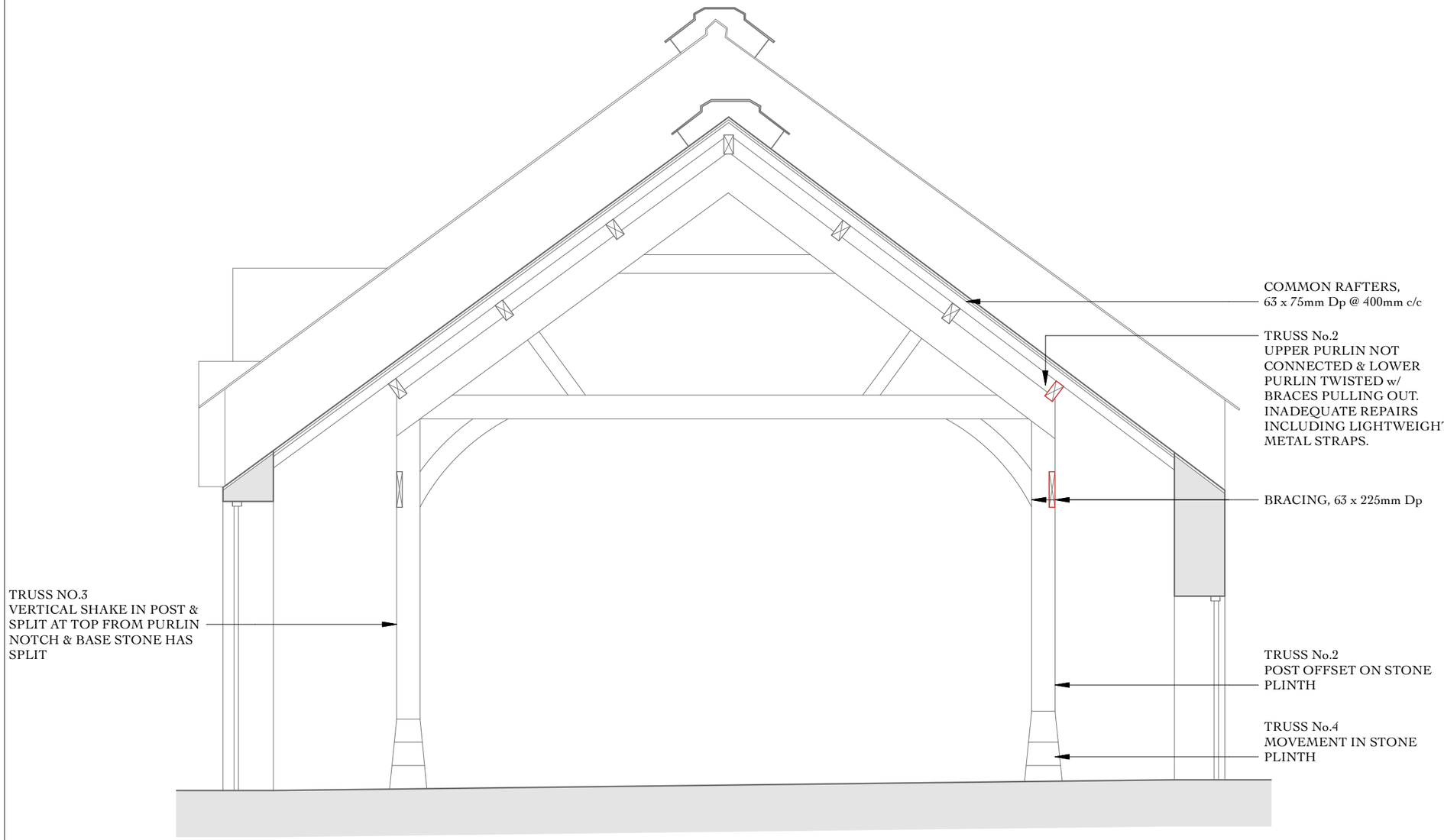
Aisled Barn: Plans

Drawing No: B79/101	Rev: -	Scale: 1:200 @ A3
Date: October 2025	Drawn by: AR	Checked by: EC



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Aisled Barn: Section

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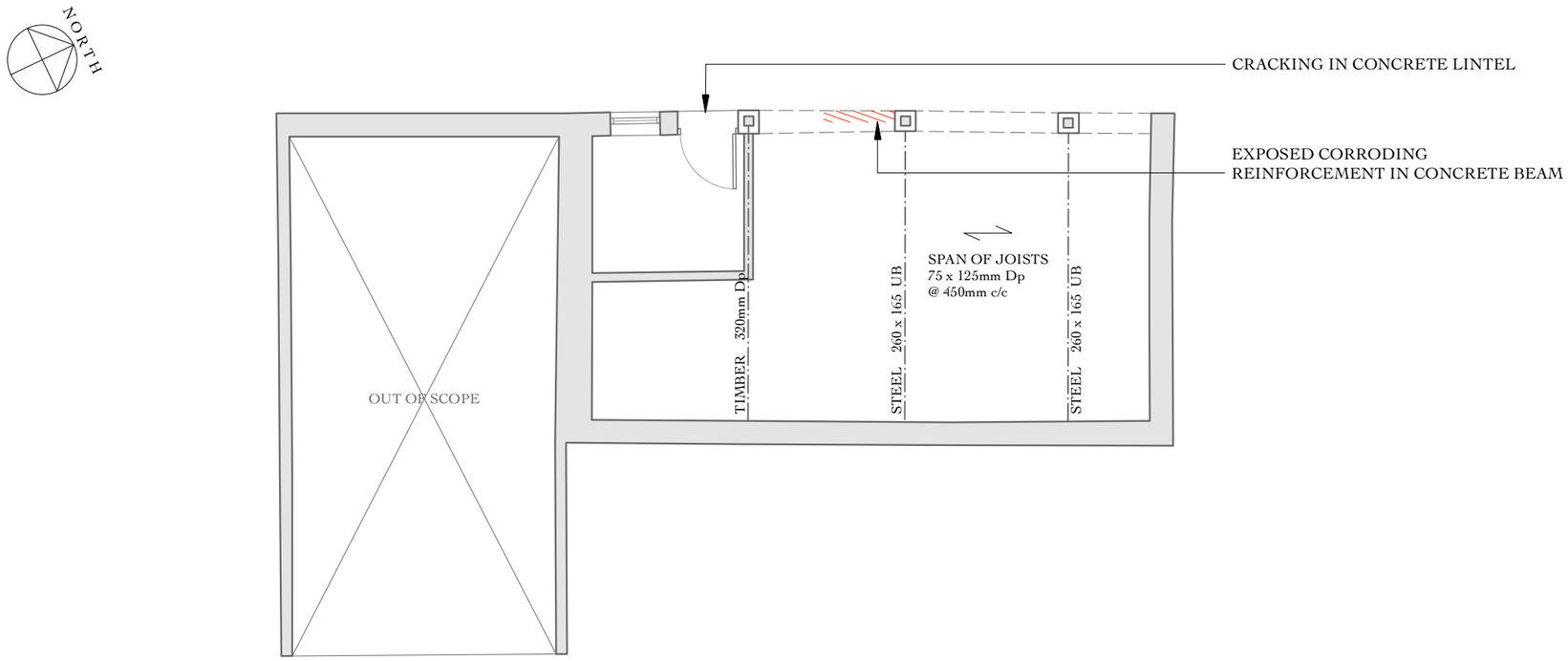
October 2025	AR	EC



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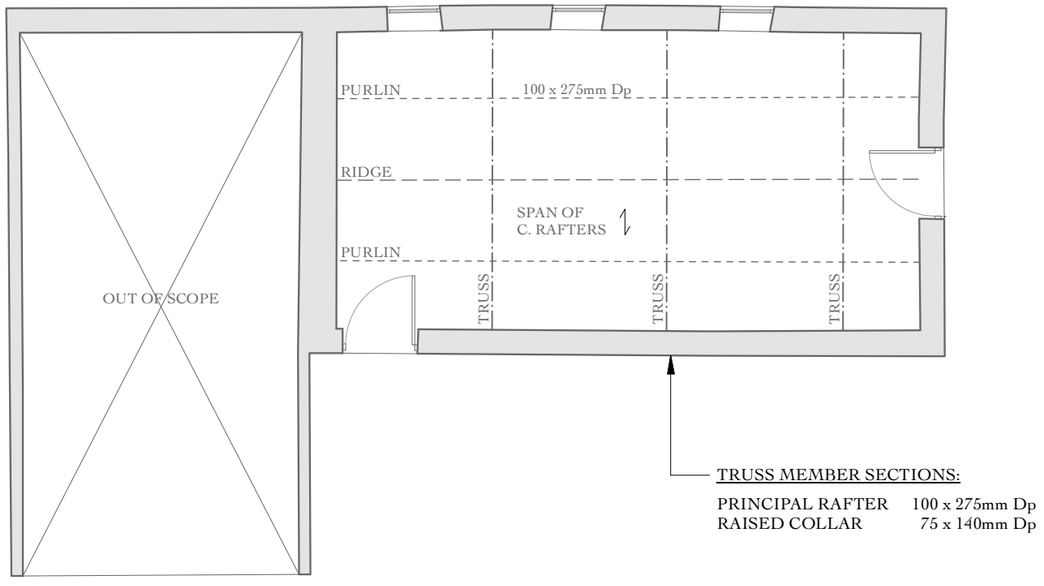

FIRST FLOOR PLAN SHOWING ROOF STRUCTURE

0 1m 2m 3m 4m 5m 10m

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Cart Shed: Plans

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Date:	Drawn by:	Checked by:
October 2025	AR	EC

NORTH

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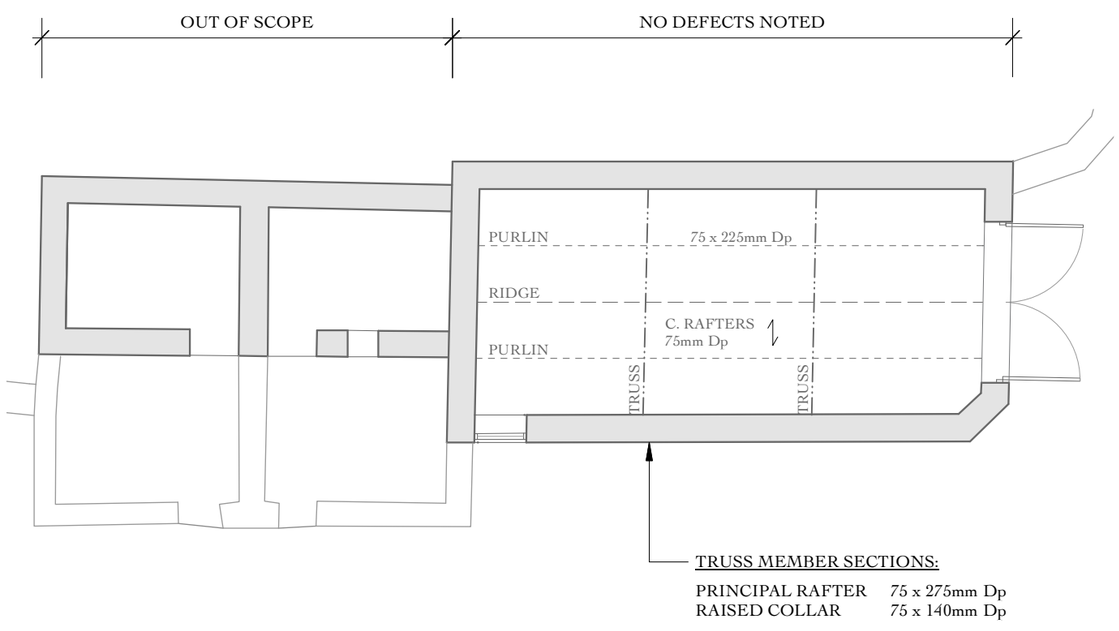

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Outbuilding: Plan

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