

AgroSmart Ltd

**Proposed Warehouse Extension
Red Doles Lane
Leeds Road
Huddersfield**

Flood Risk Assessment

**Prepared by EWE Associates Ltd
Draft Rev0 December 2024**



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CLIENT DETAILS

**Agrosmart Ltd,
Red Doles Lane,
Huddersfield,
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CONTRACT

This report describes work commissioned by AgroSmart Ltd following written instruction by their representative during November 2024. AgroSmart Ltd representative for the contract was Mr Tony Stead of ADP Architecture & Design. Lea Favill of EWE Associates Ltd carried out the work.

Date: 22nd December 2024

Prepared by:

Lea Favill
Director

REVISION HISTORY

Draft Report Rev0 issued 22nd December 2024
- 1No copy issued to Tony Stead

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1. INTRODUCTION

Terms of Reference

This report was commissioned by AgroSmart Ltd to support a planning application for a warehouse extension within a commercial site off Red Doles Lane located off Leeds Road in Huddersfield. The site can presently be accessed from the east off Red Doles Lane. The location of the site is shown on Table 2-1.

The existing building lies within Zone 2 of the Environment Agency Flood Map (version 2.8.2), being the zone with risk of 1 in 1,000 year (1% AEP) or greater for river flooding. The overall size of the development is less than 1 hectare.

It is usual for the Agency to raise an objection to development applications within the floodplain or Zone 2 or 3 of the flood map until the question of flood risk has been properly evaluated. The Agency will also object to developments where the total site area is more than 1 hectare until suitable consideration has been given to surface water runoff.

Approach to the Assessment

As there are four sources of flood risk – River Colne, Allison Dike, Grimescar Beck and surface water runoff – it is necessary to determine flood water levels at the site for the desired return periods emanating from these sources. Consideration has also been given to the site flooding from either overland flow or ponding of localised rainfall within the site.

Kirklees Council was included in the Calder Valley SFRA completed by JBA Consulting during July 2016. References have been taken from the assessments; however, there is very little site-specific information within the report relevant to the area close to the site.

The River Colne is located to the south east of the site. In line with the site the river is open channel. The river is Main River, as such, the responsibility for flood defence and land drainage lies with the Environment Agency. The Environment Agency has been approached for modelled flood data for the river. The Environment Agency has modelled flood data which may assist in predicting the design flood level for the river adjacent to the proposed development site.

The Allison Dike is located to the north east of the site. In line with the site the river is culverted. The river is Main River, as such, the responsibility for flood defence and land drainage lies with the Environment Agency. The Environment Agency has been approached for modelled flood data for the river. The Environment Agency has modelled flood data which may assist in predicting the design flood level for the river adjacent to the proposed development site.

The Grimescar Beck is located to the south west of the site. In line with the site the river is open channel. The river is Main River, as such, the responsibility for flood defence and land drainage lies with the Environment Agency. The Environment Agency has been approached for modelled flood data for the river. The Environment Agency has modelled flood data which may assist in predicting the design flood level for the river adjacent to the proposed development site.

The works are limited to a 500m² ware house extension to be constructed on a paved area which is currently supported by formalised drainage. As such, the roofed and paved areas within the site will not be affected and not increased due to the development. Therefore, the impact on the surface water drainage system will be insignificant and has not been considered further at this stage.

A walk over of the site was conducted by Mr Lea Favill, a senior river engineer during December 2024; during the visit a photograph survey of the site and adjacent river was undertaken. A topographic survey of the site has been provided by the clients representative. These surveyed levels have been utilised within this report.

The requirements for flood risk assessments are generally as set out in National Planning Policy Framework (NPPF). The detail and complexity of the study required should be appropriate to the scale and potential impact of the development. For the purposes of this study, the following have been considered: -

- Available information on historical flooding in the area.
- Site level information.
- Details of structures, which may influence hydraulics of the watercourse and consideration of the effect of blockage of structures.
- Estimates of design levels, equivalent to a 200-year (coastal/tidal) and a 100-year (fluvial) return period flood event.
- Allowances for increased flows resulting from the effects of climate change.
- Allowances for sea level rise resulting from the effects of climate change.

Assess the existing runoff characteristics and the potential impact the proposed development will have on the runoff.

Further guidance is also provided in the CIRIA Research Project 624 “Development and Flood Risk: Guidance for the Construction Industry”.

Application of Sequential & Exceptions Test

The existing and proposed building lies within Zone 2 of the Environment Agency Flood Map (version 2.8.2), being the zone with risk of 1 in 1,000 year (0.1% AEP) or greater for river flooding. The proposed development is commercial, as such, is less vulnerable.

Table 1: Flood Risk Vulnerability and Flood Zone ‘Compatibility’

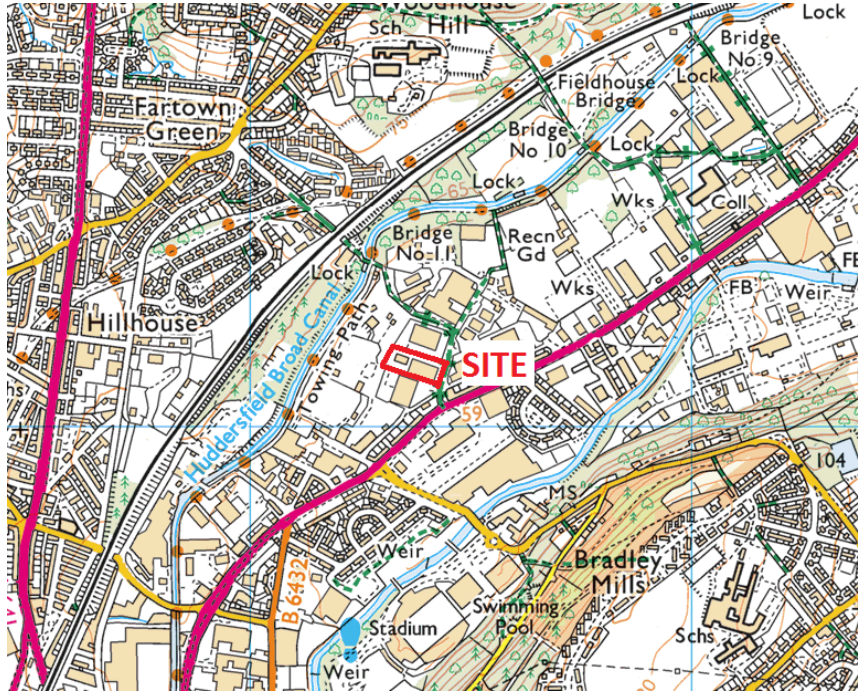
Flood Zone	Flood Risk Vulnerability classification	Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b	Exception Test required	✓	✗	✗	✗

- ✓ Development is appropriate
✗ Development should not be permitted

2. DETAILS OF THE SITE

Site Location

Table 2-1: Location Plan



Ordnance Survey Licence no.: WL1005160

Site Details

Table 2-2: Site Details

Site Name	Extension to Warehouse Red Doles Lane Huddersfield
Existing Land Use	Commercial
Proposed Development	Commercial Extension
Grid Reference	SE 15332 18139
County	West Yorkshire
Local Planning Authority	Kirklees Council
Internal Drainage Board	Not Applicable
Others	Not Applicable
Post Code	HD2 1YF

Site Description

The proposed development site is currently an existing commercial site which includes a large building and car parking/yard areas. An aerial photograph of the site is shown below in Figure 2.1. During the day of the site inspection there was evidence of formalised drainage in the form of roof gutters and down pipes to all roofed areas and gullies to the paved areas which conveyed runoff below ground.

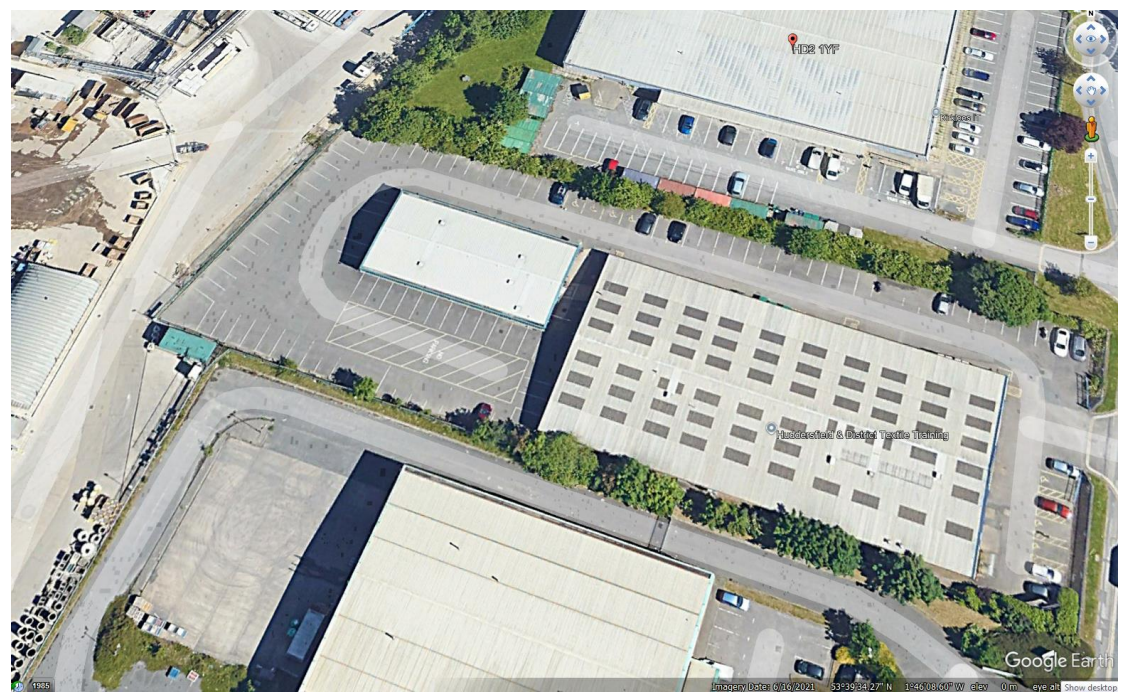
The existing ground floor level is at 58.629mOD. The ground levels within the site are illustrated at Appendix A of this report.

There is existing development to all sides of the site. The River Colne is to the south east, the Allison Dike to the north and the Grimescar Beck to the south west.

The proposal is to provide an additional 500m² of commercial building to be located on an area of existing car park. The impermeable area within the site will be maintained with no increases anticipated. The proposed layout plan is provided at Appendix B of this report.

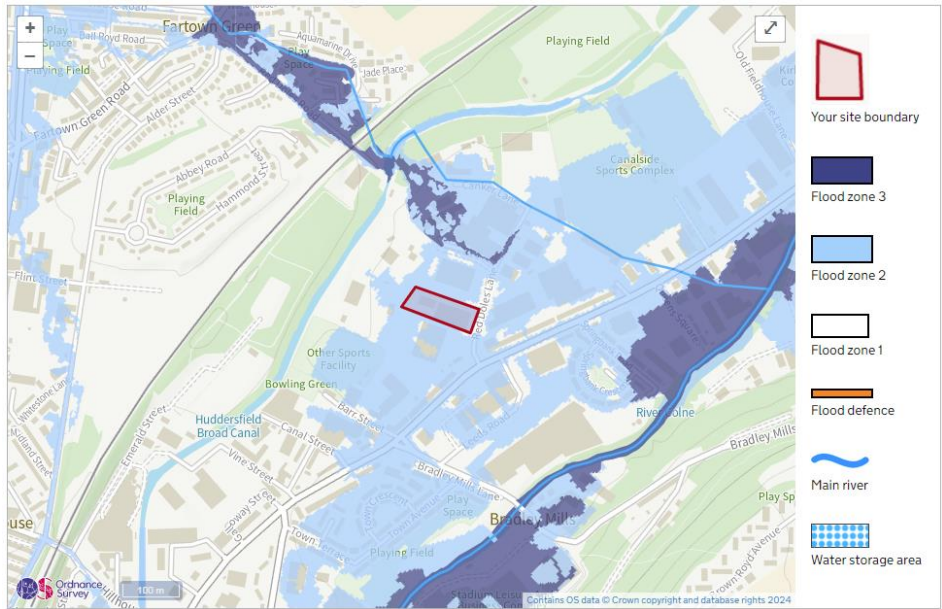
Site Photographs

Figure 2.1: Aerial Photograph of the Existing Site.

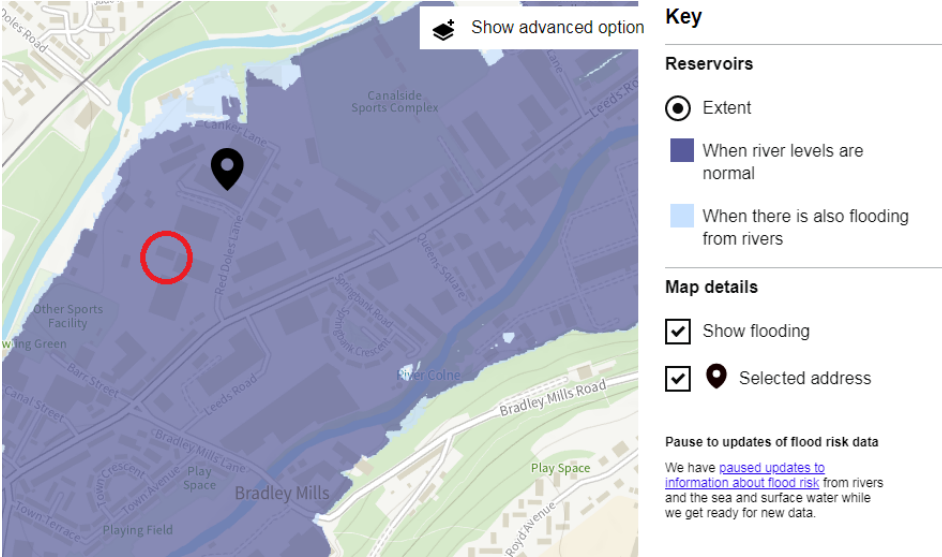


3. INITIAL ASSESSMENT

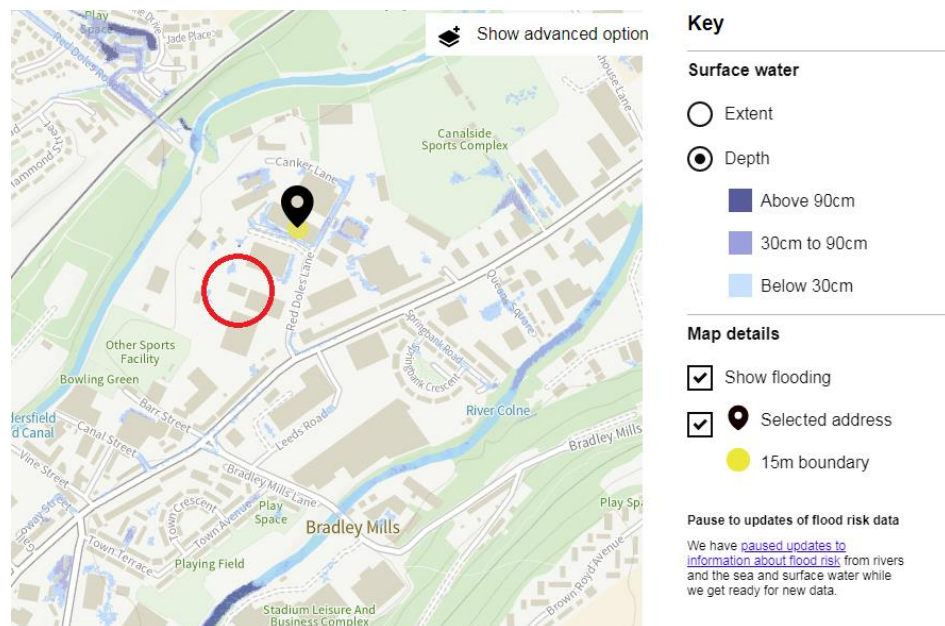
Environment Agency Flood Map



Environment Agency Reservoir Flood Map



Environment Agency Surface Water Flood Map



Past Flooding History

A search on the British Hydrological Society Chronology of British Hydrological Events website¹ found no records of past flooding close to the site.

Undertaking an internet based search for flooding found no further reference to flooding close to the site.

SFRA Flooding History

The SFRA contained no references to the site being flooded.

Environment Agency Flooding History

The Environment Agency comment that they had no records of flooding within the site. They provided the February 2020 and February 2022 flood maps which confirmed that the site was not affected during these events.

Environment Agency Reservoir Flood Risk

The Environment Agency reservoir risk map shows that the site is within a risk area. The risk is from the reservoirs upstream of Huddersfield which use the River Colne as a flood conduit. The reservoir flood map shows the consequences of a full breach of the dam structure with the reservoir at full capacity, as such a worst-case scenario. However, the flood maps do not consider the probability of such a failure. Following

¹ <http://www.dundee.ac.uk/geography/cbhe/>

discussions with Yorkshire Water who are responsible for the reservoirs it was commented that the probability of failure is low as the reservoir is inspected and maintained in accordance with the Reservoirs Act. As such the dam is regularly inspected for defects and any necessary works undertaken prior to a failure. As such the probability of a failure is extremely low.

Environment Agency Surface Water Flood Risk

The Environment Agency surface water risk map shows the impact of a 1 in 100 year surface water event on the site and local area. The site and the area proposed for the building extension are not within a flood risk area.

Possible Flooding Mechanisms

As there is a single sources of flood risk – River Colne, Allison Beck and Grimescar Beck – it is necessary to determine flood water levels at the site for the desired return periods emanating from these sources.

The River Colne is located to the south east of the site. The river is open channel with no flood defences inline and therefore only overtopping will need to be considered.

The Allison Dike is located to the north east of the site. In line with the site the river is culverted therefore only overtopping will need to be considered.

The Grimescar Beck is located to the south west of the site. In line with the site the river is open channel. The river is open channel with no flood defences inline and therefore only overtopping will need to be considered.

There is no significantly higher ground adjacent to the site. There are no depressed areas within the site which could encourage ponding, therefore these flood mechanisms have not been considered further.

Information on groundwater flooding is limited within the Kirklees Council. The SFRA provided no further information. In addition, reference to the Groundwater Vulnerability Map and Source Protection Zones produced by the Environment Agency indicate that district is predominantly underlain by secondary A aquifer and are therefore unlikely to be source of significant flood risk.

Yorkshire Water is the statutory water undertaker and is responsible for the public sewer systems within Huddersfield area. Yorkshire Water maintains a register of historical sewer flooding events (DG5 Register) within the area. There are no report incidents close to the site. The SFRA provided no further information.

4. FLOOD RISK ASSESSMENT

Requirements of the Environment Agency

The Environment Agency, as part of its development control procedures, generally require finished floor levels to be set above the 1% AEP plus climate change flood water level at the site. The development is commercial in nature, as such it is considered that access and egress from the development site will be desirable during times of extreme floods.

River Colne

The River Colne is located 450m to the south east of the site. The river is open channel with no flood defences inline and therefore only overtopping will need to be considered.

There is limited formal flood defences adjacent to the site. As such, the site relies upon the natural river bank level to provide a flood defence.

The Environment Agency provide flood level data and flood mapping extracted from the River Colne 2019 model. The information is provided at Appendix C of this report.

1 in 100 year flood event within the River Colne

It is considered that node reference 10 which is directly in line with the site is the most representative. The 1 in 100 year flood level has been estimated at 56.85mOD at this node.

The existing ground floor level of the adjacent building has been surveyed at 58.629mOD. It is therefore unlikely that the site and access will flood during this event.

Increase in estimated flood level due to Climate Change

NPPF states that ‘...*Flood risk assessment should be carried out to the appropriate degree at all levels of the planning process, to assess the risks of all forms of flooding to and from development taking climate change into account. The future users of the development must not be placed in danger from flood hazards and should remain safe throughout the lifetime of the plan or proposed development and land use.*

As the proposed development is for a commercial land use, consideration has therefore been given to consider the potential effects of climate change over the next 75 years in accordance with NPPF. The Environment Agency provided an estimated 1 in 100 year plus climate change flood level in line with the site.

The 1 in 100 year plus climate change 30% flood level has been estimated at 57.14mOD at this node. Current guidance recommends for commercial development located within flood zone 2 that 20% is applied.

The existing ground floor level of the adjacent building has been surveyed at 58.629mOD. It is therefore unlikely that the site and access will flood during this event.

Extreme 1 in 1,000 year flood event within the River Colne

The 1 in 1,000 year flood level has been estimated at 57.23mOD at this node.

The existing ground floor level of the adjacent building has been surveyed at 58.629mOD. It is therefore unlikely that the site and access will flood during this event.

Combined event River Colne, Allison Dike & Grimescar Beck

The River Colne is located 450m to the south east of the site, the Allison Dike is 250m north east and the Grimescar Beck is 600m to the south west. Allison Dike and the Grimescar Beck are culverted in line with the site. The watercourses become open channel upstream of the canal. The inlets to the Allison Dike and Grimescar Beck culverts are elevated above the level of the site.

The Environment Agency provide flood level data and flood mapping extracted from the River Colne 2019 model, Allison Dike 2011 study and Grimescar Beck 2011 study. The information is provided at Appendix C of this report.

1 in 100 year combined flood event

At the upstream end of the Allison Dike culvert the flood level is estimated at 60.73mOD and at the upstream end of the Grimescar Beck culvert the level is 66.89mOD. The existing ground floor level of the adjacent building has been surveyed at 58.629mOD. However, individual and combined flood mapping shows that the site remain dry during this event.

Increase in estimated flood level due to Climate Change

NPPF states that *'...Flood risk assessment should be carried out to the appropriate degree at all levels of the planning process, to assess the risks of all forms of flooding to and from development taking climate change into account. The future users of the development must not be placed in danger from flood hazards and should remain safe throughout the lifetime of the plan or proposed development and land use.'*

As the proposed development is for a commercial land use, consideration has therefore been given to consider the potential effects of climate change over the next 75 years in accordance with NPPF. The Environment Agency provided an estimated 1 in 100 year plus climate change 20% flood level in line with the site.

At the upstream end of the Allison Dike culvert the flood level is estimated at 61.12mOD and at the upstream end of the Grimescar Beck culvert the level is 67.01mOD. The existing ground floor level of the adjacent building has been surveyed at 58.629mOD. However, individual and combined 20% climate change

flood mapping shows that the site remains dry during this event. During the 50% climate change model the site is shown the flood to a level of 58.660mOD. Based on an adjacent ground floor level the new extension would be flooded to a depth of 31mm.

Extreme 1 in 1,000 year combined flood event

At the upstream end of the Allison Dike culvert the flood level is estimated at 60.39mOD and at the upstream end of the Grimescar Beck culvert the level is 67.09mOD. The existing ground floor level of the adjacent building has been surveyed at 58.629mOD. However, individual and combined extreme event flood mapping shows that the site could be flooded. During the extreme model the site is shown the flood to a level of 58.670mOD. Based on an adjacent ground floor level the new extension would be flooded to a depth of 41mm.

5. MITIGATION MEASURES

Raising Floor Levels/Land Raising

During a 1 in 100 year and a 1 in 100 year plus climate change 30% flood event the site is unlikely to flood based on the Environment Agency flood data provided. However, during a 1 in 100 year plus climate change 50% event to existing ground floor of the adjacent building (58.629mOD) could be flooded to a depth of 31mm and during an extreme 1 in 1,000 year event to a depth of 41mm.

As the ground floor remains dry during the 1 in 100 year plus climate change 30% event and the proposal is for an extension the adjacent building floor level of 58.629mOD should be adopted.

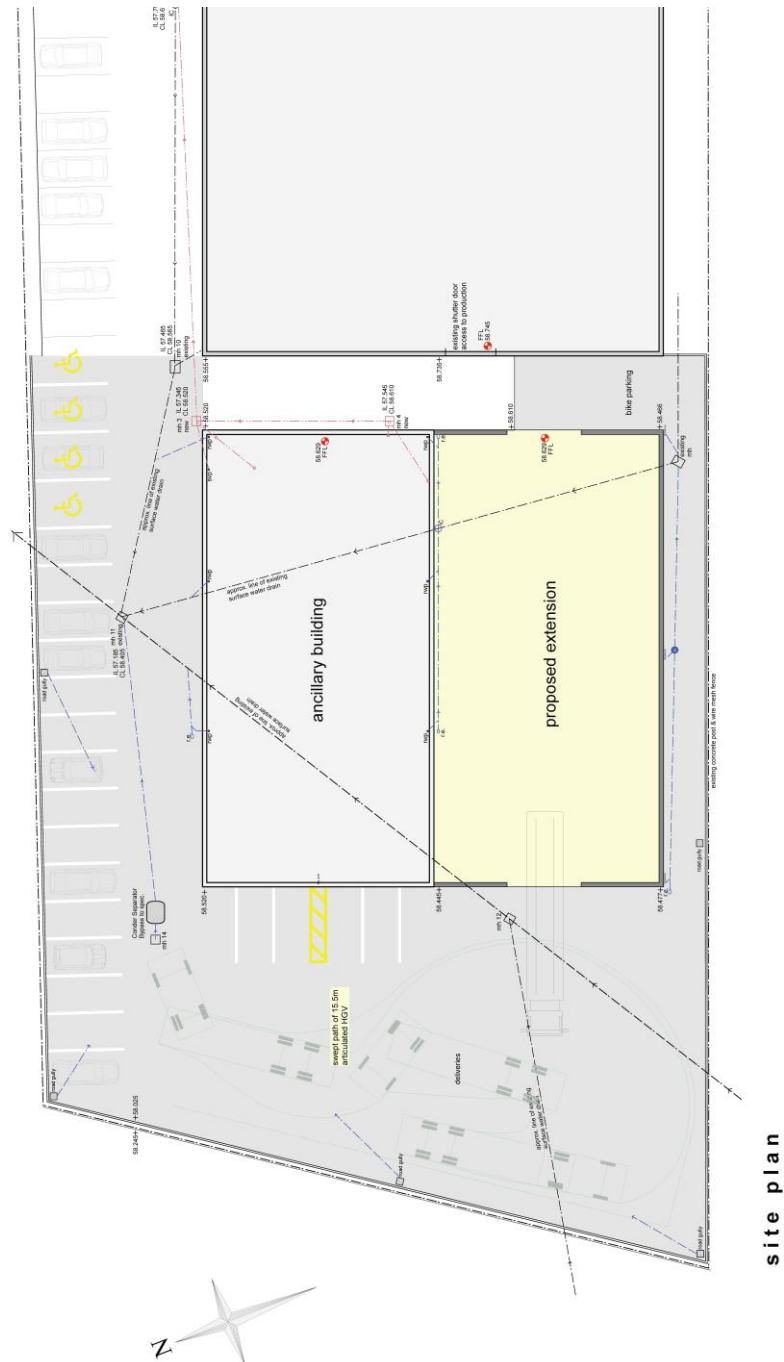
Access & Egress

The proposed extension will be constructed above the 1 in 100 year plus climate change 30% flood level and will therefore be a safe area during design flood event. There will also be dry access and egress from the site to flood zone 1 during this event.

6. CONCLUSION

It is concluded that there is a risk of fluvial flooding to the proposed building from the fluvial sources, however, maintaining floor level should mitigate risk. It is also unlikely that the proposed development will have any adverse impact on the surface water drainage in the area.

Appendix A: - Existing Ground Levels



Appendix B: - Proposed Layout Plan



Appendix C: - Environment Agency Flood Data