



Fells Farm, Wigglesworth Road, Slaidburn, BD23 4SY
Flood Risk Assessment

For Tom Pope

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Status	Final
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EXECUTIVE SUMMARY

The Site would be expected to remain dry in all but the most extreme conditions. The consequences of flooding are acceptable, and the development would be in accordance with the requirements of the National Planning Policy Framework (NPPF). The Proposed Development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF.

The Proposed Development should not therefore be precluded on the grounds of flood risk or drainage.

1.0 INTRODUCTION

1.1 Background

This Flood Risk Assessment (FRA) has been prepared by KRS Enviro at the request of Mr Tom Pope to support a planning application for the demolition of an existing dwelling; the conversion of the attached barn to create a replacement dwelling; and a single-storey extension on the footprint of an original farmhouse (“the Proposed Development”) at Fells Farm, Wigglesworth Road, Slaidburn, BD23 4SY (“the Site”).

This FRA has been carried out in accordance with guidance contained in the National Planning Policy Framework (NPPF)¹, associated Planning Practice Guidance on flood risk and coastal change² (PPG) and the PPG ‘Site-specific flood risk assessment checklist’. This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

It is recognised that developments which are designed without regard to flood risk may endanger lives, damage property, cause disruption to the wider community, damage the environment, be difficult to insure and require additional expense on remedial works. The development design should be such that future users will not have difficulty obtaining insurance or mortgage finance, or in selling all or part of the development, as a result of flood risk issues.

1.2 National Planning Policy Framework (NPPF)

One of the key aims of the NPPF is to ensure that flood risk is taken into account at all stages of the planning process; to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk.

It advises that where new development is exceptionally necessary in areas of higher risk, this should be safe, without increasing flood risk elsewhere, and where possible, reduce flood risk overall. A risk-based approach is adopted at stages of the planning process, applying a source pathway receptor model to planning and flood risk. To demonstrate this, an FRA is required and should include:

- whether a Proposed Development is likely to be affected by current or future flooding from all sources;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate;
- if necessary, provide the evidence to the Local Planning Authority (LPA) that the Sequential Test can be applied; and
- whether the development will be safe and pass part c) of the Exception Test if this is appropriate.

The report findings are based upon professional judgement and are summarised below with detailed recommendations provided at the end of the report. The report includes rainfall data

¹ Ministry for Housing, Communities and Local Government (2025) National Planning Policy Framework: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf

² Communities and Local Government (2022) Planning Practice Guidance - Flood Risk and Coastal Change: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

from the Flood Estimation Handbook (FEH) and hydrogeological information from the British Geological Survey (BGS). The assessment will summarise and refer to these datasets in the text.

1.3 Report Structure

This FRA has the following report structure:

- Section 2 describes the location and the existing and Proposed Development;
- Section 3 outlines the flood risk to the existing and Proposed Development;
- Section 4 details the proposed surface water drainage for the Site;
- Section 5 describes the risk management methods used to mitigate all sources of flood risk;
- Section 6 provide details of the Sequential and Exception Tests; and
- Section 7 presents a summary and conclusions.

2.0 LOCATION & DEVELOPMENT DESCRIPTION

2.1 Site Location

The Site is located at Fells Farm, Wigglesworth Road, Slaidburn, BD23 4SY (see Figure 1). The National Grid Reference (NGR) of the Site is 375661, 453581.

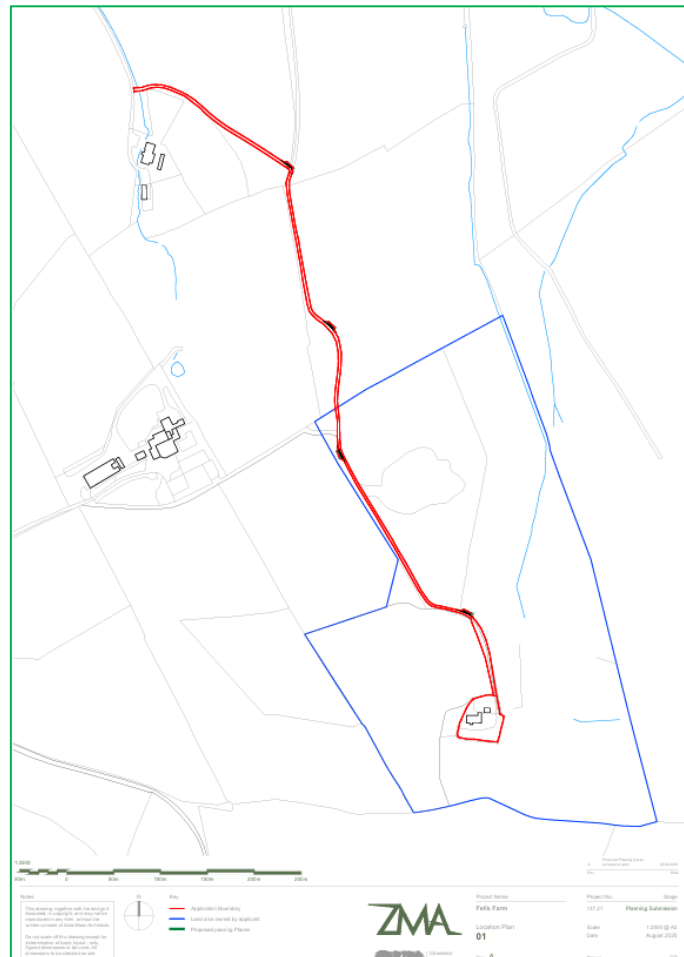


Figure 1 - Site Location

2.2 Existing Development

The existing Site currently consists of a 1-bedroom cabin-style dwelling attached to a traditional stone barn, with a front driveway/parking area, front and rear gardens. The property is accessed via a private lane which meets Wigglesworth Road to the north (see Appendix 1).

2.3 Proposed Development

It is understood the Proposed Development is for the demolition of an existing dwelling; the conversion of the attached barn to create a replacement dwelling; and a single-storey extension on the footprint of an original farmhouse (see Appendix 1). Further details with regard to the Proposed Development can be found in the accompanying information submitted with the planning application.

2.4 Ground Levels

A topographical survey of the Site has recently been undertaken (see Appendix 2). The Site falls from south to north with a maximum ground level of 274.33 metres Above Ordnance Datum (mAOD) to the south and a minimum ground level of 268.33mAOD to the north. The existing finished floor level of the building is 271.41mAOD.

2.5 Catchment Hydrology/Drainage

There are two drainage ditches to the east and north east of the Site. There is also a drainage ditch near the entrance of the access track to the Site. The Threap Green Brook is located approximately 300m to the south of the Site. Stocks Reservoir is located approximately 3km to the north west of the Site. The existing Site discharges surface water runoff to the drainage ditches and soakaway.

2.6 Ground Conditions

The British Geological Survey (BGS) map³ shows that the bedrock deposits underneath the Site consist of the Pendleside Sandstone Member - sandstone and argillaceous rocks, interbedded. Sedimentary bedrock formed between 330.90 and 329 million years ago during the Carboniferous period. The superficial deposits consist of Till, Devensian - diamicton. Information from the National Soil Resources Institute⁴ details the Site area as being situated on freely draining slightly acid but base-rich soils .

³ https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.14476159.932338379.1655890995-1831306757.1655472887

⁴ <http://www.landis.org.uk/soilscapes/>

3.0 FLOOD RISK

3.1 Sources of Flooding

All sources of flooding have been considered, these are; fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial drainage systems/infrastructure failure.

3.2 Climate Change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Guidance included within the NPPF recommends that the effects of climate change are incorporated into FRA's. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the flood risk assessments: climate change allowances guidance⁵.

The flood risk assessments: climate change allowances guidance recommends that for 'more vulnerable' that the central allowances are used to assess climate change throughout the lifetime of the development which is 100 years. Table 1 shows the peak river flow allowances by river catchment therefore, the fluvial design event for the Site is the 1 in 100 year (+36%) event.

Table 1 - Peak River Flow Allowances by River Catchment

River Catchment	Allowance Category	2020s	2050s	2080s
Ribble Management Catchment	Upper	+27%	+44%	+71%
	Higher	+19%	+29%	+46%
	Central	+16%	+23%	+36%

3.3 Historic Flooding

Environment Agency data indicates that the Site has not historically flooded. There are no other records of anecdotal information of flooding at the Site. The British Hydrological Society "Chronology of British Hydrological Events" has no information on flooding within the vicinity of the Site. No other historical records of flooding for the Site have been recorded. Therefore, it has been concluded that the Site has not historically flooded.

3.4 Existing and Planned Flood Defence Measures

The Site is not protected against flooding by flood defence measures.

3.5 Environment Agency Flood Zones

A review of the Environment Agency's Flood Zones indicates that the Site is located within Flood Zone 1 and therefore has a 'low probability' of flooding with less than a 1 in 1000 annual probability of river flooding in any year (<0.1%), as shown in Figure 2.

The Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. They show the worst case scenario.

⁵ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances>

The Environment Agency Flood Zones and acceptable development types are explained in Table 1. Table 1 shows all some development types are acceptable in Flood Zone 1.

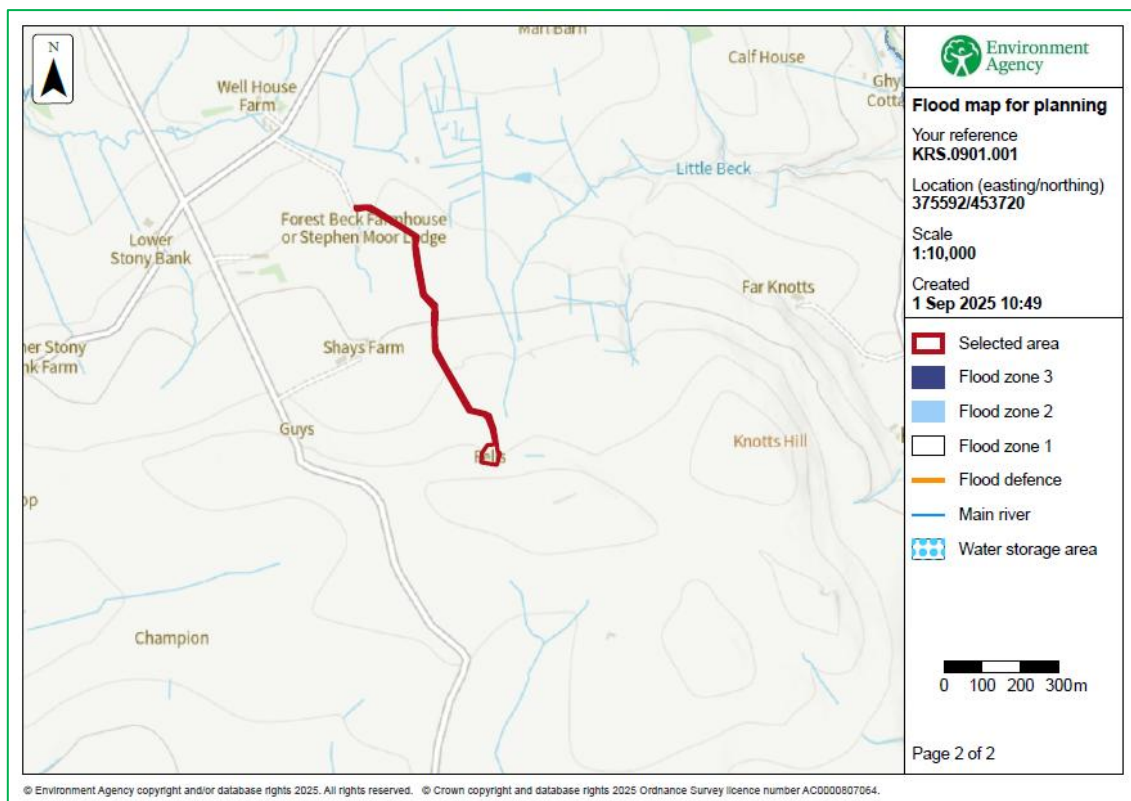


Figure 2 - Environment Agency Flood Zones

Table 2 - Environment Agency Flood Zones and Appropriate Land Use

Flood Zone	Probability	Explanation	Appropriate Land Use
Zone 1	Low	Less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%)	All development types generally acceptable
Zone 2	Medium	Between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year	Most development type are generally acceptable
Zone 3a	High	A 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year	Some development types not acceptable
Zone 3b	'Functional Floodplain'	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:	Some development types not acceptable

	<ul style="list-style-type: none"> land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). <p>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)</p>	
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3.6 Flood Vulnerability

In the PPG appropriate uses have been identified for the Flood Zones. Applying the Flood Risk Vulnerability Classification in the PPG, the existing and proposed use is classified as ‘more vulnerable’. The Proposed Development will not increase the vulnerability of the Site to flooding or introduce a new ‘more vulnerable’ use into the floodplain.

Table 3 of this report and the PPG state that ‘more vulnerable’ uses are appropriate within Flood Zone 1 after the completion of a satisfactory FRA.

Table 3 - Flood Risk Vulnerability and Flood Zone ‘Compatibility’

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception test required	✓	✓
Zone 3a	Exception test required	✓	✗	Exception test required	✓
Zone 3b ‘Functional Floodplain’	Exception test required	✓	✗	✗	✗

Key: ✓: Development is appropriate, ✗: Development should not be permitted.

3.7 Fluvial (River) Flooding

The Site is not located within the vicinity of fluvial flooding sources and the risk of fluvial flooding is considered to be **not significant**.

3.8 Tidal (Coastal) Flooding

The Site is not located within the vicinity of tidal flooding sources and the risk of tidal flooding is considered to be **not significant**.

3.9 Groundwater Flooding

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers).

Environment Agency data states that flooding from groundwater is unlikely in this area. Site ground conditions also suggest a low potential for groundwater flooding. The risk of flooding from groundwater flooding is considered to be **not significant**.

3.10 Surface Water (Pluvial) Flooding

The Site is not situated near to large areas of poor permeability and the soil conditions at the Site and within the vicinity of the Site indicate that the Site would not be at risk of surface water flooding. Surface water flooding tends to occur sporadically in both location and time such surface water would tend to be confined to the streets around the development.

The Environment Agency Surface Water flood map shows that the Site has a very low risk of surface water flooding with a chance of flooding of less than a 1 in 1000 (0.1%) annual probability of flooding in any year, as shown in Figures 3 to 5.

Given the scale and nature of the Proposed Development and the size and location of the surface water flooding sources it has been concluded that surface water flooding poses a very low flood risk to the Site. Therefore, the risk of flooding from surface water flooding is considered to be **not significant**.

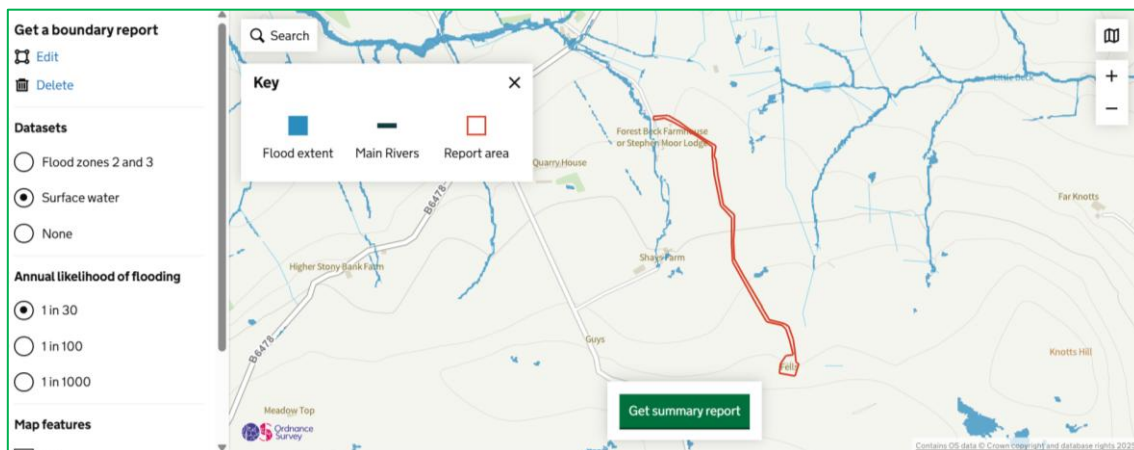


Figure 3 - Environment Agency Surface Water Flood Map: High Risk 1 in 30 Year Event

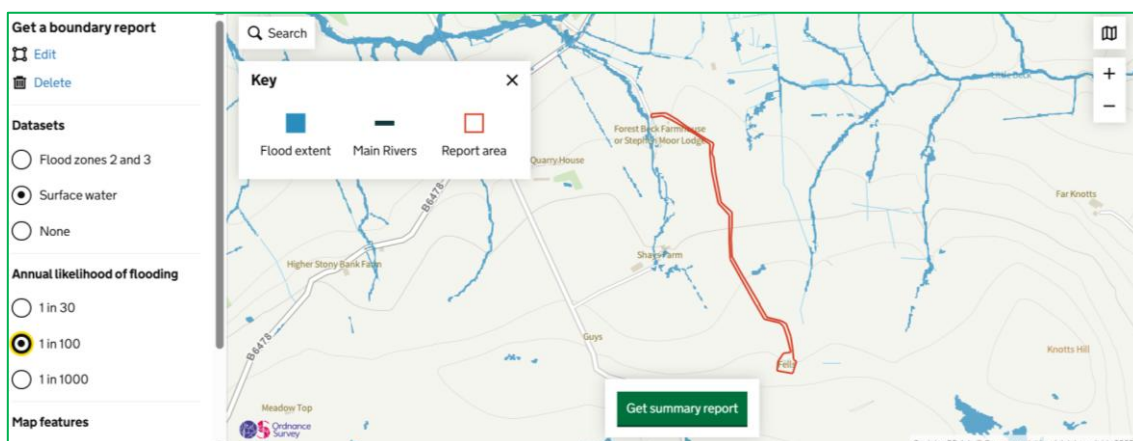


Figure 4 - Environment Agency Surface Water Flood Map: High Risk 1 in 100 Year Event

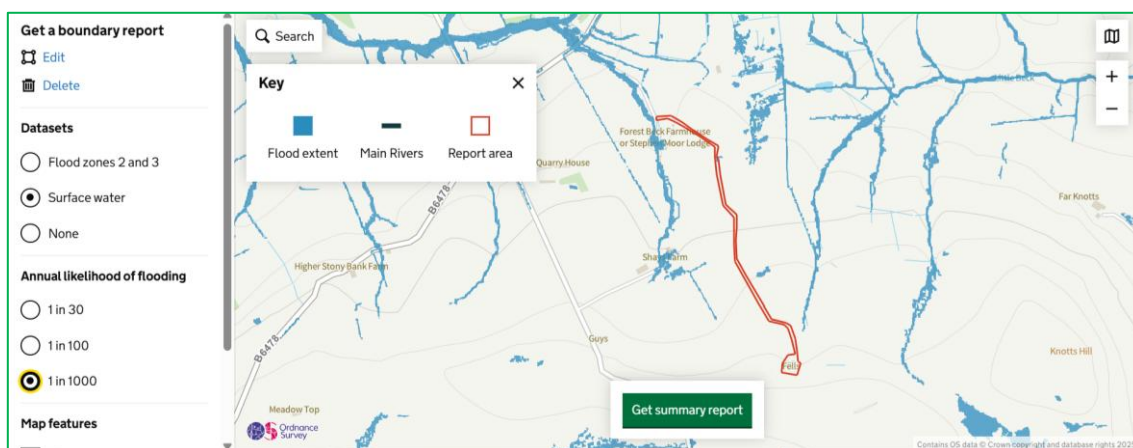


Figure 5 - Environment Agency Surface Water Flood Map: High Risk 1 in 1000 Year Event

3.11 Sewer Flooding

Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time such flood flows would tend to be confined to the streets around the development.

There are existing sewers located within the vicinity of the Site and these will inevitably have a limited capacity so in extreme conditions there would be surcharges, which may in turn cause flooding. Flood flows could also be generated by burst water mains, but these would tend to be of a restricted and much lower volume than weather generated events and so can be discounted for the purposes of this assessment.

Given the design parameters normally used for drainage design in recent times and allowing for some deterioration in the performance of the installed systems, which are likely to have been in place for many years, an appropriate flood risk probability from this source could be assumed to have a return period in the order of 1 in 10 to 1 in 20 years. The provision of adequate level difference between the ground floors and adjacent ground level would reduce the annual probability of damage to property from this source to 1 in 100 years or less. Therefore, the risk of flooding from sewer flooding is considered to be **not significant**.

3.12 Flooding from Artificial Drainage Systems/Infrastructure Failure

There are no other nearby artificial water bodies, reservoirs, water channels and artificial drainage systems that could be considered a flood risk to the Site. The Environment Agency Reservoir flood map shows that the Site is not at risk of reservoir flooding (see Figure 6). The risk of flooding from artificial drainage systems/infrastructure failure is considered to be **not significant**.



Figure 6 - Environment Agency Reservoir Flood Map

3.13 Impact of the Proposed Development on Flood Risk

The Site is occupied by an existing building and no land raising will occur within the Site, therefore the Proposed Development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed Site and surrounding area. There will no net loss in flood storage capacity. The conveyance routes (flow paths) will not be blocked or obstructed.

There will be no increase in the flood water levels due to the Proposed Development. There will be no loss in flood storage capacity and no change in the on-site and off-site flood risk.

3.14 Summary of Site Specific Flood Risk

A summary of the sources of flooding and a review of the risk posed by each source at the Site is shown in Table 4.

The Site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The Site has a 'low probability' of fluvial flooding as the site is located within Flood Zone 1 with less than a 1 in 1000 annual probability of river/tidal flooding in any year (<0.1%). The risk of flooding from all sources is considered to be not significant and the Site has no history of flooding.

The existing and proposed use is classified as 'more vulnerable'. The Proposed Development will not increase the vulnerability of the Site to flooding or introduce a new 'more vulnerable' use into the floodplain. 'More vulnerable' uses are appropriate within Flood Zone 1.

There will be no increase in the flood water levels due to the Proposed Development. There will be no loss in flood storage capacity and no change in the on-site and off-site flood risk.

The flood risk at the Site, will be further managed and mitigated by using a number of risk management techniques, and mitigation strategies to manage and reduce the overall flood risk at the Site.

In conclusion, the flood risk to the Site can be considered to be limited; the Site is situated in Flood Zone 1, with a very low annual probability of flooding and from all sources. The Site is unlikely to flood except in very extreme conditions.

Table 4 - Risk Posed by Flooding Sources

Sources of Flooding	Potential Flood Risk	Potential Source	Probability/Significance
Fluvial Flooding	No	None Reported	None
Tidal Flooding	No	None Reported	None
Groundwater Flooding	No	None Reported	None
Surface Water Flooding	No	None Reported	None
Sewer Flooding	No	None Reported	None
Flooding from Artificial Drainage Systems/Infrastructure Failure	No	None Reported	None

4.0 SURFACE WATER DRAINAGE STATEMENT

4.1 Surface Water Management Overview

It is recognised that consideration of flood issues should not be confined to the floodplain. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in the catchment, particularly flooding downstream. For example, replacing vegetated areas with roofs, roads and other paved areas can increase both the total and the peak flow of surface water runoff from the development Site. Changes of land use on previously developed land can also have significant downstream impacts where the existing drainage system may not have sufficient capacity for the additional drainage.

An Outline SuDS Statement for the Site proposals has been developed to manage and reduce the flood risk posed by the surface water runoff from the Site. An assessment of the surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the Site.

The requirement for managing surface water runoff from developments depends on the predeveloped nature of a site. The impact of the development will need to be mitigated so that the runoff from the site replicates the natural drainage characteristics of the pre-developed site. It should be acknowledged that the satisfactory collection, control and discharge of surface water runoff are now a principle planning and design consideration. This is reflected in guidance as well as the Defra non-statutory technical standards for SuDS.

4.2 Climate Change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the flood risk assessments: climate change allowances guidance⁶. The recommended precautionary sensitivity range for peak rainfall intensity are summarised in Table 5.

Table 5 - Peak Rainfall Intensity Allowance

River Catchment	Return Period (yrs)	Allowance Category	2050s	2070s
Ribble Management Catchment	30	Upper end	+35%	+40%
		Central	+25%	+30%
	100	Upper end	+40%	+50%
		Central	+25%	+35%

4.3 Surface Water Runoff Rates/Volumes

It is necessary to identify the most appropriate method of controlling and discharging surface water. The existing Site discharges surface water runoff to the drainage ditches and soakaway it is therefore, deemed sustainable to re-use the existing connections to the drainage ditches and soakaway.

The Proposed Development consists of the demolition of the existing property, and rebuilding on the footprint of the original 2-storey farmhouse, along with converting the attached barn to use as part of the dwelling. Therefore the Proposed Development will not alter the impermeable areas of the Site. It is understood that the existing drainage infrastructure at the Site efficiently and effectively manages surface water runoff generated at the Site. As there is

⁶ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances>

no recent history of surface water flooding at the Site it is likely that the current drainage system is sufficient for the current and proposed Site use. There will be no increase in surface water runoff or exacerbation of off-site risk as a result of the development.

4.4 Greenfield Runoff Rates

An estimation of surface water runoff is required to permit effective site surface water management and prevent any increase in flood risk to off-site receptors. In accordance with The SuDS Manual, the Greenfield runoff from the Site has been calculated using the Institute of Hydrology 124 (IoH124) method. Table 6 shows the IoH124 method Greenfield runoff rates calculated for the impermeable area of circa 0.0225 hectares (ha). QBAR has been calculated to be 0.30 litres/second (see Appendix 3).

Table 6 - IoH124 Method Greenfield Runoff Rates

Rainfall Event	Runoff Rate (l/s)
1	0.30
QBAR (rural)	0.30
30	0.50
100	0.70

The method used for calculating the runoff complies with the NPPF, as well as the Defra non-statutory technical standards for SuDS, and assumes that the excess runoff associated with the Proposed Development (plus an allowance for future climate change) will need to be managed.

4.5 Proposed Outline SuDS Statement

The objective of this Outline SuDS Statement is to ensure that a sustainable drainage solution can be achieved which reduces the peak discharge rate to manage and reduce the flood risk posed by the surface water runoff from the Site and takes into account the following principles:

- No increase in the volume or runoff rate of surface water runoff from the Site.
- No increase in flooding to people or property off-site as a result of the development.
- No surface water flooding of the Site.
- The proposals take into account a 50% increase in rainfall intensity due to climate change during the next 100 years which is the lifetime of the development.

In line with adopting a 'management train' it is recommended that water is managed as close to source as possible. This will reduce the size and cost of infrastructure further downstream and also shares the maintenance burden more equitably. It is therefore recommended that the Site provides its own attenuation and could take the form of:

- Re-use the existing connections to the drainage ditches and soakaway.
- Paths around the building drain to grassed lawns.
- Car parking areas drained by permeable surfaces.
- For larger events in other areas such landscaped areas, provided that it will not cause damage or prevent access.

For all developments, both the Building Regulations and NPPF promote a hierarchical approach to surface water management. This approach has been adopted within this Outline SuDS Statement, infiltration devices. It is deemed sustainable to re-use the existing connections to the drainage ditches and soakaway. All areas drained would be designed to accommodate a 100 year (+50%) event.

The remainder of the Site that is not formally drained, i.e. landscaped areas, will be permeable (grass). The majority of rainwater falling on these areas will soak into the ground. Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the building and through contouring of the hardstanding areas.

Additional storage would be provided within the manholes, pipes and drainage gullies which will provide betterment over and above the 1 in 100 year (+50%) event. Flooding will not occur on any part of the Site during the 1 in 30 year event, no flooding will occur within any part of the building during the 1 in 100 year (+50%) event, all areas drained have been designed to accommodate the 1 in 100 year (+50%) event.

These methods will reduce peak flows, the volume of runoff, and slow down flows and will provide a suitable SuDS solution for this Site. The Outline SuDS Statement will reduce the risk of flooding to the Site and off-site locations. In adopting these principles, it has been demonstrated that a scheme can be developed that does not increase the risk of flooding to adjacent properties and development further downstream.

4.6 Designing for Local Drainage System Failure/Exceedance Events

When considering residual risk, it is necessary to make predictions as to the impacts of a storm event that exceeds the design event, or the impact of a failure of the local drainage system. The Outline SuDS Statement applies a safe and sustainable approach to discharging rainfall runoff from the Site and this reduces the risk of flooding however, it is not possible to completely remove the risk. This section of the FRA is therefore associated with the way the residual risk is managed.

As part of the Outline SuDS Statement it must be demonstrated that the flooding of property would not occur in the event of local drainage system failure and/or design exceedance. It is not economically viable or sustainable to build a drainage system that can accommodate the most extreme events. Consequently, the capacity of the drainage system may be exceeded on rare occasions, with excess water flowing above ground.

The size of the storage has been designed to accommodate the 1 in 100 year event plus climate change (+50%). The design of the Site layout provides an opportunity to manage this local drainage system failure/exceedance flow and ensure that indiscriminate flooding of property does not occur.

There will not be an extensive sewerage network on the Site and therefore any potential exceedance flooding would be from the sewers and lateral drains connecting the buildings to the underground storage areas. It is very unlikely that a catastrophic failure would occur. An exceedance or blockage event of the sewers would not affect the proposed buildings because the finished floor level will be raised above surrounding ground levels, ensuring any exceedance flooding would not affect the buildings. Exceedance flows would be contained within the Site and would flow to the lower ground levels where the landscaped areas will be located. It is not considered that there is an increased risk to the properties on the Site or located adjacent to the Site.

Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the buildings and through contouring of the hardstanding areas. When considering the impacts of a storm event that exceeds the 1 in 100 year (+50%) event, there is safety factor, even under the design event conditions. Consequently, if this event were to be exceeded there is additional capacity with the system to accommodate this (i.e. within the manholes, pipes etc.). If this freeboard was to be exceeded the consequences would be similar, if not less than for the local drainage system failure. Consequently, the impact of an exceedance event is not considered to represent any significant flood hazard.

The above manages and mitigates the flood risk from surface water runoff to the proposed properties from surface water runoff generated by the Site development and to off-site locations as well the risk from surface water runoff generated off-site.

5.0 RISK MANAGEMENT

5.1 Introduction

In this flood zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout, form of the development and the use of flood mitigation measures including SuDS techniques. The flooding sources will have to be mitigated on the site by using a number of techniques, and mitigation strategies to manage and reduce the overall flood risk at the site. These will be used to ensure the development will be safe and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the proposed development on flood risk generally; and;
- Minimal disruption to natural heritage.

5.2 Minimum Floor Level

There is no minimum finished floor level proposed as a result of flooding. However, it is recommended that the building is set above the ground level to enable the full capacity of any secondary flood conveyance to be utilised.

5.3 Flood Resilience and Resistance

The development of the layout should always consider that the site is potentially at risk from an extreme event and as such the implementation of flood resilience and resistance methods should be assessed. Relatively simple measures such as raising utility entry points, using first floor or ceiling down electrical circuits and sloping landscaping away from properties can be easily and economically incorporated into the development of the Site.

5.4 Access and Egress

A permanently safe and dry access can be maintained.

5.5 Flooding Consequences

The mitigation measures detailed above show that the flood risk can be effectively managed and therefore the consequences of flooding are acceptable. In conclusion, the flood risk to the site can be considered to be limited; the site is situated in Flood Zone 1, with a very low annual probability of flooding and from all sources.

6.0 THE SEQUENTIAL APPROACH

6.1 Sequential and Exception Tests

The Sequential and Exception Tests ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. The approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk.

The flood risk posed to the Site can be considered to be limited; the site is located within Flood Zone 1 and has a very low annual probability of flooding from all sources. The Site is unlikely to flood except in very extreme conditions. Therefore, the Sequential and Exception Tests will not need to be undertaken as part of this planning application.

7.0 SUMMARY AND CONCLUSIONS

7.1 Introduction

This report presents a FRA in accordance with the NPPF for the Proposed Development at Fells Farm, Wigglesworth Road, Slaidburn, BD23 4SY

This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

7.2 Flood Risk

The Site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The Site has a 'low probability' of fluvial flooding as the site is located within Flood Zone 1 with less than a 1 in 1000 annual probability of river/tidal flooding in any year (<0.1%). The risk of flooding from all sources is considered to be not significant and the Site has no history of flooding.

The existing and proposed use is classified as 'more vulnerable'. The Proposed Development will not increase the vulnerability of the Site to flooding or introduce a new 'more vulnerable' use into the floodplain. 'More vulnerable' uses are appropriate within Flood Zone 1.

There will be no increase in the flood water levels due to the Proposed Development. There will be no loss in flood storage capacity and no change in the on-site and off-site flood risk. The flood risk at the Site, will be further managed and mitigated by using a number of risk management techniques, and mitigation strategies to manage and reduce the overall flood risk at the Site.

In conclusion, the flood risk to the Site can be considered to be limited; the Site is situated in Flood Zone 1, with a very low annual probability of flooding and from all sources. The Site is unlikely to flood except in very extreme conditions.

7.3 Proposed Outline SuDS Statement

The Outline SuDS Statement ensures that a sustainable drainage solution can be achieved which reduces the peak discharge rate to manage and reduce the flood risk posed by the surface water runoff from the Site and takes into account the following principles:

- No increase in the volume or runoff rate of surface water runoff from the Site.
- No increase in flooding to people or property off-site as a result of the development.
- No surface water flooding of the Site.
- The proposals take into account a 45% increase in rainfall intensity due to climate change during the next 100 years which is the lifetime of the development.

In line with adopting a 'management train' it is recommended that water is managed as close to source as possible. This will reduce the size and cost of infrastructure further downstream and also shares the maintenance burden more equitably. It is therefore recommended that the Site provides its own attenuation and could take the form of:

- Re-use the existing connections to the drainage ditches and soakaway.
- Paths around the building drain to grassed lawns.

- Car parking areas drained by permeable surfaces.
- For larger events in other areas such landscaped areas, provided that it will not cause damage or prevent access.

For all developments, both the Building Regulations and NPPF promote a hierarchical approach to surface water management. This approach has been adopted within this Outline SuDS Statement, infiltration devices. It is deemed sustainable to re-use the existing connections to the drainage ditches and soakaway. All areas drained would be designed to accommodate a 100 year (+50%) event.

The remainder of the Site that is not formally drained, i.e. landscaped areas, will be permeable (grass). The majority of rainwater falling on these areas will soak into the ground. Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the building and through contouring of the hardstanding areas.

Additional storage would be provided within the manholes, pipes and drainage gullies which will provide betterment over and above the 1 in 100 year (+50%) event. Flooding will not occur on any part of the Site during the 1 in 30 year event, no flooding will occur within any part of the building during the 1 in 100 year (+50%) event, all areas drained have been designed to accommodate the 1 in 100 year (+50%) event.

These methods will reduce peak flows, the volume of runoff, and slow down flows and will provide a suitable SuDS solution for this Site. The Outline SuDS Statement will reduce the risk of flooding to the Site and off-site locations. In adopting these principles, it has been demonstrated that a scheme can be developed that does not increase the risk of flooding to adjacent properties and development further downstream.

7.4 Risk Management

The flood risk at the Site will be reduced by mitigation measures, discussed below.

Minimum Floor Level: There is no minimum finished floor level proposed as a result of flooding. However, it is recommended that the building is set above the ground level to enable the full capacity of any secondary flood conveyance to be utilised.

Flood Resilience and Resistance: Relatively simple measures such as raising utility entry points, using first floor or ceiling down electrical circuits and sloping landscaping away from properties can be easily and economically incorporated into the development of the Site.

Access and Egress: A permanently safe and dry access can be maintained.

7.5 Sequential/Exception Tests

The development proposals should therefore be considered by the LPA to satisfy the Sequential and Exception Tests as set out in the NPPF.

7.6 Conclusion

In conclusion, the Proposed Development, would be expected to remain dry in all but the most extreme conditions. Providing the recommendations made in this FRA are instigated, flood risk from all sources would be minimised, the consequences of flooding are acceptable and the development would be in accordance with the requirements of the NPPF.



This FRA demonstrates that the Proposed Development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF. The development should not therefore be precluded on the grounds of flood risk.



APPENDICES



APPENDIX 1 – Existing and Proposed Site Layout

Agricultural grazing land owned by client

Agricultural grazing land owned by client



Notes
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Do not scale off this drawing except for determination of basic layout - only figured dimensions to be used. All dimensions to be checked on site.



Key	Tree Key
Land Ownership Boundary	Category 'C' Tree
Domestic Curtilage	Root Protection Areas
PROW	



Project Name	Project No.	Stage
Fells Farm	137.21	Planning Submission
Existing Site Plan		
02		
Scale	1:200 @ A1	
Date	August 2025	
Rev --	Drawn	SP

Agricultural grazing land owned by client

Agricultural grazing land owned by client



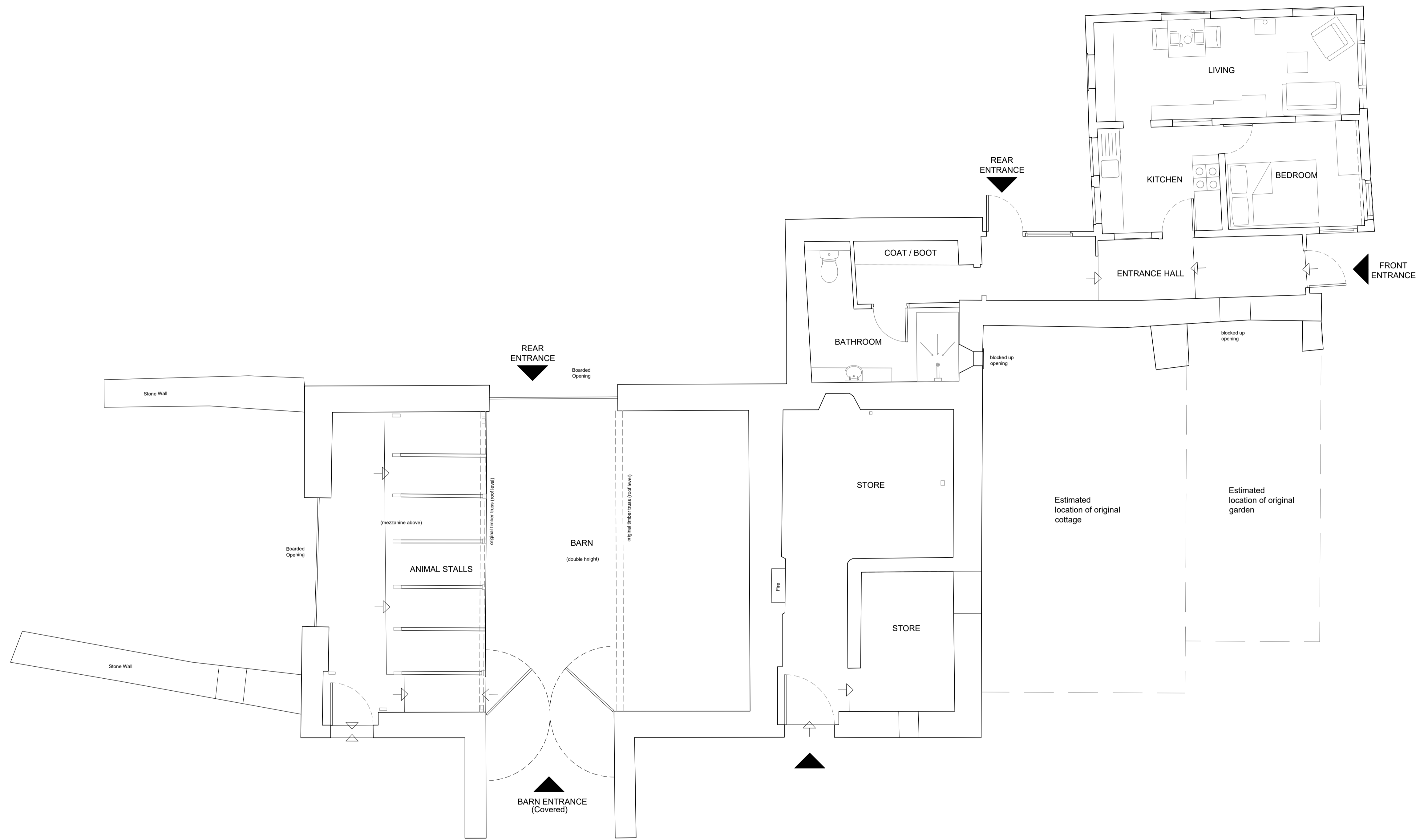
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Key
 Land Ownership Boundary
 Domestic Curtilage
 PROW

Tree Key
 Category 'C' Tree



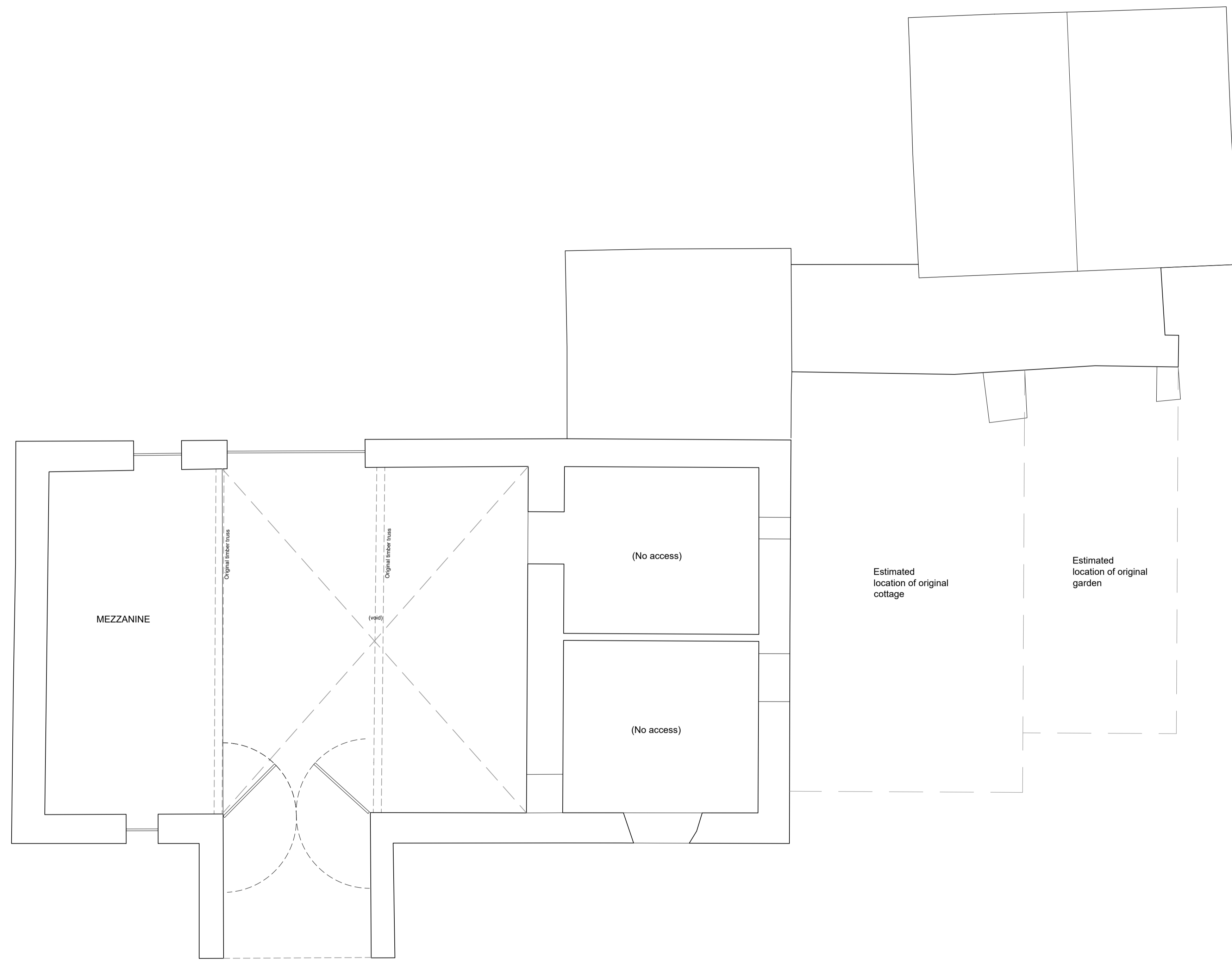
Project Name	Project No.	Stage
Fells Farm	137.21	Planning Submission
Existing Site Plan - Ground Floor	Scale	1:100 @ A1
03	Date	August 2025
Rev --	Drawn	SP



Existing Ground Floor Plan
Scale 1:50

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Existing First Floor Plan
Scale 1:50

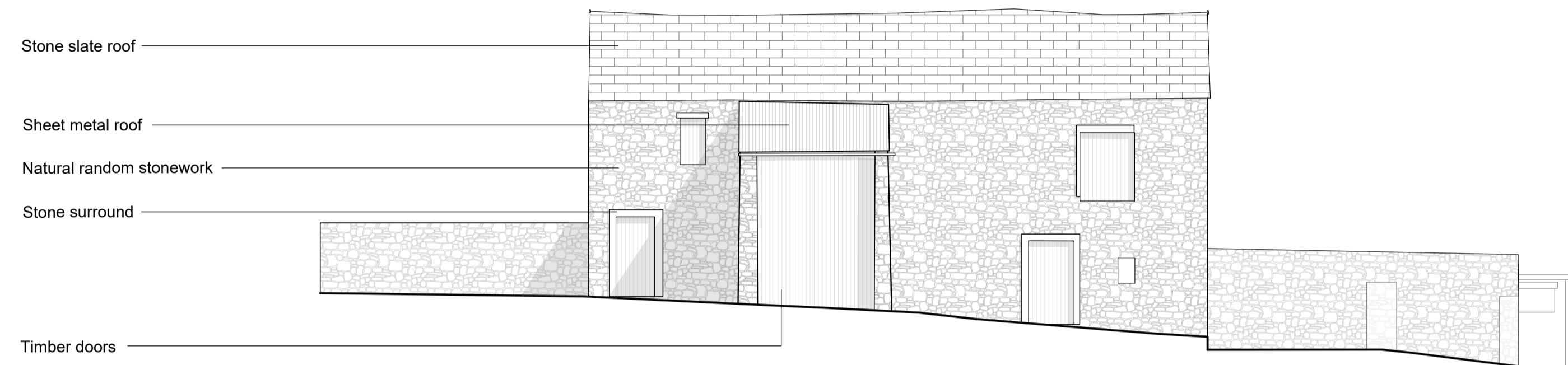
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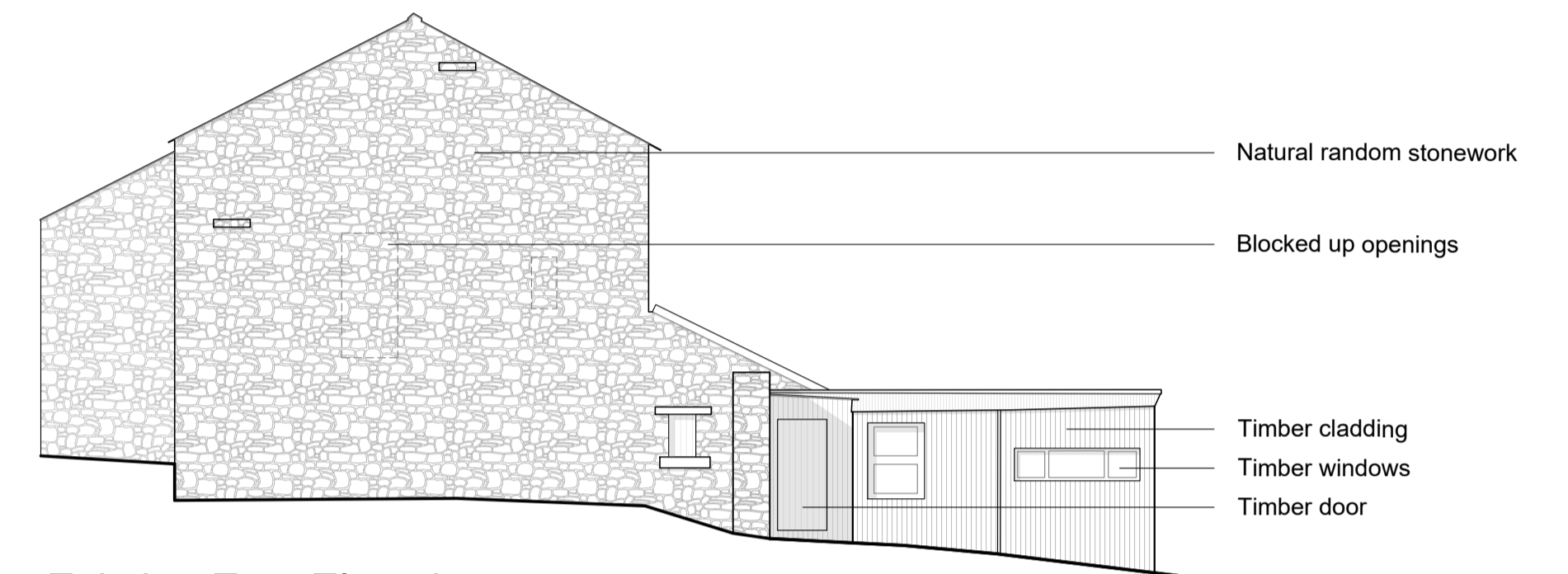
Rev: A
Date: -



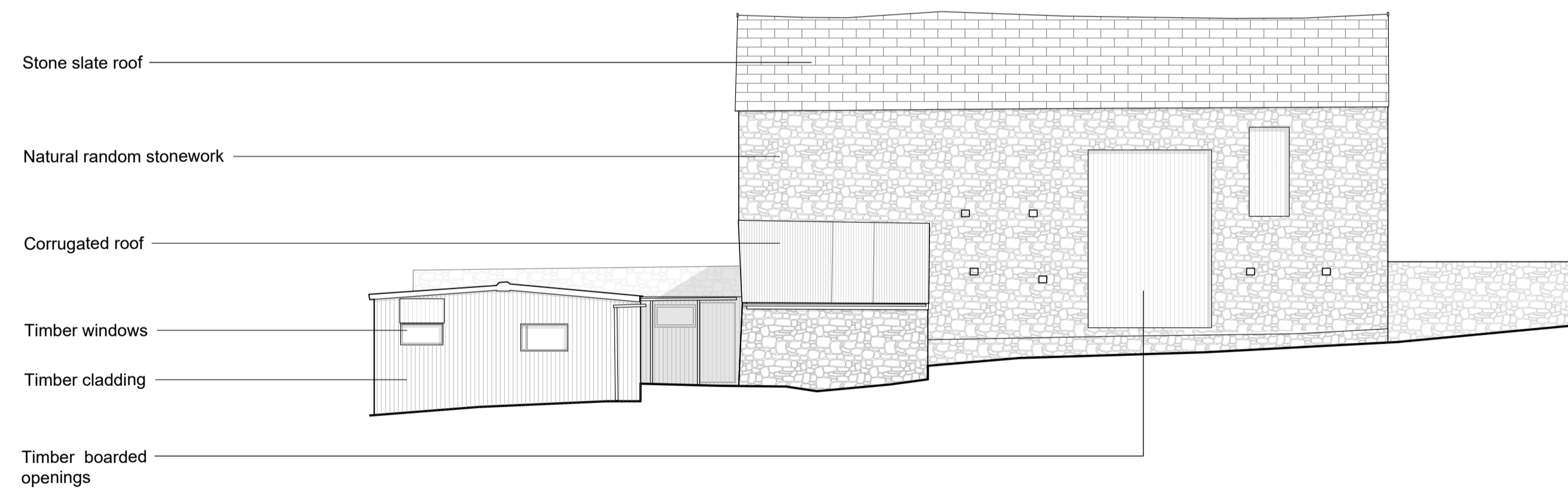
Project Name	Project No.	Stage
Fells Farm	137.21	Planning Submission
Existing First Floor Plan	05	Scale 1:50 @ A1
		Date August 2025
Rev --		Drawn SP



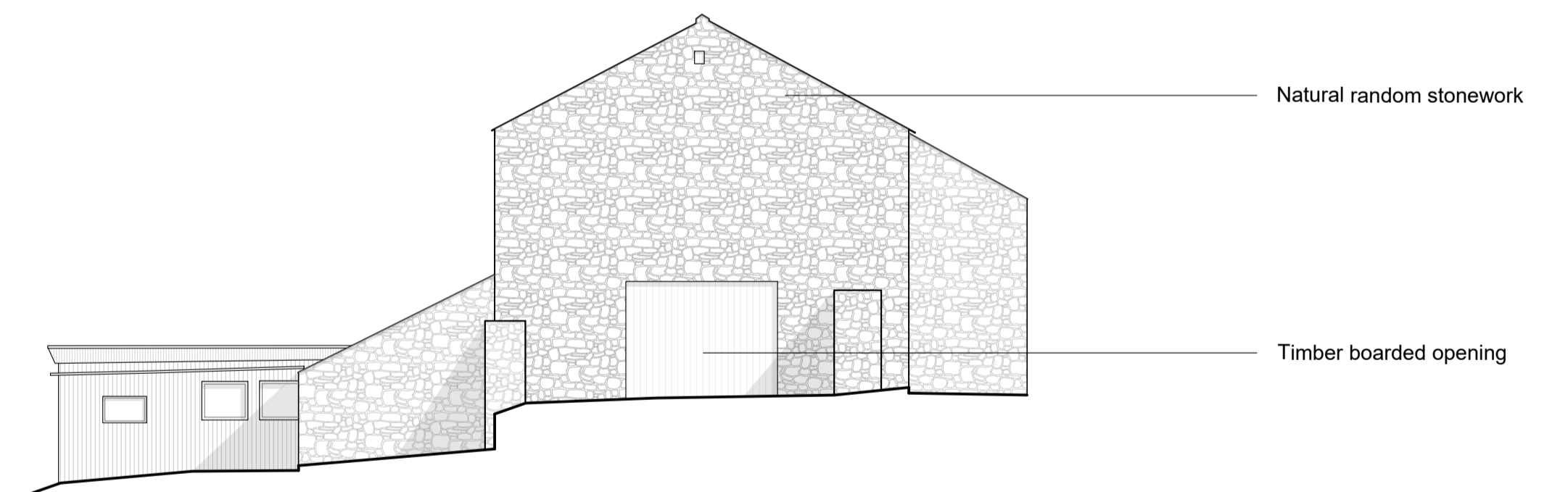
Existing South Elevation
Scale 1:100



Existing East Elevation
Scale 1:100

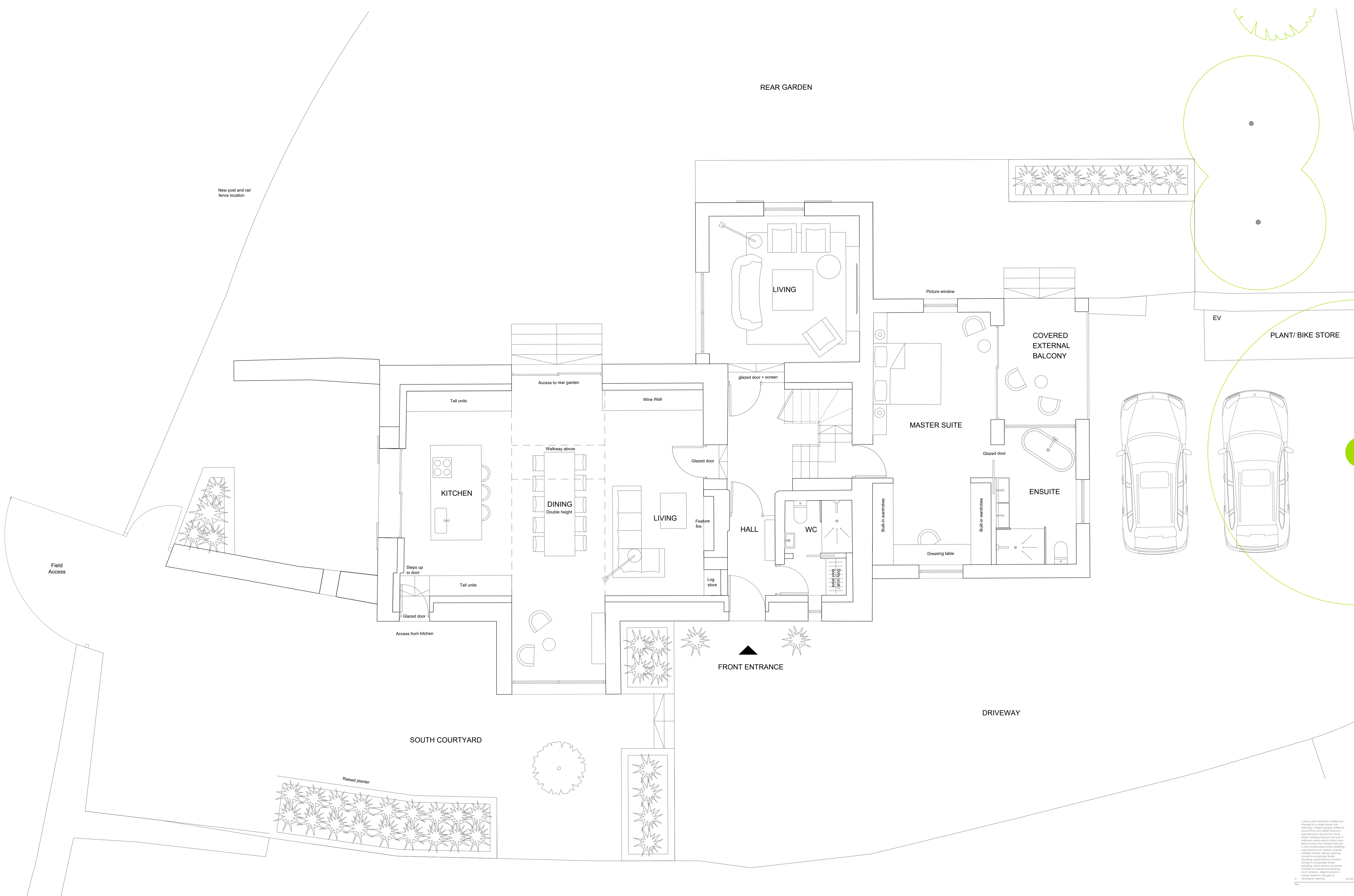


Existing North Elevation
Scale 1:100

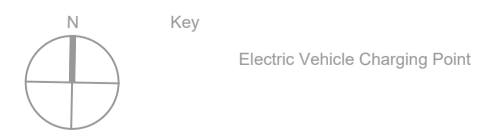


Existing West Elevation
Scale 1:100

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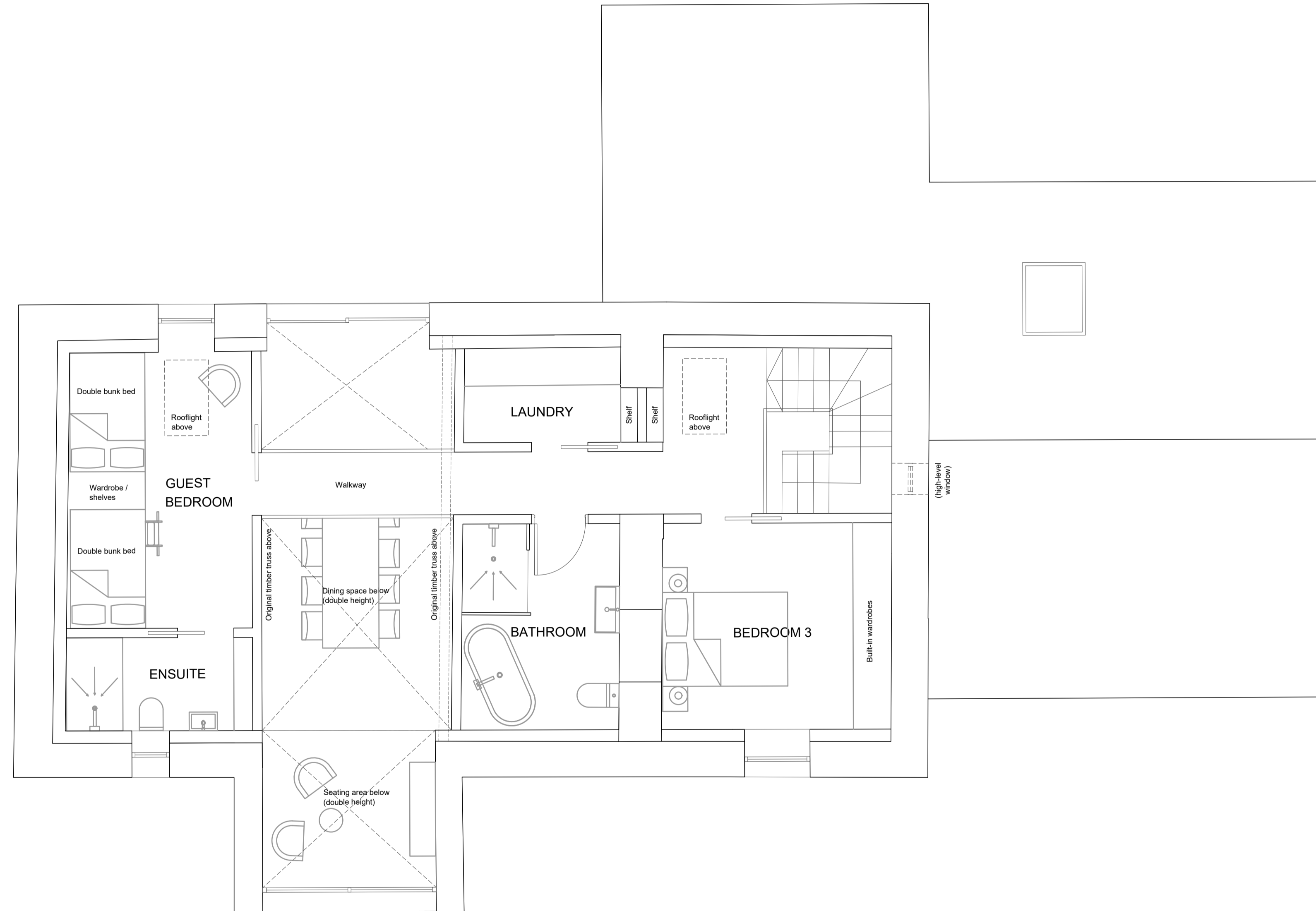


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2-storey with extension central and attached to original house. One extension is single garage unit at ground floor and includes kitchen, bathroom, dining, living and out of site. extension units made to match main house in living room window reduced in size and including timber paneling oak framed porch unit. include double height window. include opening window to incorporate timber paneling. glazed bedroom window. include in courtyard. include paneling. stone window surrounds located in living and dining room windows. angled window in master bedroom changed to rectangular opening.

02.08.2025
 Rev: 01



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2-storey side extension omitted and designed to align with existing side extension. Original garage omitted at ground floor and replaced by kitchen. Existing garage retained and set of 4. All external doors made to match main house in long iron window retained in side extension below. Existing oak framed porch omitted. Existing rooflight omitted. Existing opening retained to incorporate brick panelling. Guest bedroom window retained to incorporate brick panelling. Stone window surrounds retained in ensuite and dressing room windows. Original window in master bedroom changed to rectangular opening.

TW: 03.08.2025
 DW: 03.08.2025



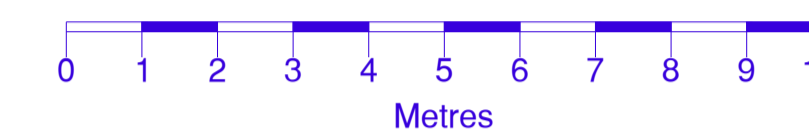
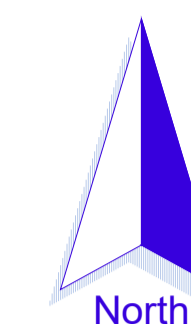
Project Name	Project No.	Stage
Fells Farm	137.21	Planning Submission
Proposed First Floor Plan	Scale	1:50 @ A1
09	Date	August 2025
Rev A	Drawn	SP



APPENDIX 2 – Topographical Survey

Notes

All Dimensions to be checked on site. Walls shown on plans are not to be assumed to be solid & should be checked for thickness, construction, load bearing capacity & stability.

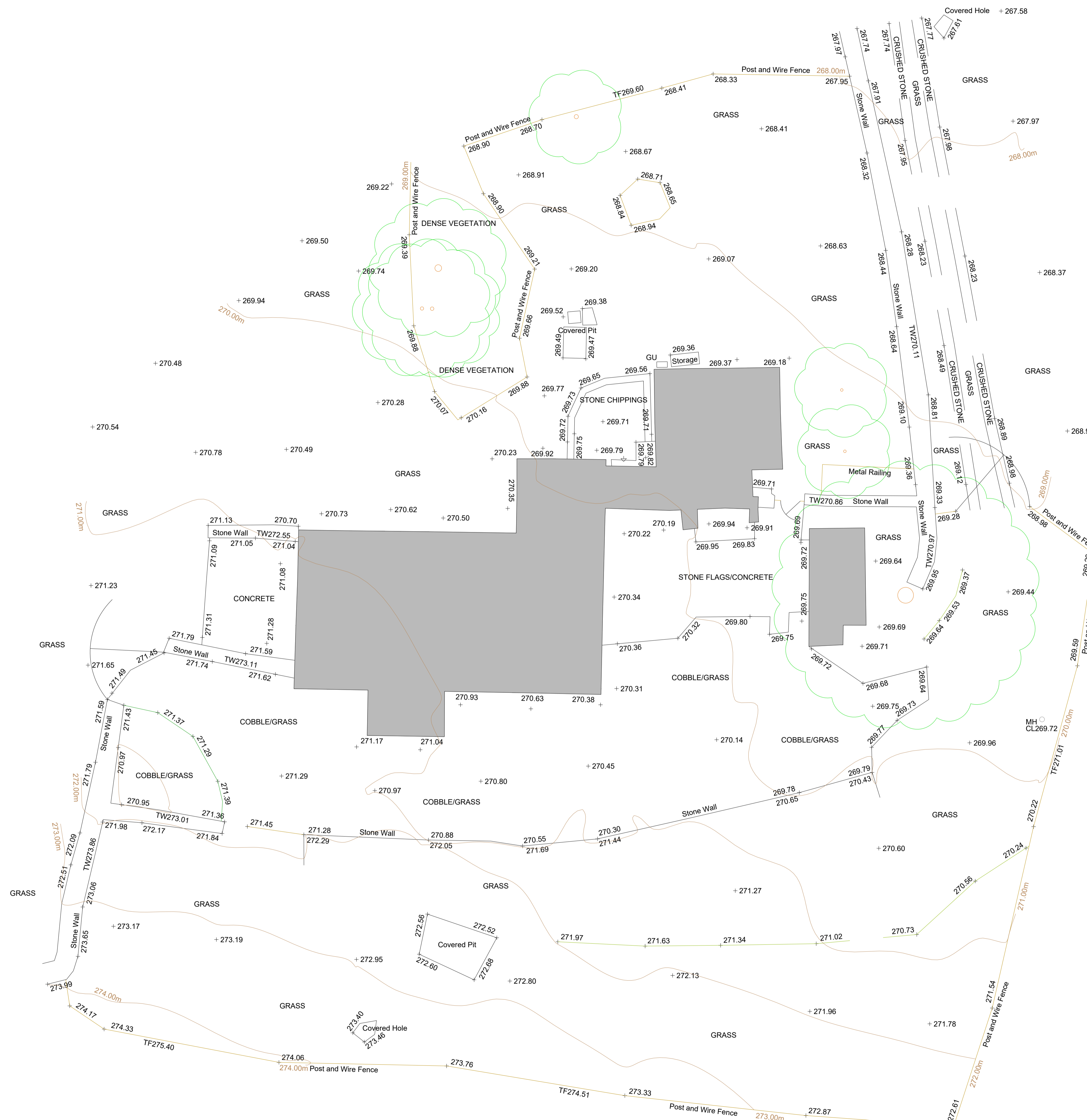


ABBREVIATIONS

- ch Ceiling Height
- CL Cover Level
- FFL Finished Floor Level
- GU Gully
- MH Man Hole
- RH Ridge/Roof Height
- RWP Rain Water Pipe
- SVP Soil Vent Pipe
- TF Top of Fence
- TW Top of Wall
- usb Under Side of Beam
- usj Under Side of Joist
- usr Under Side of Ridge
- ust Under Side of Truss

NOTE

All levels and coordinates relate to OSGB36(15) using GNS5 data.
Levels defining edge of carriageway are observed at channel bottom of kerb.



Rev.0 Description. Issued



2 Berkshire Close | Wilpshire | Blackburn | Lancashire | BB1 9NG
tel 01254 614055 fax 01254 209754 e-mail sales@tricadsolutions.co.uk

Site Address

Fells Barn,
Tosside,
BD23 4SY

Project Description
Site Survey

Drawing Title

Existing
Site Layout

Scale	Date	Drawn By
1:100@A1	07/08/2023	SN/IW

Drawing Number

TRI-4189-01

APPENDIX 3 – Greenfield Runoff Calculations

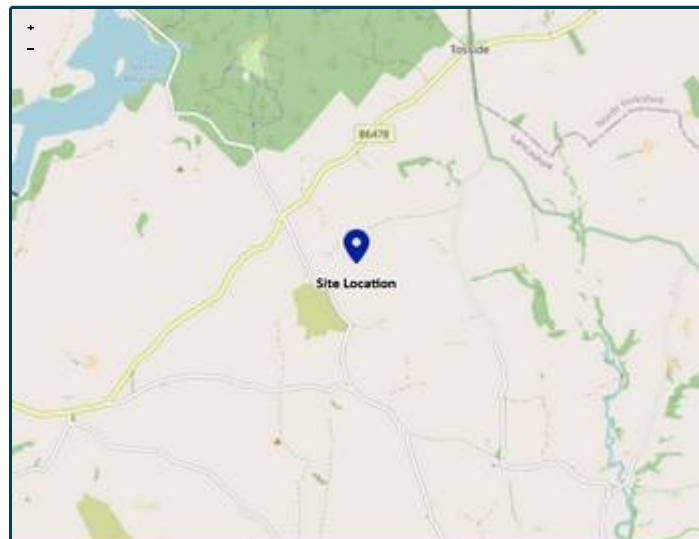
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	<input type="text" value="01/09/2025"/>
Calculated by	<input type="text"/>
Reference	<input type="text"/>
Model version	<input type="text" value="2.1.2"/>

Location

Site name	<input type="text"/>
Site location	<input type="text"/>



© OpenStreetMap (<https://www.openstreetmap.org/copyright>) contributors.

Site easting (British National Grid)	<input type="text" value="375664"/>
Site northing (British National Grid)	<input type="text" value="453544"/>

Site details

Total site area (ha)	<input type="text" value="0.0225"/>	ha
----------------------	-------------------------------------	----

Greenfield runoff

Method

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IH124		
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How should SPR be derived?	<input type="text" value="WRAP soil type"/>	
WRAP soil type	<input type="text" value="5"/>	<input type="radio"/> <input type="text" value="5"/>
SPR	<input type="text" value="0.53"/>	
QBar (IH124) (l/s)	<input type="text" value="0.32"/> l/s	

Growth curve factors

Hydrological region	<input type="text" value="10"/>	<input type="radio"/> <input type="text" value="10"/>
1 year growth factor	<input type="text" value="0.87"/>	
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30 year growth factor	<input type="text" value="1.7"/>	
100 year growth factor	<input type="text" value="2.08"/>	
200 year growth factor	<input type="text" value="2.37"/>	

Results

Method	<input type="text" value="IH124"/>	
Flow rate 1 year (l/s)	<input type="text" value="0.3"/>	l/s
Flow rate 2 year (l/s)	<input type="text" value="0.3"/>	l/s
Flow rate 10 years (l/s)	<input type="text" value="0.4"/>	l/s
Flow rate 30 years (l/s)	<input type="text" value="0.5"/>	l/s
Flow rate 100 years (l/s)	<input type="text" value="0.7"/>	l/s
Flow rate 200 years (l/s)	<input type="text" value="0.7"/>	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.1.2) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

