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**The Hill, Barns**  
Burrington

## Structural Condition Report

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March 2024  
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## 1. Introduction

This report is based on a survey of two outbuildings located adjacent to a house named The Hill in Burrington. KB2 Consulting Engineers Ltd were appointed by Yeo Valley Farms Limited to undertake a Structural Condition Survey of the buildings with a view to future conversion, subject to permissions.

A site visit was carried out on the 14<sup>th</sup> March 2024, an overcast and partly wet day. The inspection was visual only and, at the time, the barns were occupied by storage and a pony. Prior to undertaking the detailed design, we recommend that intrusive surveys are carried out to confirm existing structural details.

## 2. Description of Existing Buildings

The existing buildings are two barns located adjacent to a residential property called The Hill. To the west is Outbuilding 1 which was built relatively recently and comprises a stable and storage room. The foundations appear to be a ground bearing reinforced concrete raft slab off which the walls are built. The walls are all formed in 140mm single leaf concrete block and the roof is of timber construction with a combination of cut rafters and tied trusses.

The building to the east is Outbuilding 2 which is a much earlier construction. It is formed using 16 inch thick random stone walls and a timber roof. Given that rock or very hard clay are expected to be present close to the surface, it is likely that the walls are built directly off the soils with no foundations. The timber roof appears to have been renewed recently and contains a central truss, purlins and cut rafters. The barn floor contains a stepped concrete slab, presumably to suit former usage, and is believed to be mass concrete cast directly onto the ground.

Based on a search of the British Geological Society maps, the site appears to be underlain directly by Mercia Mudstone bedrock formation. Close to the surface, this type of bedrock is likely to present as weathered rock or hard clay.

### 3. Observations

During our inspection the following observations were made:

#### Outbuilding 1

- 3.1. The existing timbers appear to be performing adequately with no sign of water ingress, deterioration or distress.
- 3.2. The raft slab appears to be well constructed with no signs of cracks or movement.
- 3.3. The existing walls are solid blockwork with no visible cracks or other signs of movement.
- 3.4. The existing timber canopy may be reliant of a diagonal timber prop to support the cantilevered ridge beam. This should be considered in the detailed design but is unlikely to be required once a new gable wall is in place to support the roof along this edge.

#### Outbuilding 2

- 3.5. The building has a single room formed by the stone walls but with a lean-to shelter to the rear forming a covered storage area.
- 3.6. The main stone walls appear to be part of an original barn which is shown on historic maps prior to 1900. It looks like these walls have been modified / rebuilt recently, especially to the west elevation where openings and piers have been formed. To the south and east elevation the walls are likely to be more original.
- 3.7. To the south-east corner of the barn there is a stone buttress built against the corner of the barn. This will have been added to offer support to the original walls and should be retained or replaced as part of any future developments.
- 3.8. The main roof appears to have been replaced recently but the roof covering still appears to let in water at the valley of the lean-to roof. This has caused some localised decay of the rafter ends along the rear wall which will need some repairs.
- 3.9. The remaining roof timbers over the main space appear to be performing adequately.
- 3.10. Timbers to the lean-to roof have been exposed to extensive water ingress due to the lack of roof felt which has caused significant rot. Even without development, this roof should be removed and replaced with new timbers and covering.

#### 4. Proposed Development / Conversion

We have based our assessment on proposals to convert the two outbuildings into a single, one bedroom residential dwelling. It is expected that the majority of the existing footprint and wall layout will be maintained with only minor alteration and a central linking extension.

The new building will need to be weathertight and insulated which may be best achieved by replacing the existing roof coverings but retaining the existing roof structure. It is also envisaged that insulation will be required to floors and perimeter walls. These details would normally be confirmed during the detailed architectural design and this report will only focus on the structural elements.

Structurally, the existing timber roof structures are performing adequately under current loading conditions and these conditions are not expected to significantly increase. Replacing the existing coverings with similar materials and adding insulation and a ceiling would result in a minor increase of applied weight but this would not be structurally significant. As part of the conversion works, we recommend adding standard building restraint straps to adequately restrain the existing roof members and prevent wind uplift.

The existing walls have been found to be performing adequately and would not be adversely affected by conversion. Where internal cross walls are removed it will be necessary to take lateral support from new partitions or add wind posts. Both options are viable without too much disruption and further support could be taken from an inner leaf installed as part of the perimeter insulation works.

The existing floor slab of Outbuilding 2 will be best replaced. This can be done without disturbing the perimeter stone walls but care will be needed to make certain that excavations do not cause undermining. Trial pits will be carried out in advance of detailed design which will highlight any risks that the new structure can address.

Within Outbuilding 1, the raft slab will need to be retained and insulating the floor would be best achieved using a dry system consisting of ridged insulation and a floating timber floor. On this basis, conversion to residential dwelling usage would not significantly increase the applied loads and the slab would be structurally suitable.

A new link extension is to replace the lean to structure and be built using traditional foundations, load-bearing walls and a timber roof structure.



## **5. Drainage**

We understand that the site is served by private facilities rather than connection to a public sewer. The proposed below ground drainage scheme will need to be designed but is likely to take the form of an on-site domestic sewage treatment plant for foul water and soakaways for storm water. Ground permeability will need to be measured to confirm infiltration rates but there is expected to be adequate space on site to accommodate the necessary drainage features.

If not already in hand and aside from potential development proposals, we recommend undertaking an assessment of existing foul drainage provisions to ensure compliance with UK General Binding Rules.

## **6. Conclusion**

Our inspection confirmed that the existing building is performing adequately with only minor repairs required to overcome localised water damage. As described above, we recommend investigations to confirm the existing details and inform detailed design which will be required to gain building control approval.

Based on our observations, we consider that the existing structure is structurally suitable for conversion to residential usage.

**Appendix A – Survey Photographs**



Photograph 1 – View from north



Photograph 2 – Outbuilding 2, from west





Photograph 3 – Outbuilding 2, lean-to from north-east



Photograph 4 – Outbuilding 2, internal





Photograph 5 – Outbuilding 1, from west



Photograph 6 – Outbuilding 1, from east





Photograph 7– Outbuilding 1, internal



Photograph 8– Outbuilding 1, storage room internal

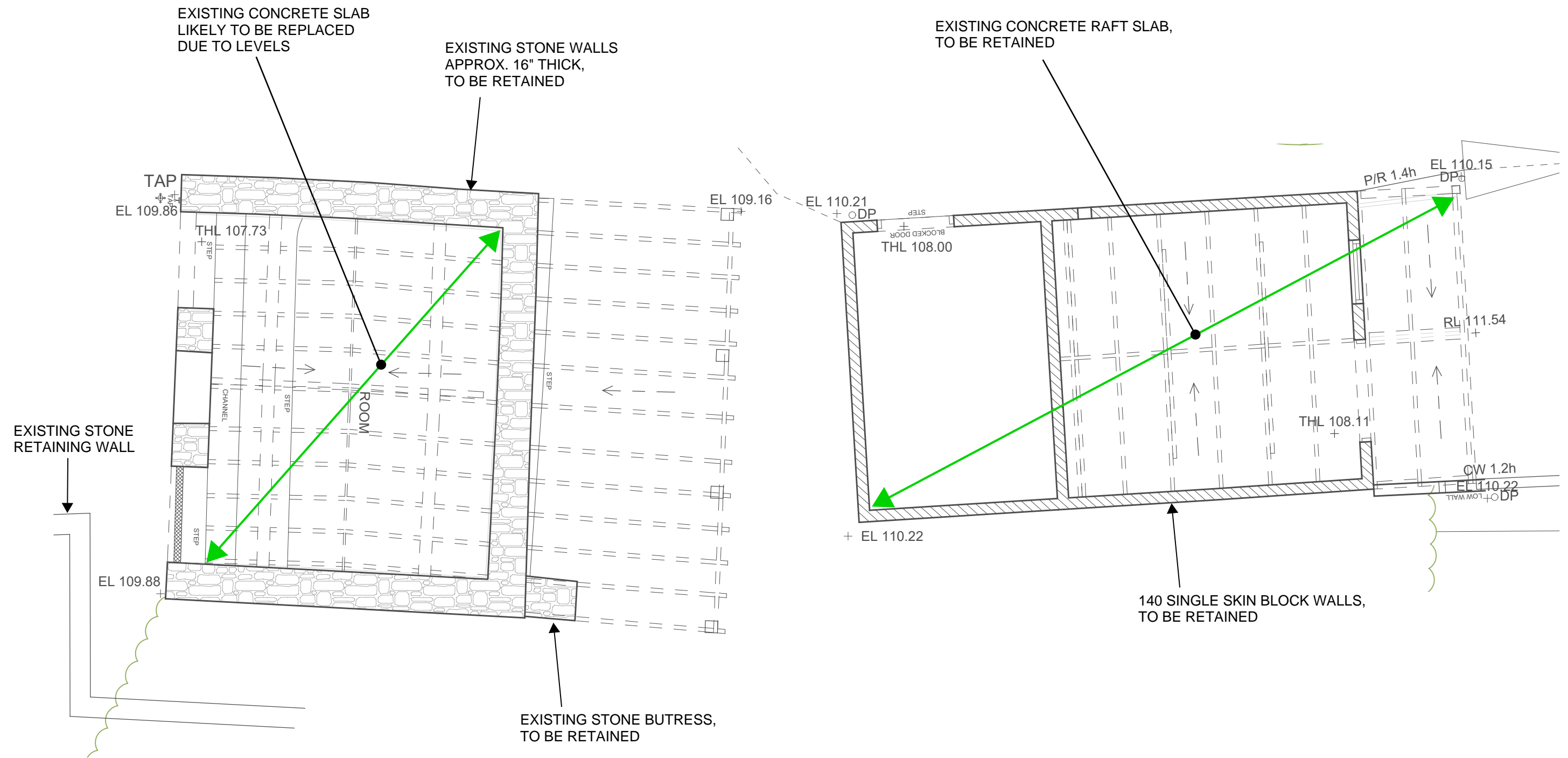
**Appendix B – Sketch Plans**



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PROJECT  
THE HILL, BARNS

**NOTES**  
 1. EXISTING FOUNDATIONS THOUGHT TO BEAR DIRECTLY ONTO MERCIA MUDSTONE SOILS. INVESTIGATION REQUIRED FOR NEW FOUNDATION DESIGN.  
 2. ALL EXISTING TIMBERS TO BE INSPECTED FOR ROT. WHERE PRESENT, CARRY OUT LOCAL REPAIRS BUT RETAIN EXISTING MEMBERS.



**GROUND FLOOR - SURVEY PLAN**

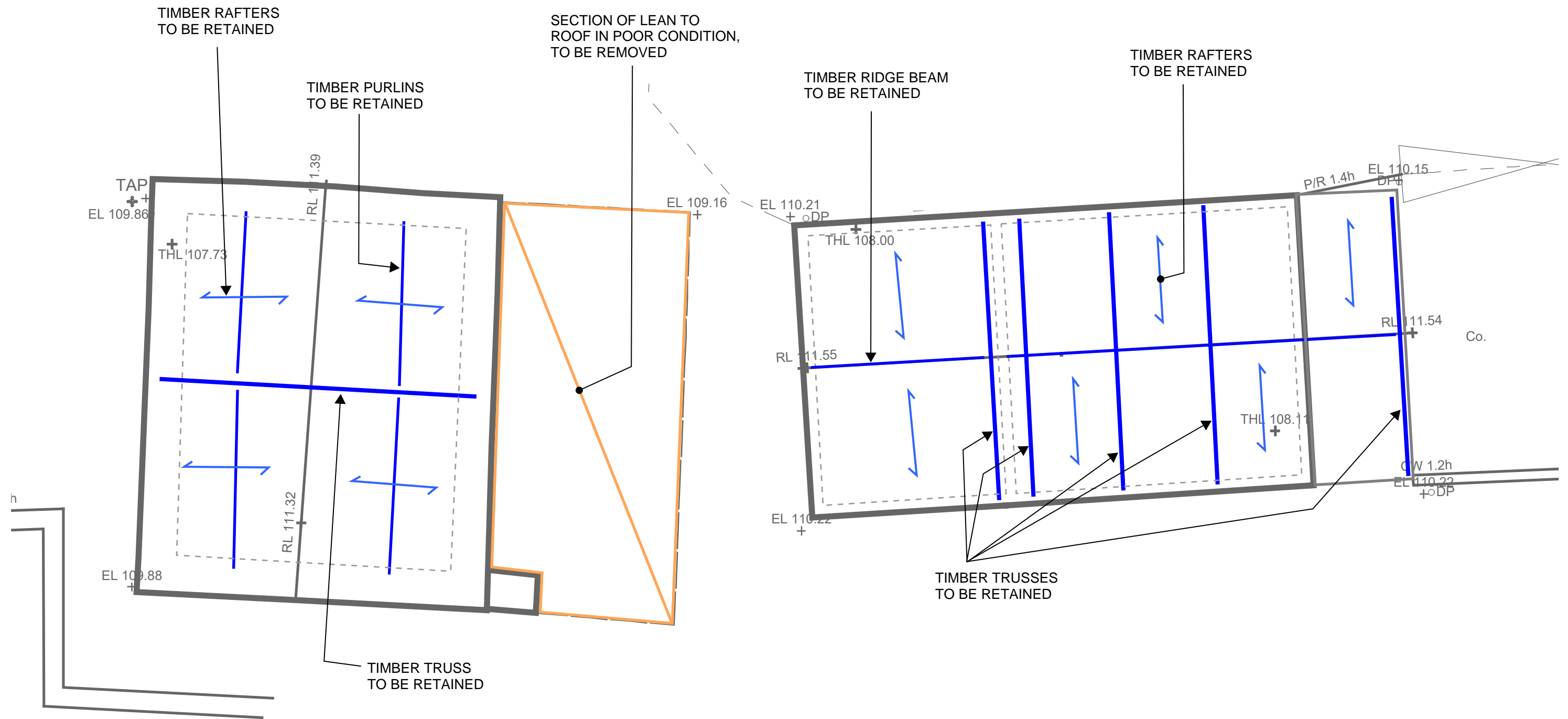




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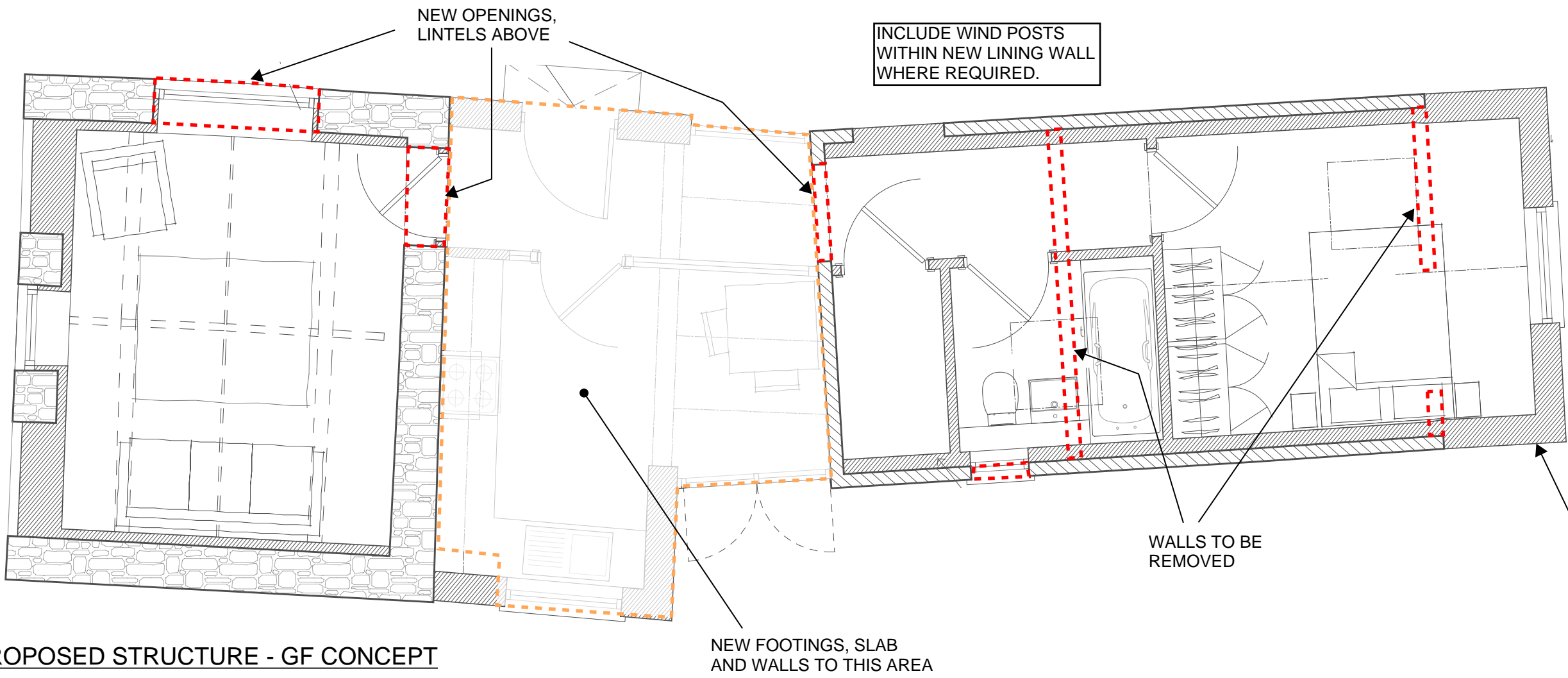
PROJECT  
**THE HILL, BARNs**

NOTES  
1. ROOF COVERING TO BE REPLACED WITH NEW WATERPROOF AND INSULATED BUILD UP WITH A WEIGHT NOMINALLY SIMILAR TO THE EXISTING COVERINGS.

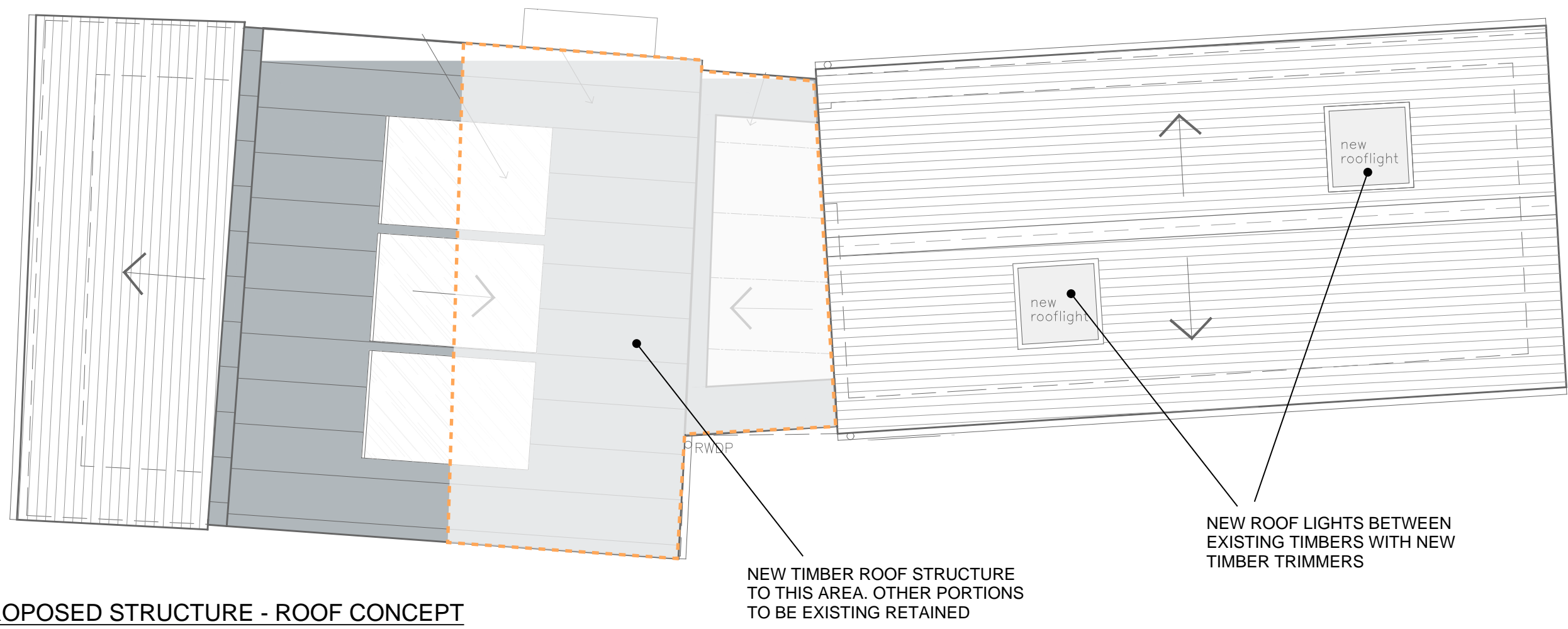


**ROOF - SURVEY PLAN**

- NOTES**
1. OUTLINE DESIGN. TO BE CONFIRMED FOR BUILDING REGULATIONS STAGE / PRIOR TO CONSTRUCTION.
  2. EXISTING SLOPE / RETAINING WALL TO REAR OF THE PROPERTY TO BE BATTERED BACK OR RETAINED BY NEW RETAINING WALL INDEPENDENT OF THE BUILDING.
  3. EXISTING TIMBERS TO BE TIED TO WALLS USING STANDARD BUILDING REGULATIONS STRAPPING DETAILS.



**PROPOSED STRUCTURE - GF CONCEPT**



**PROPOSED STRUCTURE - ROOF CONCEPT**