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Conversion of Outbuildings, Esp Hill Farm, Frog Lane, Holt, Wrexham

Structural Appraisal Report

June 2021

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1.0 Executive Summary

The outbuildings are single storey and extend from the gable elevation of the farm house. The outbuildings are T shaped in plan and are currently used for storage. External walls are of solid brickwork with various window and door openings with timber and concrete lintels over. The roof over the outbuilding comprise slates supported off traditional purlin and rafter roofs spanning between the gable elevations, internal solid walls, timber trusses and fabricated steel frames. The ground floor comprises a solid concrete slab. Foundation type and depth were not proven, however given the age of the buildings, it is assumed that shallow brick spread foundations are present.

The inspection was carried out during the morning of Monday 21st June 2021.

The overall condition of the outbuildings is considered to be fair.

The outbuildings show evidence of deterioration that is consistent with their age, ongoing use and a lack of routine maintenance over recent years.

The elevations appeared to be generally straight and plumb. Outwards leans were apparent in several areas which would have appeared to have resulted from roof spread. No distortions were apparent that would be attributable to foundation movements or settlement. Although the foundations were not exposed, it is apparent that they are satisfactory and would not require modification in the proposed scheme. All of the elevations will require localised repair and repointing as part of the conversion scheme. Lintels to openings generally comprise timber sections which have degraded over time. It would be prudent to replace all of the lintels as part of the conversion scheme to ensure long term durability.

No dpc is apparent. The brickwork is generally soft a susceptible to erosion resulting from rising damp, which is apparent in several areas internally. Therefore a new dpc should be installed as part of any conversion scheme. Any new dpc should carry an insurance backed guarantee.

The ground floors to the outbuilding generally comprise solid concrete ground bearing slabs. It is unlikely that the floors will have a suitable damp proof membrane or insulation and will also need to be adjusted to suit the proposed levels. Therefore, a new floor incorporating a dpm and insulation to modern standards will be required as part of the conversion scheme.

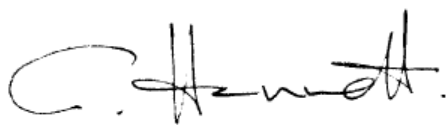
The condition of the roof over the outbuildings are generally fair with areas which are considered to be poor. The roof alignment shows several areas of significant sag which have resulted from deflection of undersized purlins and modified timber trusses. In several areas, weather penetration over an extended period has resulted in rot to timbers. Over the smaller barn, temporary propping has been introduced to prevent partial collapse. The felt membrane under the slated finishes has degraded and will need to be replaced. Although no widespread evidence of slipped slates was noted, daylight is clearly visible through finishes in several areas. The roof and its supports are considered to be beyond economic repair and wholesale replacement will be required to ensure long term durability.

Gutters and downpipes were intact and discharge into gulleys all of which appeared functional at the time of inspection. It would be prudent to carry out a full inspection of the drainage serving the property and carry out modifications/repairs as necessary.

The Clients, Adrian and Elizabeth Bellis-Marks, are seeking planning application to convert the outbuildings into additional accommodation, garages and stores.

The outbuildings are robustly constructed and are considered to be suitable for conversion into additional accommodation, garages and stores following repairs and alterations as necessary.

Report Compiled by:

A handwritten signature in black ink, appearing to read 'A. Hannett', with a stylized flourish at the end.

Andrew Hannett
BEng(Hons), CEng, MICE

2.0 Client's Brief

This report was commissioned by Blueprint Architectural Services acting on behalf of Adrian and Elizabeth Bellis-Marks in support of the proposed planning application to convert the outbuildings into additional accommodation, garages and stores. The purpose of the report is to identify whether the buildings are suitable for conversion and to confirm the extent of repairs required to ensure viability in the long term.

3.0 Inspection

3.1 General

The inspection was carried out during the morning of Monday 21st June 2021. The weather during the inspection was warm and dry. The inspection comprised a visual inspection of those elements of the outbuildings readily visible from ground level and from within the buildings. No excavations were undertaken to uncover buried elements and any notes on the condition of these elements are made based on the visible condition of the property. Testing requiring the use of specialist equipment or training, e.g. electrical systems, gas appliances, water systems, etc., has not been undertaken. Manhole covers were not lifted and drains were not tested.

The outbuildings are single storey and extend from the gable elevation of the farm house. The outbuildings are T shaped in plan and are currently used for storage. External walls are of solid brickwork with various window and door openings with timber and concrete lintels over. The roof over the outbuilding comprise slates supported off traditional purlin and rafter roofs spanning between the gable elevations, internal solid walls, timber trusses and fabricated steel frames. The ground floor comprises a solid concrete slab. Foundation type and depth were not proven, however given the age of the buildings, it is assumed that shallow brick spread foundations are present.

Elevations and rooms are referenced on Architect's Drawings – refer to Appendix B.

3.2 EXTERNAL INSPECTION

3.2.1 Front Elevation

The elevation comprises brickwork to full height with timber lintels to openings (see Photos 1 and 2). The roof over is finished with slate.

The overall condition of the elevation is considered to be fair.

Cracking is apparent extending diagonally upwards from both ends of the lintel on the gable elevation. The cracking was noted as up to 3mm wide and has resulted from degradation to the timber lintel over the large opening (see Photo 3).

Deterioration is apparent to the timber lintel over the large opening on the gable with a significant split at one end and apparent section losses throughout (see Photo 3). The bed joints over the opening show a significant sag at mid span. The timber lintels to the smaller openings all show evidence of slight degradation, however no distress was apparent.

The pointing to the masonry is lime based and appeared to be generally intact and sound except on the gable where erosion up to 30mm deep was noted. Erosion of brick units was also apparent on the gable due to weathering of relatively soft units.

The roof over is in generally good condition with no evidence of missing, slipped or cracked slates apparent. The alignment of the ridge shows slight sagging between supports along the full length. The sagging is worst in the three bays closest to the farmhouse which are in the poorest condition internally. A mortar flashing is provided between the roof and the farmhouse elevation. The flashing was noted as being in good condition. The mortar to the verge on the gable is cracking but intact. The guttering and downpipes were intact. The downpipes discharge into gulleys all of which appeared functional.

The elevation appeared to be reasonably straight and shows a slight outwards lean at up to 1.5% along the face of the short leg. The gable to the end of the long leg appeared generally plumb and straight.

No dpc was apparent.

3.2.2 Left Hand Side Elevation

The elevation comprises brickwork to full height with timber lintels to openings. The roof over is finished with slate (see Photo 4). The central section appears to have been rebuilt in past indicated by a different brick type.

The overall condition of the elevation is considered to be fair.

Minor cracking up to 1mm wide was noted extending up from the low level opening at the right hand end. The cracking appeared relatively recent and may have resulted from the general degradation of the timber lintel over the opening.

Deterioration is apparent to the timber lintels over all of the openings, though no section losses were apparent.

The mortar pointing is cement based and appears to have been recently renewed.

The roof over is in generally good condition with no evidence of missing, slipped or cracked slates apparent. The alignment of the ridge shows slight sagging between supports at the right hand end. The guttering and downpipes were intact. The downpipes discharge into gulleys all of which appeared functional.

The elevation appeared generally straight and plumb, though it should be noted that a significant proportion of the elevation was hidden by vegetation.

No dpc was apparent.

3.2.3 Rear Elevation

The elevation comprises brickwork to full height with timber lintels to openings (see Photo 5). The roof over is finished with slate. The lean-to roof is finished in asbestos cement sheets and is due to be demolished and is considered to be outside the scope of this report.

The overall condition of the elevation is considered to be fair.

Cracking is apparent extending vertically at both ends of the gable down from eaves level. The cracking was noted as up to 3mm wide and would appear to have resulted from roof spread (see Photo 6). Further cracking up to 3mm wide was also apparent to the return adjacent to the gable. Rot was apparent to the exposed ends of the purlins and wall plates with significant section losses noted to the purlin ends.

The pointing to the masonry is lime based and appeared to be generally intact and sound. Isolated areas of losses up to 30mm were apparent particularly at low level.

The roof over is in generally good condition with no evidence of missing, slipped or cracked slates apparent. The alignment of the ridge shows slight sagging between supports along the full length. The sagging is worst in the three bays closest to the farmhouse which are in the poorest condition internally. A mortar flashing is provided between the roof and the farmhouse elevation. The flashing was noted as being in good condition. The mortar to the verge on the gable is cracking but intact. The guttering and downpipes were intact. The downpipes discharge into gulleys all of which appeared functional.

The visible parts of the elevation appeared to be reasonably straight and plumb. The side of the return shows an outwards lean at up to 1.5% probably due to roof spread.

No dpc was apparent.

3.2.4 Right Hand Side Elevation

The elevation comprises brickwork to full height with timber lintels to openings. The roof over is finished with slate (see Photo 7).

The overall condition of the elevation is considered to be fair.

No significant cracking was apparent to the elevation at the time of inspection.

Deterioration is apparent to the timber lintels over all of the openings, though no section losses were apparent.

The mortar pointing is cement based and was noted as hard and flush with the brickwork generally. Pointing losses and erosion to brick units is apparent at low level particularly at the left hand end.

The roof over is in generally good condition with no evidence of missing, slipped or cracked slates apparent. The alignment of the ridge shows slight sagging between supports at the left and right hand ends. The sagging at the right hand end is particularly severe. The guttering and downpipes were intact. The downpipes discharge into gulleys all of which appeared functional.

The elevation appeared generally straight and plumb except at the left hand end where an outwards lean of up to 2% was noted.

No dpc was apparent.

3.3 INTERNAL INSPECTION

3.3.1 Store

The Store is located at the end of the longer leg of the outbuilding. The room has tiled finishes to the walls, timber panel finishes to the ceiling and a concrete slab floor. The roof above the ceiling comprises traditional timber purlin and rafter construction. The roof void is accessed via a hatch close to the internal wall.

The overall condition of the room is considered to be good/fair.

Minor cracking was apparent to tiled finishes extending to ceiling level from the window opening. The cracking was noted as up to 2mm wide and appeared fairly longstanding.

The roof over the room appeared to be in generally fair condition. The felt membrane has degraded significantly and is now torn and drooping down (see Photo 8). Staining is apparent to the rafters and purlins though all areas appeared dry at the time of inspection. No daylight was visible through finishes. A slight sag was apparent in the purlins which is consistent with that noted externally.

The walls were noted as generally straight and plumb and the floor generally level though slightly uneven.

3.3.2 WC

The WC is located at the end of the longer leg of the outbuilding. The room has lime washed brick external walls, a block internal wall, a sloping rafter roof over and a concrete slab floor.

The overall condition of the room is considered to be fair.

Minor cracking was apparent above the opening to the end elevation (see Photo 9). The cracking was noted as less than 1mm wide and appeared longstanding. Erosion to brickwork units was apparent at low level particularly on the end elevation wall (see Photo 10). This type of defect is typically attributable to rising damp and soft units. This type of defect is not uncommon on outbuildings of this age. The erosion is quite deep in places and localised repairs will need to be implemented. Lintels to openings comprise timber sections which all appeared to be in good condition.

The roof over the room appeared to be in generally fair condition. It is apparent that a lath and plaster ceiling has been removed in the past (see Photo 11). The felt membrane has degraded and is torn in several locations. Staining is apparent to timbers, though all areas were noted as dry at the time of inspection.

The walls were noted as generally straight and plumb and the floor generally level though slightly uneven.

3.3.3 Barn

The large barn occupies the majority of the long leg of the outbuilding. The room has part tiled and part rendered walls and a concrete slab floor. The roof over comprises traditional timber purlin and rafter construction supported off a series of timber trusses, frames and fabricated steel frames. A timber boarded ceiling is provided over part of the room.

The overall condition of the room is considered to be fair.

Dislodged brickwork was apparent at the end of the steel lintel at the top end of the room (see Photo 12). A section of brickwork above the lintel over the supporting pier is cracked and slightly dislodged, possibly resulting from an impact on the elevation. The lintels to openings all appeared to be in good condition with no significant defects apparent.

The roof over the room appeared to be in generally fair condition with several areas noted as poor (see Photo 13). Several of the timber trusses/frames supporting the roof show evidence of significant sagging at midspan. It is apparent that several of the trusses/frames have been modified in the past – some of which have weakened the structure. The purlins appear to be slightly undersized and show evidence of sagging between supports which is reflected in the alignment of the ridge line noted externally. The purlins generally have very little bearing onto their supports and some movement is apparent in scarf joints where present. Timbers around the intersection of the roofs show evidence of section losses resulting from rot following weather penetration (see Photo 14). A purlin supporting valley blades shows section losses along the top edge possibly due to insect infestation. The felt membrane has degraded and is torn and hanging down in several locations. Staining is apparent to timbers, though all areas were noted as dry at the time of inspection. Significant repairs will have to be implemented to ensure long term durability.

The walls were noted as generally straight and plumb. The floor was noted as generally level though slightly uneven except for several bays at one end of the room which show a slight slope to the side elevation.

3.3.4 Barn

The small barn occupies the majority of the short leg of the outbuilding. The room has part rendered walls and a concrete slab floor. The roof over comprises traditional timber purlin and rafter construction supported off a series of timber trusses. A lean-to roof finished with asbestos cement sheets cut into the slate roof on one side. The lean-to roof is to be removed and is outside the scope of the report, however its effect on the main roof will be noted.

The overall condition of the room is considered to be fair/poor.

Severe cracking was apparent to render finishes on the wall at the rear of the room. The render has also extensively debonded indicative of severe rising damp. The exposed brickwork shows evidence of erosion to units. The lintels to openings all appeared to be in good condition with no significant defects apparent.

The roof over the room appeared to be in generally poor condition with evidence of severe degradation to timbers at the intersection with the lean-to roof. It is apparent that weather penetration has continued over a very long period with severe rot to the rafters, purlins and supports locally. In several areas the roof has been propped to prevent collapse (see Photo 15). The ends of the bottom chords of the supporting trusses are splayed – probably to fit under the original roof slope – the remaining section is small above the bearing. Although no distress is apparent, repairs will be required to ensure long term durability. The felt membrane has degraded and is torn and hanging down in several locations. Replacement of the roof supports should be considered to ensure long term durability.

The external walls show an outwards lean of up to 3.8% at the rear and 1.5% at the front. The internal walls were noted as generally plumb and straight. The floor shows a slight run towards the front elevation with several drainage channels noted within.

3.3.5 Store

The store is located within the short leg adjacent to the farm house. The room has been partitioned off the smaller barn and comprises plastered walls and a concrete slab floor. The roof over comprises traditional timber purlin and rafter construction supported off a series of timber trusses extending over the small barn, store and boot room. A plaster boarded ceiling is provided over.

The overall condition of the room is considered to be fair/poor.

Peeling paint is apparent to the majority of the walls within the room with several small areas of debonding plaster also apparent. These defects are indicative of weather penetration from above and rising damp.

The roof over the room appeared to be in generally poor condition with evidence of severe degradation to timbers at the intersection with the lean-to roof. It is apparent that weather penetration has continued over a very long period with severe rot to the rafters, purlins and supports locally. Over the room the roof has been propped to prevent collapse (see Photo 16). The felt membrane has degraded and is torn and hanging down in several locations. Replacement should be considered to ensure long term durability. The ceiling over the room has collapsed in the past due to weather penetration through the roof finishes over.

The external wall shows an outwards lean of up to 3.8%, the internal walls were noted as plumb. The floor was noted as generally level.

3.3.6 Boot Room

The boot room is located within the short leg adjacent to the farm house. The room has been partitioned off the smaller barn and comprises plastered walls and a concrete slab floor. The roof over comprises traditional timber purlin and rafter construction supported off a series of timber trusses extending over the small barn, store and boot room. A plaster boarded ceiling is provided over. Access to the boot room is via a door adjacent to the main entrance to the farm house.

The overall condition of the room is considered to be good.

No significant defects were apparent at the time of inspection. The room has a slightly damp feel due to the presence of a washing machine and drier and a lack of mechanical ventilation.

The walls were noted as generally straight and plumb. The floor was noted as generally level though slightly uneven.

4.0 Conclusions and Discussion

The overall condition of the outbuildings is considered to be fair.

The outbuildings show evidence of deterioration that is consistent with their age, ongoing use and a lack of routine maintenance over recent years.

The elevations appeared to be generally straight and plumb. Outwards leans were apparent in several areas which would have appeared to have resulted from roof spread. No distortions were apparent that would be attributable to foundation movements or settlement. Although the foundations were not exposed, it is apparent that they are satisfactory and would not require modification in the proposed scheme. All of the elevations will require localised repair and repointing as part of the conversion scheme. Lintels to openings generally comprise timber sections which have degraded over time. It would be prudent to replace all of the lintels as part of the conversion scheme to ensure long term durability.

No dpc is apparent. The brickwork is generally soft and susceptible to erosion resulting from rising damp, which is apparent in several areas internally. Therefore a new dpc should be installed as part of any conversion scheme. Any new dpc should carry an insurance backed guarantee.

The ground floors to the outbuilding generally comprise solid concrete ground bearing slabs. It is unlikely that the floors will have a suitable damp proof membrane or insulation and will also need to be adjusted to suit the proposed levels. Therefore, a new floor incorporating a dpm and insulation to modern standards will be required as part of the conversion scheme.

The condition of the roof over the outbuildings are generally fair with areas which are considered to be poor. The roof alignment shows several areas of significant sag which have resulted from deflection of undersized purlins and modified timber trusses. In several areas, weather penetration over an extended period has resulted in rot to timbers. Over the smaller barn, temporary propping has been introduced to prevent partial collapse. The felt membrane under the slated finishes has degraded and will need to be replaced. Although no widespread evidence of slipped slates was noted, daylight is clearly visible through finishes in several areas. The roof and its supports are considered to be beyond economic repair and wholesale replacement will be required to ensure long term durability.

Gutters and downpipes were intact and discharge into gulleys all of which appeared functional at the time of inspection. It would be prudent to carry out a full inspection of the drainage serving the property and carry out modifications/repairs as necessary.

The Clients, Adrian and Elizabeth Bellis-Marks, are seeking planning application to convert the outbuildings into additional accommodation, garages and stores.

The outbuildings are robustly constructed and are considered to be suitable for conversion into additional accommodation, garages and stores following repairs and alterations as necessary.

5.0 Recommendations

The following items should be addressed as part of any works to the barn to ensure structural viability in the long term:

- Remove existing slated finishes to the roof and set aside for re-use. Demolish all existing rafters, purlins, trusses and steel frames supporting the roof. Provide new rafters and timber/steel supporting beams as required to suit new layout.
- Replace existing lintels with new precast concrete units as required.
- Carry out repairs to eroded brickwork by replacing individual units. Repoint elevations by raking out existing pointing to a minimum depth of 30mm. New pointing shall comprise a 1:1:6 lime:cement:sand mortar packed tight into joints and finished flush with the face of the wall.
- Install injected chemical or sheet dpc at least 150mm above ground level to external and internal walls of the original part of the building. A ten year insurance backed guarantee should be provided for all materials and installation. As an alternative, provide vertical damp proofing to internal walls lapped and sealed with floor dpm.
- Provide new concrete ground floors throughout incorporating insulation to modern standards. A dpm should also be provided which shall be lapped or tucked into the new dpc or damp proofing.

6.0 Limitations and Liability

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by Andrew Hannett Limited, no other party may use, make use of or rely on the contents of the report. No liability is accepted by Andrew Hannett Limited for any use of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the report are on the basis of Andrew Hannett Limited using due skill, care and diligence in the preparation of the same and no explicit warranty is provided as their accuracy. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Andrew Hannett Limited has been made.

The timber or other parts of the building which are covered, unexposed or inaccessible to the Structural Engineer without the assistance of a ladder in excess of 3m have not been inspected. The report does not cover the condition of the dpc, possible damp penetration or condensation unless specifically highlighted as part of the inspection. Where the property was furnished at the time of inspection those elements of the structure covered over have not been fully inspected. Therefore it is not possible to confirm that those elements are free from defect.

No excavations were undertaken to uncover buried elements or foundations and any notes on the condition of such elements are made based on the visible condition of the property. No intrusive testing was carried out. Manhole covers were not lifted and drains were not tested. Testing requiring the use of specialist equipment or training, e.g. electrical systems, gas appliances, water systems, etc., has not been undertaken.

This report is not intended to be an exhaustive list of all defects and only significant structural faults which could lead to instability of the structure in the present or future have been reported. Further defects may become apparent during more extensive investigation or during future refurbishment works.

Detailed calculations to determine the adequacy of structural members are outside the scope of this report and have not been undertaken. However evidence of distress as a result of overloading or deterioration will be identified so that provision for additional works can be made during any future refurbishment scheme.

The report shall be solely used by the Client to determine the extent of works to the property and liability in this respect will be limited to the instructing Client.

Nothing in the Contract confers nor purports to confer on any third party any benefit nor any right to enforce any terms of this Contract pursuant to the Contracts (Rights of Third Parties) Act 1999.

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Appendix A – Photographs



Photo 1 – Front Elevation.



Photo 4 – Left Hand Side Elevation.



Photo 2 – Front Elevation.



Photo 5 – Rear Elevation.



Photo 3 – Cracking extending from timber lintel.
Note: sag to bed joints over lintel.



Photo 6 – Cracking extending down from eaves.



Photo 7 – Right Hand Side Elevation.



Photo 8 – General view of roof over store.



Photos 9 – Cracking above opening.



Photo 10 – Erosion to brick units.



Photo 11 – General view of roof over WC.



Photo 12 – Dislodged brickwork at lintel end.



Photo 13 – General view of roof over barn.



Photo 15 – Severe rot to timbers.
Note propping to timber beam.

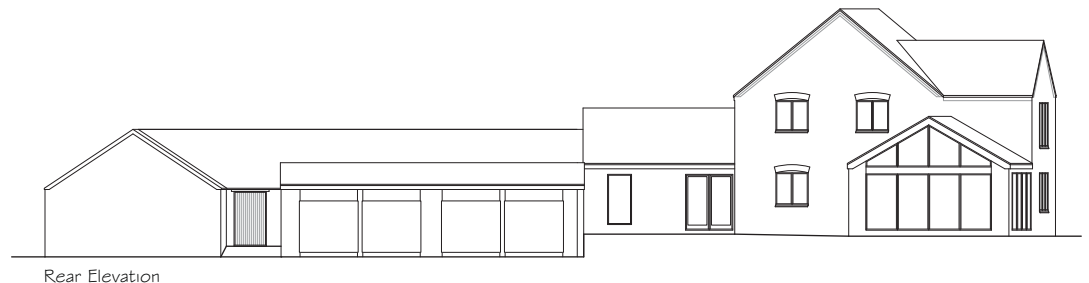
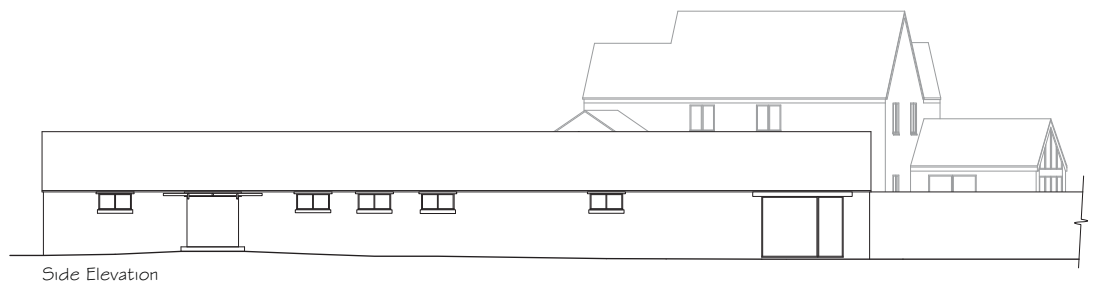


Photo 14 – General view of roof at intersection.



Photo 16 – Severe rot to timber
with props to underside.

Appendix B – Architect's Drawings



Rev	Date	Detail	Initial

Project:
Proposed Alterations to,
ESP Hill Farm,
Frog Lane, Holt,
LL13 8SL.

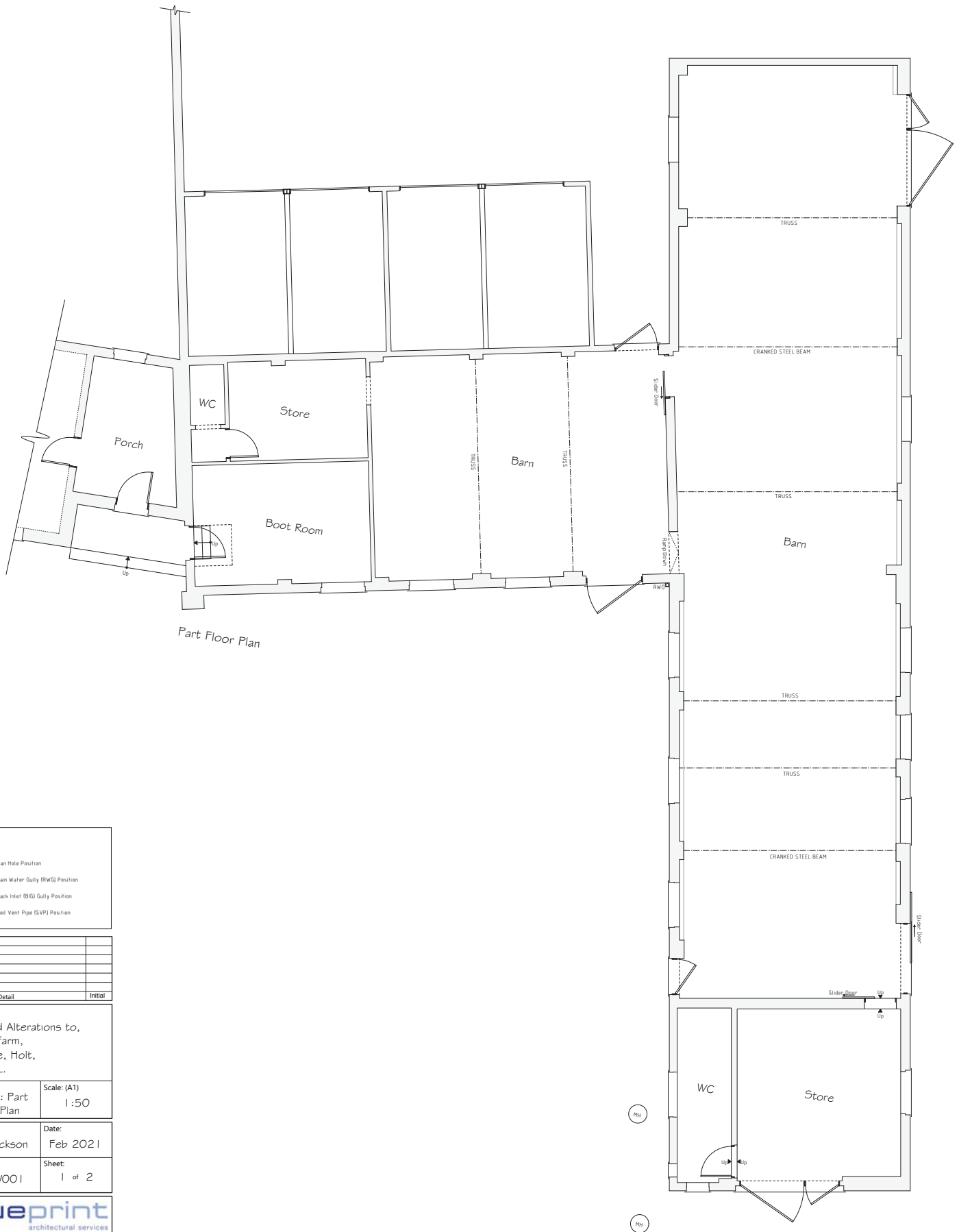
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Drawn By: E.M.Jackson	Date: Feb 2021
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Drawing No: B148/001	Sheet: 2 of 2
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Services Key	
MH	Existing Man Hole Position
■	Existing Rain Water Gully (RWG) Position
■	Existing Back Inlet (BIG) Gully Position
○	Existing Soil Vent Pipe (SVP) Position

Rev	Date	Detail	Initial

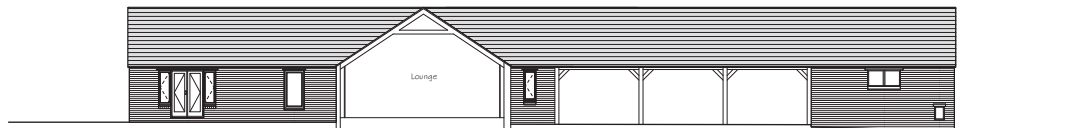
Project: Proposed Alterations to, ESP Hill Farm, Frog Lane, Holt, LL13 8SL.	
Title: Existing: Part Floor Plan	Scale: (A1) 1:50

Drawn By: E.M.Jackson	Date: Feb 2021
Drawing No: B148/001	Sheet: 1 of 2

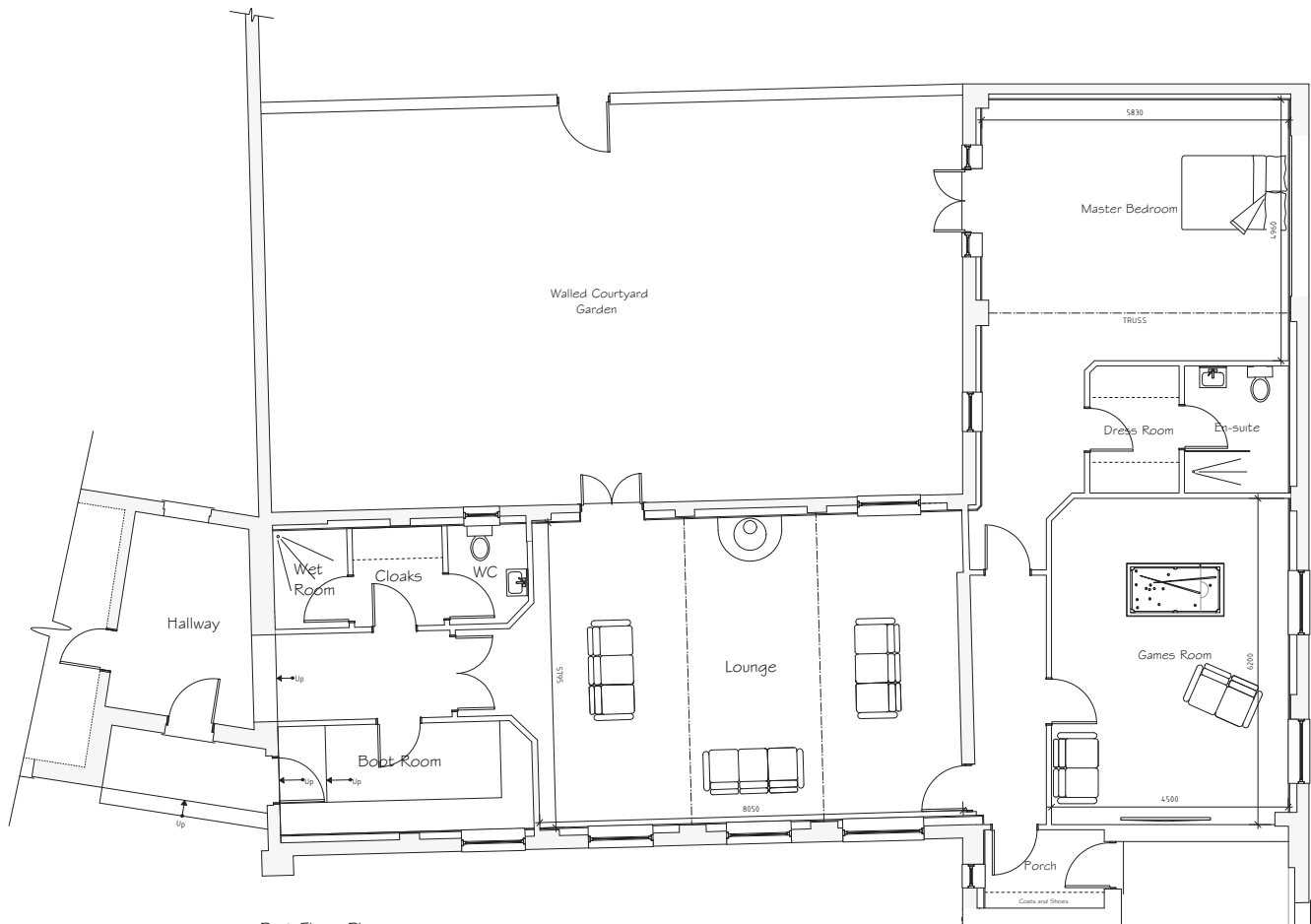
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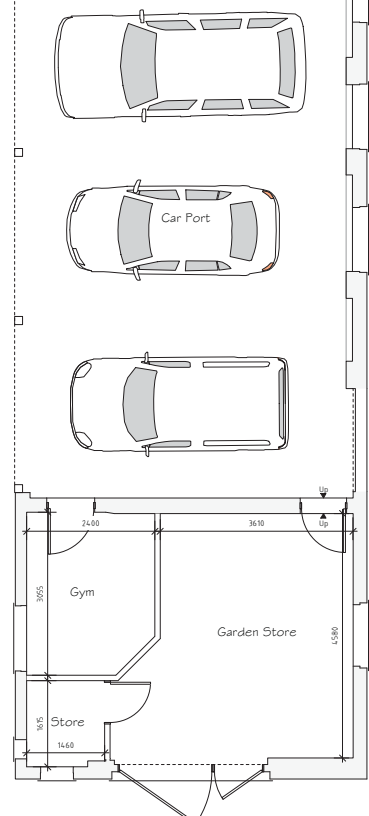
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Side Elevation

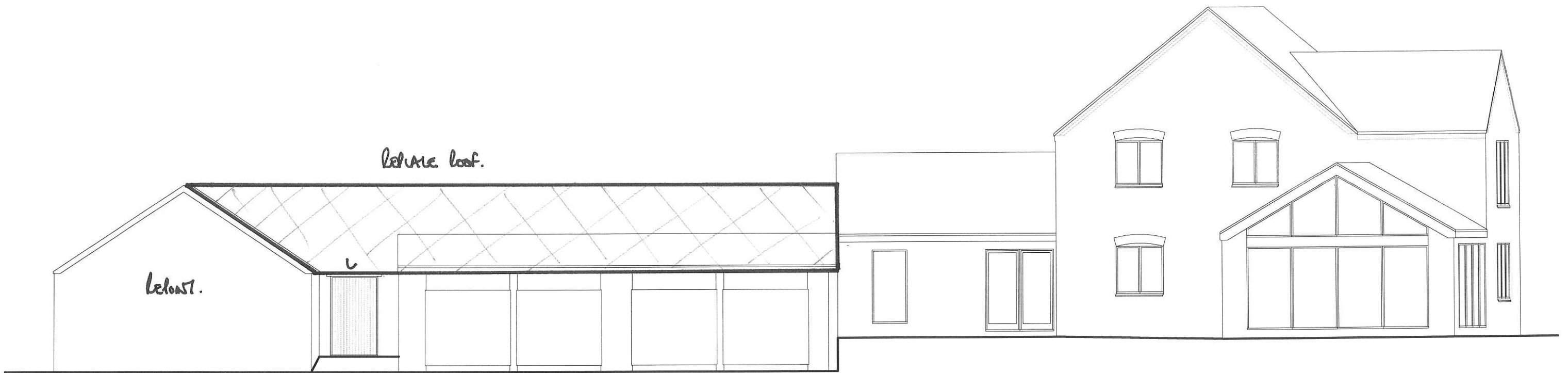


Part Floor Plan



Rev	Date	Detail	Initial	
Project: Proposed Alterations to, ESP Hill Farm, Frog Lane, Holt, LL13 8SL.				
Title: Proposed		Scale: (A1) 1:50 & 1:100		
Drawn By: S Hatherall		Date: Feb 2021		
Drawing No: B148/002		Sheet: 1 of 1		
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Appendix C – Repair Drawings

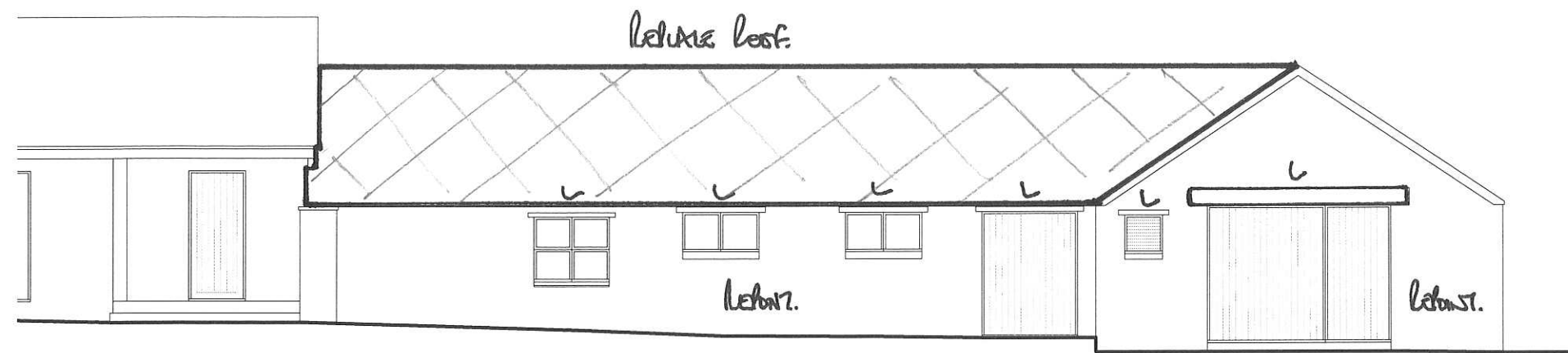


Rear Elevation

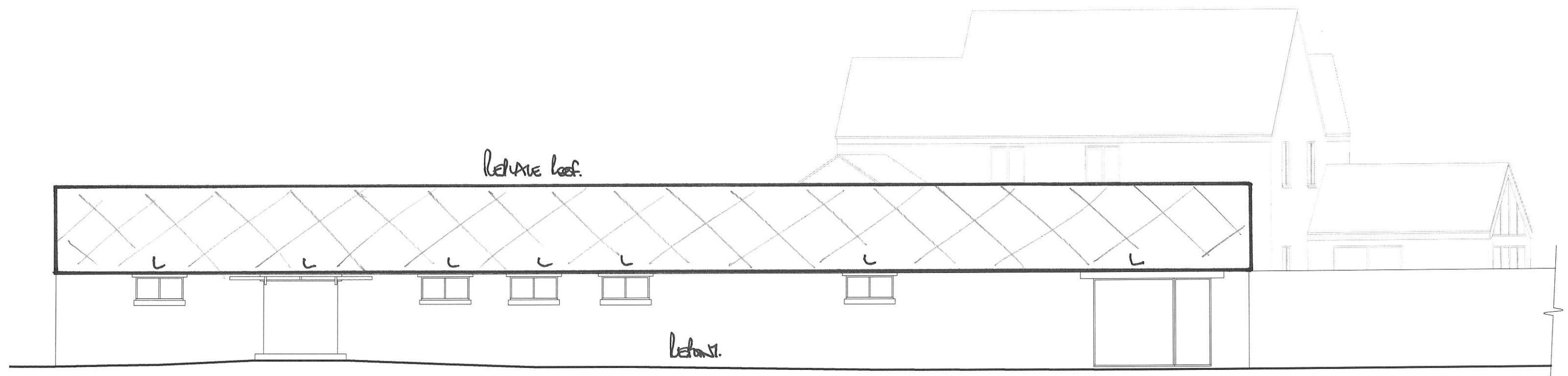
Key:
L - behind window.



Side Elevation



Key:
L - Relative Locations.



Side Elevation