

FLOOD RISK AND DRAINAGE
SOLUTIONS LTD

NPPF Flood Risk Assessment

Land off Smithy Nook,
Higher Calderbrook Road,
Littleborough

Report No: 2024-060

Client: Paul Butler

Date: 15/11/2024

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Contract

This report describes work commissioned by Paul Butler dated 31st October 2024 Chris Vose BSc of Flood Risk and Drainage Solutions Ltd carried out the work.

Disclaimer

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Executive Summary

Flood Risk and Drainage Solutions Ltd have been appointed by Paul Butler to provide a Flood Risk Assessment in support of a planning application for the erection of a single residential property on land off Smithy Nook on Higher Calderbrook Road in Littleborough.

The development site is located within Flood Zone 1 and therefore has a low risk of fluvial flooding.

The application site comprises of a previously developed plot and currently accommodates a storage building, located on the east side of Higher Calderbrook Road, with direct access via the highway.

The closest watercourse to the application site is unnamed and flows east under Calderbrook Road approximately 120m north.

Development proposals comprise of the erection of a single residential property with off street parking.

An initial assessment indicates that the primary flood risk at the proposed development is from an increase in runoff as a result of the development.

Consideration has also been given to the site flooding from secondary sources such as pluvial, groundwater; artificial water bodies; infrastructure failure and ponding.

Fluvial

Due to the application site being located within Flood Zone 1, the risk of flooding from this mechanism is considered to be low and therefore does not require any further evaluation.

Pluvial Flooding

The Environment Agency's Surface Water Flood Map identifies that the application site has a very low risk associated with pluvial (surface water) flooding.

- Very low means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).

Proposed Drainage Strategy

The proposed drainage strategy directs surface water from the roof and driveway area into the existing combined drain on-site, which ultimately discharges into the public combined sewer within Higher Calderbrook Road.

Surface water flows have been restricted to no more than 4l/s via the orifice chamber for all return periods up to and including the 1 in 100 year + 45% climate change event.

Flows in excess of this will be stored within the piped network.

A green roof has also been incorporated into the design over the lounge area.

Flood Mitigation Measures

Due to the proposed development being located within Flood Zone 1 it is recommended that finished floor levels are elevated 150mm above surrounding ground.

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1.0 Introduction

1.1 Terms of Reference

Flood Risk and Drainage Solutions Ltd have been appointed by Paul Butler to provide a Flood Risk Assessment in support of a planning application for the erection of a single residential property on land off Smithy Nook on Higher Calderbrook Road in Littleborough.

The development site is located within Flood Zone 1 and therefore has a low risk of fluvial flooding.

It is usual for the Environment Agency to raise an objection to development applications within the floodplain, or Zones 2 and 3 of the flood map, until the issue of flood risk has been properly evaluated. The Agency will also object to developments where the total site area is in excess of 1 Hectare until suitable consideration has been given to the management of surface water runoff.

1.2 Objectives

The objective of this assessment is to evaluate the following issues in regard to flood risk at the application site.

- Suitability of the proposed development in accordance with current planning policy.
- Identify the risk to both the proposed development and people from all forms of flooding.
- Provide a preliminary assessment of foul and surface water management.
- Increasing the risk of flooding elsewhere e.g. surface water flows and flood routing.
- Recommendation of appropriate measures to mitigate against flooding both within the proposed development, and neighbouring land and property.

1.3 Data Sources

This assessment is based on desk-top study of information from the following sources:

- National Planning Policy Framework (September 2023)
- Planning Practice Guidance at www.gov.uk
- Building Regulations Approved Document H
- Environment Agency Flood Mapping
- Bury, Rochdale and Oldham Strategic Flood Risk Assessment Volume 1 2009
- Level 1 Strategic Flood Risk Assessment for Greater Manchester Update 2019
- British Geological Society – Historic Borehole Logs
- Cranfield University's Soilscape Viewer
- CIRIA C697 The SUDS Manual
- Chronology of British Hydrological Events (Dundee University)

2.0 Planning Policy Context

2.1 Approach to the Assessment

An initial assessment indicates that the primary flood risk at the proposed development is from an increase in runoff as a result of the development.

Consideration has also been given to the site flooding from secondary sources such as pluvial, groundwater; artificial water bodies; infrastructure failure and ponding.

The requirements for flood risk assessments are generally as set out in the 'Technical Guidance to the National Planning Policy Framework', updated in September 2023; and in more detail from the Environment Agency's 'Standing Advice on Flood Risk' available from <https://www.gov.uk/government/publications/national-planning-policy-framework-3>.

2.2 National Planning Policy Framework (NPPF)

The information provided in the flood risk assessment should be credible and fit for purpose.

Site-specific flood risk assessments should always be proportionate to the degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the interactive flood risk maps available on the Environment Agency's website.

A flood risk assessment should also be appropriate to the scale, nature and location of the development.

2.2.1 Site Specific Flood Risk Assessment Checklist

The following checklist has been extracted from Flood Risk & Coastal Change Section available from www.gov.uk, updated in September 2023

1. Development site and location

Provide a description of the site you are proposing to develop, including, or making reference to, a location map which clearly indicates the development site.

- A. Where is the development site located? (e.g. postal address or national grid reference)
- B. What is the current use of the site? (e.g. undeveloped land, housing, shops, offices)
- C. Which Flood Zone (for river or sea flooding) is the site within? (i.e. Flood Zone 1, Flood Zone 2, Flood Zone 3).

Check the Flood Map for Planning (Rivers and Sea) and the Strategic Flood Risk Assessment for the area available from the local planning authority.

2. Development proposals

Provide a general summary of the development proposals, including, or making reference to, an existing block plan and a proposed block plan, where appropriate.

- A. What are the development proposal(s) for this site? Will this involve a change of use of the site and, if so, what will that change be?
- B. In terms of vulnerability to flooding, what is the vulnerability classification of the proposed development?
- C. What is the expected or estimated lifetime of the proposed development likely to be? (E.g. less than 20 years, 20-50 years, 50-100 years?).

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3. Sequential test

For developments in flood zones 2 or 3 only.

(If the development site is wholly within flood zone 1, this section can be skipped - go to section 4).

Describe how the sequential test has been applied to the development (if required, and as set out in paragraphs 101-104 of the National Planning Policy Framework); and provide the evidence to demonstrate how the requirements of the test have been met.

See paragraph 033 of the NPPF guidance for further information. (It is recommended that the Developer or Agent contacts the LPA to confirm whether the sequential test should be applied and to ensure the appropriate level of information is provided).

- A. What other locations with a lower risk of flooding have you considered for the proposed development?
- B. If you have not considered any other locations, what are the reasons for this?
- C. Explain why you consider the development cannot reasonably be located within an area with the lowest probability of flooding (flood zone 1); and, if your chosen site is within flood zone 3, explain why you consider the development cannot reasonably be located in flood zone 2.
- D. As well as flood risk from rivers or the sea, have you taken account of the risk from any other sources of flooding in selecting the location for the development?

Exception test

Provide the evidence to support certain development proposals in flood zones 2 or 3 if, following application of the sequential test, it is appropriate to apply the exception test, as set out in paragraphs 102-104 of the National Planning Policy Framework.

It is advisable to contact the local planning authority to confirm whether the exception test needs to be applied and to ensure the appropriate level of information is provided.

- A. Would the proposed development provide wider sustainability benefits to the community? If so, could these benefits be considered to outweigh the flood risk to and from the proposed development?
- B. How can it be demonstrated that the proposed development will remain safe over its lifetime without increasing flood risk elsewhere?
- C. Will it be possible to for the development to reduce flood risk overall (e.g. through the provision of improved drainage)?

4. Climate Change

How is flood risk at the site likely to be affected by climate change? (The local planning authority's Strategic Flood Risk Assessment should have taken this into account). Further advice on how to take account of the impacts of climate change in flood risk assessments is available from the Environment Agency.

5. Site specific flood risk

Describe the risk of flooding to and from the proposed development over its expected lifetime, including appropriate allowances for the impacts of climate change. It would be helpful to include any evidence, such as maps and level surveys of the site, flood datasets (e.g. flood levels, depths and/or velocities) and any other relevant data, which can be acquired through consultation with the Environment Agency, the lead local flood authority for the area, or any other relevant flood risk management authority. Alternatively, you may consider undertaking or commissioning your own assessment of flood risk, using methods such as computer flood modelling.

- A. What is/ are the main source(s) of flood risk to the site? (E.g. tidal/sea, fluvial or rivers, surface water, groundwater, other?). You should consider the flood mapping available from the Environment

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Agency, the Strategic Flood Risk Assessment for the area, historic flooding records and any other relevant and available information.

- B. What is the probability of the site flooding, taking account of the maps of flood risk available from the Environment Agency, the local planning authority's Strategic Flood Risk Assessment and any further flood risk information?
- C. Are you aware of any other sources of flooding that may affect the site?
- D. What is the expected depth and level for the design flood? See paragraph 055 of the NPPF guidance for information on what is meant by a "design flood". If possible, flood levels should be presented in metres above Ordnance Datum (i.e., the height above average sea level).
- E. Are properties expected to flood internally in the design flood and to what depth? Internal flood depths should be provided in metres.
- F. How will the development be made safe from flooding and the impacts of climate change, for its lifetime? Further information can be found in paragraphs 054 and 059 (including on the use of flood resilience and resistance measures) of the NPPF guidance.
- G. How will you ensure that the development and any measures to protect the site from flooding will not cause any increase in flood risk off-site and elsewhere? Have you taken into account the impacts of climate change, over the expected lifetime of the development? (e.g. providing compensatory flood storage which has been agreed with the Environment Agency).
- H. Are there any opportunities offered by the development to reduce the causes and impacts of flooding?

6. Surface water management*

Describe the existing and proposed surface water management arrangements at the site using sustainable drainage systems wherever appropriate, to ensure there is no increase in flood risk to others off-site.

- A. What are the existing surface water drainage arrangements for the site?
- B. If known, what (approximately) are the existing rates and volumes of surface water run-off generated by the site?
- C. What are the proposals for managing and discharging surface water from the site, including any measures for restricting discharge rates? For major developments (e.g. of ten or more homes or major commercial developments), and for all developments in areas at risk of flooding, sustainable drainage systems should be used, unless demonstrated to be inappropriate.
- D. How will you prevent run-off from the completed development causing an impact elsewhere?
- E. Where applicable, what are the plans for the ongoing operation and/or maintenance of the surface water drainage systems?

7. Occupants and users of the development

Provide a summary of the numbers of future occupants and users of the new development; the likely future pattern of occupancy and use; and proposed measures for protecting more vulnerable people from flooding.

- A. Will the development proposals increase the overall number of occupants and/or people using the building or land, compared with the current use? If this is the case, by approximately how many will the number(s) increase?
- B. Will the proposals change the nature or times of occupation or use, such that it may affect the degree of flood risk to these people? If this is the case, describe the extent of the change.
- C. Where appropriate, are you able to demonstrate how the occupants and users that may be more vulnerable to the impact of flooding (e.g., residents who will sleep in the building; people with health or mobility issues; etc.,) will be located primarily in the parts of the building and site that are at lowest risk of flooding? If not, are there any overriding reasons why this approach is not being followed?

8. Residual risk

Describe any residual risks that remain after the flood risk management and mitigation measures are implemented, and to explain how these risks can be managed to keep the users of the development safe over its lifetime.

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- A. What flood related risks will remain after the flood risk management and mitigation measures have been implemented?
- B. How, and by whom, will these risks be managed over the lifetime of the development? (e.g., putting in place flood warning and evacuation plans).

9. Flood risk assessment credentials

Provide details of the author and date of the flood risk assessment.

- A. Who has undertaken the flood risk assessment?
- B. When was the flood risk assessment completed?

Other considerations

* Managing surface water

The site-specific flood risk assessment will need to show how surface water runoff generated by the developed site will be managed. In some cases, it may be advisable to detail the surface water management for the proposed development in a separate drainage strategy or plan. You may like to discuss this approach with the lead local flood authority.

Surface water drainage elements of major planning applications (e.g., of ten or more homes) are reviewed by the lead local flood authority for the area. As a result, there may be specific issues or local policies, for example the Local Flood Risk Management Strategy or Surface Water Management Plan, that will need to be considered when assessing and managing surface water matters.

It is advisable to contact the appropriate lead local flood authority prior to completing the surface water drainage section of the flood risk assessment, to ensure that the relevant matters are covered in sufficient detail.

Proximity to Main Rivers

If the development of the site involves any activity within specified distances of main rivers, a flood risk activity permit may be required in addition to planning permission.

For non-tidal main rivers, a flood risk activity permit may be required if the development of the site is within 8 metres of a river, flood defence structure or culvert.

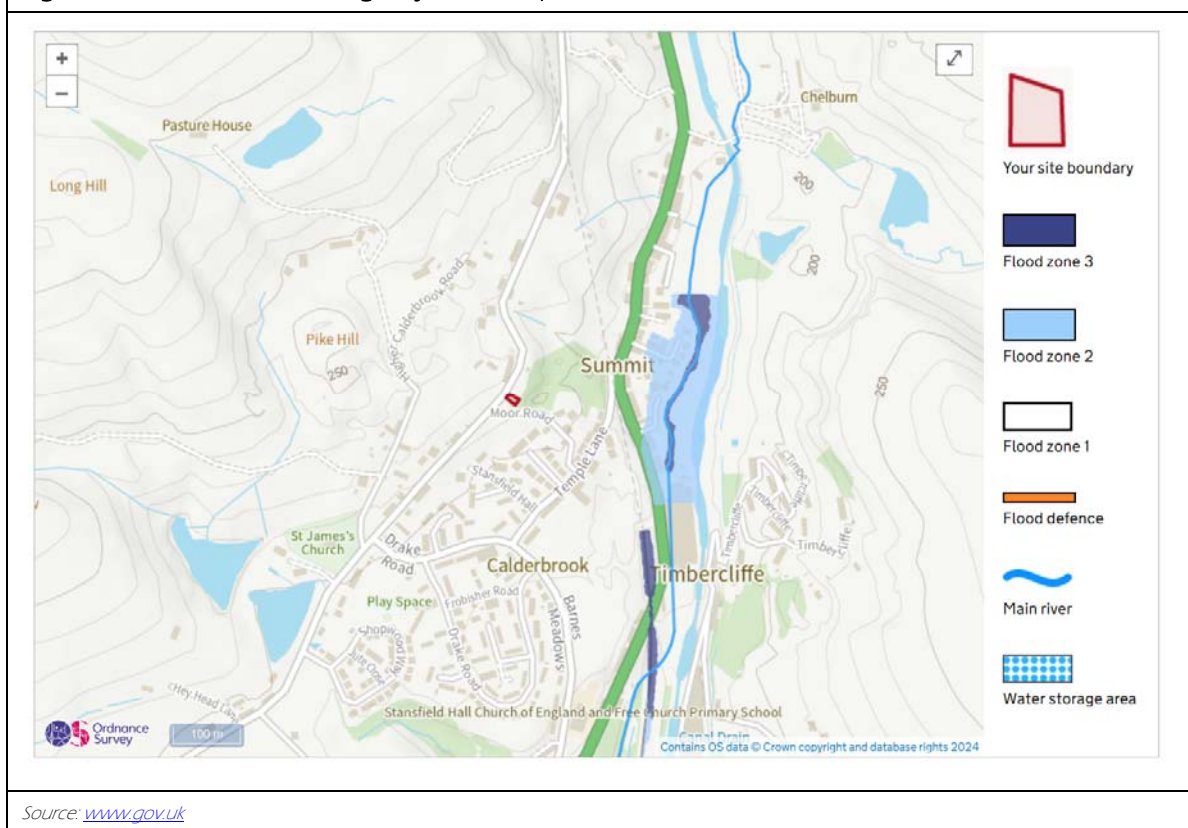
For tidal main rivers, a flood risk activity permit may be required if the development of the site is within 16 metres of a river, flood defence structure or culvert.

Details on obtaining a Flood Risk Activity Permit are available from the Environment Agency.

2.2.2 Sources of Flooding

- **Rivers (fluvial):** Flooding occurs when flow within river channels exceeds capacity; and the type of flood event experienced e.g. flash flooding; depends upon the characteristics of the river catchment.
- **The Sea (tidal):** Flooding at low lying coastline and tidal estuaries is caused by storm surges and high tides; with overtopping and breach failure of sea defences possible during extreme storm events.
- **Pluvial (surface flooding or overland flows):** Heavy rainfall, which is unable to soak away via infiltration or enter drainage systems can flow overland, resulting in localised flooding. Topography generally influences the direction and depth of flooding caused by this mechanism.
- **Groundwater:** Caused when ground water levels rise to the surface; and is most likely to occur in low lying areas underlain by aquifers.
- **Sewers and drains:** Generally, occurs in more urban areas; where sewers and drains are overwhelmed by heavy rainfall or blocked pipes and gullies.
- **Artificial Sources (reservoirs, canals, lakes and ponds):** Reservoir and canal flooding may occur as a result of capacity exceedance or structural failure.

Figure 2.1: The Environment Agency Flood Map



Source: www.gov.uk

2.2.3 Flood Zones

- **Flood Zone 1:** Low probability (less than 1 in 1000 year (<0.1% AEP) annual probability of river or sea flooding in any year).
- **Flood Zone 2:** Medium probability (between 1 in 100 year (1.0% AEP) and 1 in 1000 year (0.1% AEP) annual probability of river flooding; or between 1 in 200 year (0.2% AEP) and 1 in 1000 year (0.1% AEP) annual probability of sea flooding in any year).
- **Flood Zone 3a:** High probability (1 in 100 year (1.0% AEP) or greater annual probability of river flooding in any year or 1 in 200 year (0.5% AEP) or greater annual probability of sea flooding in any year).
- **Flood Zone 3b:** This zone comprises land where water has to flow or be stored in times of flood. Land which would flood with an annual probability of 1 in 20 (5% AEP), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

2.2.4 Vulnerability of Different Development Types

- **Essential Infrastructure:** Transport infrastructure (railways and motorways etc...); utility infrastructure (primary sub-stations, water treatment facilities; power stations; and wind turbines).
- **Water Compatible Development:** Flood control infrastructure; water and sewage infrastructure; navigation facilities.
- **Highly Vulnerable:** Emergency services; basement dwellings; mobile home parks; industrial or other facilities requiring hazardous substance consent.
- **More Vulnerable:** Hospitals; residential dwellings; educational facilities; landfill sites caravan and camping sites.
- **Less Vulnerable:** Commercial premises; emergency services not required during a flood; agricultural land.

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2.2.5 Climate Change

The NPPF requires the application of climate change over the lifetime of a development. As of 27th May 2022, the Technical Guidance for NPPF has updated the climate change allowances based on river basin catchments. The climate change allowance for the Irwell Management Catchment is tabulated below:

Table 1: Peak Rainfall Intensity Allowance

Applied Across All of England	2050's	2070's
Upper End	40%	45%
Central	25%	35%

Due to the development having a proposed life span in excess of 50 years, 45% should be applied to rainfall intensity when developing the drainage strategy, to account for climate change over the lifetime of the development,

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3.0 Details of the Site

3.1 Site Details

Table 2: Development Location

Site Name:	Land off Smithy Nook
Purpose of Development:	Residential
Existing Land Use:	Previously Developed
OS NGR:	SD9440918427
Country:	England
County:	Lancashire
Local Planning Authority:	Rochdale Borough Council
Lead Local Flood Authority	Rochdale Borough Council
Internal Drainage Board:	Not Applicable
Other Authority (e.g. British Waterways/ Harbour Authority)	Not Applicable

Location Plan:



Source: Google Maps

3.2 Site Description

The application site comprises of a previously developed plot and currently accommodates a storage building, located on the east side of Higher Calderbrook Road, with direct access via the highway.

The closest watercourse to the application site is unnamed and flows east under Calderbrook Road approximately 120m north.

3.3 Proposed Development Details

Development proposals comprise of the erection of a single residential property with off street parking.

4.0 Historic Flooding

4.1 Internet Search

An internet search for historic flooding within the vicinity of Higher Calderbrook Road, returned with no results.

4.2 Strategic Flood Risk Assessments 2009/2019

A review of both the Bury, Rochdale and Oldham Strategic Flood Risk Assessment Volume 1 2009 and the Level 1 Strategic Flood Risk Assessment for Greater Manchester Update 2019 do not identify the local vicinity as flooding in the past.

5.0 Initial Evaluation of Flood Risk

5.1 The Environment Agency Flood Map

The development site is located within Flood Zone 1 and therefore it has a low risk of fluvial flooding.

The definition for each of the flood zones highlighted above is provided for reference within Section 2.2.3 of this report.

5.2 Sources of Flooding

Table 3: Possible Flooding Mechanisms

Source/Pathway	Significant?	Comment/Reason
Fluvial	No	Not Applicable
Canal	No	Not Applicable
Tidal/Coastal	No	Not Applicable
Reservoir	No	EA Map shows that the site will not be affected by reservoir flooding.
Pluvial (urban drainage)	Yes	Site will require a new positive drainage strategy
Groundwater	No	Groundwater is considered to be a low risk based on the development proposals.
Surface Water Flooding	No	Site is located within an area that has a very low risk surface water flooding.
Overland Flow	No	Site is located within an area that has a very low risk surface water flow route traversing through the site.
Blockage	No	Not Applicable
Infrastructure failure	No	Not Applicable
Rainfall Ponding	No	No areas of ponding visible

From the initial assessment it is concluded that the primary source of flood risk will be from the increase in runoff as a result of the development.

Fluvial

Due to the application site being located within Flood Zone 1, the risk of flooding from this mechanism is considered to be low and therefore does not require any further evaluation.

Pluvial Flooding

The Environment Agency's Surface Water Flood Map identifies that the application site has a very low risk associated with pluvial (surface water) flooding.

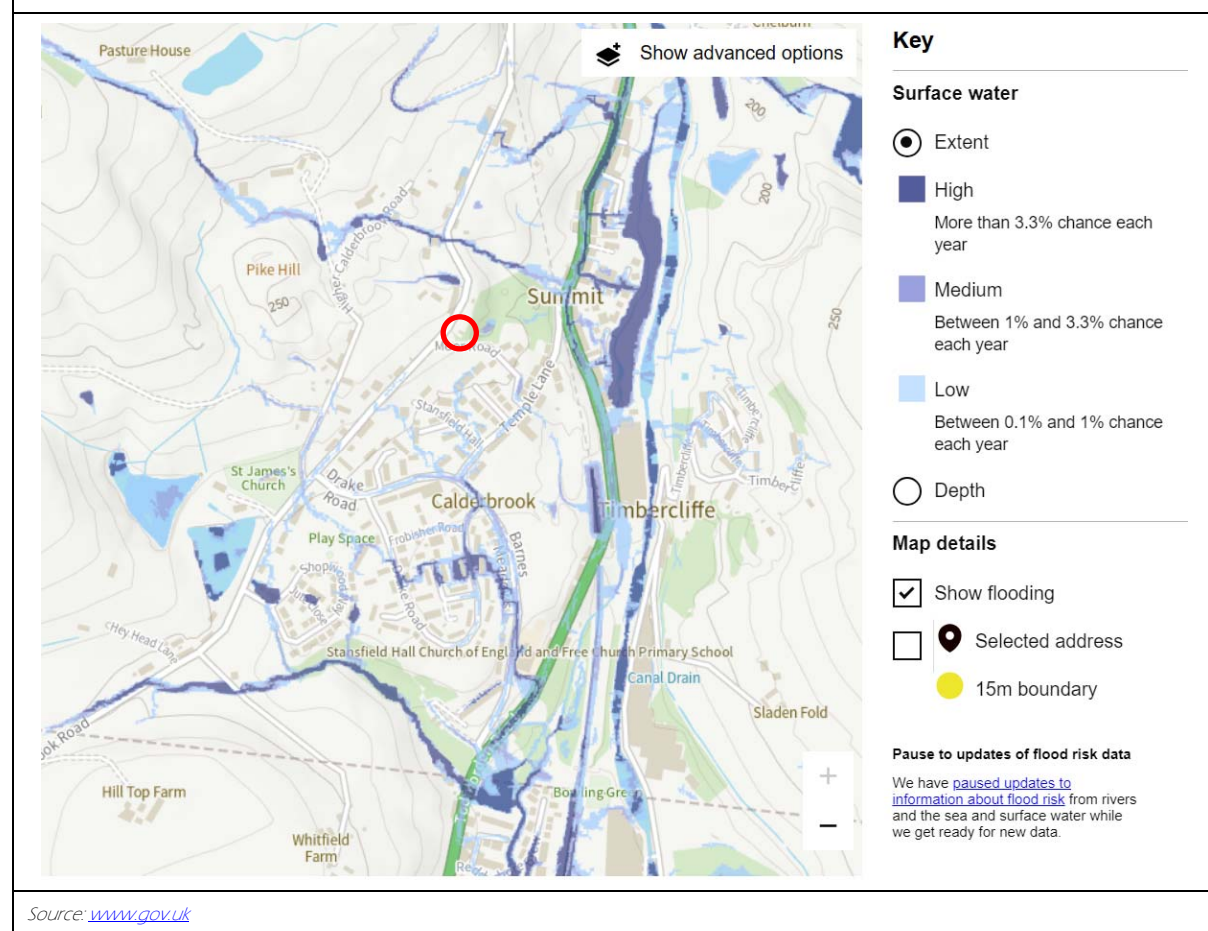
- **Very low** means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).

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Figure 5.1: Environment Agency Surface Water Flood Map



Due to the application site being considered to have a very low risk of surface water flooding, no further evaluation is required.

6.0 Quantitative Flood Risk Assessment

6.1 Surface Water Runoff

6.1.1 General

The application site comprises of a previously developed plot and currently accommodates a storage building, located on the east side of Higher Calderbrook Road, with direct access via the highway.

- Redline boundary = 0.0144Ha

6.1.2 Existing On-site Drainage Regime

The provided CCTV Survey identifies that the existing property has a live connection into the public combined sewer located within Higher Calderbrook Road the west of the site via a single 100mm combined connection.

6.1.1 Public Sewers

The United Utilities Sewer Records identify that a 150mm diameter public combined sewer is located within Higher Calderbrook Road.

There are no public surface water sewers located within the vicinity of the site.

6.1.2 Surface Water Drainage Hierarchy

The hierarchy for disposal of surface water from new developments is outlined within the Building Regulations Approved Document H and specifies the following methods in order of preference:

- Infiltration via soakaway or other suitable infiltration device
- Discharge to watercourse
- Discharge to public surface water sewer
- Discharge to public combined sewer

Infiltration

The proposed development site does not have the required space to provide the 5m easement for soakaways from any building.

Furthermore, the rear of the property is set on a steep embankment where soakaways risk water ingress at lower levels of the property.

For then above reasons soakaways, are not considered suitable for inclusion within the proposed drainage design.

Watercourse

There are no watercourses within a suitable distance in which a surface water connection could be made.

Sewer

Due to the fact that infiltration methods and discharge to watercourse is not feasible, it is recommended that surface water from the development is directed into public combined sewer located within Higher Calderbrook Road, as per the existing situation.

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6.1.3 Sustainable Urban Drainage Systems (SUDS)

SUDS act to reduce the impact of surface water runoff from the development by limiting runoff volumes and rates from leaving the site.

Undertaking an assessment using the SUDS Planner a number of different methods could be used within the development. A summary of the results is tabulated overleaf:

Table 4: SUDS Planner

SUDS Criteria	Rank 1	Rank 2	Rank 3
Hydrological	Green Roof	Permeable Paving	On/offline Storage
Land Use	Infiltration Trench/Soakaway	Bioretention Area	On/offline Storage
Site Features	Green Roof	Permeable Paving	Filtration Techniques
Community & Environment	Bioretention Area	Infiltration Trench/Soakaway	Stormwater Wetlands
Economics & Maintenance	Wet Ponds	Grassed Swales	Dry Detention
Total	Green Roof	Permeable Paving	On/offline Storage

1. Source Control

The inclusion of source control in SUDS schemes is one of the more important principles of SUDS design, and source control components should be upstream of any pond, wetland or other SUDS component.

Source control can help provide interception storage which can handle and treat some of the more frequent but smaller, polluting events (at least 5mm).

Most source control components will be located within the private properties or highway areas. Their purpose is to manage rainfall close to where it falls, not allowing it to become a problem elsewhere.

The main types of source control include:

- Green roofs
- Rainwater harvesting
- Permeable paving
- Other permeable surfaces

Source control methods look to maximize permeability within a site to promote attenuation, treatment and infiltration, thereby reducing the need for off-site conveyance.

a) Green Roofs

Green roof solutions generally comprise of a multi-layered system that covers the roof of a building with vegetation cover, and/or landscaping over a drainage layer, designed to intercept and retain rainfall.

The incorporation of green roofs is to be decided by the architect/developers during the final design stage and is largely dependent on the final building design.

A Green roof has been incorporated into the design covering the lounge area.

b) Permeable Paving

Pervious surfaces can be either porous or permeable. The important distinction between the two is:

Porous surfacing is a surface that infiltrates water across the entire surface. Permeable surfacing is formed of material that is itself impervious to water but, by virtue of voids formed through the surface, allows infiltration through the pattern of voids.

Pervious surfaces provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into underlying layers.

The water can be temporarily stored before infiltration to the ground, reused, or discharged to a watercourse or other drainage system. Surfaces with an aggregate sub-base can provide good water quality treatment.

Permeable paving has been discounted due to the fact that the driveway falls towards the property and risks flooding if siltation occurs, also soakaways are not recommended on the site due to the risk from ingress into lower level of the property.

2. On/offline Storage

This is a traditional form of surface water attenuation and may be provided via online or offline structures such as oversized pipes; or shallow attenuation structures such as geo-cellular crate systems e.g. Hydro-International's Stormcell System or similar. These structures may be easily placed within either hardstanding or landscaped areas to provide ease of access for maintenance purposes.

Storage can be provided within the piped network

6.1.4 Greenfield Runoff Rates

Greenfield runoff rates have been calculated using the ih124 Method for a redline boundary of 0.0144Ha

- $Q_{Bar} = 0.01 \text{ L/s}$

6.1.5 Restricted Discharge Rates

Restricting flows to $Q_{Bar} 0.1 \text{ l/s}$ would result in aperture within the flow control of less than 50mm causing flooding of the system due to blockage or siltation. As such flows have been restricted using an aperture of no less than 50mm, which resulted in a maximum discharge rate of 4l/s.

- Proposed discharge rate = 4l/s during the 1 in 100 year + 45% climate change event.

6.1.6 Proposed Drainage Strategy

The proposed drainage strategy directs surface water from the roof and driveway area into the existing combined drain on-site, which ultimately discharges into the public combined sewer within Higher Calderbrook Road.

Surface water flows have been restricted to no more than 4l/s via the orifice chamber for all return periods up to and including the 1 in 100 year + 45% climate change event.

Flows in excess of this will be stored within the piped network.

A green roof has also been incorporated into the design over the lounge area.

7.0 Mitigation Measures

7.1 Finished Floor Levels

Due to the proposed development being located within Flood Zone 1 it is recommended that finished floor levels are elevated 150mm above surrounding ground.

8.0 Conclusions & Recommendations

Fluvial

Due to the application site being located within Flood Zone 1, the risk of flooding from this mechanism is considered to be low and therefore does not require any further evaluation.

Pluvial Flooding

The Environment Agency's Surface Water Flood Map identifies that the application site has a very low risk associated with pluvial (surface water) flooding.

- Very low means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).

Proposed Drainage Strategy

The proposed drainage strategy directs surface water from the roof and driveway area into the existing combined drain on-site, which ultimately discharges into the public combined sewer within Higher Calderbrook Road.

Surface water flows have been restricted to no more than 4l/s via the orifice chamber for all return periods up to and including the 1 in 100 year + 45% climate change event.

Flows in excess of this will be stored within the piped network.

A green roof has also been incorporated into the design over the lounge area.

Flood Mitigation Measures

Due to the proposed development being located within Flood Zone 1 it is recommended that finished floor levels are elevated 150mm above surrounding ground.

APPENDICES

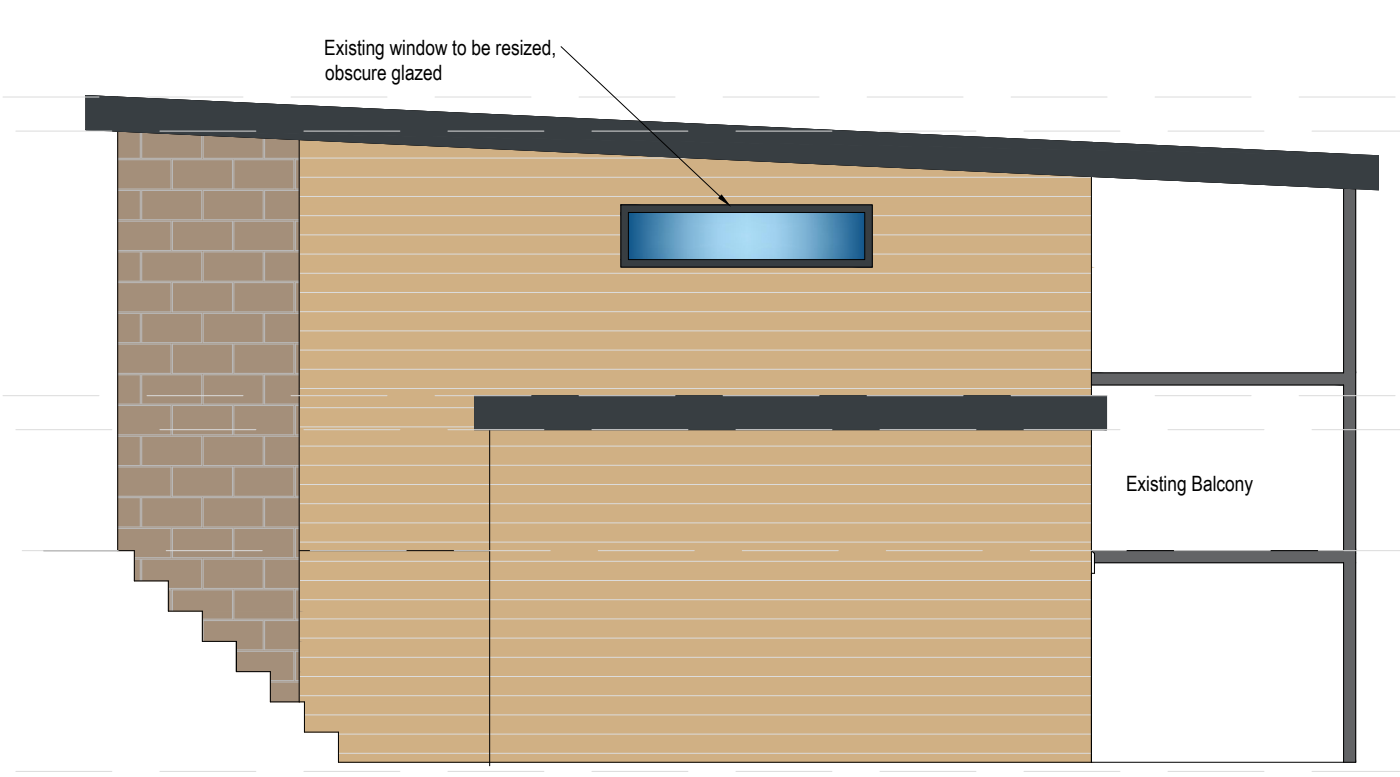
Appendix A: - Development Proposals



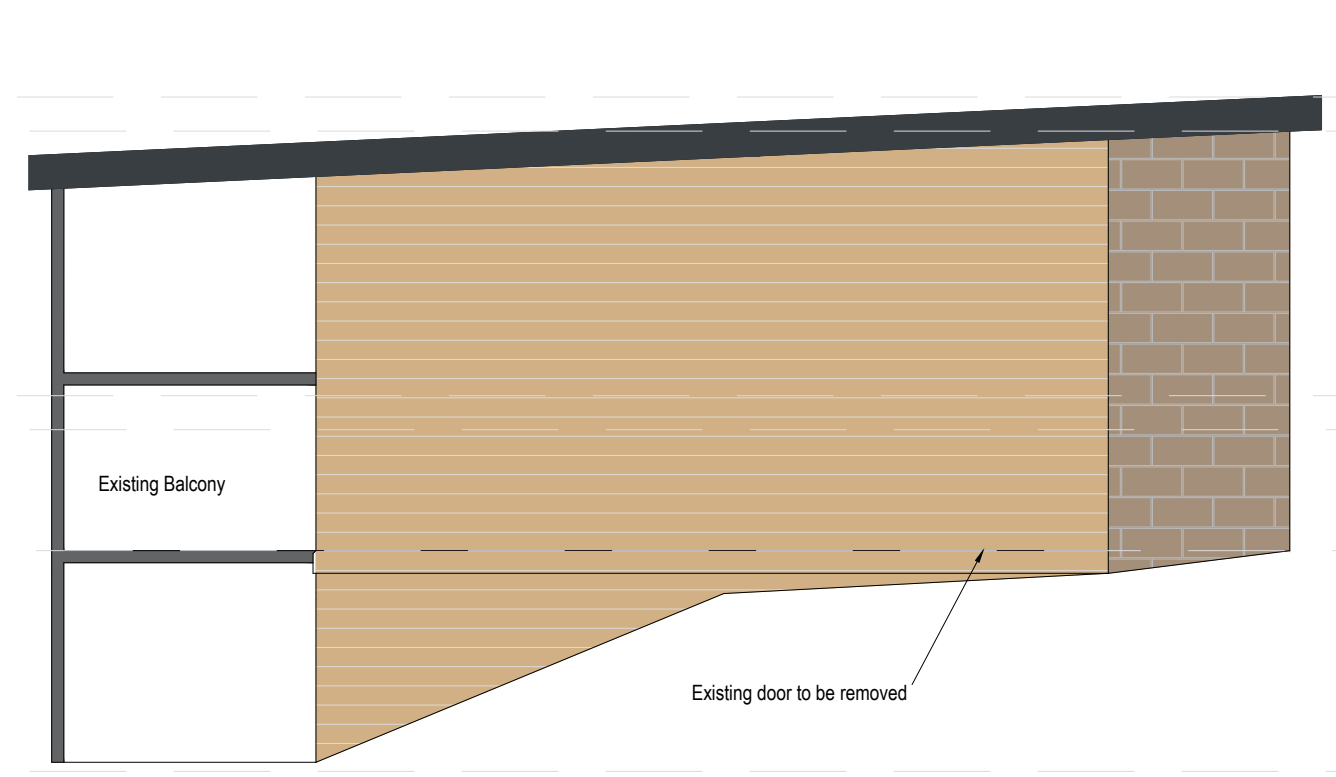
Proposed Front Elevation



Proposed Rear Elevation



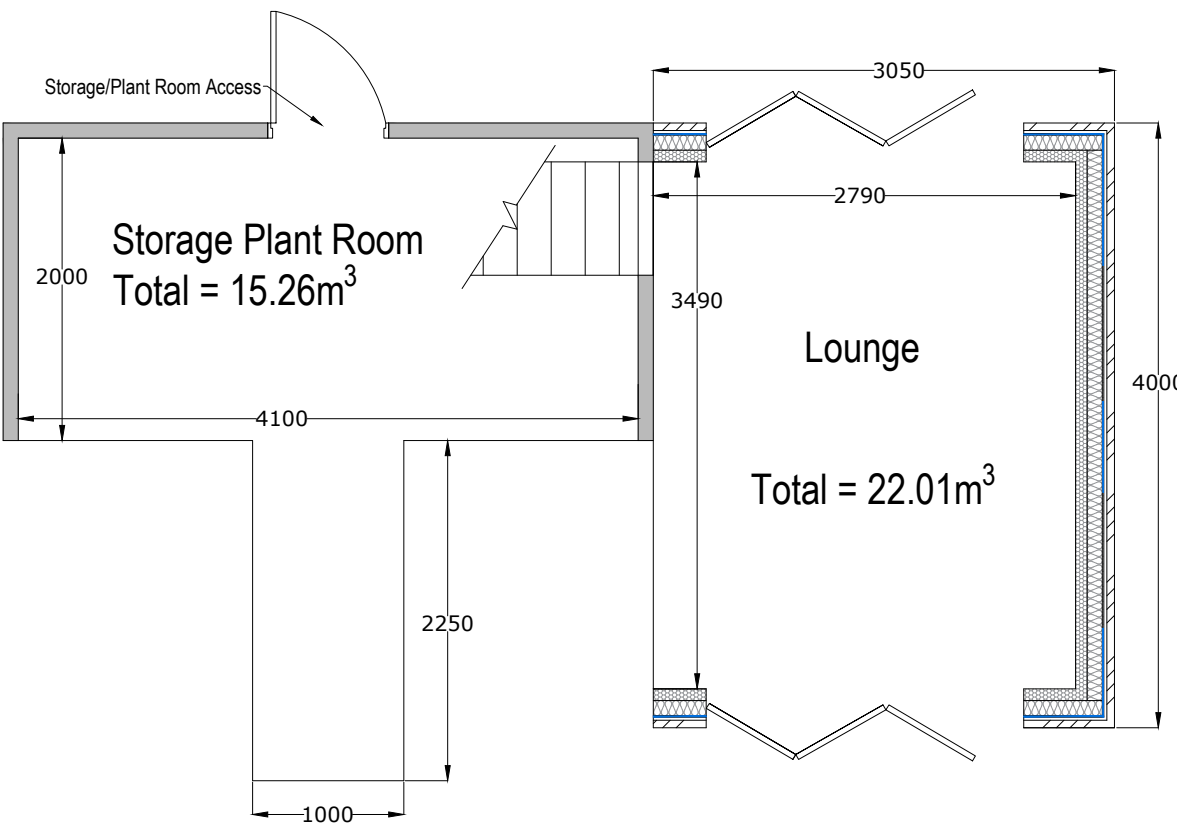
Proposed Gable Elevation (RHS)



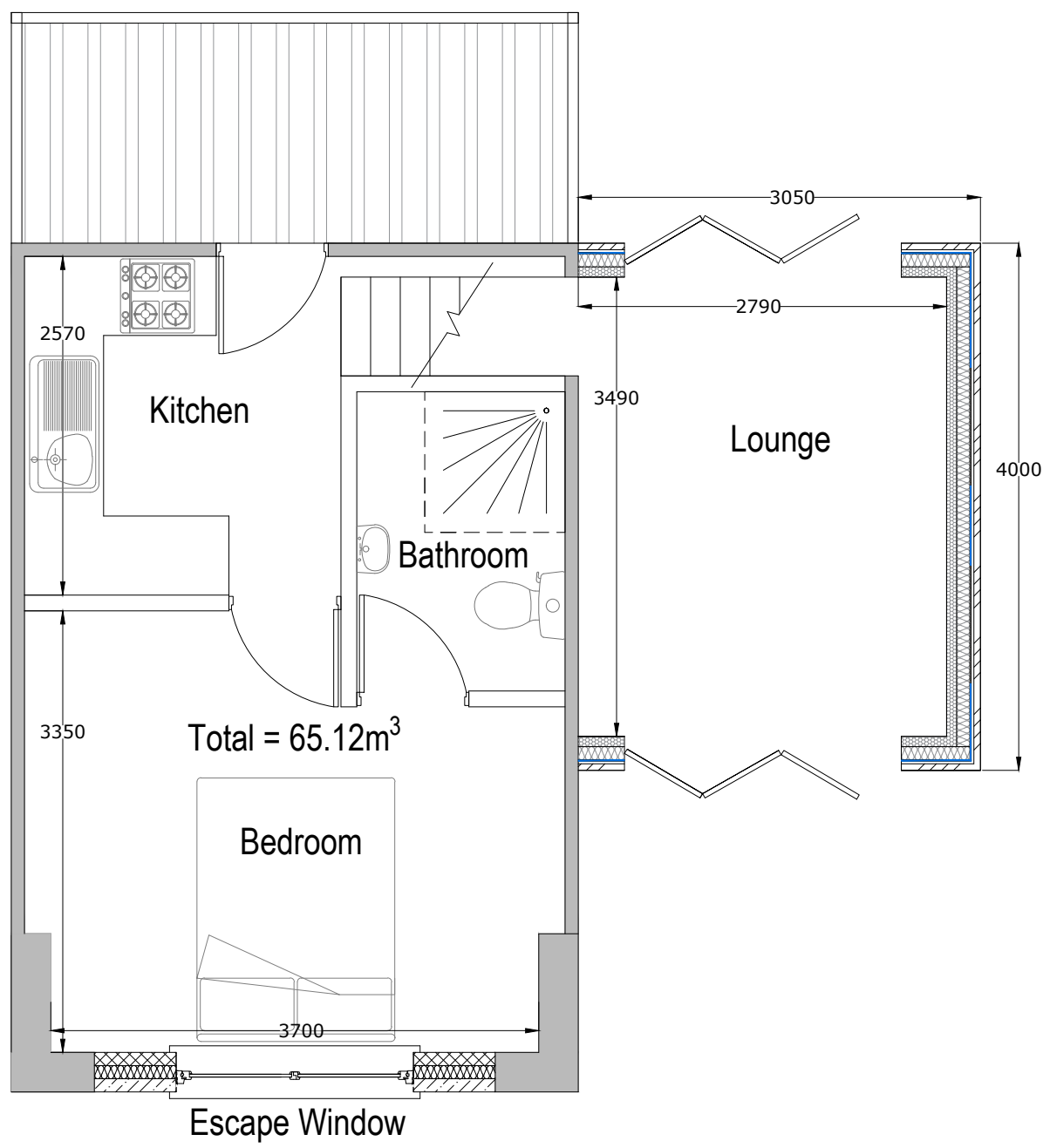
Proposed Gable Elevation (LHS)

Legend

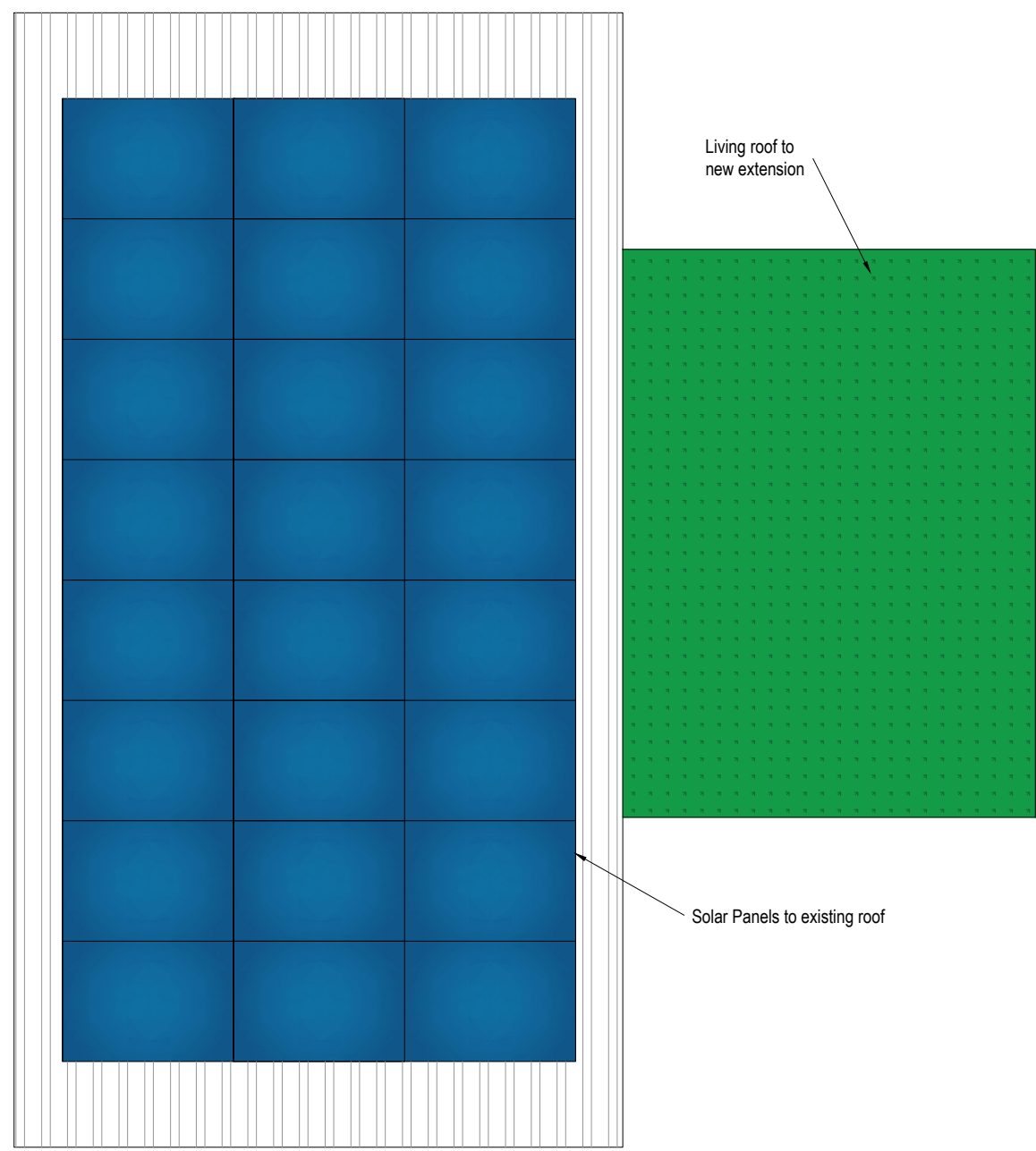
- Existing Walls
- Stone outer
- Timber Cladding
- Profiled Metal Roofing
- Insulation
- Windows
- Living Roof
- Solar Panels
- Cladding Timber Faced (Plan)
- Breathable Membrane
- Block
- Stone section
- Insulated Plasterboard



Proposed Lower Ground Floor



Proposed Ground Floor



Proposed Roof Plan

GENERAL NOTES

Front Elevation

Existing main elevation outer face stone construction, New windows to be replaced grey in colour. All new gutters grey colour and rain water pipes black in colour to match existing material.

Gable Elevations

Existing stone adjoining the front, main elevation outer face timber cladding, windows white UPVC. New doors and windows to be replaced grey in colour. All new gutters grey colour and rain water pipes black in colour to match existing material.

Rear Elevation

Existing timber cladding, windows white UPVC. New doors and windows to be replaced grey in colour. All new gutters grey colour and rain water pipes black in colour to match existing material.

Roof

Existing main roof profiled cladding. Proposed extension roof EPDM built-up to form a living roof.

Building Regulations

All work is to comply with the relevant Building Regulations and all statutory notices are to be given to the Building Control department at the local authority at the appropriate stages. All contractors are to visit site to acquaint themselves with the layout and access to the site prior to tendering. If an approved inspector is used then the AI must notify the local authority that the building regulations will be carried out under the initial notice procedure. AI to be given notice of statutory inspections to allow inspection at appropriate stages.

Materials, goods and workmanship

Goods, materials and workmanship are to be of the best quality of their respective kinds and those for which there are a British Standard or Code of Practice are to conform thereto unless otherwise stated. Descriptions of goods, materials and workmanship given in any one

trade are to apply throughout this Specification unless otherwise stated. All workmanship shall be carried out in accordance with current Building Regulations. All materials shall be used and fixed strictly in accordance with manufacturer's instructions, unless specified otherwise. All commodities to be new and left in perfect condition on completion and when incorporated into the works.

Health & Safety

The Contractor shall ensure that all safety, health and welfare measures required under or by virtue of the provision of any enactment or regulations or the working rules of any industry are complied with. In carrying out the works the contractor shall at all times comply with the requirements of the Construction (Design and Management) Regulations 2015, this will include taking on Clients duties, unless Client appoints separate Principal Designer. Where necessary notifications to be served to HSE and appropriate Construction manuals produced.

Additional Notes For Planning.

- a) Existing volume of the original property 80.38m³
- b) Volume of the proposed works 22.01m³
- c) % increase above the size of the original building 27.38%

01	Room Identification Added	28.06.24
Rev. No.	Revision note.	Date.
Title:	Proposed Elevations, Plans And Roof Layout	
Project:	Land Off Smithy Nook Calderbrook Road Littleborough OL15 9NF	
Client:	Paul Butler 3 Warkworth Terrace Bacup OL13 9LY	
Scale:	Designed:	Drawn:
1:50@A1	AW	JW
		Date:
		21.05.2024
Drawing No. JCBD-24-383 - 2. Rev01		
 J C Building Design Ltd Tel: 01706 599352 / 07824 871086 enquiries@jcbuildingdesign.co.uk		

NPPF Flood Risk Assessment

Land off Smithy Nook, Higher Calderbrook Road, Littleborough
Report No: 2024-060

Appendix B: - CCTV Survey



Cripplegate Lane, Hoghton, Preston. PR5 0RR
Tel: 01254 851500 Fax: 01254854004 service@drain-alert.co.uk

Mr Paul Butler
3 Warkworth Terrace
Bacup
Lancashire
OL13 9LY

05/11/2024

Dear Mr Butler,

Reference: - JN35692, Land off Smith Nook.

May we thank you for your valued custom. As requested, we have conducted a CCTV inspection at the above premises. We have emailed a link to you to access the Wincan VX video clips and documents via the cloud.

We trust that the report is to your satisfaction; however, should you have any queries then please do not hesitate to contact me.

Yours sincerely,

Mr S W Ormisher, B.A.(Hons.),
Technical Services Consultant

Service areas: Preston • Bolton • Wigan • Salford • Tameside • Rochdale • Cheshire • Fylde • Burnley
Company Reg. No. 02950360 • VAT Reg. No. 448 2116 57





Conclusion

As requested, a CCTV survey and investigation of foul water drainage line serving small property was carried out as instructed by client. Upon arrival visible inspection found one manhole to be in front driveway area at dwelling.

The survey was conducted downstream from manhole (See photos).





Evidence from the survey found drainage line to be of 100mm PVC construction throughout it was found drainage line connects to a United Utilities pumping station on Calderbrook road area.

The general condition of line surveyed was found to be good and in expected working order throughout with no faults found structural or otherwise.

Recommendations

No remedial work required.

We trust that the above is acceptable; however, should you require any further information, please do not hesitate to contact me.

Yours sincerely,

Mr S W Ormisher,
Technical Services Consultant

Disclaimer - Please note that any dimensions, levels, and drainage layout drawings that are provided by Drain Alert, should be checked before being relied upon. All updated drawings are not to scale. It is the responsibility of the client to verify all information given with regards to the drainage prior to commencing any design or work site.



Project

Project Name: 2024_11_04 35692 Land off Smithy Nook
Project Description: CCTV Drainage Survey
Project Number: 35692
Project Status: Complete
Project Date: 11/4/2024
Inspection Standard: MSCC5 Sewers & Drainage GB (SRM5 Scoring)





Table of Contents		
Project Name	Project Number	Project Date
2024_11_04 35692 Land off Smithy Nook	35692	11/4/2024

Scoring Summary	P-2
Section Item 1: MH1 > MainLineX (MH1X)	3



Scoring Summary

Project Name	Project Number	Project Date
2024_11_04 35692 Land off Smithy Nook	35692	11/4/2024

Structural Defects

Section	PLR	Grade	Description
All inspected pipes are in an acceptable structural condition (< grade 3).			

Service / Operational Condition

Section	PLR	Grade	Description
All inspected pipes are in an acceptable service condition (< grade 3).			

Abandoned Surveys

Section	PLR	Description
All inspections complete, none are abandoned.		

Information

These scoring summaries are based on the SRM grading from the WRc.



Completed section inspection



Item No. 1	Insp. No. 1	Date 04/11/24	Time 15:41	Client`s Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned No	PLR MH1X
Operator L Hilton		Vehicle PK65 HFB		Camera P350 Flexitrax	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Littleborough	Inspection Direction:	Downstream	Upstream Node:	MH1
Road:	Calderbrook Road	Inspected Length:	12.00 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	12.00 m	Downstream Node:	MAIN LINEX
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Flow Control:	No flow control	Material:	Polyvinyl chloride		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:104 Position [m] Code Observation Grade

Depth: m
MH1

0.00 MH Start node, manhole, reference: MH1

1.33 LL Line deviates left

5.09 LR Line deviates right

10.52 JN Junction at 10 o'clock, 100mm dia: Unknown

12.00 MHF Finish node, manhole, reference: Main LineX:
Internal UU Pump Station Manhole

Main LineX
Depth: m

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Appendix C: - Greenfield Runoff Rates

Calculated by: Christian vose

Site name: Smithy Nook

Site location: Littleborough

Site Details

Latitude: 53.66223° N

Longitude: 2.08632° W

Reference: 892764418

Date: Nov 13 2024 16:24

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.

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.1

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	1354	1354
Hydrological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 30 years:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is SPR/SPRHOST ≤ 0.3?

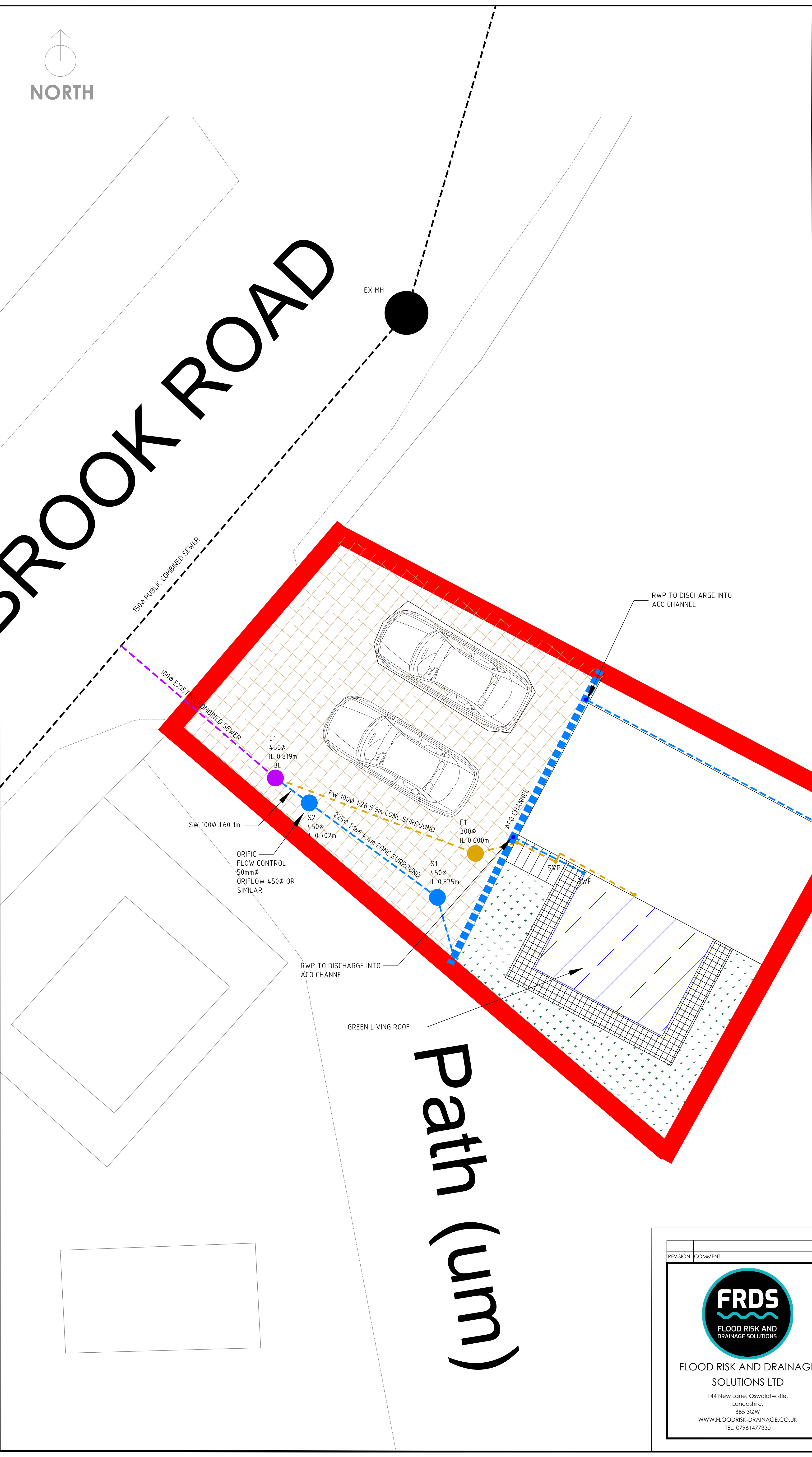
Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
-------------------------	---------	--------

Q_{BAR} (l/s):	1.04	1.04
1 in 1 year (l/s):	0.9	0.9
1 in 30 years (l/s):	1.83	1.83
1 in 100 year (l/s):	2.17	2.17
1 in 200 years (l/s):	2.48	2.48

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix D: - Proposed Drainage Strategy



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- POSITION OF RAINWATER DOWN PIPES TO BE CONFIRMED BY THE ARCHITECT.
- FLOATATION CALCULATIONS OF ANY ATTENUATION STRUCTURES SHOULD BE PROVIDED BY A CIVIL ENGINEER OR MANUFACTURE.

SURFACE WATER ATTENUATION

IN PIPE NETWORK 225Ø PIPE

FLOW CONTROL DETAILS

S2
ORIFICE CHAMBER
APERTURE DIA = 50mm
ORIFLOW 450Ø CHAMBER OR SIMILAR
CHAMBER DETAILS TO BE SPECIFIED BY MANUFACTURE

PROPOSED DISCHARGE RATES

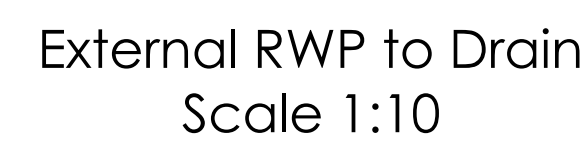
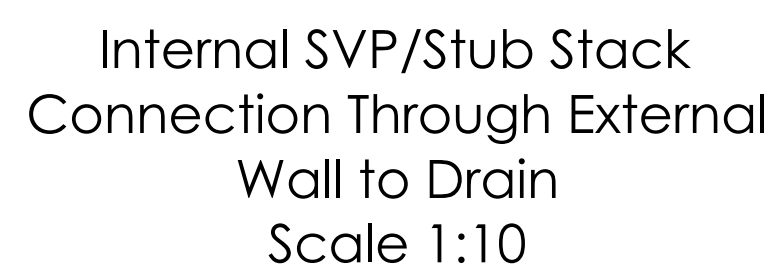
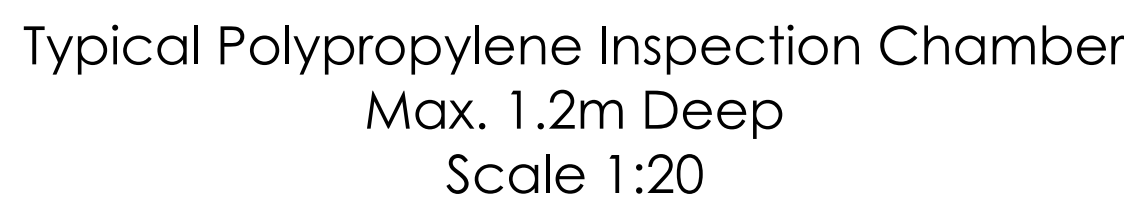
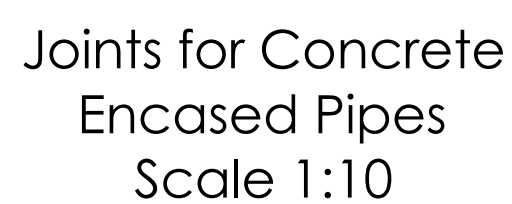
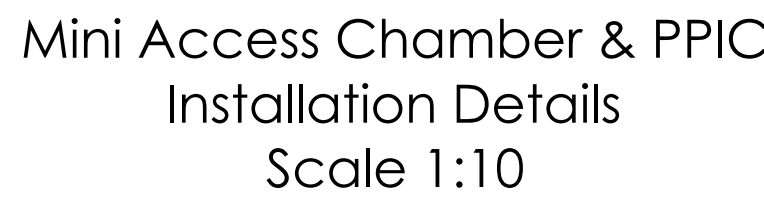
1 IN 1 YEAR = 1.2L/S
1 IN 30 YEAR = 2.3L/S
1 IN 100 YEAR + 45% CLIMATE CHANGE = 4.0L/S

KEY

SW 1000	PROPOSED SURFACE WATER DRAIN
FW 1000	PROPOSED FOUL DRAIN
EX COMB 1000	EXISTING PRIVATE COMBINED SEWER
EX COMB 1000	EXISTING PUBLIC COMBINED SEWER

REVISION	COMMENT	DATE	BY
 FLOOD RISK AND DRAINAGE SOLUTIONS LTD 144 New Lane, Oswaldtwistle, Lancashire, BB5 3QW WWW.FLOODRISK-DRAINAGE.CO.UK TEL: 07961 477330		CLIENT: PAUL BUTLER	DATE: 15/11/2024 STATUS:
		PROJECT: LAND AT SMITHY NOOK LITTLEBOROUGH	DRAWN BY: CV SCALE: 1:50
		DRAWING TITLE: PROPOSED SURFACE WATER AND FOUL LAYOUT	SIZE: A1
		DRAWING REFERENCE: 2024-060-01	REVISION:

Appendix E: - Typical Drainage Details



Extract from Table A2 WIS 4-08-02

Processed granular bedding & sidefill materials for flexible pipes

Pipe nominal bore (mm) (see note D)	Nominal Maximum particle size (mm)	Materials specified in British Standards (see note A)
100	10	10mm nominal single size
Over 100 to 150	15	10 or 14mm nominal single size or 14mm to 5mm graded
Over 150 to 300	15	10-14mm or 20mm nominal single size or 14-5mm graded or 20-5mm graded
Over 300 to 500	20	14 or 20mm nominal single size or 14-5mm graded or 20-5mm graded
Over 500	40	14 or 20mm or 40mm nominal single size or 14-5mm graded or 20-5mm graded or 40-5mm graded

Notes:

A. Processed granular materials to include aggregates and air cooled blast furnace slag to BS EN 12620:200 + A1:2008; and lightweight aggregates to BS EN 13101:2002

B.

C. For the purpose of this table, PE pipe of 630mm OD can be regarded as having nominal bores of over 550mm, irrespective of wall thickness.

D. 100

classifications for flexible pipes.

Minimum Recommended Trench Widths
for Structured Wall Pipes in Poor Ground
Conditions.

Native soil modulus between 3 & 4 MPA

Typical soil Classifications: Very loose gravel, loose sand, medium dense clayey silty sand, firm clay

Nominal pipe diameter (mm)	150	225	300	375	450	525	600	750	900
----------------------------	-----	-----	-----	-----	-----	-----	-----	-----	-----

Minimum trench width (mm)*	450	525	600	750	900	1050	1200	1500	1800
----------------------------	-----	-----	-----	-----	-----	------	------	------	------

* A vertical trench face has been assumed to allow a modulus of 7MPa to be achieved for the pipe bedding and sidefill material.

Other assumed values:
Depth of cover = 4m (max)

Traffic loading = main road

Pipe stiffness = SNB

Note: Where the native soil modulus is below 3MPa or the depth of cover exceeds 6m, guidance should be sought from the pipe manufacturer regarding structural design and installation details.

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SURFACE WATER ATTENUATION

IN PIPE NETWORK 225Ø PIPE

FLOW CONTROL DETAILS

S2
ORIFICE CHAMBER
APERTURE DIA = 50mm
ORIFLOW 450Ø CHAMBER OR SIMILAR
CHAMBER DETAILS TO BE SPECIFIED BY MANUFACTURE

PROPOSED DISCHARGE RATES

1 IN 1 YEAR = 1.2L/S
1 IN 30 YEAR = 2.3L/S
1 IN 100 YEAR + 45% CLIMATE CHANGE = 4.0L/S

REVISION	COMMENT	DATE	BY
 FLOOD RISK AND DRAINAGE SOLUTIONS LTD 144 New Lane, Oswaldtwistle, Lancashire, BB5 3QW WWW.FLOODRISK-DRAINAGE.CO.UK TEL: 07961 477330		CLIENT:	DATE:
		PAUL BUTLER	15/11/2024
		PROJECT:	STATUS:
		LAND AT SMITHY NOOK LITTLEBOROUGH	DRAWN BY:
			CV
			SCALE:
			AS SHOWN
		DRAWING TITLE:	SIZE:
		TYPICAL DRAINAGE DETAILS	A1
		DRAWING REFERENCE:	REVISION:
		2024-060-02	

Appendix F: - Modelled Calculation Report

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	150.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.200	Preferred Cover Depth (m)	0.350
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	4.400	166.0	225	Circular	0.000	-0.575	0.350	0.100	-0.602	0.477
1.001	1.000	58.8	100	Circular	0.100	-0.602	0.602	0.200	-0.619	0.719

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	Adoptable	S2	450	Manhole	Adoptable
1.001	S2	450	Manhole	Adoptable	C1	450	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S1	0.000	0.575	450	Manhole	Adoptable					
							0	1.000	-0.575	225 Circular
S2	0.100	0.702	450	Manhole	Adoptable					
							1	1.000	-0.602	225 Circular
										
							0	1.001	-0.602	100 Circular
C1	0.200	0.819	450	Manhole	Adoptable					
							1	1.001	-0.619	100 Circular

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.200	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	11	-0.522	0.053	1.6	0.0289	0.0000	OK
15 minute winter	S2	11	-0.521	0.081	1.4	0.0128	0.0000	OK
15 minute summer	C1	1	-0.619	0.000	1.1	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	1.4	0.350	0.034	0.0439	
15 minute winter	S2	Orifice	C1	1.2				0.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	12	-0.377	0.198	3.8	0.1071	0.0000	OK
15 minute winter	S2	12	-0.377	0.225	2.9	0.0357	0.0000	SURCHARGED
15 minute summer	C1	1	-0.619	0.000	2.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	2.9	0.388	0.071	0.1687	
15 minute winter	S2	Orifice	C1	2.3				1.7

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S1	21	-0.001	0.574	6.0	0.3113	0.0000	FLOOD RISK
30 minute winter	S2	21	-0.001	0.601	4.6	0.0955	0.0000	FLOOD RISK
15 minute summer	C1	1	-0.619	0.000	3.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	5.4	0.482	0.133	0.1750	
30 minute winter	S2	Orifice	C1	4.0				4.5