

STRUCTURAL ASSESSMENT REPORT

Green Oak Barn, Stonham Road, Mickfield



Client: Sally Keep

Prepared by: Gina Sowden Turner of Steria Consulting Ltd

Date: October 2022

Reference: GT/2170/srep02

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| Revision | Date | Comments | Name |
|-----------------|---------------------|-----------------------------------|-------------|
| 01 | October 2022 | Draft | GST |
| 02 | October 2022 | Issued Tim Moll Architects | GST |
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1.0 Introduction and Clients Brief

- 1.1 Steria Consulting have been appointed by Sally Keep to review the structural assessment of the barn, feasibility of conversion into a residential dwelling to support a Planning and Listed Building Application.
- 1.2 We inspected the barn on Friday 1st July 2022, the weather at the time of inspection was warm and sunny with highs of 21° C.
- 1.3 This survey has been undertaken by visual inspection only with no intrusive inspection undertaken. Our assessment takes into consideration the structural capacity of the barn and its suitability for conversion into a residential dwelling
- 1.4 For the purpose of this report, the gable elevation which faces the roadside is described as the west elevation, with all other elevations described in relation to this, whether strictly correct by a compass. The barn is situated to the east, rear, of Green Oak Farmhouse, Grade II Listed Building.
- 1.5 Tim Moll Architects drawings of the existing and proposed scheme are included within Appendix B

2.0 Brief Description

- 2.1 Green Oak Farm is situated in the Village of Mickfield, five miles northeast of Stowmarket, within 2.5 acres site.
- 2.2 Green Oak Farm is Grade II Listed, dating from early 16th Century, a copy of Historic England official list entry has been included in Appendix D. The barn is situated east of the farmhouse. The Barn forms part of a farmstead associated with Green Oak Farm and is curtilage listed.
- 2.3 The Barn five bay timber frame, on brick plinth with corrugated metal sheet roofing. Originally three-bay threshing barn, early 17th Century with later 19th and 20th Century additions.

3.0 Structural Assessment

- 3.1 Whilst the barn has suffered from neglect of maintenance in recent years, the introduction of the corrugated metal roof covering has protected the roof structure and the internal timber members to prevent further decay. Damage has occurred to the masonry elements of the barn from defective rainwater goods and inappropriate repairs.
- 3.2 The weatherboard cladding has deteriorated, with extensive ivy growth externally around the perimeter of the barn on all elevations.
- 3.3 The roots of the vegetation extend into the mortar joints of the brick plinth and has caused distortion to the brickwork.
- 3.4 The brick plinth has been historically repaired with concrete along the north elevation over half its length. The repair has been carried out in a manner of shuttering the existing walls and pouring concrete in situ to stabilise the brickwork and timber. This repair continues at plinth level along the east elevation and to the mid-stray outshoot on the south elevation.
- 3.5 The shelter coat to the clay lump has eroded on the lean-to, on both the east and south elevations.
- 3.6 The southeast corner of the lean-to, the brickwork at low level has been dislodged.
- 3.7 Internally the ground levels have been raised with the insertion of a concrete floor slab. The soleplate sits approximately 150mm above the top of slab level.
- 3.8 The concrete plinth repair has been cast around the timber frame. Partner timber repairs have been introduced alongside posts and studs.
- 3.9 The roof structure over the three western bays has been replaced. The eastern two bays, the timbers show evidence of racking.
- 3.10 Additional tie beams have been provided across the barn at wall plate level.
- 3.11 The projecting bay on the south elevation the roof has been replaced.
- 3.12 At the junction of the projecting bay to the main barn roof at the valleys, prolonged water ingress has decayed the wall plate on both sides.
- 3.13 The shelter coat finish to the clay lump walls has eroded, with a panel collapsed.
- 3.14 From within the lean-to viewing the east wall of the projecting bay the original brick plinth and timber frame is evident, the concrete repair has been applied to the timber frame above the wall plate in this location.
- 3.15 The barn has had significant repairs during the course of its life, not all of these have been appropriate, or sympathetic to its original construction.
- 3.16 The sequencing and type of repairs indicate there has been decay to the sole plate, allowing the sole plate to roll, this has facilitated the racking of the roof. Concrete, poured directly around the plinth and timbers has encased the timber frame.
- 3.17 Additional members and ties were introduced to accommodate the movement caused by the racking of the roof with rafters to the main barn being replaced in their entirety to three of the five bays.

- 3.18 The ivy roots and tendrils have weakened the brickwork, as the plant grows it expanded forcing the masonry apart. The extent of the vegetation has influenced the movement.
- 3.19 Water ingress at vulnerable locations has decayed the timber, as the plates are no longer continuous members the continuity of lateral restraint is reduced facilitating movement at eaves level.
- 3.20 The two phases of construction of the main barn vary, this is visible in the construction and the approach of repairs historically. The majority of the structural movement originating within the eastern two bays, with extensive repairs to plinth encased in concrete and racking of the roof. The replacement roof on the western three bays the battens continue over the entire roof to support the corrugated roof sheeting.
- 3.21 The store on the south west corner, the roof will need to be replaced and re-pitched to provide an effective waterproof detail between the junctions of the intersecting roofs. The brick plinths have been replaced on two sides with concrete and should be rebuilt in masonry.
- 3.22 The proposed scheme layout is within the form of the existing structure, accommodating the levels on site to minimise excavations and potential undermining of the barn. The extension has been positioned in the location where repairs are required to the plinth and frame, reducing the loss of historic fabric.
- 3.23 When considering new foundation requirements for this building, new pad footings to support the mezzanine floor posts and localised thickening of the new ground floor slab to pick up loadbearing internal partition walls. Its historic use would accommodate an imposed load of up to 5kN/m². Domestic loading is 2.5kN/m² but analysis of the existing timber would be conducted prior to recommending a full structural scheme.
- 3.24 Trial holes will be required to understand the proposal implications on the existing foundations. The scheme reflects the stepped nature of the buildings and landscape without the need for the reduction of existing levels. It is therefore likely the existing foundations could facilitate a new domestic ground floor, incorporated insulation to comply with modern Building Regulation
- 3.25 The introduction of the first floor will benefit the structure to enable it to resist racking.
- 3.26 The proposed scheme fenestration is positioned to retain the original frame
- 3.27 The location of the proposed extension is such that no specialised foundation will be required.

4.0 Philosophy of Repair

- 4.1 The philosophy of the repair will be to retain the majority of the original structure, replacing decayed or missing elements of the timber frame using traditional repairs and framing methods.
- 4.2 The principal timber members can be splice repaired and the masonry walls locally rebuilt and repointed using like for like materials. It is expected that the areas of brickwork encased in concrete will require rebuilding off their existing footings. With new sole plates and splice repairs to the timber frame studwork and posts. There was no current indication of subsidence and there would be no requirements to underpin the structure.
- 4.3 No calculations have been carried out in relation to the capacity of the existing members, some of which appear slender. It is feasible to conceive that these members can be strengthened using panelvent DWD (breathable sheathing board) this will be satisfactory to support new internal finishes and provide sheathing to resist racking forces on the timber walls. Bracing will be required to the roof structure to resist racking, and this can be achieved with additional timber braces or sheathing.
- 4.4 All new sections of timbers will match that of the existing, using splice repairs, half laps, and traditional framing and construction methods. Metal restraint straps can be introduced to plate corners and to connection of principle framing members, (i.e. post to plate) to reinforce a tenon joint that has opened up due to historic movement to prevent replacement of the member.
- 4.5 The clay lump is stable and can be repaired using patch repair and cut out for the larger areas, reusing the material onsite with additional straw to prevent shrinkage.
- 4.6 By the selection of appropriate breathable materials, methodology of conversion can be harmonious with the conservation approach to retaining a breathable structure, as the Barn would have originally been designed to perform
- 4.7 It is expected that minor general timber repairs will be required to the rafter feet and other venerable locations. These can be addressed on an individual basis using traditional timber repair methods
- 4.8 Vegetation should be cut back and allowed to die off before it is removed to prevent further damage from occurring to the barn
- 4.9 It is my conclusion that the barn, can be repaired and converted into a singular residential accommodation. To ensure the building, long-term has a viable use the frame can be repaired. The overall structural integrity of Green Oak Farm Barn, I believe can accommodate a single-use residential dwelling within the existing building envelope without significant loss to the historic fabric.

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

Photographs



Photograph 01
North Elevation



Photograph 02
East Elevation

October 2022



Photograph 03
South Elevation



Photograph 04
West Elevation

October 2022



Photograph 05
Brick Plinth North Elevation



Photograph 06
Brick Plinth West Elevation

October 2022



Photograph 07
Concrete Repair to Plinth North Elevation



Photograph 08
Concrete Repair to Plinth South Elevation

October 2022



Photograph 09
East Elevation of Lean-To



Photograph 10
Plinth South East Corner



Photograph 11
Sole Plate West Elevation



Photograph 12
Concrete Repair to Plinth North Elevation

October 2022



Photograph 13
Concrete Repair to Plinth and Partner Repair to Stud East Elevation



Photograph 14
Post Decay North Elevation

October 2022



Photograph 15
Partner Repair to Post



Photograph 16

October 2022

Partner Repairs to Purlin



Photograph 17
Replacement Rafters Western Bays



Photograph 18
Eastern Bays Racking to Roof

October 2022



Photograph 19
Projecting Bay Roof



Photograph 20
West Wall of Projecting Bay

October 2022



Photograph 21
Lean-To



Photograph 22
Lean-To

October 2022

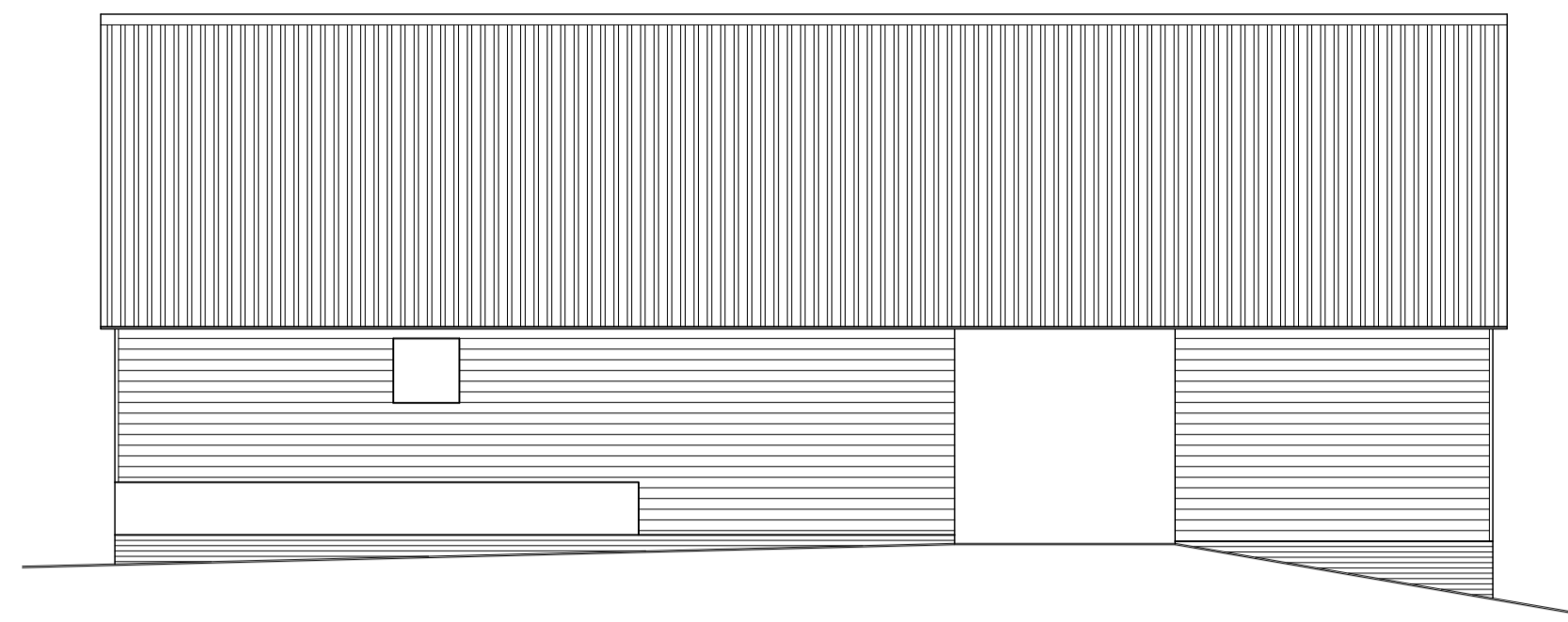


Photograph 23
Store South West Corner

October 2022

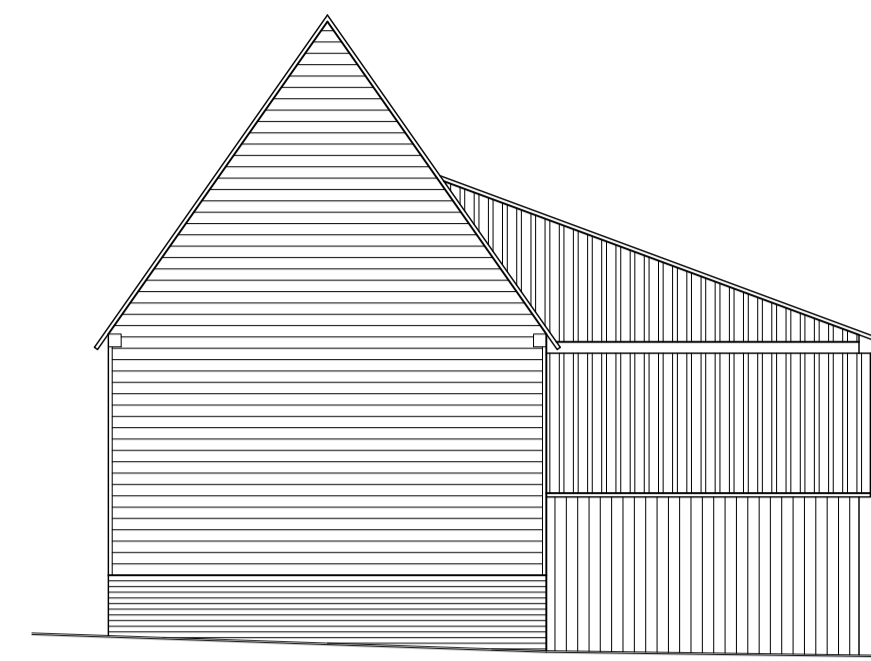
APPENDIX B

Tim Moll Architect Drawings

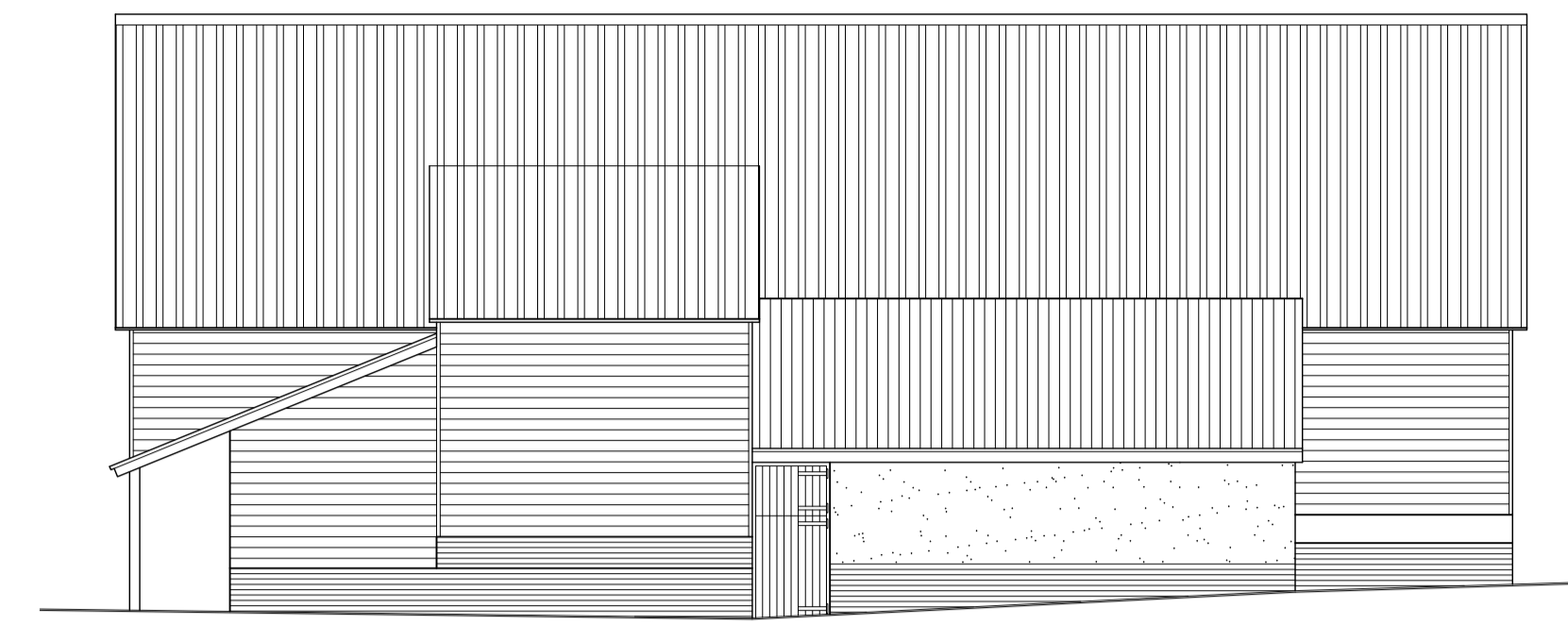


Front Elevation

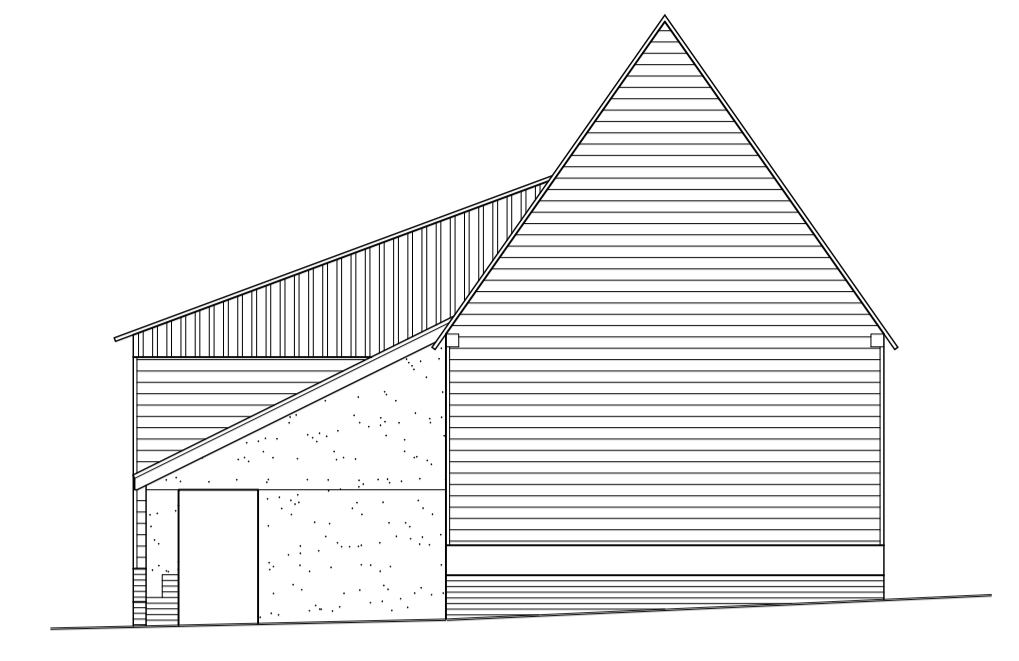
Existing Elevations
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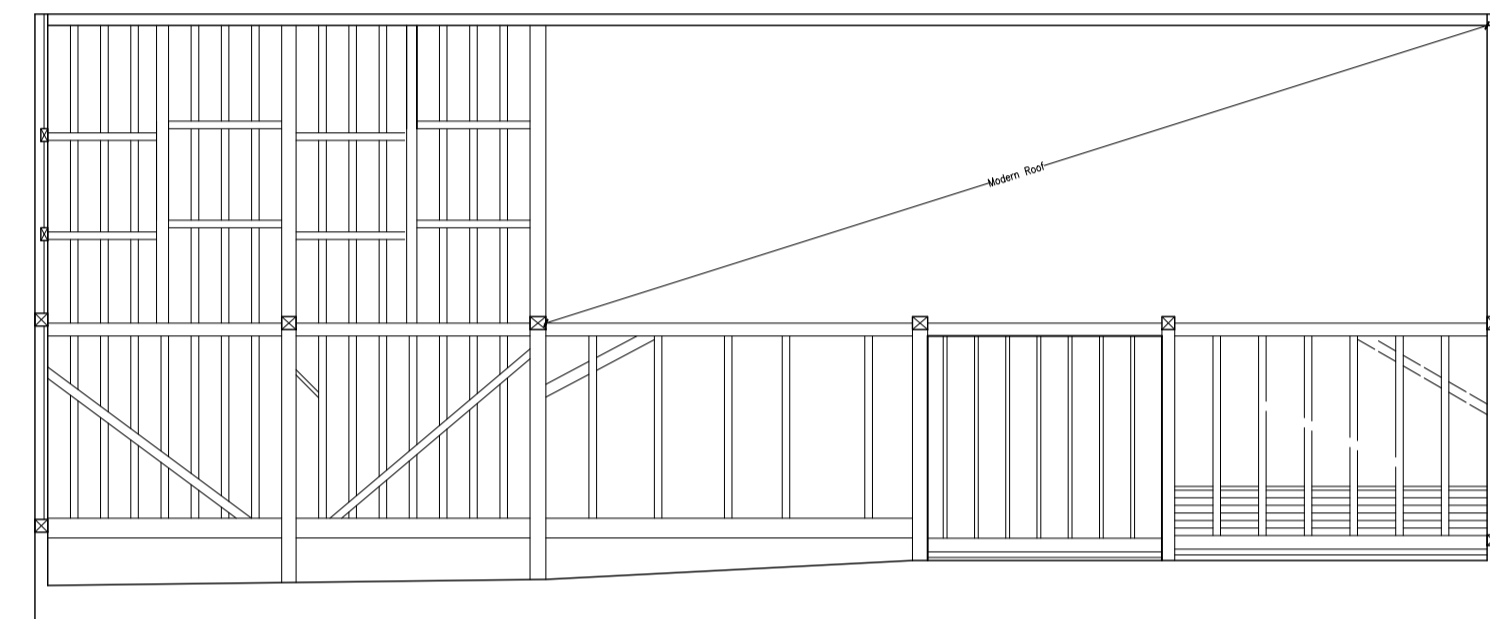
Side Elevation



Rear Elevation

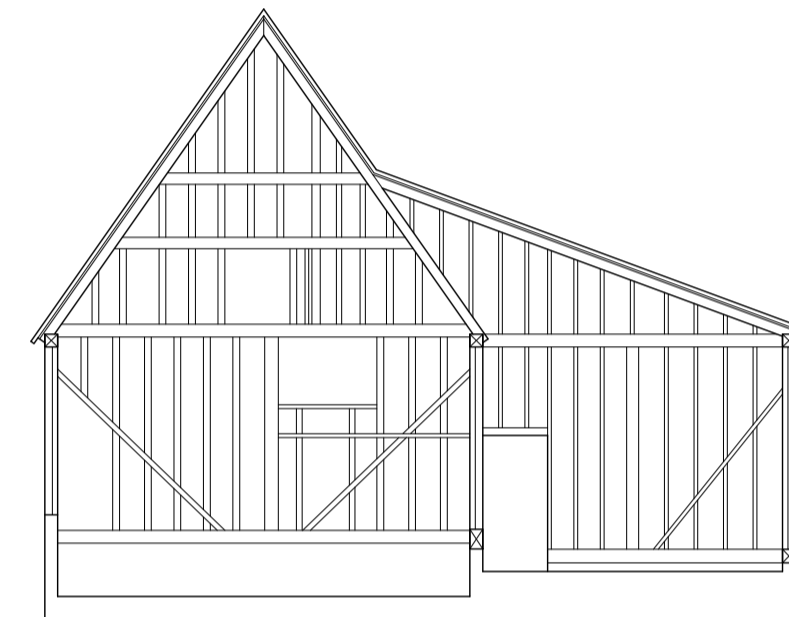
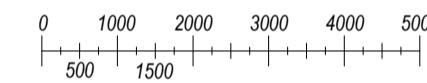


Side Elevation

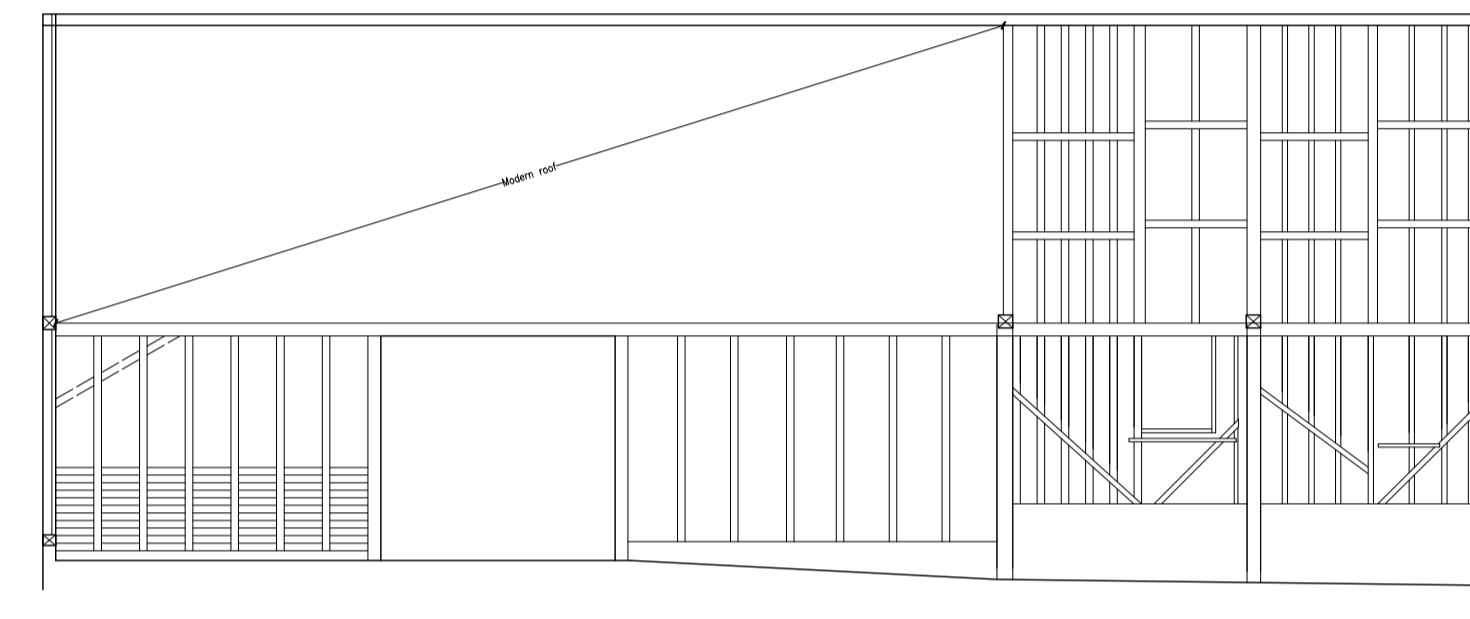


Rear Elevation

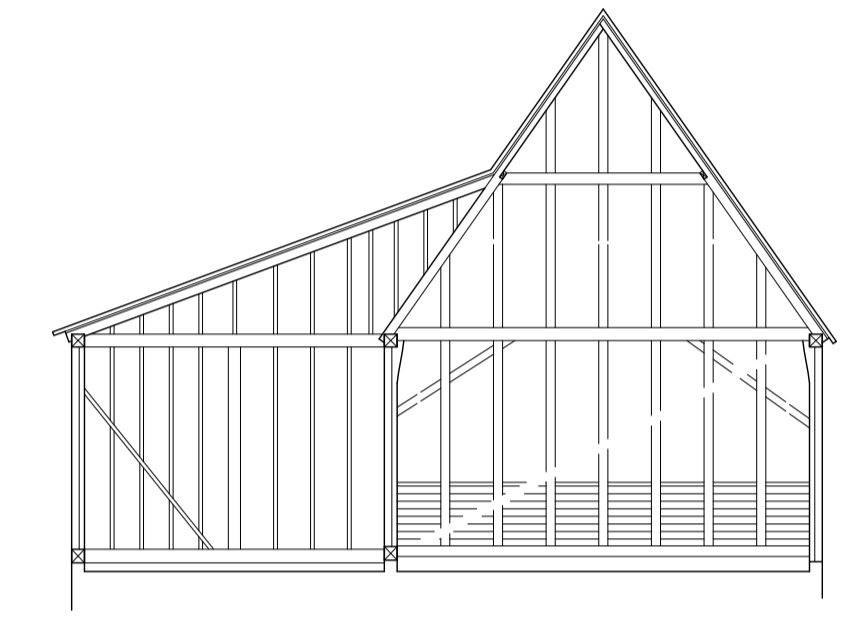
Existing Internal Elevations
Scale: 1:100



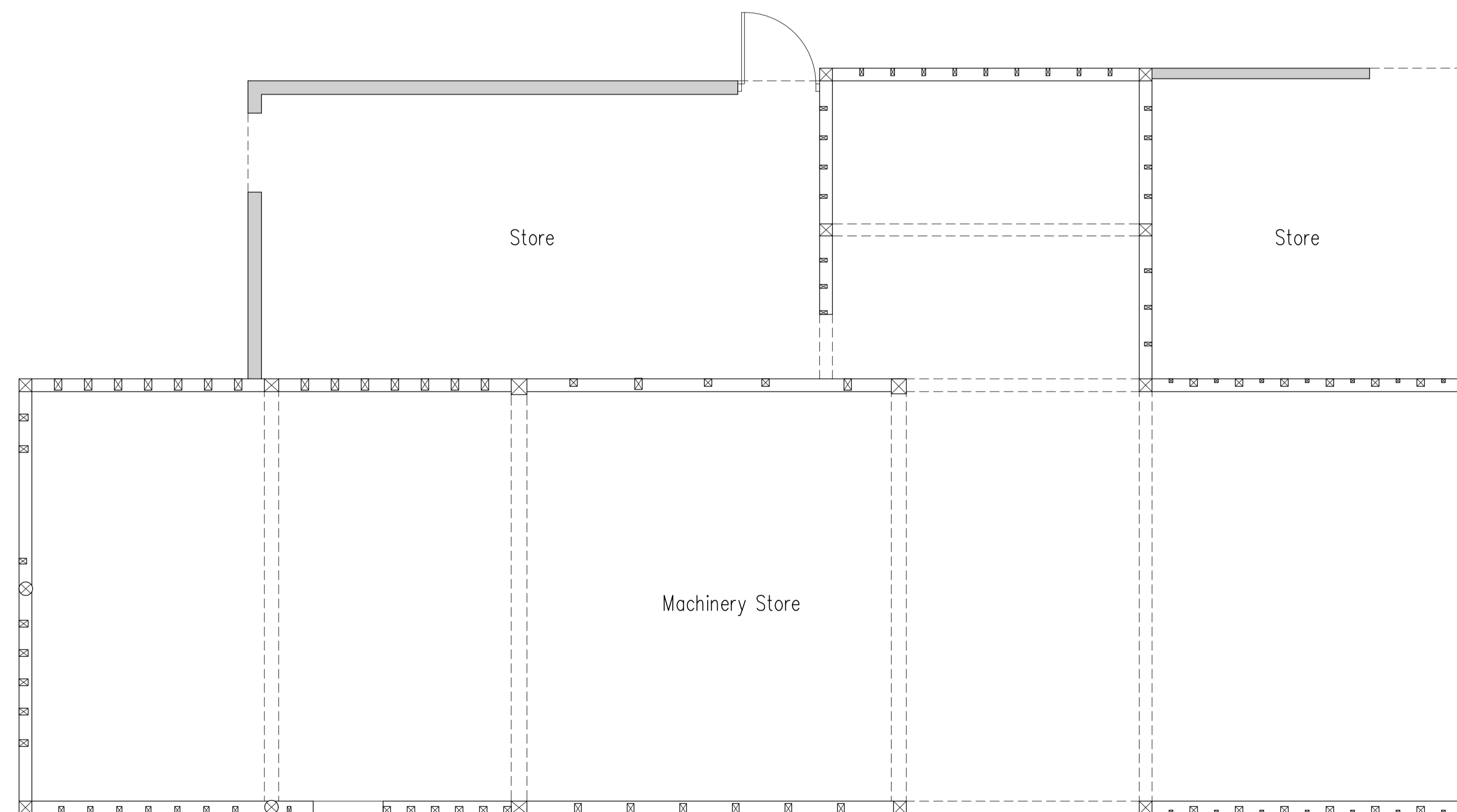
Side Elevation



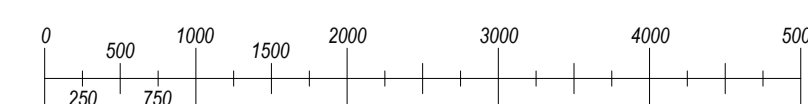
Front Elevation



Side Elevation



Existing Floor Plan
Scale: 1:50



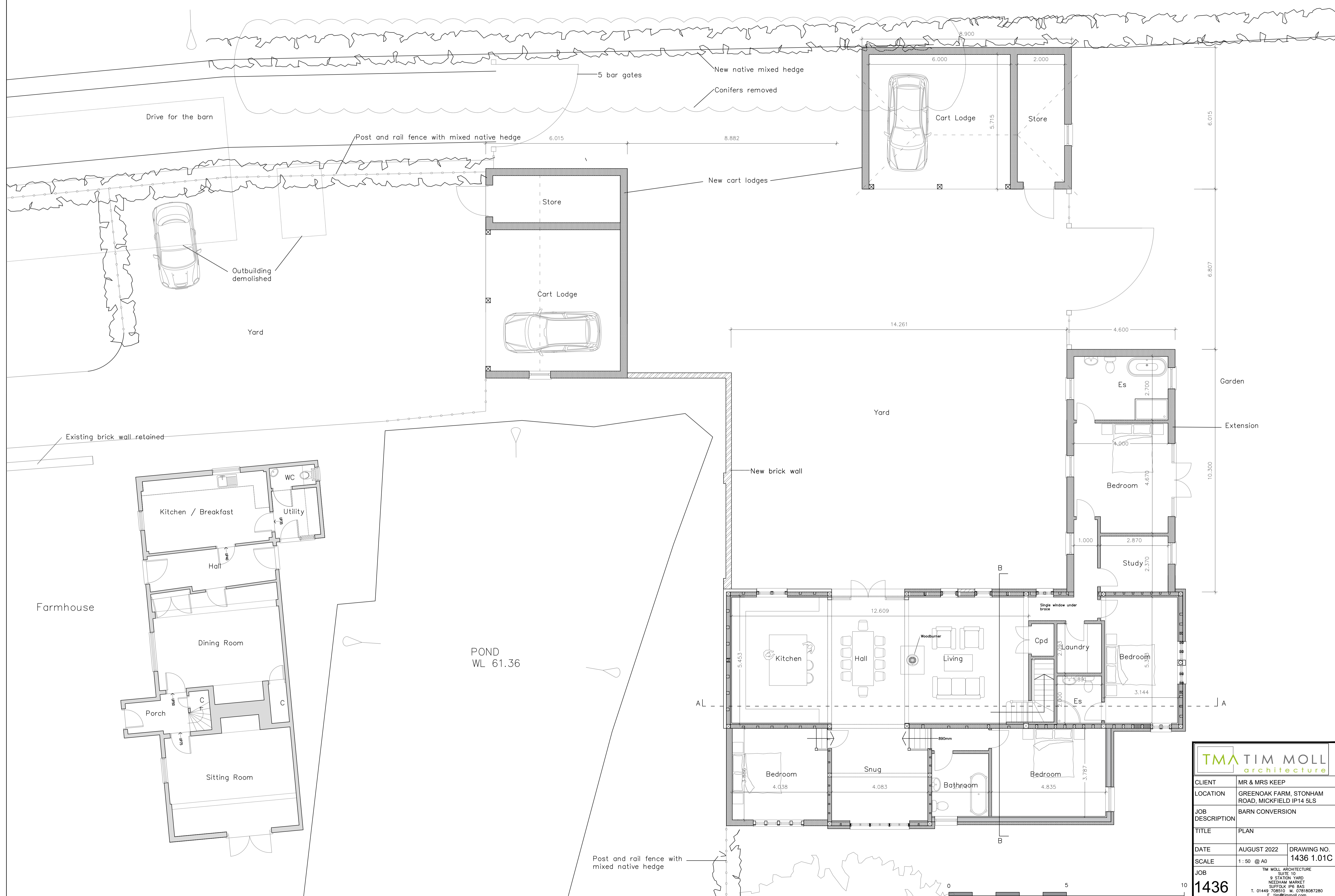
Tim Moll Architecture
Chartered Architect

JOB 1436

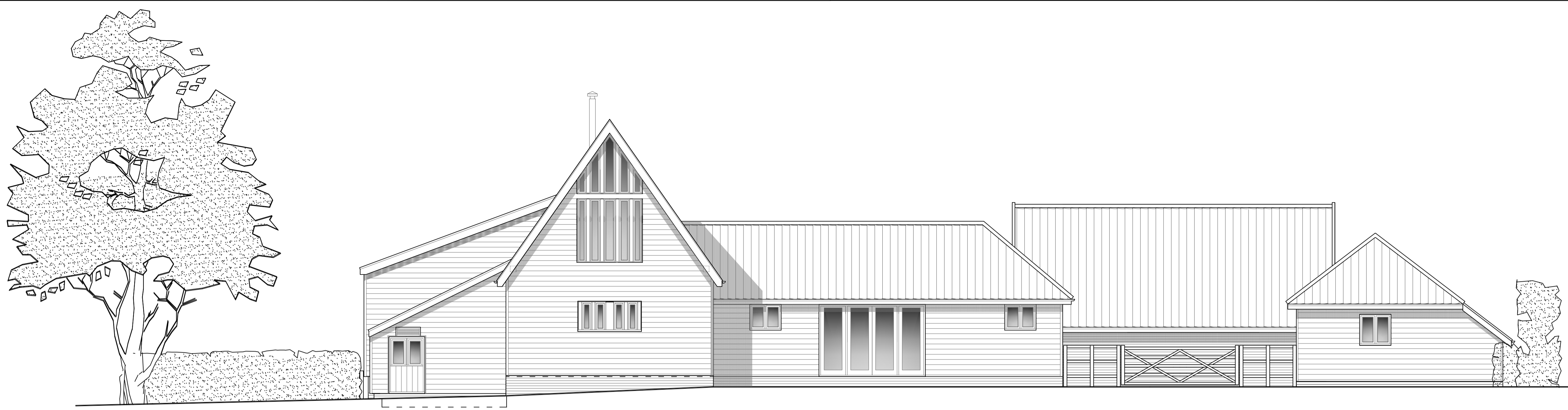
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E. tim@timmollarchitecture.co.uk

| | | | |
|-----------------|---|----------------|------------|
| CLIENTS | MR & MRS Keep | | |
| JOB LOCATION | GREEN OAK FARM, STONHAM ROAD, MICKFIELD, SUFFOLK, IP14 5LS | | |
| JOB DESCRIPTION | EXTENSION & ALTERATIONS | | |
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| MAY 2022 | AS SHOWN @ A1 | .04B | MJM |

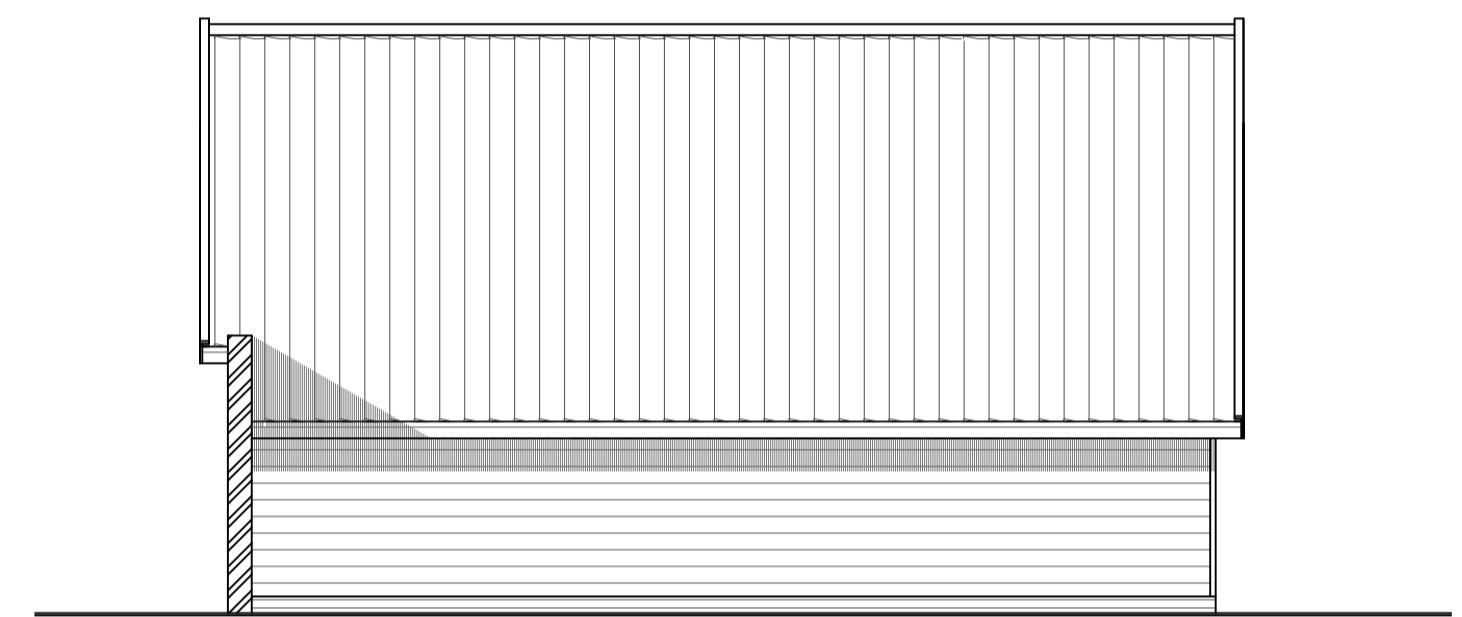
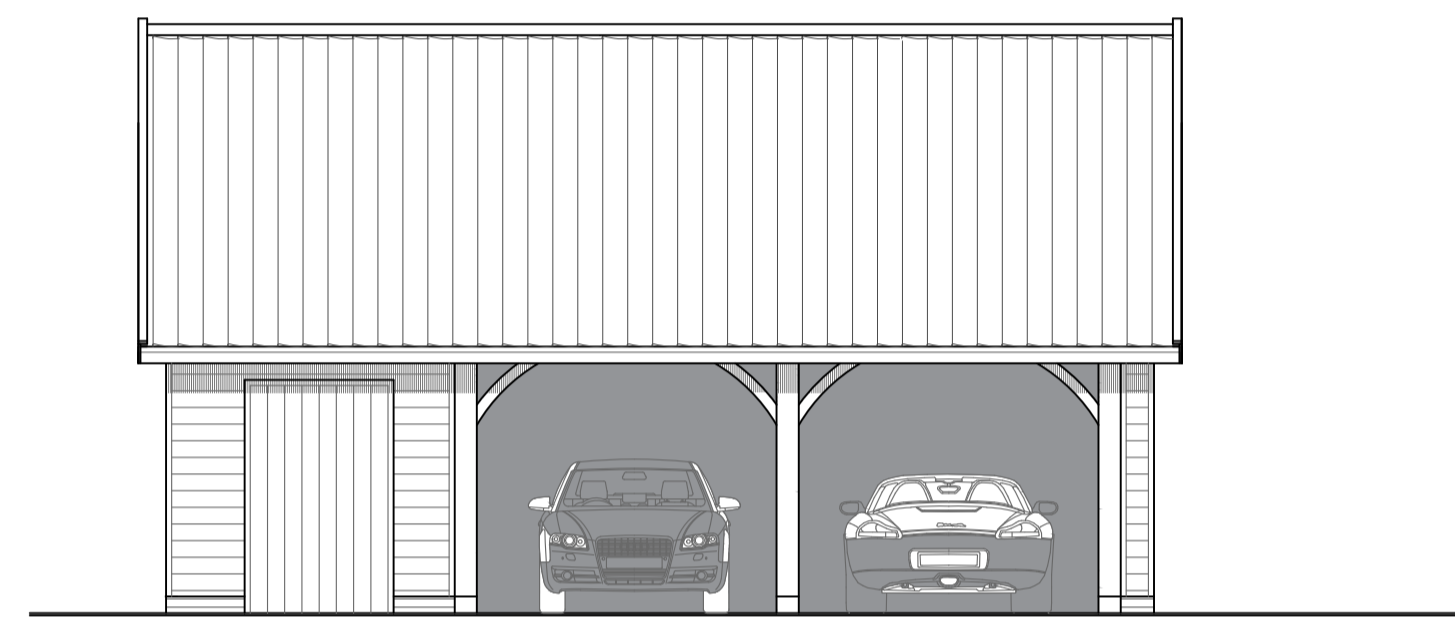
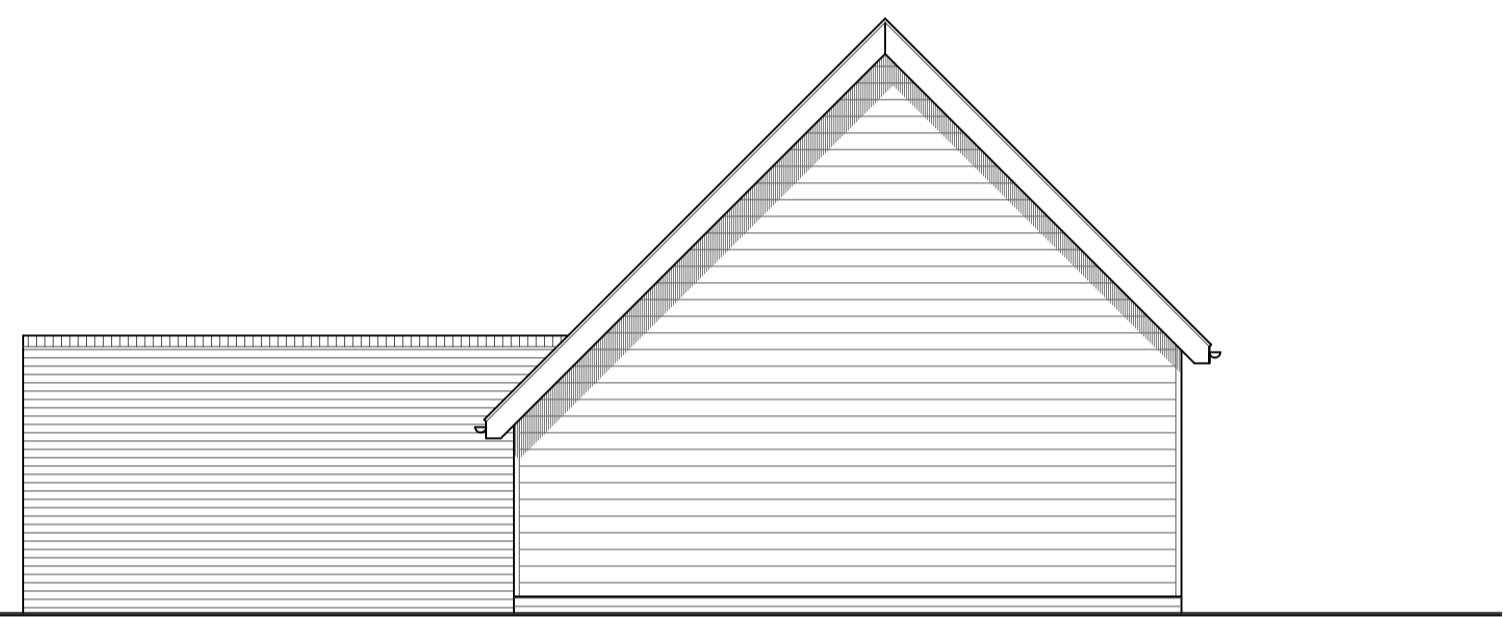
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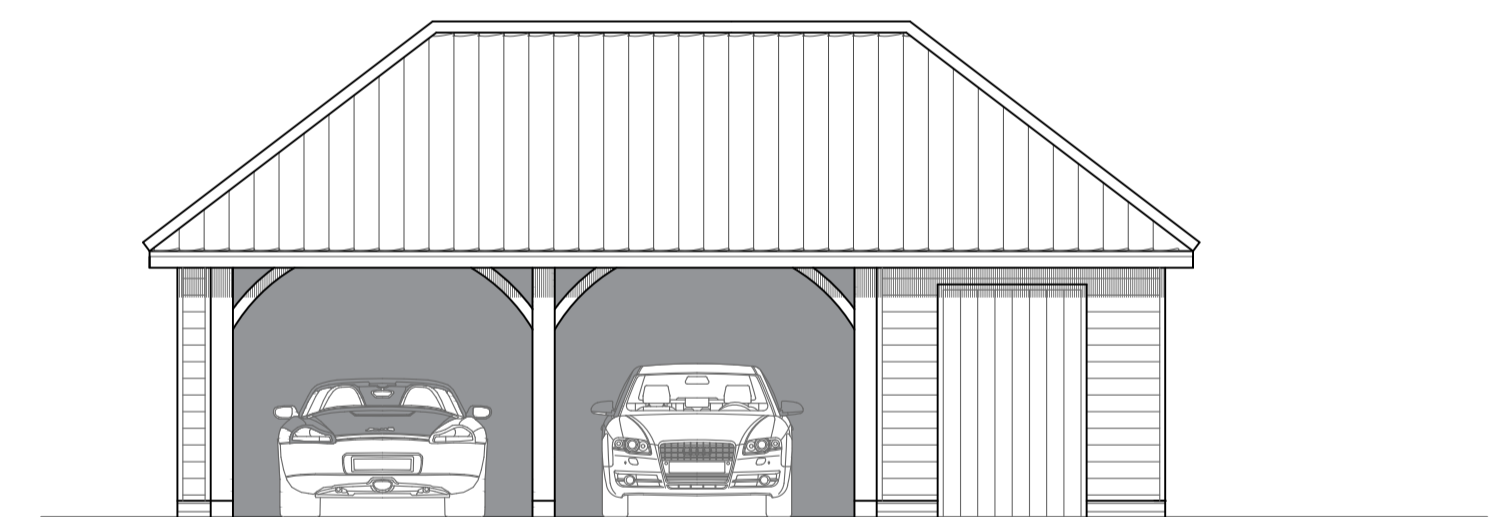
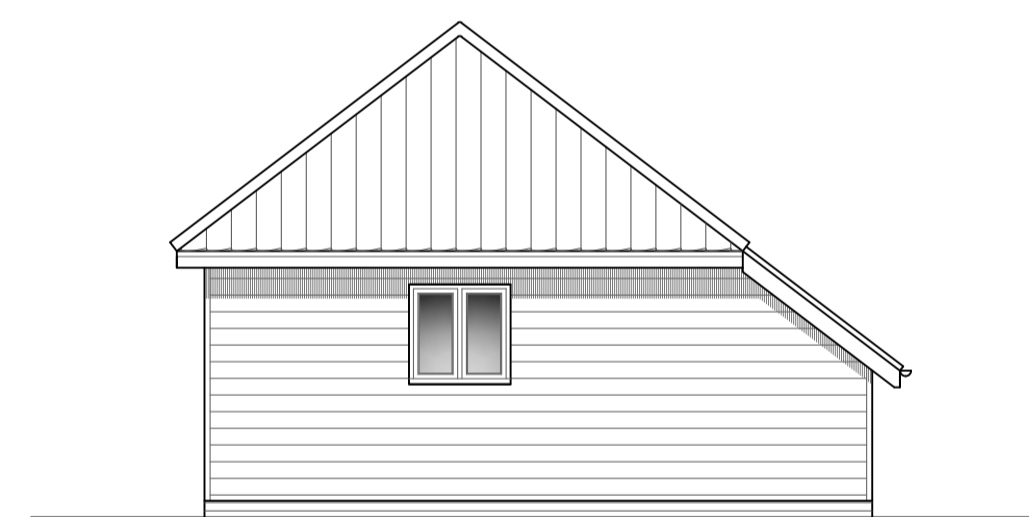
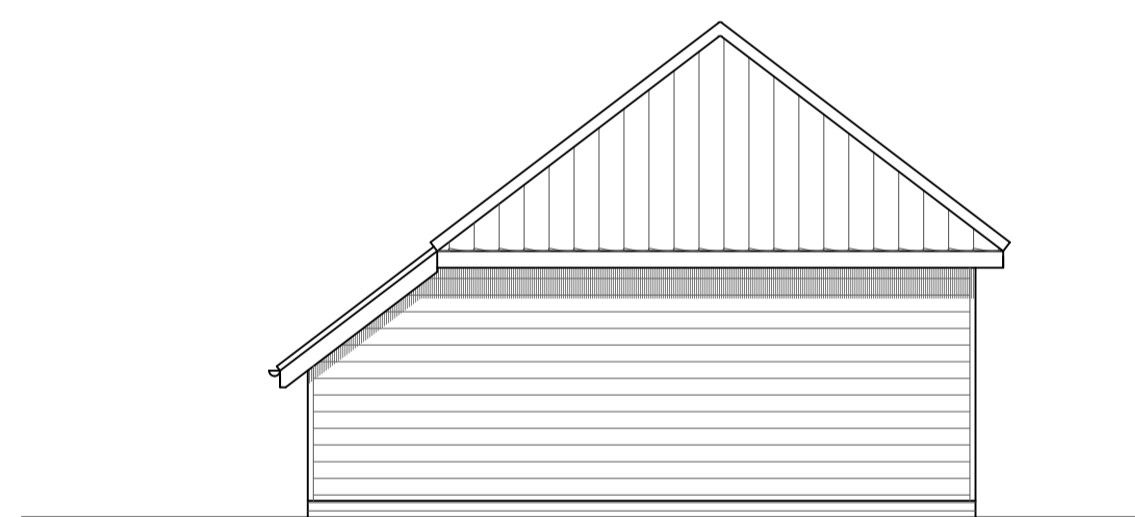
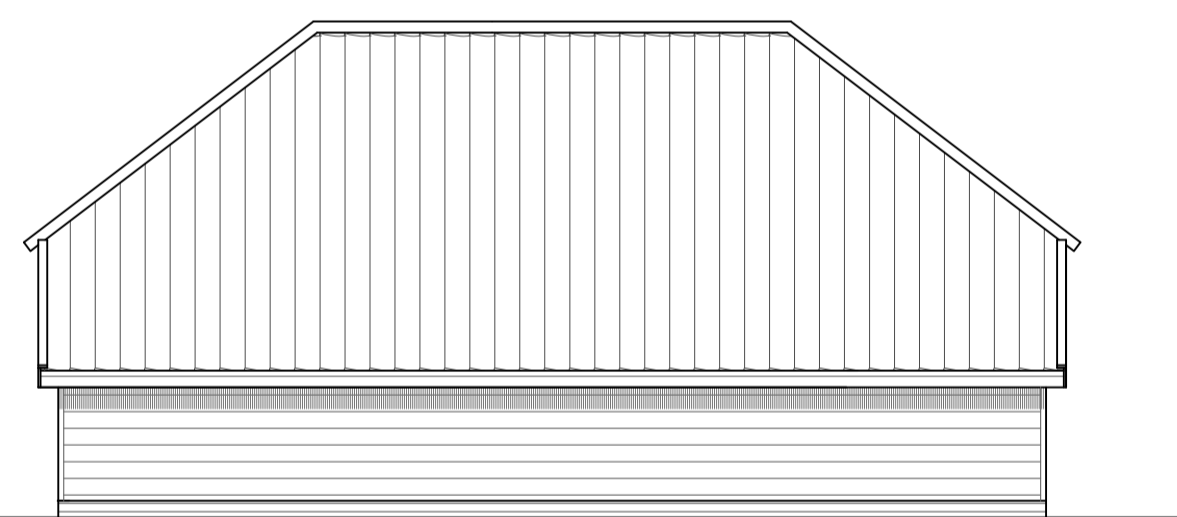
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| TITLE | PLAN |
| DATE | AUGUST 2022 |
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| <small>TIM MOLL ARCHITECTURE SUITE 10 9 STATION YARD NEEDHAM MARKET SUFFOLK IP6 6AS T. 01449 708510 M. 07818 8087280 E. tim@timoll.com</small> | |



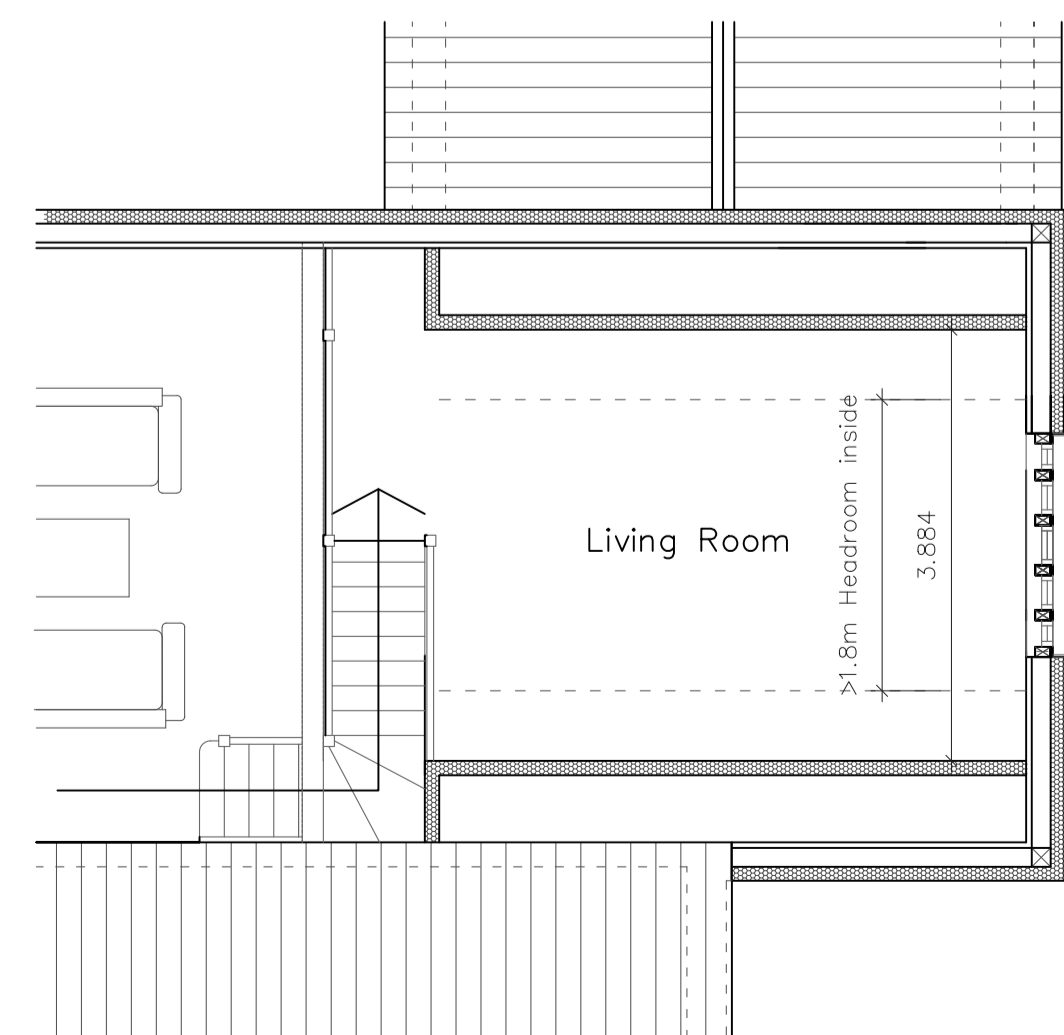
Proposed Side Elevation East



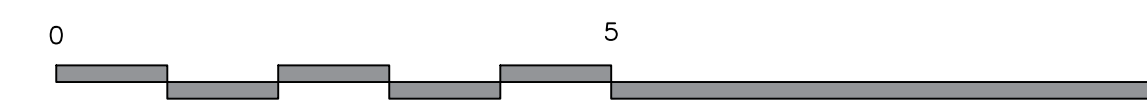
Proposed Front Cart Lodge Elevation



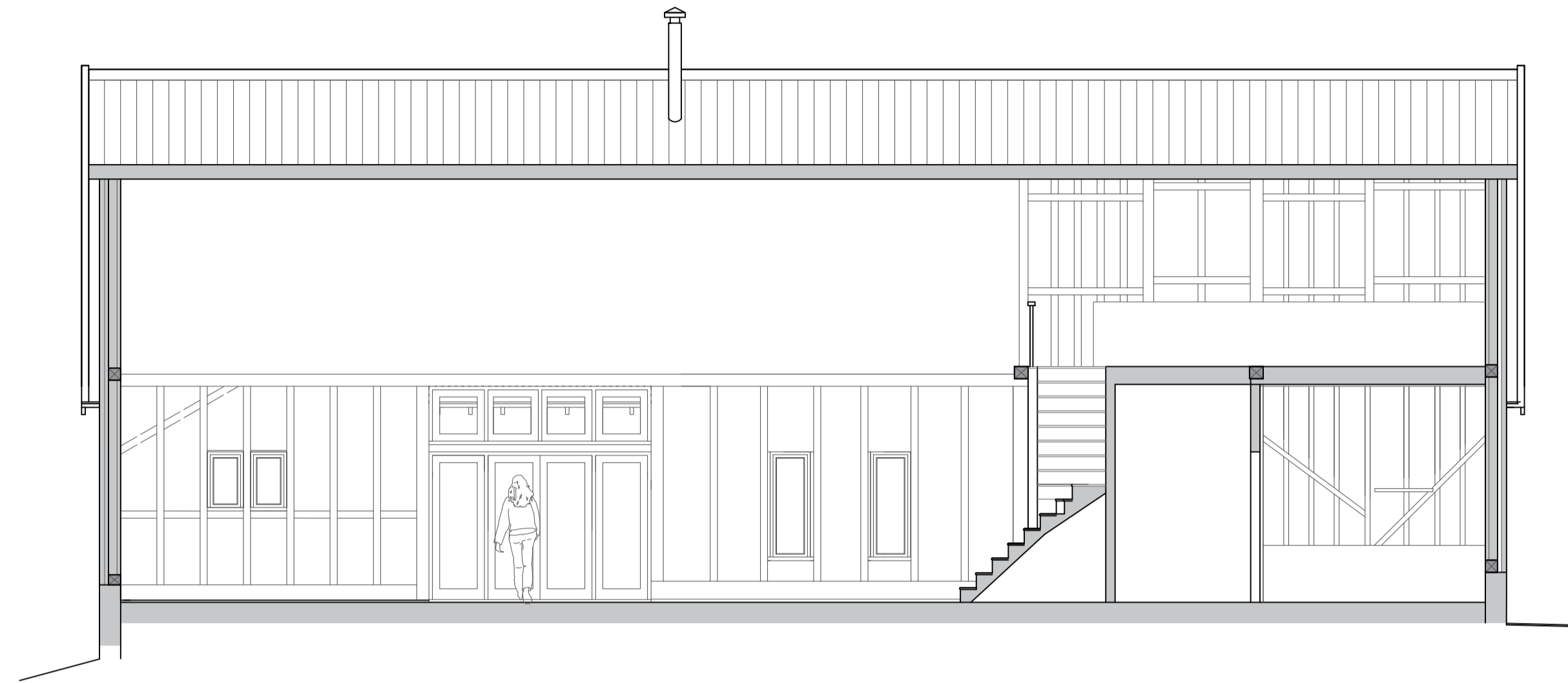
Proposed Rear Cart Lodge Elevation



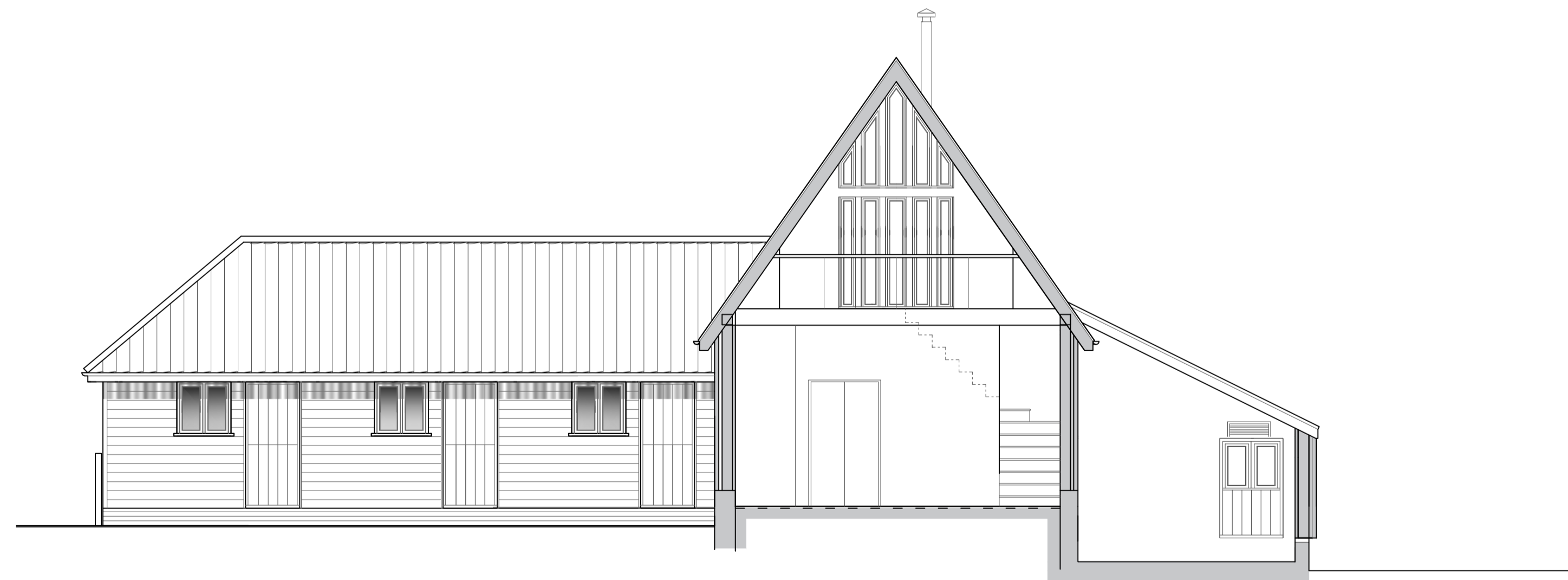
Proposed First Floor



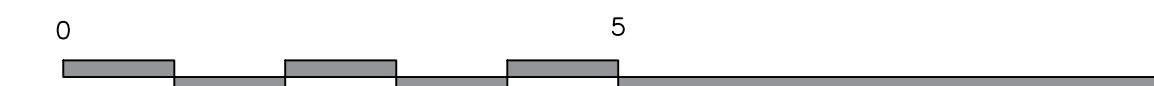
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| CLIENT | MR & MRS KEEP |
| LOCATION | GREENOAK FARM, STONHAM ROAD, MICKFIELD IP14 5LS |
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| TITLE | ELEVATIONS AND FF PLAN |
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| <small>TIM MOLL ARCHITECTURE SUITE 10 9 STATION YARD NEEDHAM MARKET SUFFOLK IP6 8AS T. 01449 708510 M. 07818 8087280 E. tim@timmoll.com</small> | |



Proposed Section AA



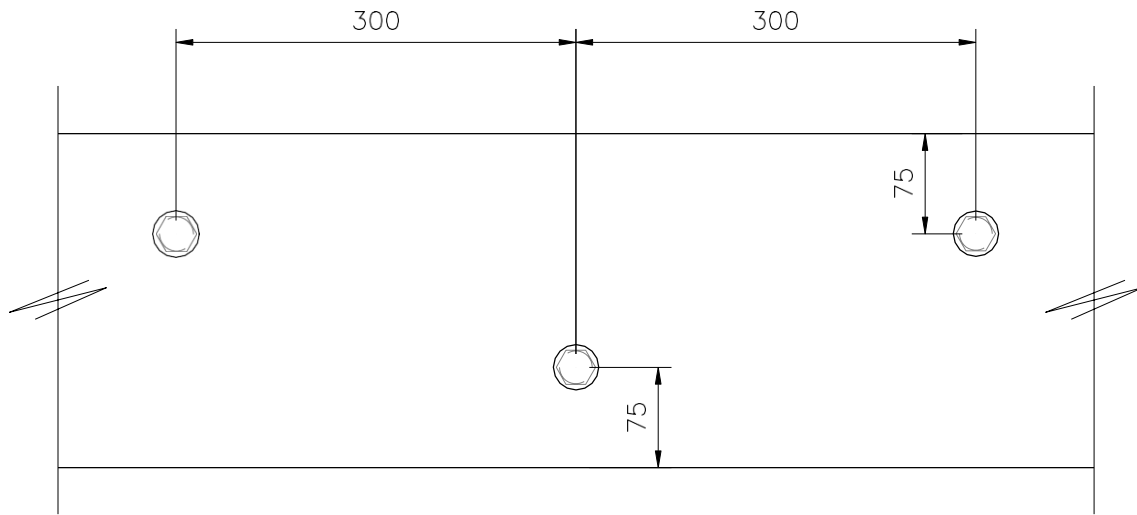
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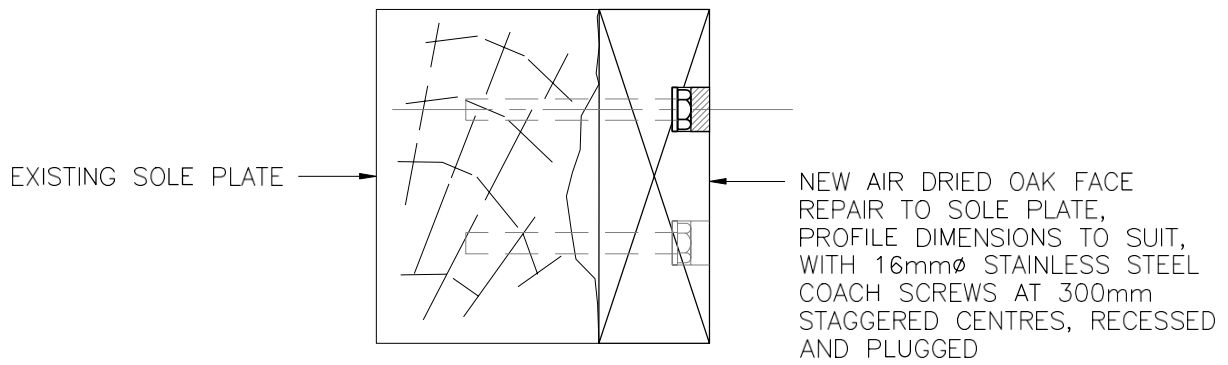
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| LOCATION | GREENOAK FARM, STONHAM ROAD, MICKFIELD IP14 5LS |
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APPENDIX C

Repair Details

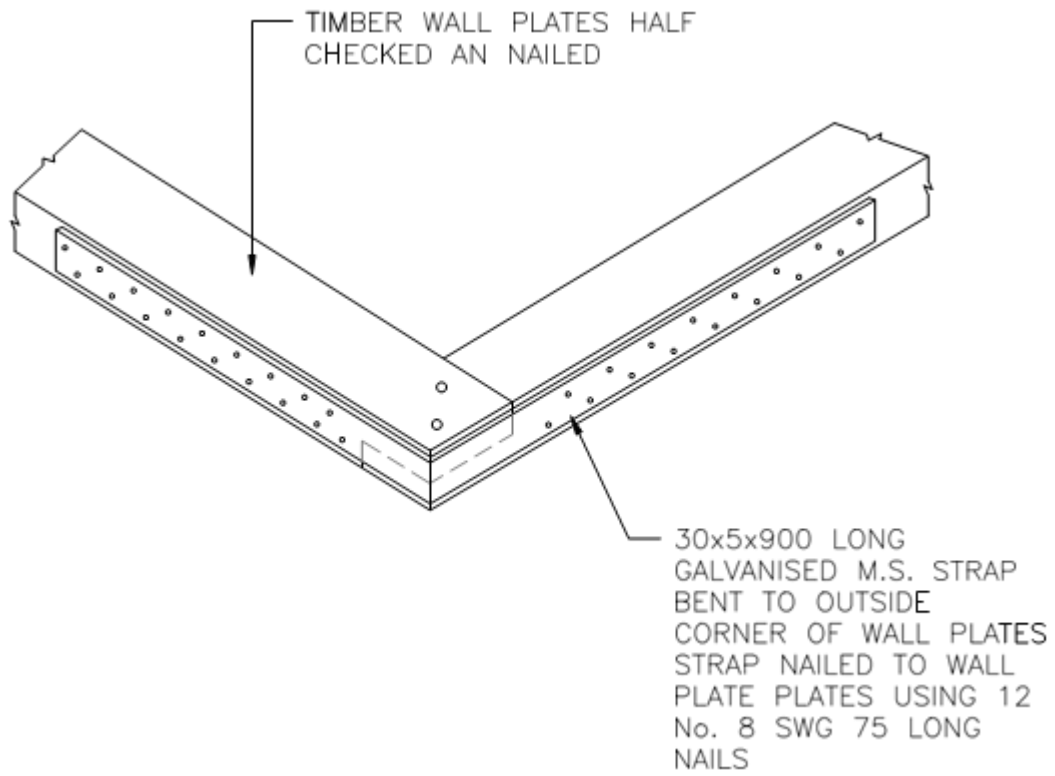


FRONT ELEVATION

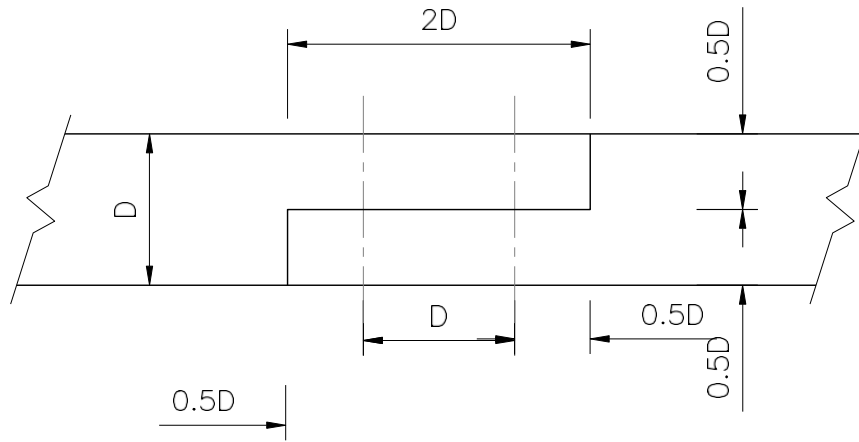


SECTION

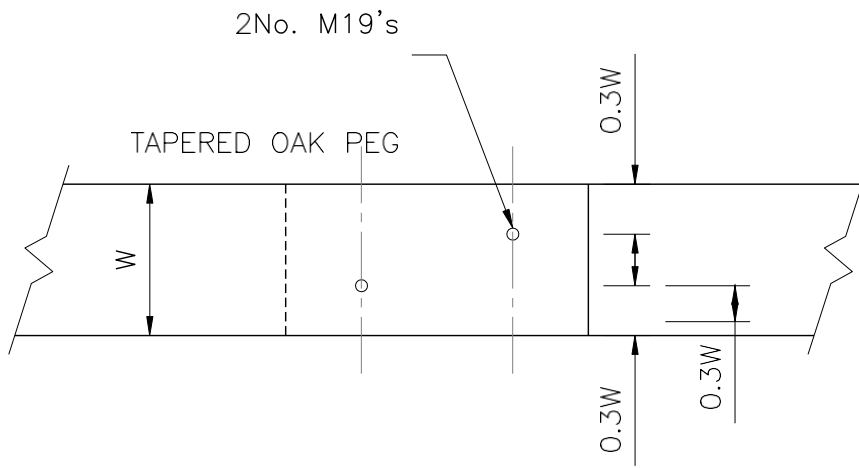
SOLE PLATE FACE REPAIR



WALL PLATE CORNER REINFORCEMENT

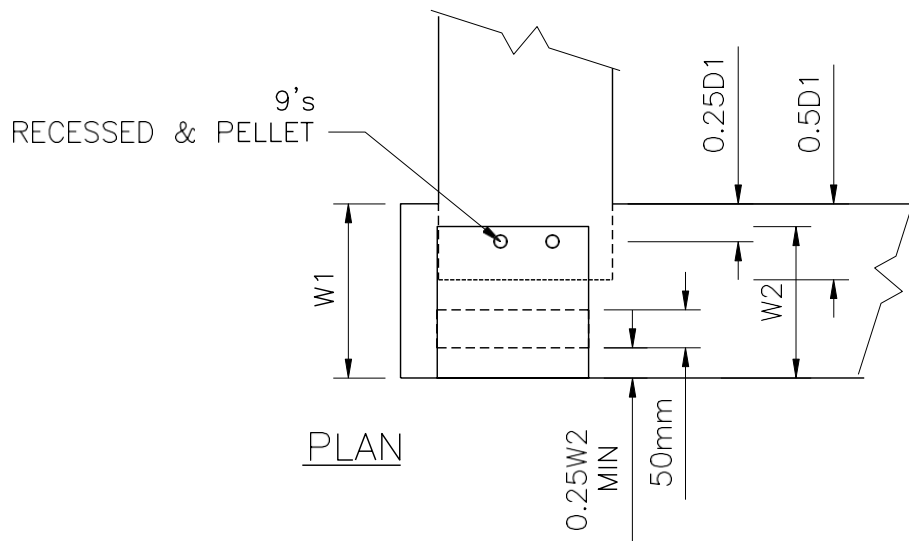
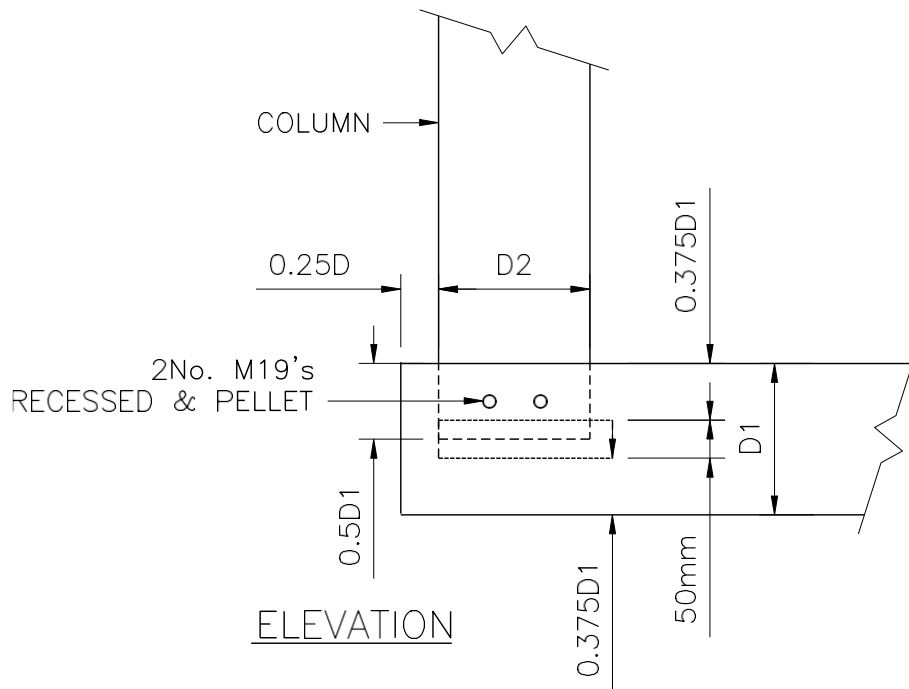


ELEVATION

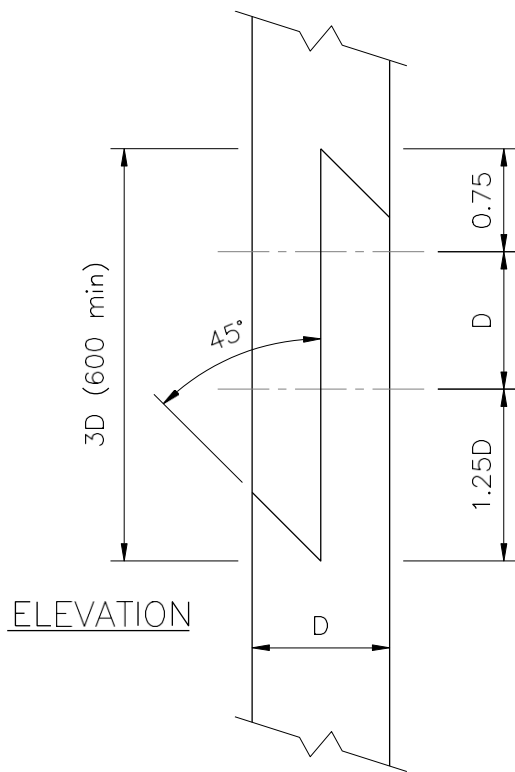


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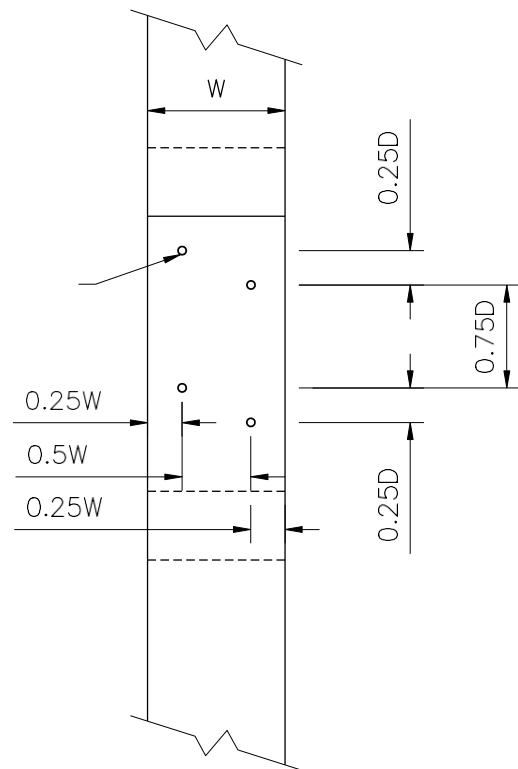
SOLE PALTE CONNECTION DETAIL



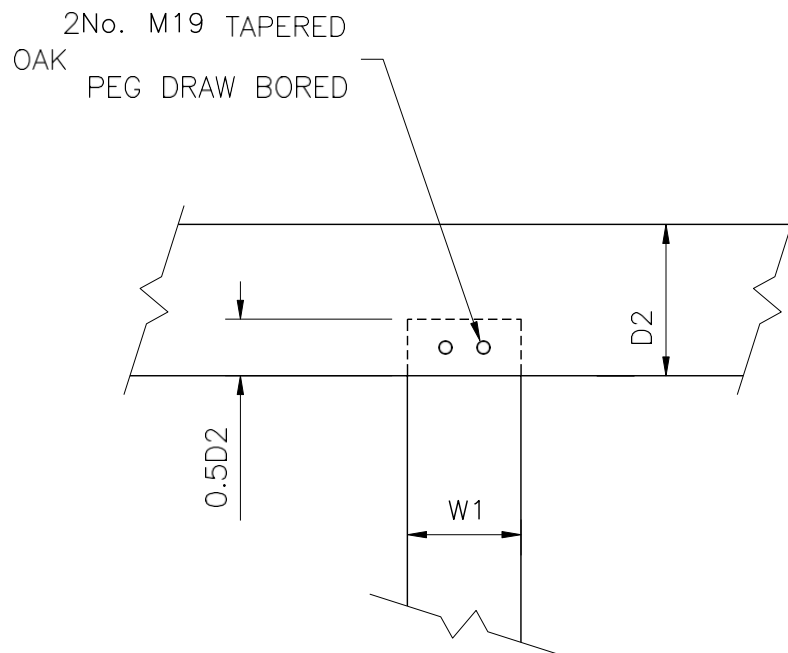
SOLE PALTE / CORNER POST CONNECTION



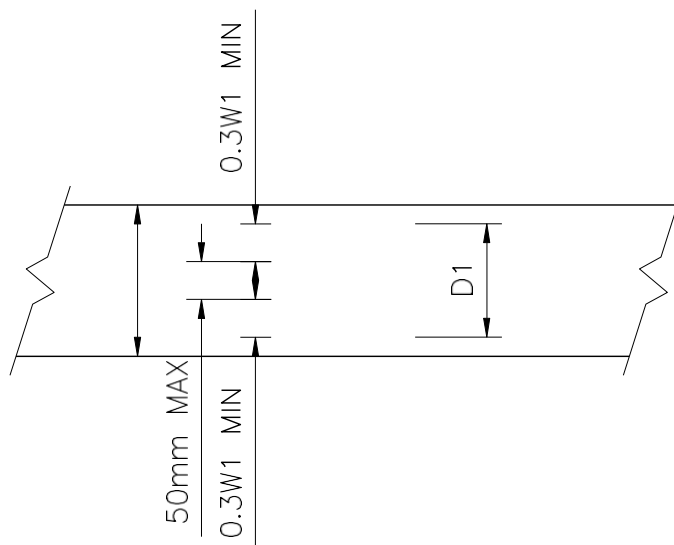
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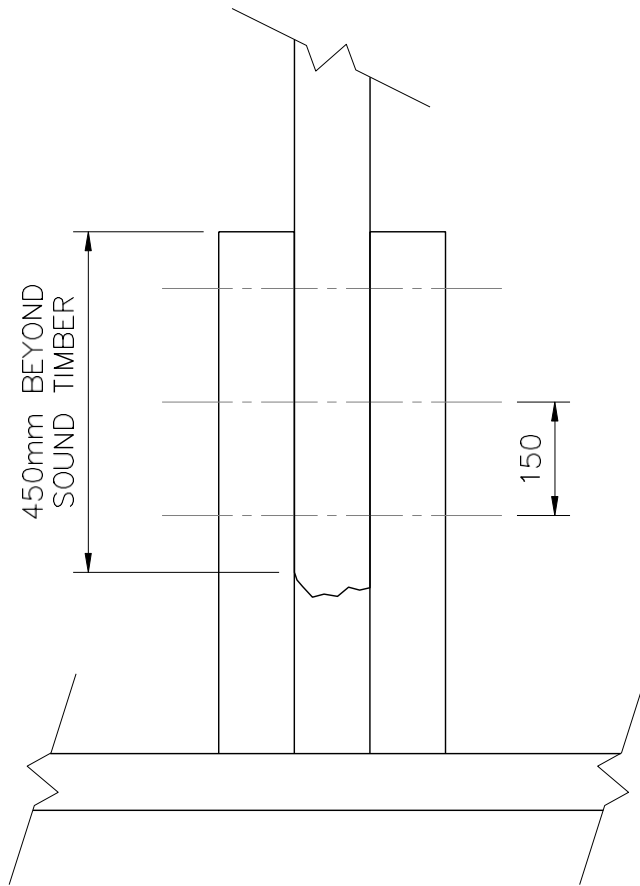
COLUMN SPLICE DETAIL



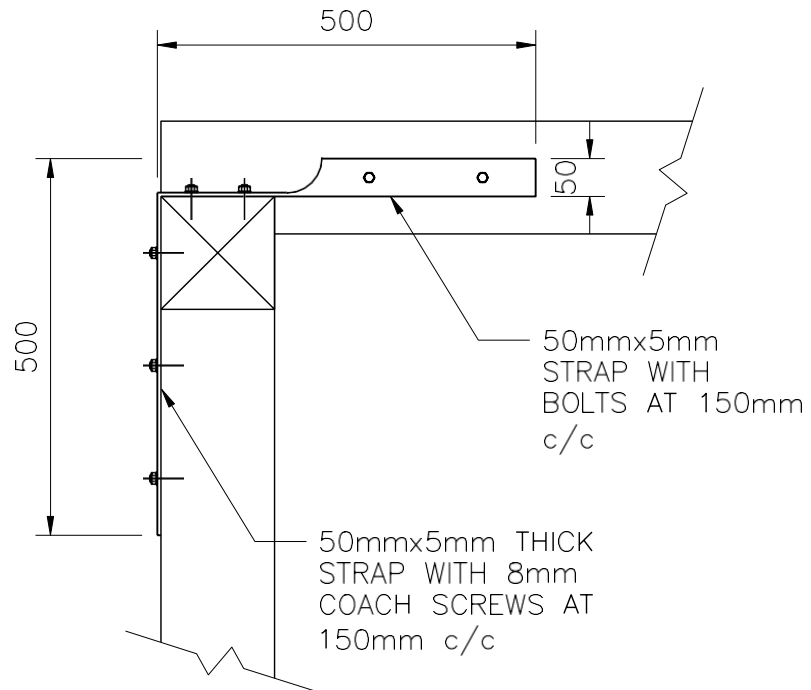
ELEVATION



WALL PLATE & SOLE PLATE TO POST TENON JOINT CONNECTION



TIMBER STUD PARTNER SPICE DETAIL



TIE BEAM TO POST RESTRAINT STRAP

APPENDIX D

Historic England List Entry

Official list entry

Heritage Category: **Listed Building**

Grade: **II**

List Entry Number: **1033202**

Date first listed: **26-Mar-1987**

Statutory Address 1: **GREENOAK FARMHOUSE, STONHAM ASPAL ROAD**

This List entry helps identify the building designated at this address for its special architectural or historic interest.

Unless the List entry states otherwise, it includes both the structure itself and any object or structure fixed to it (whether inside or outside) as well as any object or structure within the curtilage of the building.

For these purposes, to be included within the curtilage of the building, the object or structure must have formed part of the land since before 1st July 1948.

[Understanding list entries](https://historicengland.org.uk/listing/the-list/understanding-list-entries/) (<https://historicengland.org.uk/listing/the-list/understanding-list-entries/>)

[Corrections and minor amendments](https://historicengland.org.uk/listing/the-list/minor-amendments/) (<https://historicengland.org.uk/listing/the-list/minor-amendments/>)

Location

Statutory Address: **GREENOAK FARMHOUSE, STONHAM ASPAL ROAD**

The building or site itself may lie within the boundary of more than one authority.

County: **Suffolk**

District: **Mid Suffolk (District Authority)**

Parish: **Mickfield**

National Grid Reference: **TM 13576 61288**

Details

MICKFIELD STONHAM ASPAL ROAD TM 16 SW 2/151 Greenoak Farmhouse - - II

Former farmhouse, early or mid C16 with alterations of c.1600. Timber-framed and roughcast. Pantiled roof, once thatched; an axial chimney of red brick. 3-cell cross-passage entrance plan. 2 storeys and attics. Various windows, mainly of early C19: a casement in the hall with transoms and boarded shutters; small-pane sashes in the parlour cell. A C19 4-panelled entrance door at cross-entry; at lobby-entrance position is a hipped slated porch with panelled door and shallow pediment above. At the service end is good C16 exposed framing. A pair of twin 4-centred arched doorways into the service rooms, which are now united. Arch-braced studwork and heavy unchamfered floor joists. Open fireplace in the hall and other alterations, probably of c.1600.

Listing NGR: TM1357661288

Legacy

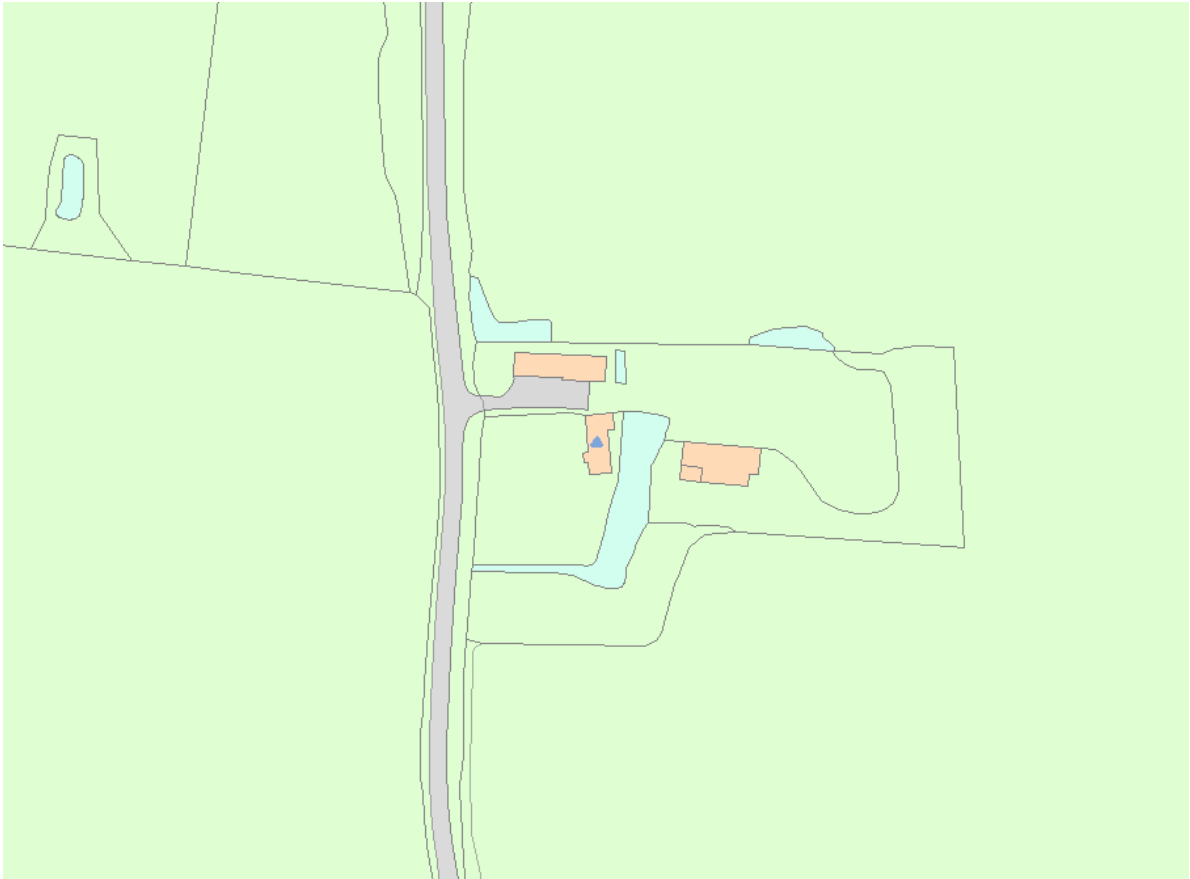
The contents of this record have been generated from a legacy data system.

Legacy System number: **279402**

Legacy System: **LBS**

Legal

This building is listed under the Planning (Listed Buildings and Conservation Areas) Act 1990 as amended for its special architectural or historic interest.



Map

This map is for quick reference purposes only and may not be to scale. This copy shows the entry on 04-Oct-2022 at 23:23:48.

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(<https://historicengland.org.uk/terms/website-terms-conditions/>).

End of official list entry