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Conversion of Outbuildings, Hillside, Erbistock

Structural Appraisal Report

August 2023

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1.0 Executive Summary

The outbuildings are single storey and generally comprise pitched purlin and rafter roofs with slated finishes supported off solid brick and masonry external and internal walls and intermediate timber trusses. The ground floor comprises stepped brickwork laid over earth. The right-hand end of the outbuildings is constructed from brick and sandstone masonry whilst the remainder is constructed from brickwork.

Three single storey outriggers are provided off the rear and left-hand side elevations. The outriggers on the rear comprise tapered masonry walls with no roof over and a timber framed store with profiled steel cladding to the walls and roof. The outrigger to the left-hand side elevation comprises blockwork external walls supporting a corrugated steel roof over. The timber framed store and blockwork pen are to be removed as part of the proposed scheme and as such only cursory inspections will be included within this report.

Foundation type and depth were not proven, however given the age of the building, it is assumed that shallow brick/masonry spread foundations are present.

The inspection was carried out during the morning of Thursday 10th August 2023.

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

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

The elevations appeared to be generally straight and plumb except for small sections of the front and rear elevations which show slight outward bulges. The outwards leans appear to have resulted from roof spread. No significant cracking was apparent which would indicate that the defects are historic. The right-hand gable is partially supported by a rotted timber beam and will need to be rebuilt. No significant 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.

The store and pen are to be demolished as part of the proposals, whilst the derelict lean-to will be brought back into use. It was difficult to assess the condition of the remaining walls to the lean-to and as such reconstruction should be considered.

No dpc is apparent. The masonry, brickwork and mortar are generally soft and susceptible to erosion. 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 outbuildings generally comprise brickwork laid over earth with steps incorporated to aid drainage. The existing floors will not have a suitable damp proof membrane or insulation and will also need to be adjusted to suit the proposed levels. Therefore, new floors incorporating a dpm and insulation to modern standards will be required as part of the conversion scheme.

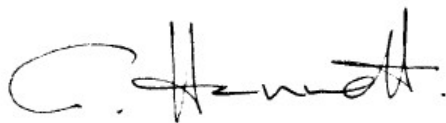
The condition of the roof over the outbuildings are poor. The roof alignment shows several significant sags which are considered to be historic. In several areas, weather penetration over an extended period has resulted in severe rot to timbers. Therefore, a new roof will be required as part of the scheme.

Gutters and downpipes were generally missing at the time of inspection. New roof drainage will be required as part of the conversion scheme. Downpipes should discharge into a new drainage system linked to a soakaway remote from the building.

The Client, Tim Walker, is seeking planning permission to convert the outbuildings into a self-contained dwelling. The proposed works will include the erection of an extension to the left-hand gable, new ground floors and a new roof.

The outbuildings are robustly constructed and are considered to be suitable for conversion into a self-contained dwelling following repairs and alterations as necessary.

Report Compiled by:

A handwritten signature in black ink, appearing to read 'A. Hannett'.

Andrew Hannett
BEng(Hons), CEng, MICE

2.0 Client's Brief

This report was commissioned by Blueprint Architectural Services acting on behalf of Tim Walker in support of the proposed planning application to convert the outbuilding into a self-contained dwelling. The purpose of the report is to identify whether the outbuildings 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 Thursday 10th August 2023. The weather during the inspection was warm and dry. The inspection comprised a visual inspection of those elements readily visible from ground level and from within the outbuildings. 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 generally comprise pitched purlin and rafter roofs with slated finishes supported off solid brick and masonry external and internal walls and intermediate timber trusses. The ground floor comprises stepped brickwork laid over earth. The right-hand end of the outbuildings is constructed from brick and sandstone masonry whilst the remainder is constructed from brickwork.

Three single storey outriggers are provided off the rear and left-hand side elevations. The outriggers on the rear comprise tapered masonry walls with no roof over and a timber framed store with profiled steel cladding to the walls and roof. The outrigger to the left-hand side elevation comprises blockwork external walls supporting a corrugated steel roof over. The timber framed store and blockwork pen are to be removed as part of the proposed scheme and as such only cursory inspections will be included within this report.

Foundation type and depth were not proven, however given the age of the building, it is assumed that shallow brick/masonry spread foundations are present.

Views of the elevations were limited by extensive vegetation close to the outbuilding.

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

3.2 EXTERNAL INSPECTION

Significant vegetation growth close to the elevations prevented full access and as such observations on condition are based on the limited views afforded.

3.2.1 Front Elevation

The elevation comprises brickwork to full height on the left-hand side and masonry with a brickwork addition to the right-hand side. Lintels to openings comprise timber units (see Photo 1). The roof over is finished with slate.

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

Cracking was noted at the junction with the right-hand side elevation. The cracking was noted as up to 4mm wide and extends through an area of previous repair (see Photo 2). The defect is indicative of a lack of bonding at the corner and roof spread. A corroded pattress plate would suggest that the defect has been an issue for some time. Degradation to timber lintels was apparent. Severe rot and section losses were apparent to the lintel over the large door opening which has resulted in significant sag. Sagging was apparent to the remaining lintels indicative of long-term weathering.

The pointing to the masonry is generally lime based and appeared to be generally intact through soft when probed. Isolated areas of losses up to 30mm were apparent particularly at high level to the left-hand part.

The roof over is in generally poor condition with significant areas of missing or broken slate finishes apparent (see Photo 3). The alignment of the ridge shows significant sagging between supports especially in the right-hand section of the roof. The guttering is generally missing with no downpipes apparent.

The elevation appeared to be reasonably straight and plumb except at the left-hand window opening where an outwards leans of up to 4% was noted. The lean would appear to have resulted from roof spread. The right-hand section of the elevation shows a slight outwards lean at the junction with the side elevation again indicative of roof spread.

No dpc was apparent.

3.2.2 Left Hand Side Elevation

The elevation comprises brickwork to full height with a timber lintel to the opening. The roof over the adjacent pen is finished with corrugated steel cladding (see Photo 4). The window opening is blocked off with translucent sheeting.

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

No significant cracking was apparent at the time of inspection. Minor erosion to the faces of brick units is apparent throughout with several minor areas of missing brick units apparent. The mortar pointing is lime based and shows a general erosion throughout.

The elevation appeared generally straight and plumb, though views were limited by vegetation.

No dpc was apparent.

3.2.3 Rear Elevation

The elevation comprises brickwork to full height on the right-hand side and masonry with a brickwork addition to the left-hand side. Lintels to openings comprise timber units (see Photo 5). The roof over is finished with slate.

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

No significant cracking was apparent at the time of inspection. Staining is apparent to small areas of the elevation due to water cascading from the roof (see Photo 6). Minor erosion was apparent to the brick faces locally with more widespread minor erosion to the faces of sandstone units. Degradation to timber lintels was apparent, though no section losses were noted.

The pointing to the masonry is generally lime based and appeared to be generally intact through soft when probed. Isolated areas of losses up to 30mm were apparent particularly at high level to the left-hand part.

The roof over is in generally poor condition with significant areas of missing or broken slate finishes apparent. The alignment of the ridge shows significant sagging between supports especially in the left-hand section of the roof. The guttering is generally missing with no downpipes apparent.

The elevation appeared to be reasonably straight and plumb except in the area of the lean-to where an outwards leans of up to 6% was noted at high level. The lean would appear to have resulted from roof spread.

No dpc was apparent.

3.2.4 Right Hand Side Elevation

The elevation comprises sandstone masonry to eaves level with brickwork to the gable peak above (see Photo 7). Profiled steel cladding has been secured over the door opening at low level.

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

No significant cracking was apparent to the elevation at the time of inspection, though it should be noted that vegetation prevented a full inspection. The mortar pointing is lime based and was noted as hard and flush with the brickwork and masonry generally. Severe rot and section losses were apparent to the end of the timber lintel over the door opening.

Cracked and missing mortar pointing was apparent to the verge of the roof particularly adjacent to the front elevation.

The elevation appeared to be generally straight and plumb where visible.

No dpc was apparent.

3.3 INTERNAL INSPECTION

3.3.1 Barn 1

Barn 1 is located on the left-hand side of the outbuildings. The room has washed brick walls, a brick floor and a traditional purlin and rafter roof over supported off the walls and an intermediate truss. The internal wall is constructed from sandstone masonry with brick additions to the rear and peak.

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

A gap up to 45mm wide was noted between the masonry and brickwork on the internal wall (see Photo 8). Where the pointing was present, the gap was noted as up to 6mm wide. This is probably due to slight differential settlement between the original masonry wall and the brickwork addition and appeared historic in nature. The front elevation wall shows a significant outwards bow at up to 4.0% (40mm in 1.0m) at the window opening. This defect has resulted from roof spread. The timber lintels to all of the openings have significant sag with associated cracking to brickwork above. The timber lintel over the large door opening has failed due to severe rot at one end and being significantly undersized (see Photo 9). The lintel has been propped in the past with limited success. Peeling/missing lime wash finishes at low level are indicative of rising damp.

The roof over the room appeared to be in poor condition with numerous slipped or missing slates apparent. Staining is apparent to the rafters and purlins with several areas of advanced rot noted. Severe section losses are apparent to one of the purlins as a result of weather penetration over an extended period (see Photo 10). Similar section losses are also apparent to the intermediate truss (see Photo 11). All of the purlins show significant sagging down the planes of the roof.

The ground floor comprises bricks laid over earth. The floor shows areas of significant settlement throughout which is consistent with the age of the building and the construction type.

The external walls were noted as generally straight and plumb except for the front elevation which shows a significant outwards bow at the window opening. The floor was uneven with areas of significant settlement noted.

3.3.2 Barn 2

Barn 2 is located on the right-hand side of the outbuildings. The room has washed sandstone masonry walls, a brick floor and a traditional purlin and rafter roof over supported off the walls and an intermediate beam. The internal wall is constructed from sandstone masonry with brick additions to the peak.

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

The walls show evidence of significant pointing losses in isolated areas with areas of repointing in good condition noted to others. Gaps through the wall were apparent to the side elevation indicating total pointing losses. A timber beam supports part of the elevation which is rotted in places especially at the supports. The condition of the sandstone is generally good with slight erosion indicative of rising damp apparent at low level. The timber lintels to all of the openings have significant sag with associated cracking to brickwork above. Peeling/missing lime wash finishes at low level are indicative of rising damp.

The roof over the room appeared to be in poor condition with numerous slipped or missing slates apparent. Staining is apparent to the rafters and purlins with several areas of advanced rot noted. Severe section losses are apparent to the intermediate beam as a

result of weather penetration over an extended period (see Photo 12). All of the purlins show significant sagging down the planes of the roof.

The ground floor comprises bricks laid over earth. The floor shows areas of slight settlement throughout which is consistent with the age of the building and the construction type.

The external walls were noted as uneven but generally straight and plumb. The floor was stepped and uneven with areas of slight settlement noted.

3.3.3 Derelict Lean-to

The Derelict Lean-to is located on the rear elevation. The area has tapered sandstone masonry and brickwork walls and no roof over (see Photo 13). The floor construction is unknown due to vegetation growth within.

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

The walls were noted as generally straight and plumb where visible. Eroded pointing is prevalent throughout with some loose units apparent along the top edges of the walls.

3.3.4 Store

The Store is located on the rear elevation. The area comprises a lightweight timber framing with corrugated steel and timber cladding to the walls and roof (see Photo 14). The floor comprises a concrete slab.

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

The lightweight timber framing supporting the roof shows evidence of staining due to weather penetration and sagging between support indicative of undersized sections. Areas of significant section losses were apparent to the sheeting on the walls.

The ground floor comprises a concrete slab. Slight settlement was apparent.

3.3.5 Pen

The Pen is located adjacent to the left-hand side elevation. The area comprises a timber framing with corrugated steel cladding to roof and painted blockwork to the walls. No access was afforded at the time of inspection.

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

No cracking or distortions were apparent to the external walls where visible. Significant sagging is apparent to the roof finishes indicative of under sizing of timber supports.

The ground floor comprises a concrete slab. Slight settlement was apparent.

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 its age, previous use and a lack of routine maintenance over recent years.

The elevations appeared to be generally straight and plumb except for small sections of the front and rear elevations which show slight outward bulges. The outwards leans appear to have resulted from roof spread. No significant cracking was apparent which would indicate that the defects are historic. The right-hand gable is partially supported by a rotted timber beam and will need to be rebuilt. No significant 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.

The store and pen are to be demolished as part of the proposals, whilst the derelict lean-to will be brought back into use. It was difficult to assess the condition of the remaining walls to the lean-to and as such reconstruction should be considered.

No dpc is apparent. The masonry, brickwork and mortar are generally soft and susceptible to erosion. 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 outbuildings generally comprise brickwork laid over earth with steps incorporated to aid drainage. The existing floors will not have a suitable damp proof membrane or insulation and will also need to be adjusted to suit the proposed levels. Therefore, new floors 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 poor. The roof alignment shows several significant sags which are considered to be historic. In several areas, weather penetration over an extended period has resulted in severe rot to timbers. Therefore, a new roof will be required as part of the scheme.

Gutters and downpipes were generally missing at the time of inspection. New roof drainage will be required as part of the conversion scheme. Downpipes should discharge into a new drainage system linked to a soakaway remote from the building.

The Client, Tim Walker, is seeking planning permission to convert the outbuildings into a self-contained dwelling. The proposed works will include the erection of an extension to the left-hand gable, new ground floors and a new roof.

The outbuildings are robustly constructed and are considered to be suitable for conversion into a self-contained dwelling 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 brick walls supporting the roof. Provide new roof construction as required to suit new layout.
- Install new guttering and downpipes. Roof drainage shall discharge into a new drainage system routed to a ditch or drain or to a soakaway at least 5m from the outbuildings.
- Replace existing lintels with new precast concrete units as required.
- Carry out repairs to severely 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.
- Demolish and rebuild walls to derelict lean-to on rear elevation. Walls to be constructed off new mass concrete strip foundations.
- Demolish timber framed store and blockwork pen outriggers.

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.

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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 2 – Cracking at junction with side elevation.



Photo 3 – Typical condition of roof finishes.



Photo 4 – Left Hand Side Elevation.



Photo 5 – Rear Elevation



Photo 6 – Staining to elevation due to water cascading downface from roof.



Photo 7 – Right hand Side Elevation.



Photo 8 – Gap between masonry and brickwork.



Photo 9 – Severe distortion to door lintel.



Photo 10 – Staining and section losses to purlin.



Photo 11 – Staining and section losses to truss.



Photo 12 – Severe section losses to beam.

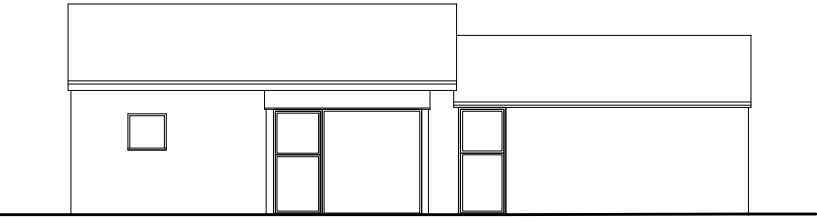


Photo 13 – Derelict lean-to.

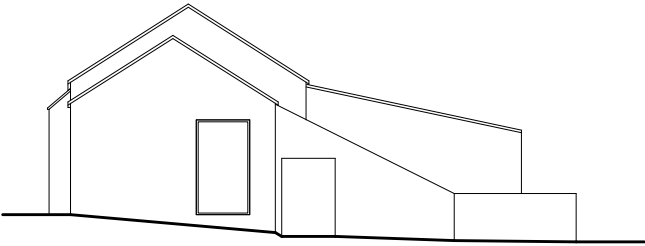


Photo 14 – Store.

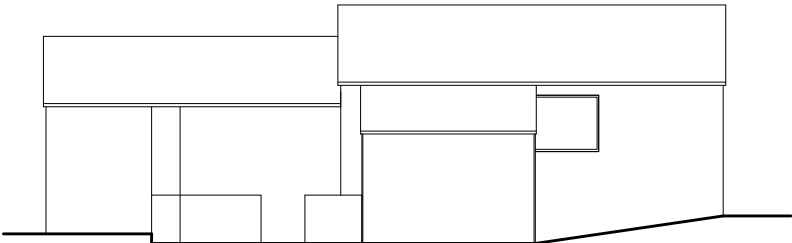
Appendix B – Architect's Drawings



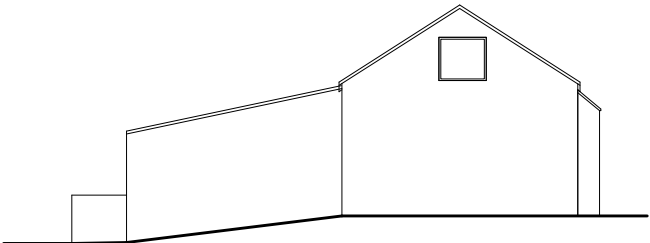
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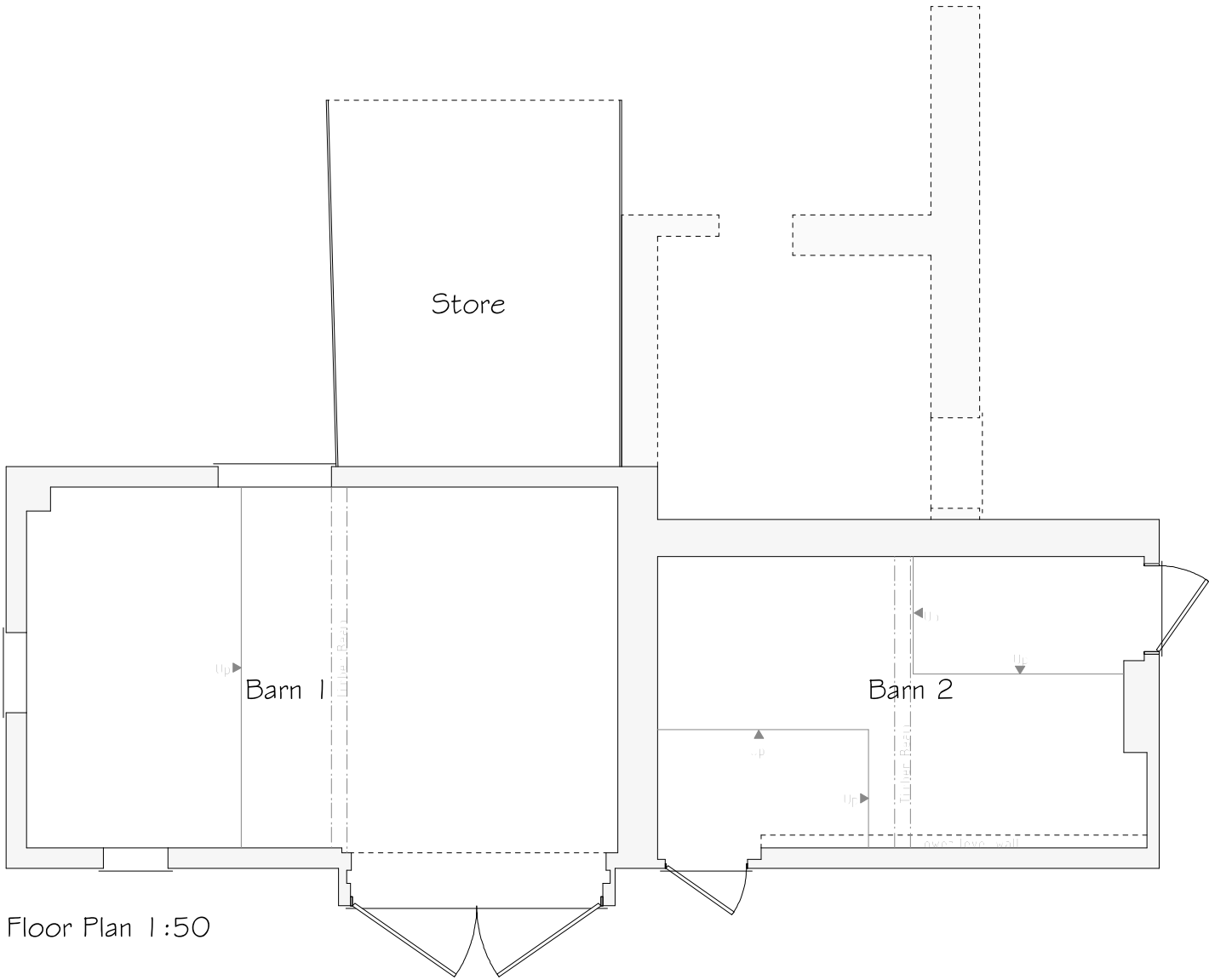
Side Elevation 1:100



Rear Elevation 1:100



Side Elevation 1:100



Floor Plan 1:50

Services Key	
	Existing Boiler Position
	Existing Gas Meter Position
	Existing Electric Meter Position
	Existing Fuse Box Position
	Existing Stopcock Position
	Existing Yarn Hole Position
	Existing Rain Water Gully (RWG) Position
	Existing Back Inlet (BGI) Gully Position
	Existing Soil Vent Pipe (SVP) Position

Rev	Date	Detail	Initial

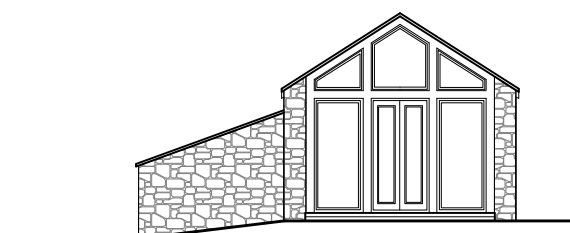
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Drawn By: E.M.Jackson	Date: May 2023
Drawing No: W202/001	Sheet: 1 of 1

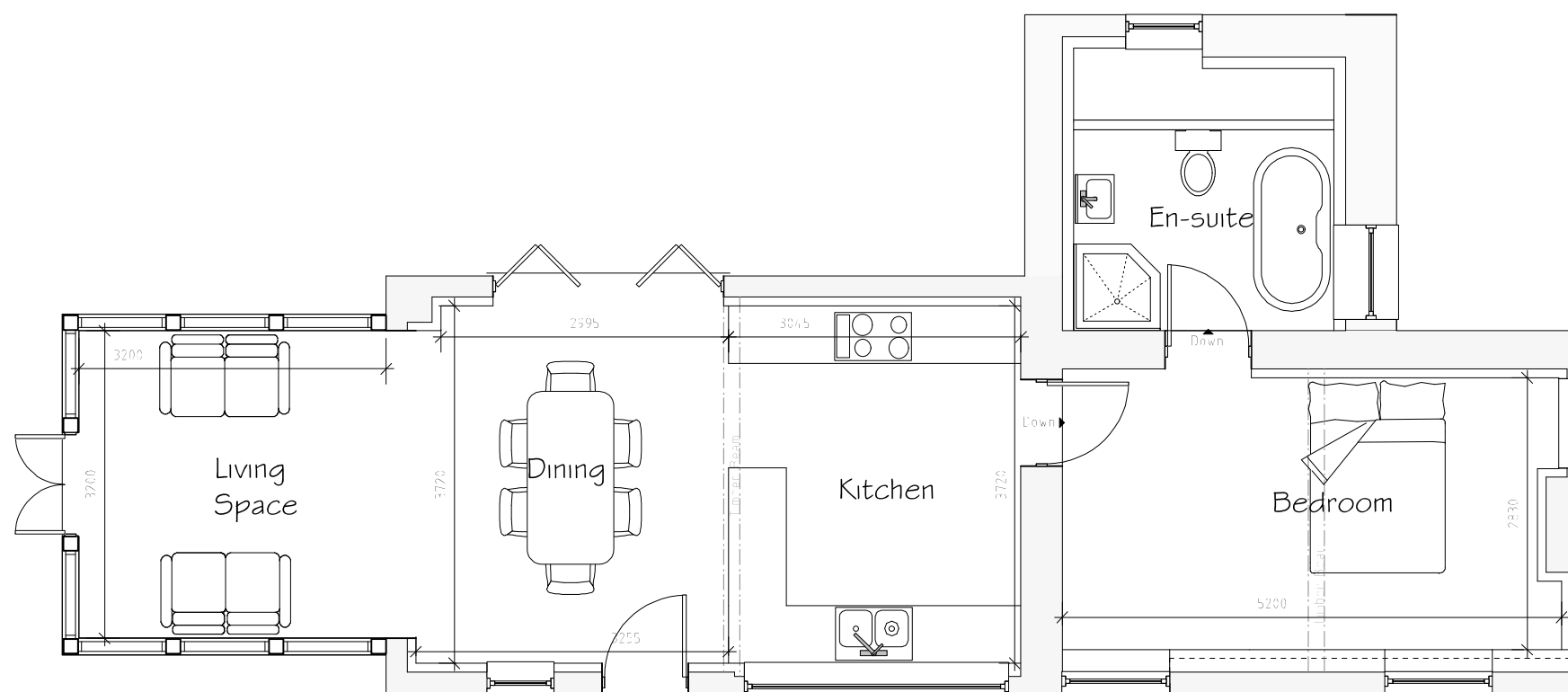
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Front Elevation 1:100



Side Elevation 1:100



Floor Plan 1:50

A	07/23	Design amends	SIH
Rev	Date	Detail	Initial

Project:
Proposed Alterations to,
Barn at Hillside,
Erbistock, Wrexham,
LL13 OPT.

Title:	Scale: (A2)
Proposed:	1:50 &
Annex	1:100

Drawn By:	Date:
D.J.Edwards	May 2023

Drawing No:	Sheet:
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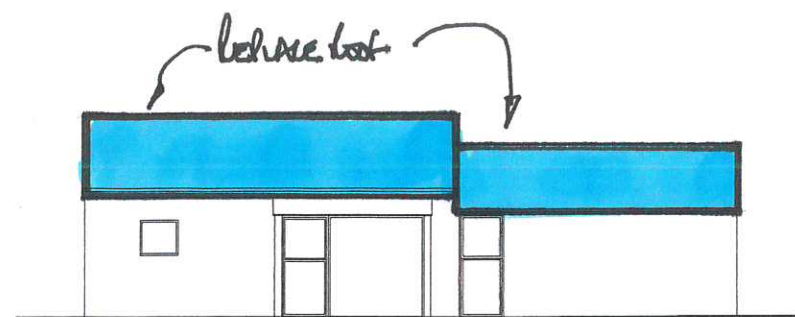
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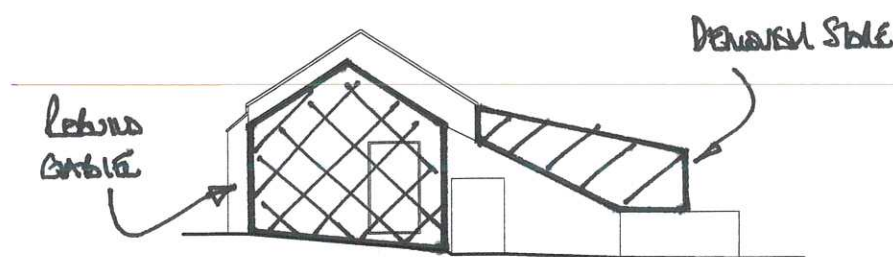
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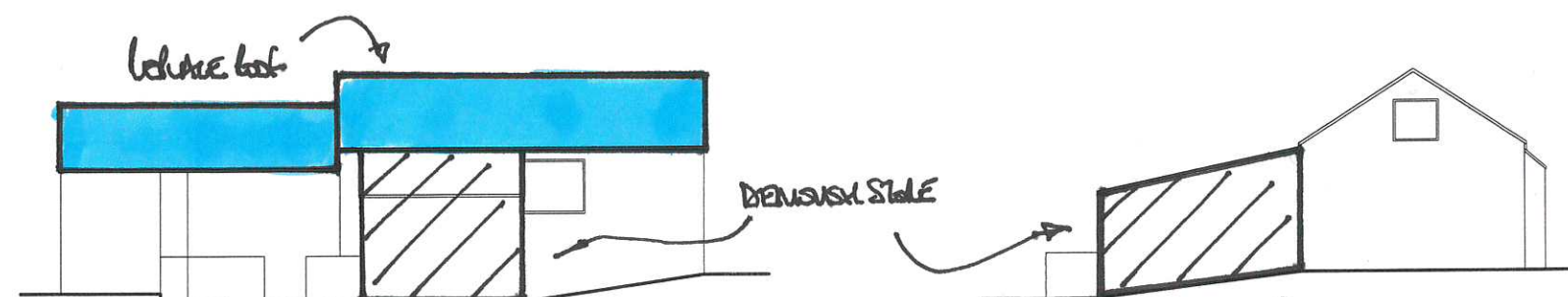
Appendix C – Repair Drawings



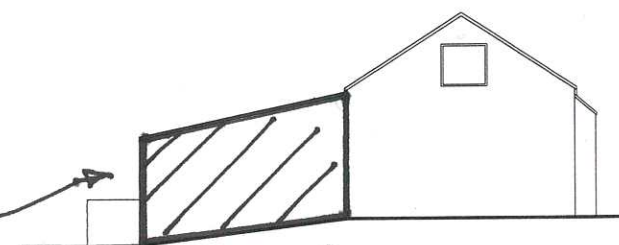
Front Elevation 1:100



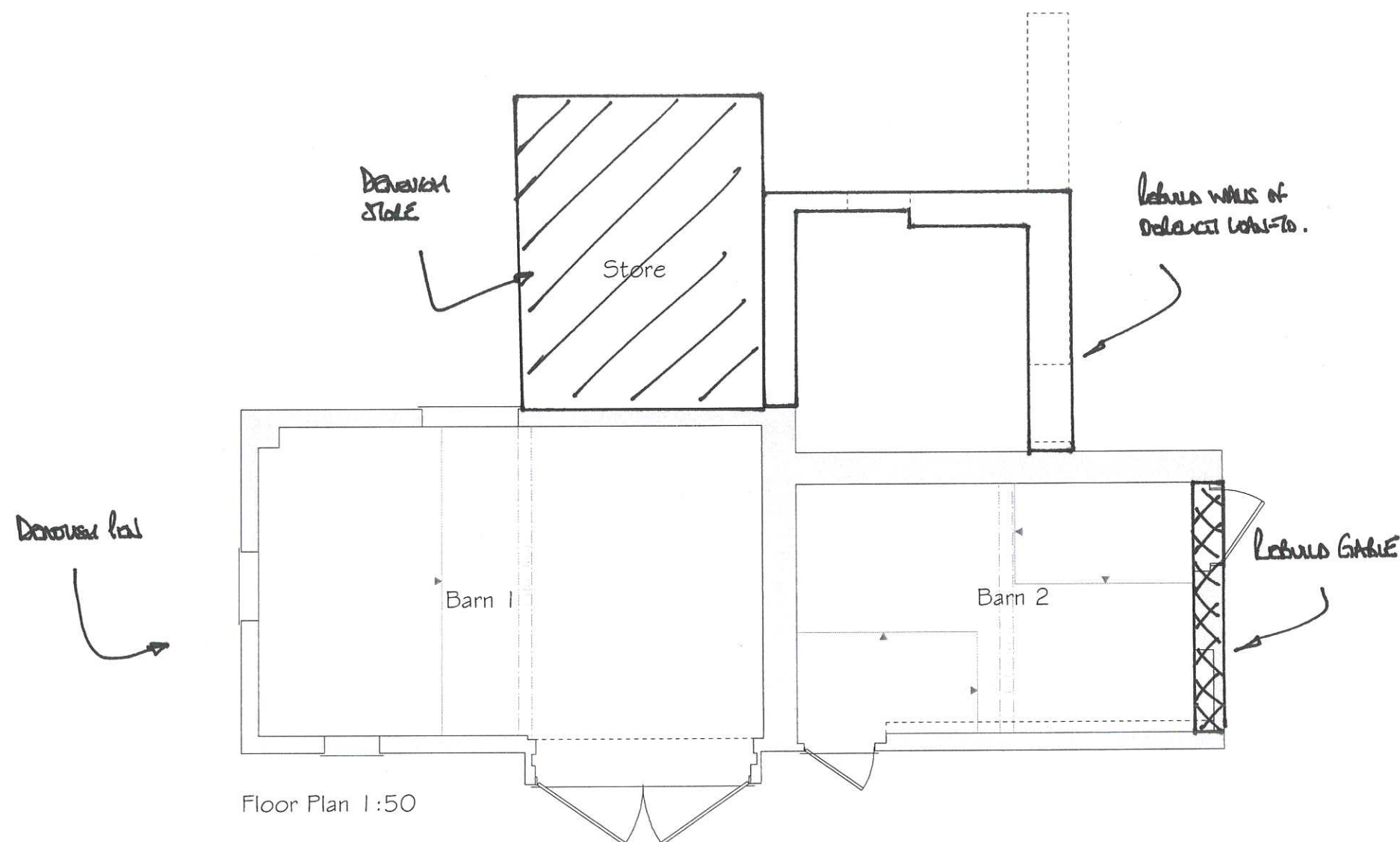
Side Elevation 1:100



Rear Elevation 1:100



Side Elevation 1:100



Floor Plan 1:50

Legend	
☐	Existing Solid Position
☐	Existing Thin Metal Position
☐	Existing Glass & Metal Position
☐	Existing Timber Position
☐	Existing Brickwork Position
☐	Existing Concrete Position
☒	Existing Reinforcement Only (RWB) Position
☒	Existing Reinforcement (RWB) Fully Position
☐	Existing Reinforcement (RWB) Fully Position

Rev	Date	Detail	Initial

Project:
Proposed Alterations to,
Barn at Hillside,
Erbistock, Wrexham,
LL13 0PT.

Title: Existing : Barn	Scale: (A2) 1:50 & 1:100
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Drawn By: E.M.Jackson	Date: May 2023
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Drawing No: W202/001	Sheet: 1 of 1
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