FLOOD RISK ASSESSMENT

LOCATION:
Fooden Hall Barns, Bolton by Bowland

CLIENT:
Mr Dent

DOCUMENT REF:
26493-FRA-001

DATE:
May 2026

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CIVIL AND STRUCTURAL ENGINEERING

CONTENTS & AMENDMENT HISTORY

Revision	Description	Date	Author	Checked
A	First Issue	May 2026	O Mountain	R Thacker

1.0 INTRODUCTION

This Flood Risk Assessment (FRA) has been prepared in support of a planning application and accords with the requirements of the National Planning Policy Framework (NPPF), the Planning Practice Guidance (PPG), and relevant local and national flood risk policy.
The purpose of this FRA is to demonstrate that the proposed development will be safe for its lifetime, will not increase flood risk elsewhere, and where possible, will reduce flood risk overall, taking account of all sources of flooding, including fluvial, pluvial, groundwater, sewer, and artificial sources.

The assessment has been undertaken using a proportionate, risk-based approach appropriate to the scale and vulnerability classification of the development.

Site Name	Fooden Hall Barns
Location	Fooden Hall Barns, Bolton by Bowland, Nr Gisburn, BB7 4LS
Development Type	Industrial
NPPF Vulnerability	More
EA Flood Zone	Flood Zone 1
EA Office	Cumbria & Lancashire
Local Planning Authority	Ribble Valley Borough Council

Table 1.1 - Site Summary

1.1 SOURCES OF DATA

The report is based on the following information:

i. Site Location Plan
ii. Proposed Site Layout
iii. Topographical Survey
iv. Environment Agency Flood Map for Planning (Rivers and Sea)
v. Environment Agency Risk of Flooding from Surface Water Mapping
vi. Environment Agency Reservoir Flood Risk Mapping
vii. Published Strategic Flood Risk Assessment (SFRA) for the Local Planning Authority area
viii. Ordnance Survey mapping
ix. Professional judgement informed by similar developments in comparable flood risk settings

No site-specific hydraulic modelling has been undertaken as the site lies within Flood Zone 1 and no fluvial or tidal floodplain encroaches the site.

1.2 EXISTING SITE

The site in question is located to the far north of Clitheroe, approximately 13km away from the town centre. The site is approximately 0.215ha in size and is bounded by greenfield land to the north and east, and residential properties to the south and west.

From Appendix A it can be considered that the development area has a steady gradient. At the far northern region of the site, the highest level is approximately 115.22 AOD. Contrastingly, in the far southern area, the lowest level is approximately 113.11 AOD. Therefore, there is a 2.11m change in levels on this site.

There are several waterbodies and watercourses within the neighbouring areas of the site. Approximately 270m to the south of the proposed site lies the River Ribble. Furthermore, 10m to the north of the site lies a second watercourse.

The site is previously developed (brownfield) land and currently drains via an established drainage network. There is no evidence of historic fluvial flooding affecting the site. Surface water flow paths generally follow local topography and do not preferentially route toward the existing building footprint.

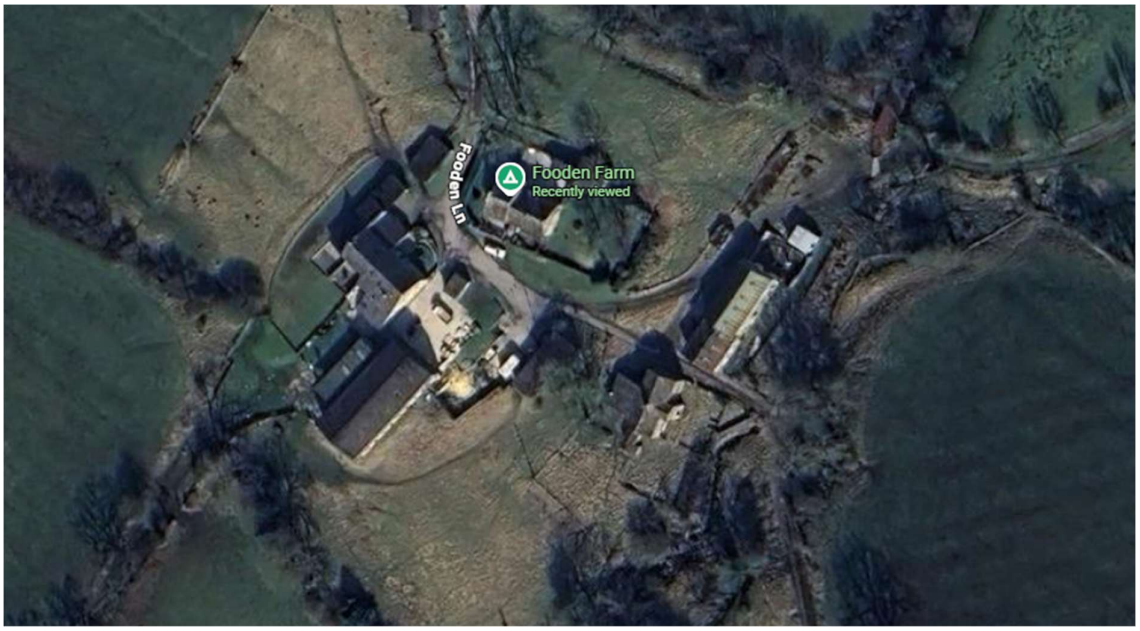


Figure 1.1 - Site Location

1.3 PROPOSED DEVELOPMENT

The proposed development is set to consist of the change of class of the existing building. The existing building is set to be altered from a barn to multiple industrial units. It is also proposed that there is additional parking to the North of the development.

The proposed development does not introduce a more vulnerable use into an area of higher flood risk and does not involve basement development or land raising within mapped flood risk extents. The scale of development is modest and does not materially alter site-wide hydrology or floodplain storage.

1.4 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

The NPPF requires development to be directed away from areas at highest risk of flooding through application of the Sequential Test and, where necessary, the Exception Test.

The PPG classifies flood risk vulnerability and confirms that development within Flood Zone 1 is appropriate for all land uses, subject to consideration of other sources of flooding and surface water management.

This FRA confirms that the Sequential Test is satisfied as the site lies entirely within Flood Zone 1, and that no Exception Test is required.

Flood Zones

The Flood Zone Map for Planning has been prepared by the Environment Agency. This identifies areas potentially at risk of flooding from fluvial or tidal sources. An extract from the mapping is included as Figure 1.2.

Figure 1.2 - Environment Agency Flood Zone Mapping

The site is shown to be located entirely within Flood Zone 1 (Low Probability) therefore the site is considered to be low risk of flooding. Flood Zone 1 is defined as land assessed as having less than a 0.1% annual probability of flooding from fluvial and tidal sources.

Table 2 of the Planning Practice Guidance classifies land use. Under these classifications the proposed industrial units are considered to be 'More Vulnerable' to the potential impacts of flooding.

Table 3 of the Planning Practice Guidance identifies that any development is considered appropriate within Flood Zone 1.

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable
Flood Zone 1	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception test required	✓
Flood Zone 3a	Exception test required	✓	**x**	Exception test required
Flood Zone 3b	Exception test required	✓	**x**	**x**

1.5 OTHER RELEVANT POLICY AND GUIDANCE

Strategic Flood Risk Assessment

The Ribble Valley Borough Council Strategic Flood Risk Assessment (SFRA) was prepared to review flood risks on a much wider scale to assess the potential for new development within the study area. The SFRA was used as an evidence base for Local Development Frameworks for each Local Planning Authority.

The SFRA therefore aims to bring together all available flood risk information for a variety of sources to provide a robust assessment. The SFRA therefore is useful for this site-specific FRA by highlighting available data and instances of known flooding in the area. Although written under the guidance of Planning Policy Statement 25, the SFRA is still considered to include relevant information.

Regard has also been had to the Local Planning Authority's Strategic Flood Risk Assessment (SFRA), which provides locally specific evidence relating to surface water, groundwater, and historic flooding.

Where relevant, this FRA also aligns with the National Standards for Sustainable Drainage Systems (June 2025), particularly in respect of ensuring that surface water is managed as close to source as reasonably practicable and that exceedance is safely routed.

2.0 POTENTIAL SOURCES OF FLOOD RISK

Each potential source of flooding has been assessed independently in accordance with PPG guidance. Both the risk to the site and the potential for the development to affect flood risk elsewhere have been considered.

The table below identifies the potential sources of flood risk to the site, and the impacts which the development could have in the wider catchment prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within Section 3.0.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial			X		The site is located in flood zone 1.
Tidal				X	There are no tidal influences effecting the site.
Canals				X	None present.
Groundwater			X		Ground conditions are not conducive to fluctuating groundwater levels.
Reservoirs and waterbodies				X	The site is shown to fall outside of the catchment for reservoir and waterbodies flooding.
Sewers			X		The site in question is higher than the surrounding sewers therefore there is a very low risk.
Pluvial runoff			X		The site is within an area of surface water flooding.
Effect of Development on Wider Catchment				X	The impermeable area of the site is not being altered.

Table 2.1 - Pre-Mitigation Sources of Flood Risk

2.1 FLUVIAL FLOOD RISK

The Environment Agency Flood Map for Planning confirms that the site lies wholly within Flood Zone 1, defined as land having a less than 0.1% annual probability of flooding from rivers or the sea.

No part of the site is affected by the 1 in 100 year or 1 in 100 year plus climate change fluvial flood extents. The nearest watercourses are located at lower elevations and are hydraulically disconnected from the site.

On this basis, fluvial flood risk to the proposed development is considered to be low.

2.2 GROUNDWATER FLOOD RISK

The Environment Agency mapping indicates that the site is not located within an area at significant risk of groundwater flooding.

While no site-specific groundwater monitoring data is available, the local geology and absence of recorded historic groundwater flooding suggest that groundwater emergence at the surface is unlikely.

Groundwater flood risk is therefore considered to be low and does not constrain the proposed development.

2.3 FLOOD RISK FROM RESERVOIRS & LARGE WATERBODIES

Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide. An extract from the mapping is included as Figure 2.1.

Figure 2.1 - Environment Agency Reservoir Failure Flood Risk Map

Reservoir flood risk mapping indicates that the site is outside any mapped reservoir inundation extents. Access and egress routes are similarly unaffected.
Given the residual and extreme nature of reservoir failure scenarios, no specific mitigation is required.

As such, there is considered to be no risk from reservoir flooding.

2.4 FLOOD RISK FROM SEWERS

Flooding from public sewers typically occurs during extreme rainfall events when capacity is exceeded.

The site is not located within a known sewer flooding hotspot, and local topography indicates that the site sits above surrounding carriageways and drainage corridors.

The risk of flooding from sewers is therefore considered low.

2.5 PLUVIAL FLOOD RISK

Risk of flooding from surface water mapping has been prepared by the Environment Agency, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. An extract from the mapping is included as Figure 2.2, 2.3 and 2.4.

Figure 2.2 - Risk of Flooding from Surface Water Mapping (1in30 low risk)

Figure 2.3 - Risk of Flooding from Surface Water Mapping (1in100 medium risk)

Figure 2.4 - Risk of Flooding from Surface Water Mapping (1in1000 high risk)

Environment Agency Risk of Flooding from Surface Water mapping indicates that areas of the site are subject to low to medium surface water flood risk during extreme rainfall events.

These areas are confined to external parts of the site and do not encroach upon the existing or proposed building footprints. Surface water depths are shallow and velocities low.

Finished floor levels remain above surrounding ground levels, and exceedance flows are able to route safely around buildings without posing a hazard to occupants.

Surface water flood risk is therefore considered manageable and does not preclude the proposed development.

2.6 EFFECT OF DEVELOPMENT ON WIDER CATCHMENT

2.6.1 Development Drainage

The proposed development does not increase the extent of impermeable area and will not result in increased surface water runoff rates or volumes leaving the site.

Existing drainage arrangements will be retained, and no off-site flood risk impacts are anticipated.

2.7 CLIMATE CHANGE CONSIDERATIONS

In accordance with the National Planning Policy Framework and Planning Practice Guidance, the potential impacts of climate change on flood risk have been considered over the lifetime of the development.

Climate change is expected to increase the frequency and intensity of extreme rainfall events, which primarily affects surface water flood risk. The proposed development has been assessed with regard to these potential changes.

The site lies wholly within Flood Zone 1 and is not affected by fluvial flood extents, including the 1 in 100 year plus climate change event. Surface water flood risk mapping already represents extreme rainfall scenarios and therefore provides an appropriate basis for assessing climate change impacts.

Finished floor levels, site layout, and surface water flow routing ensure that the development will remain safe for its lifetime, without increasing flood risk elsewhere as a result of climate change.

3.0 FLOOD RISK MITIGATION

Although the site is at low risk of flooding, proportionate mitigation measures have been considered to address residual risks and to ensure compliance with national and local policy.

Section 2.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be considered within the proposed development detail design to address and reduce the risk of flooding to within acceptable levels.

3.1 SITE ARRANGEMENTS

3.1.1 Sequential Arrangement

The site layout reflects a sequential approach to flood risk, with built development located in areas of lowest identified flood risk. Areas susceptible to surface water accumulation are retained as external space.

3.1.2 Finished Levels

Finished floor levels will be set to match or exceed existing ground levels and will remain above surrounding surface water flow paths.

This ensures resilience against extreme rainfall events and provides additional freeboard above any shallow surface water ponding.

3.2 SAFE ACCESS & EGRESS

Safe access and egress to and from the site has been assessed with reference to Environment Agency guidance, flood hazard principles, and the nature of the proposed development.

The site is accessed via Fooden Lane, which lies outside mapped fluvial flood extents and is not subject to hazardous depths or velocities of surface water flooding during extreme rainfall events.

Surface water mapping indicates only shallow, low-velocity ponding in external areas of the site. Access routes are affected, however, the mapped Pluvial flood extents do not exceed 300mm in depth and therefore pose a low risk to vehicles in the case if a flood event.

As such, safe access and egress can be maintained at all times, including during extreme rainfall events.

Given the low vulnerability of flooding at the site and the availability of safe dry routes, the development is considered safe for users and emergency services. Emergency vehicle access would not be impeded during flood events.

3.3 FLOOD WARNING & EMERGENCY PLANNING

The site is not located within an area benefiting from Environment Agency Flood Warning or Flood Alert services, as it lies outside fluvial flood risk areas.

Given the low probability of flooding and absence of deep or fast-flowing floodwater, a site-specific Flood Emergency Plan is not considered necessary.

Nevertheless, building users will benefit from standard operational procedures, including awareness of severe weather forecasts and appropriate response during extreme rainfall events.

The residual flood risk at the site is low and can be managed through responsible site operation without reliance on formal flood warning systems.

3.4 RESIDUAL RISK & EXCEEDANCE ROUTING

Residual flood risk relates to flooding that may occur during events exceeding the design standard of drainage infrastructure.

In such exceedance scenarios, surface water would be routed along existing overland flow paths and across external areas of the site, away from buildings and access points.
Finished floor levels remain above predicted exceedance depths, ensuring no internal flooding occurs. This approach accords with good practice and the National Standards for Sustainable Drainage Systems.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Mr Dent.

This Flood Risk Assessment demonstrates that the proposed development is appropriate for its location and will be safe for its lifetime, taking account of climate change.

The site lies entirely within Flood Zone 1 and is at low risk from fluvial, tidal, groundwater, sewer, and reservoir flooding. Surface water flood risk is limited, shallow, and manageable through site layout and finished floor levels.

The development will not increase flood risk elsewhere and complies with the requirements of the NPPF, PPG, and the Local Planning Authority's SFRA.

On this basis, there are no flood risk grounds to resist the proposed development.

The identified risks and mitigation measures are summarised within Table 4.1.

Flood Source	Proposed Mitigation Measure
Fluvial	Site is shown to be in Flood Zone 1.
Impact of the Development	A strategic surface water drainage strategy prepared for wider development will ensure a sustainable approach to surface water management.

Table 4.1 - Summary of Flood Risk Assessment

The Flood Risk Assessment demonstrates full compliance with national and local flood risk policy and confirms that the development will be safe for its lifetime, without increasing flood risk elsewhere. The proposals are therefore acceptable in flood risk terms.

5.0 APPENDICES

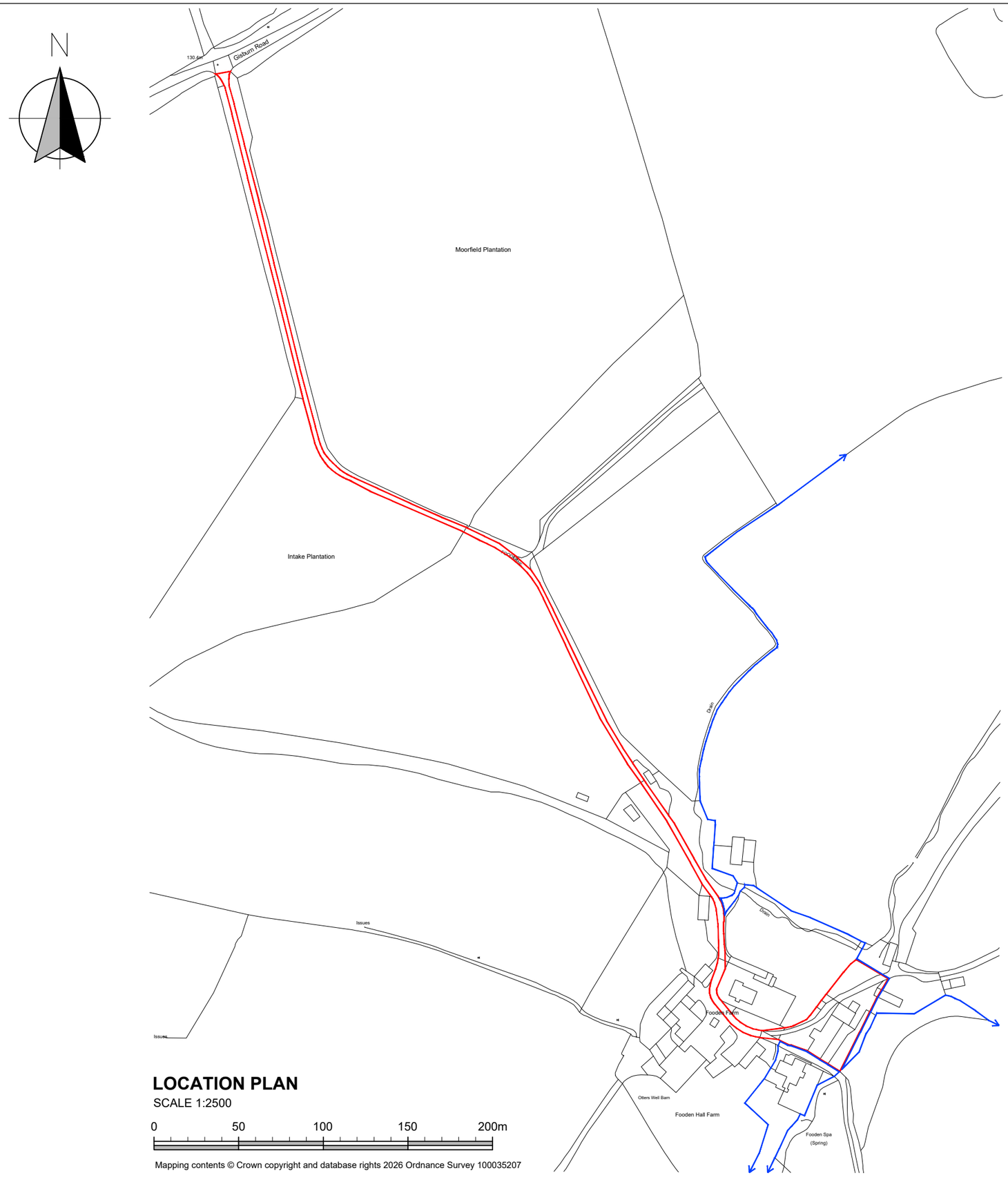
Appendix A – Site Location Plan

Appendix B – Proposed Site Layout

Appendix C – Topographical Survey

Appendix A

Site Location Plan



LOCATION PLAN

SCALE 1:2500

0 50 100 150 200m

Client
Mr Dent

Job Title
Barn at Fooden Hall Farm
Fooden Hall farm
Gisburn Road
Bolton By Bowland
Lancashire
BB7 4LS

Drawing Title
Location Plan

Scale	Date	Drawn
1:2500 @ A3	Jan 2026	MF

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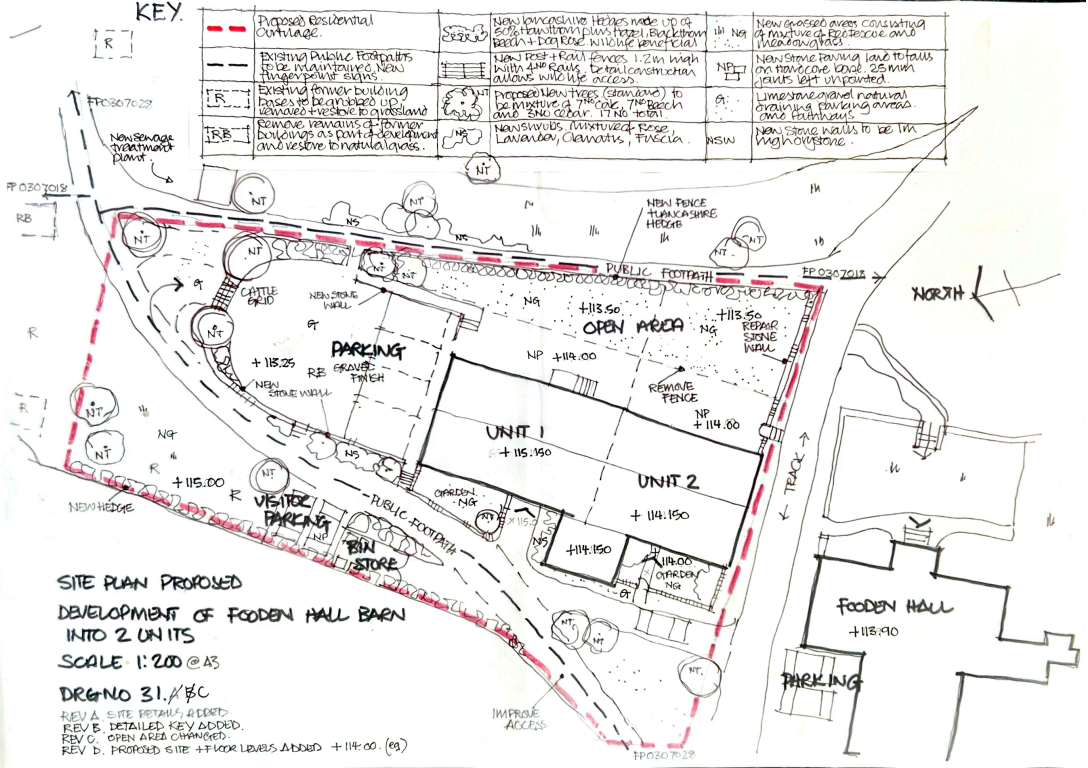
Appendix B

Proposed Site Layout



SITE PLAN PROPOSED

DEVELOPMENT OF FODDEN HALL BARN INTO 2 UNITS

SCALE 1:200 @ A3

DRG NO 31./BC

REV A. SITE DETAILS ADDED.
REV B. DETAILED KEY ADDED.
REV C. OPEN AREA CHANGED.
REV D. PROPOSED SITE + FLOOR LEVELS ADDED +114.00. (eg)

Appendix C

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.

North

0 2 4 6 8 10 12 14 16 18 20
Metres

ABBREVIATIONS

CH	Cable Height
CL	Cover Level
EH	Eaves Height
EP	Electric Pole
GP	Gate Post
GU	Gully
IC	Inspection Cover
LP	Lamp Post
MH	Man Hole
RE	Rodding Eye
RH	Ridge/Roof Height
TC	TriCAD Control
TF	Top of Fence
TP	Telegraph Pole
TH	Top of Hedge
TW	Top of Wall
WV	Water Valve

NOTE

All levels and coordinates relate to OSGB36(15) using GNSS data.

Levels defining edge of carriageway are observed at channel (bottom of kerb).

Rev.0 Description. Issued

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Bolton by Bowland,
BB7 4LS

Project Description

Site Survey

Drawing Title

Existing Site Layout

Scale	Date	Drawn By
1:200@A1	04/03/2021	JF

Drawing Number

TRI-3318-01