

**ADDENDUM INFORMATION TO REPORT
 ON CONDITION OF
 AGRICULTURAL BUILDING
 AT
 CROCKWELL FARM, GT BOURTON**



Survey by		
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1.0 BRIEF

AB Design Solutions Ltd were asked to inspect and comment on the condition of structural elements and the suitability of a Dutch barn style agricultural buildings to form part of an application of change of use to residential dwelling. The original report was solely for the purposes to form part of a planning application to Cherwell District Council, this was issued in July 2020.

The application raised some matters requiring additional information with regards to the existing structure, to which the purpose of this addendum is to address these. The matters raised are as follows: -

“The structural survey states that the existing building is in fair condition and is structurally suitable for conversion to residential use without any strengthening of the building envelope. However, what the structural survey fails to account for is the fundamental change to the structure of building that would occur through the partial demolition. This, and what appear to be widescale changes that are required to make the building suitable and habitable for residential use is not detailed anywhere within this prior approval application. There is also no detail provided for the number or location of windows that would be required and how these may alter the structure.”

2.0 GENERAL DESCRIPTION

2.01 Crockwell Farm is a listed property to which there is a main farmhouse, and there is an arrangement of buildings which form several farmyards. Building 2 is situated in a farmyard, which could have probably been referred to as a rickyard. This farm building is probably of 1980's construction, comprising of a steel frame. Adjoining building 2 is a timber framed shed, which could be described as a “pole barn”.

Further to our original report designs have been submitted illustrating the proposed details of the change of use of the building. This includes demolition of the adjoining “pole barn”

3.0 COMMENTARY ON PROPOSED SCHEME AND EXISTING STRUCTURE

3.0.1 This commentary is best demonstrated with the assistance of sketches and mark ups of the architect's drawings, please refer to these in section 4 of the report.

3.1 The Local planning Authority have concerns that the development has the potential to be effectively a "replacement structure" rather than a conversion of the original structure. We can confirm that this is not the case. Whilst we assume that there will be significant upgrading of the building fabric to convert it into a habitable accommodation, such as linings and insulation we aim to demonstrate that nearly all of the existing structure will be retained and does not require strengthening.

Modern steel framed buildings differ to traditional farm buildings due to their form and the materials they are constructed from. However, in a similar way to a traditional agricultural barn, this building will be converted with the same approach. Particularly keeping the vast majority of structural fabric, and adding to this with new elements such as the proposed first floor structure, etc. Also, we aim to demonstrate that the load path from the structure is the same as the existing. This is relevant as this confirms that the existing structure is utilised and is not a structure that has been "built over and around".

3.2 Primary and secondary Structural Members

The structure of the barn can be divided into primary and secondary structural members. The primary members being the portal frames themselves including portal rafters, portal columns, gable posts and foundations. Secondary members would include cladding rails and purlins spanning between portal frames.

3.3 Existing Ground Floor

The existing ground floor is a concrete ground bearing oversite floor slab. This is in good condition, with a small area that would require repair. This is shown on the sketch plan AB3522-ADD-GF PLAN.

3.4 New Openings for Windows and Doors.

In the main part these are made in areas where they will not impact the existing structure as these are sympathetically where there are large openings, and there is no structure to impact upon. This can be due to either none being fitted originally or they are located in an area where repair is required. A logical approach, similar to conversion of a traditional barn whereas much original fabric is unaltered. We refer to these areas on Elevation drawings in Section 5.

3.5 Roof

The existing roof structure secondary members by inspection are satisfactory to support a new metal roof structure, even a built-up insulated twin skin metal roof as this is lighter than the original fibre cement roofing sheeting. So we can confirm that the purlins are satisfactory to support this roof covering without strengthening.

Some concerns have been raised that the envelope of the building will be increased. The roof covering can be replaced in a way so that the height isn't increased, in the same way if a twin skin built up roof was utilised, due to the additional thickness of insulation, even though this is common to many upgrades of replacement of roof sheeting to agricultural buildings. However, if this is not acceptable of part Q prior consent process, then insulating the roof can be done in conjunction with internal linings, to avoid increasing the height/volume of the building.

Internal linings such as plasterboard and skim finishes internally as in most modern dwellings. We would suggest that these are supported independently to the existing purlins. Thus, not having any effect on the original structure and not requiring it to be strengthened.

3.6 First Floor

A new first floor has been proposed for the taller part of the building. At present there is not a first-floor structure. Similar to many traditional agricultural barns that are converted. These are usually an addition to the original structure. In this proposal we would suggest that the first floor is constructed with steel edge beams and primary beams spanning between existing columns. This would provide primary support for secondary members such as timber floor joists and floor boarding. Whilst the span of the primary beams is large, and a new intermediate column would be desirable to keep depth of the floor structure to a reasonable overall depth. The new floor structure has two main effects on the original structure. It does place additional load upon the existing portal frames. However, by inherent nature of connecting it to the original portal frames it will provide additional restraint, and thus increasing its strength to be able to carry the additional load and beneficially improves the stiffness of the building without the requirement for additional strengthening of the portal columns. Also, this is the most economical, beneficial and environmentally conscious way of adding a first floor, by utilising what structure exists.

3.7 Foundations

The foundations are assumed to be mass concrete pad foundations at column locations with no other foundations expected. We can confirm that these are satisfactory, even with some additional load from replacement wall cladding and first floor structure. Inherently the addition of a first floor stiffens the structure, reducing overturning moments as foundation level. This reduction creates capacity for the additional vertical load from a new first floor affixed to the portal columns.

3.8 Walls

The external walls are currently clad with corrugated metal sheeting. The proposed timber cladding can be supported upon timber framing fixed to the existing cladding rails. There is likely to be some alterations in local areas to accommodate some openings. However, it appears openings have been fitted within existing cladding rails in most areas, with 2 openings requiring adjustment of rails. Please refer to Appendix 5 for drawings

There is one opening to the North Elevation, a large opening for glazed doors. As a proportion of the North elevation the alteration will require the removal of 2 cladding rails (one at mid height, one at low level), the elevation has 4 bays of 3 rails, 12 number in total. The alteration represents less than 17 percent of the rails to the elevation. We consider cladding rails to be secondary members of the structure, in the same light as joists or rafters in a traditional building.

The East elevation has 3 glazed openings proposed. 1 is in an area where there is no structure at present. This is the opening for the large sliding doors to the kitchen area. Thus, not requiring any alteration of any existing cladding rails.

Similarly, the large ground floor window, to the proposed home office. Here there is some existing damage to the existing blockwork wall, where it appears to have been impacted by machinery or stored forage and will require rebuilding. Hence, there is not a net impact upon retaining existing fabric. This is a demonstration of a sympathetic location to add an opening.

Above this there is a new window opening to the proposed bedroom 1. This will require some adjustment to cladding rails. It is likely to impact upon 2 cladding rails. We perceive this as a local alteration and is not a regular repetition around the building, and thus should be considered as a minor alteration to the existing secondary structural members of the building.

There are two windows proposed to the Snug and Bedroom 5. These are large openings and do impact upon the mid height cladding rail in each panel they are

located. The eaves beam above and cladding rail at sill level can remain. This is a minor alteration to a secondary structural member.

4.0 Conclusions

We do understand the concern of the local Planning Authority, with the conversion of the building requiring replacement of many structural elements, and the building becoming effectively a replacement structure.

We can confirm that nearly all of the existing structural elements will remain as part of this conversion, maintaining the intention of Class Q prior consent notification developments.

This is achieved by the following points:

- All existing primary steelwork to remain, without requirement for strengthening.
- Nearly all existing secondary steelwork members to remain, over 85 percent.
- New openings where there are existing large openings or damaged blockwork.
- Existing ground floor to remain, with a small area requiring repair.
- New first floor structure fitted to existing columns.
- New wall panels constructed in similar way to existing spanning between columns
- Load path of building similar to existing, keeping the character of the building.

Obviously, there is some works to be carried out with regard to “fit-out” and upgrading thermal performance of the building, in a similar way to which a traditional masonry agricultural building would be carried out. We confirm the approach of this conversion is to “add” these upgrades and incorporate all of the existing primary structure, with some local alterations to secondary members, also in a similar way to a traditional barn conversion, and without the need for strengthening works.

There are some infill panels required to the western and Northern elevations where proposed demolished buildings adjoin the building. We confirm the load path of these will be the same as the existing infill panels, spanning horizontally to adjacent columns, to carry load to existing footings.

There is the addition of a first floor, however, with some intermediate columns this can be fitted to the existing columns. A scheme proposal can be seen in the drawings in section 5 of this report.

There are some additional walls, internally, we anticipate nearly all of these to be lightweight non load bearing partitions. We anticipate these to be lightweight metal or timber stud partitions with plasterboard and skim finish. These can be constructed off the first-floor structure or the existing ground floor oversite slab. We would recommend that the garage dividing walls are constructed off a new foundation, as these are required to have more mass, to be able to provide a minimum of 1 hour passive fire protection between the dwelling and garage.

We therefore conclude that the building is suitable for conversion to a habitable dwelling, although it is a modern agricultural building it is part of our agricultural heritage. We do understand the LPA's concerns with any structural works becoming extensive and replacing or strengthening large amounts of the existing structure. We are of the belief that there have been class Q conversions that have pushed the limits of the policy, however, since the time of introduction of the policy there has been greater understanding of it by Architects, Engineers and other professionals. We believe that this scheme fits within this policy. The new openings have been placed in areas where existing structure will not be affected with only a few exceptions. We also confirm and demonstrate that the intension is to use the existing structure to support the external envelope in the same way as it does it currently, and not as a redundant structure that has been built around. The existing structure will continue to carry the load of the external envelope, including roof and wall cladding, ground floor finishes, and support a new first floor structure. Thus, confirming the proposal is a true conversion and not a construction of a new building, with all of the existing primary structure remaining unaltered and few local alterations to secondary structure, demonstrating that the existing structure will remain and be utilised. We are of the opinion the scheme proposed by the Architect is sympathetic to the existing structure, which is a permanent and substantial structure, that does not require any strengthening to achieve the proposed dwelling.

If there are any specific areas that require clarification please do not hesitate to contact us.

AB DESIGN SOLUTIONS LTD

5.0 SKETCHES AND MARKED UP PLANS

ROOF PLAN (STRUCTURE)

WORKED BY : AIB DESIGNS
(MCA)

DATE: 16.08.2021



KEY

— EXISTING

— PROPOSED

NEW COLUMN TO MATCH OPPOSITE CORNER

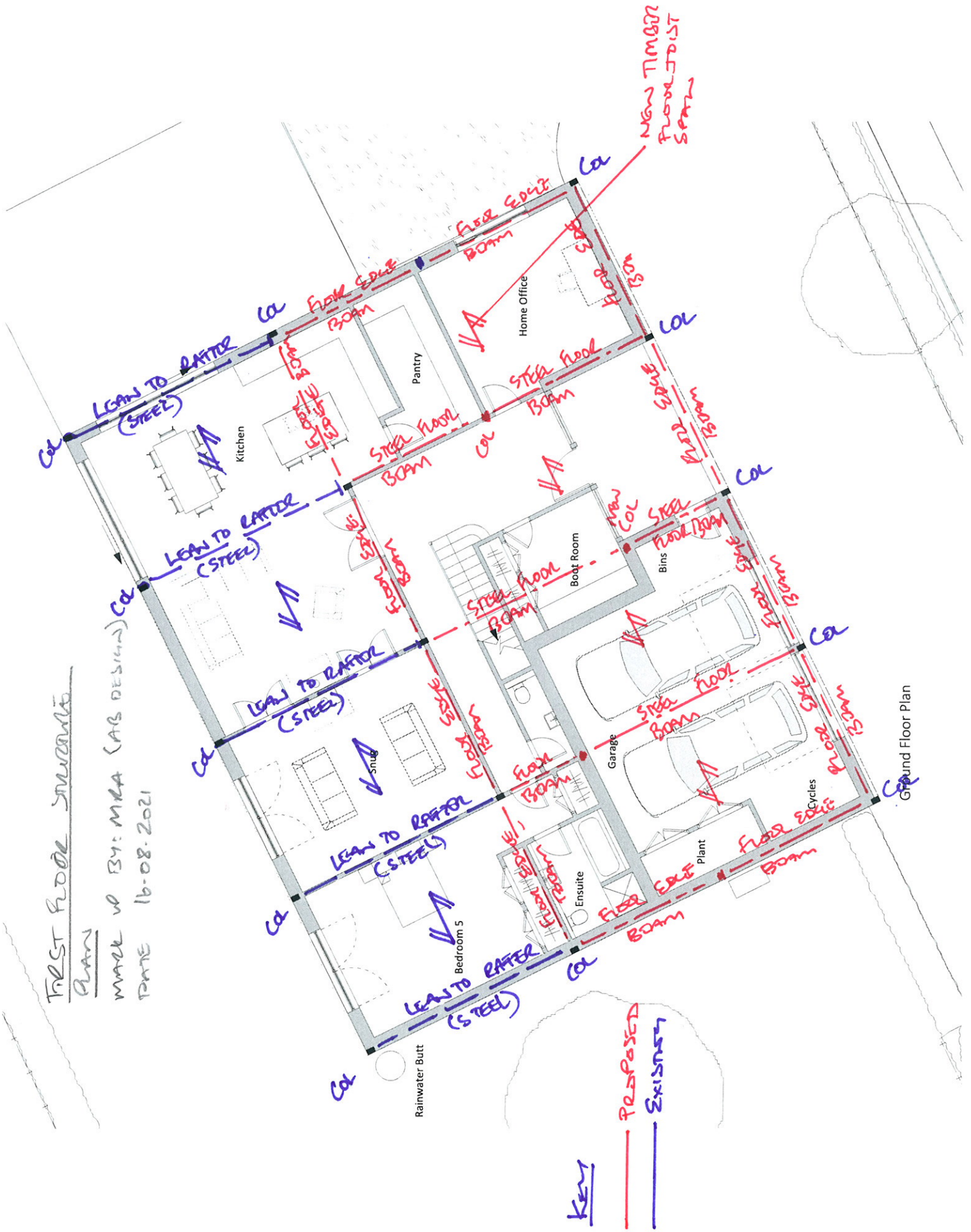
First Floor Plan

FIRST FLOOR STRUCTURE

PLAN

MADE UP BY: MHA (AS DESIGN)

DATE 16-08-2021



KEY

— PROPOSED

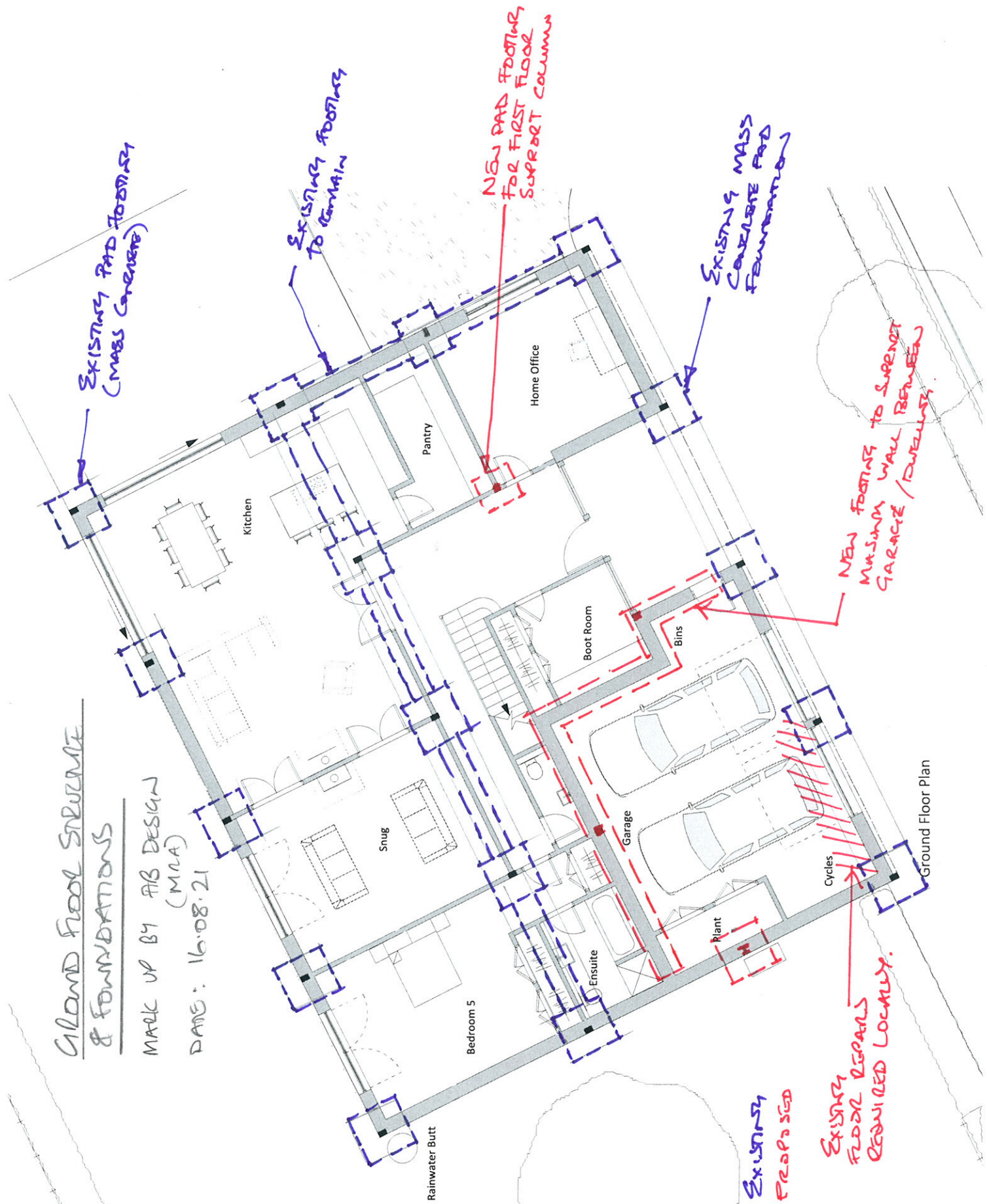
— EXISTING

Ground Floor Plan

GROUND FLOOR STRUCTURE & FOUNDATIONS

MARK UP BY AIB DESIGN (MNA)

DATE: 16.08.21



KEY

EXISTING
PROPOSED

EXISTING FLOOR REPAIRS REQUIRED LOCALLY.

NEW FOOTINGS TO SUPPORT MURKIN WALL BETWEEN GARAGE/DWELLING.

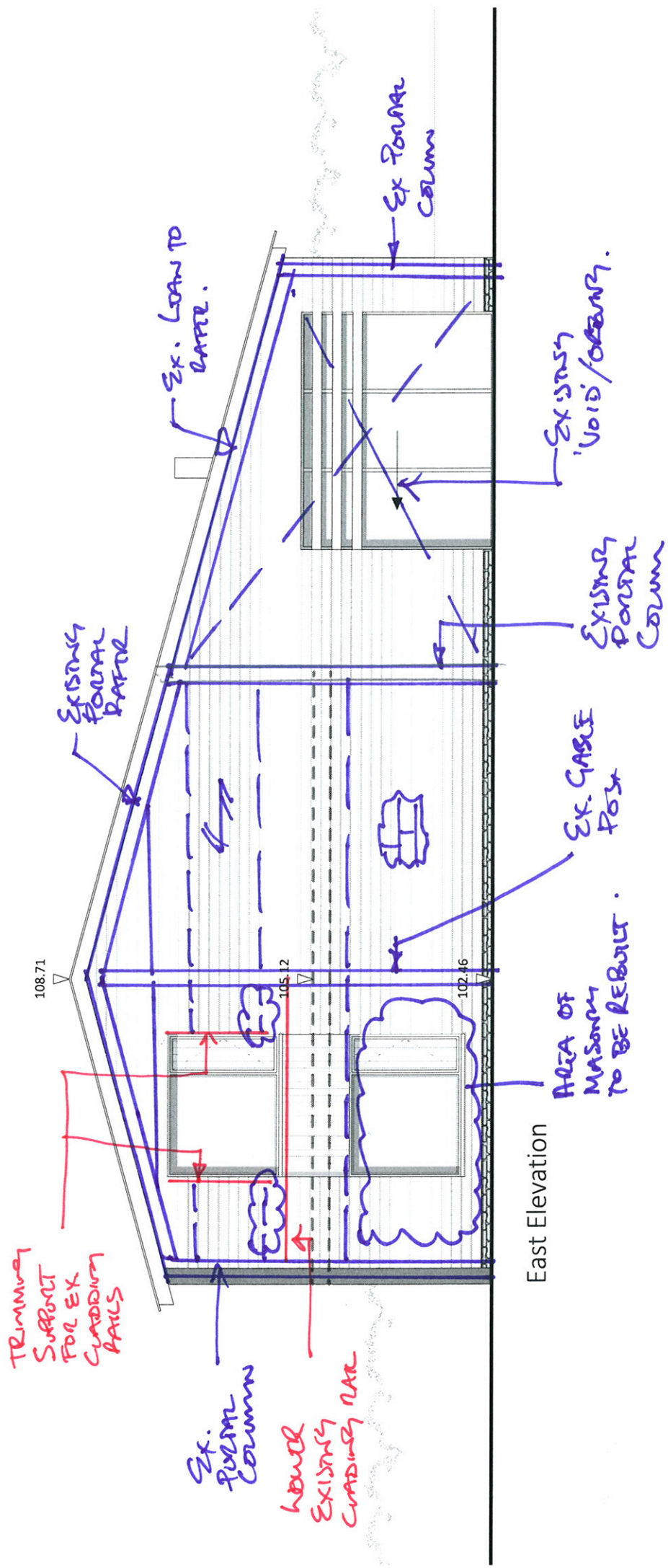
EXISTING MASS CONCRETE FOUNDATION

NEW PAD FOOTINGS FOR FIRST FLOOR SUPPORT COLUMN

EXISTING FOOTINGS TO REMAIN

EXISTING PAD FOOTINGS (MASS CONCRETE)

Ground Floor Plan



TRIMMING
SUPPORT
FOR EX
CURBING
PAIS

EX.
PORTAL
COLUMN

LOWER
EXISTING
CURBING PAIS

108.71

105.12

102.46

EX. LOAN TO
RAFTER.

EX PORTAL
COLUMN

EXISTING
PORTAL
PIER

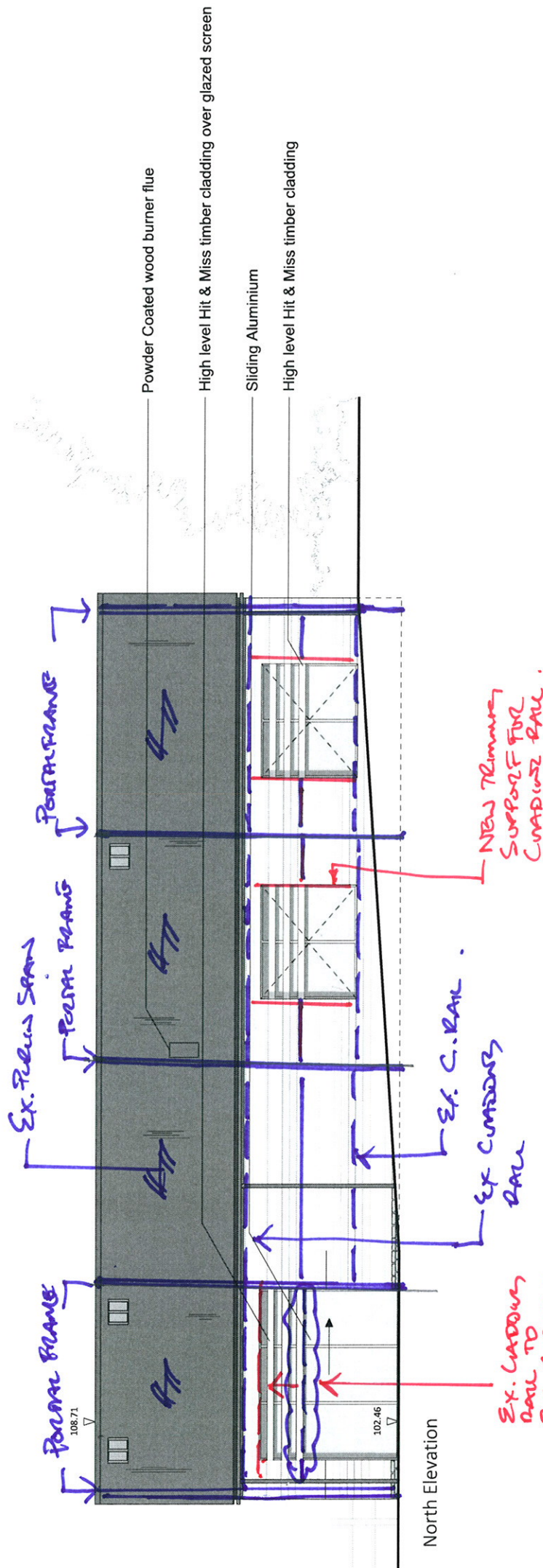
EXISTING
VOID/
OPENING.

EXISTING
PORTAL
COLUMN

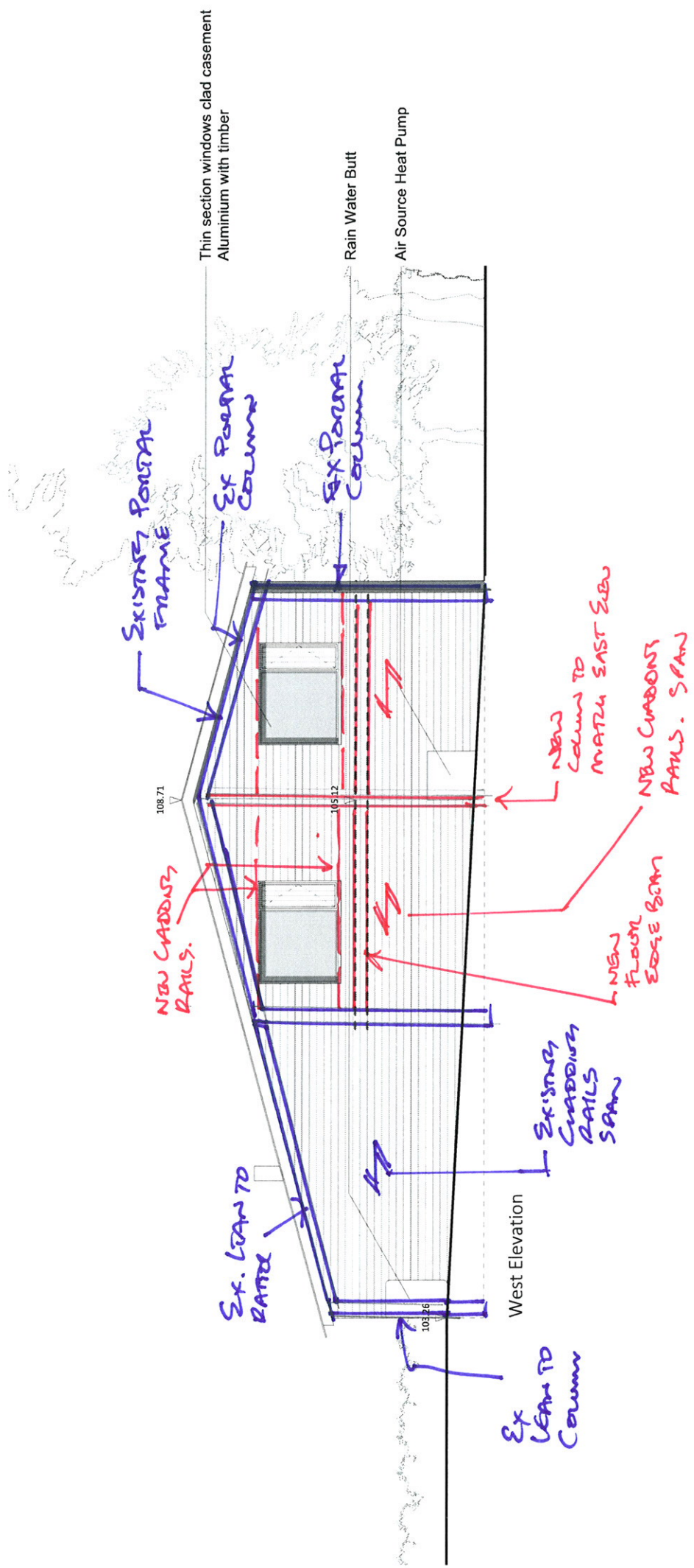
EX. GASE
POST

AREA OF
MASONRY
TO BE REBUILT.

East Elevation



North Elevation



6.0 PHOTOGRAPHS



Southern Elevation



Southern Gable



Eastern lean to. Mid height cladding rail to Eastern elevation to be modified in 3 bays.



Pole barn part demolished

