

Level 2 Scoping Study Flood Risk & Drainage Impact Assessment

Car Park Associated with Holmes
Mill, Clitheroe

Report No: 2015-028-010-A

Date: 01/02/2017

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Document Control

Document Title: Flood Risk Assessment

Project Number: 2015-028-010

Revision	Date	Issued to	Status	Comments
/	25/01/2017	Charles Stanton (Stanton Andrews Architects)	Final	
A	01/02/2017	Charles Stanton (Stanton Andrews Architects)	Final	Revised Following Discussions with Architect

Contract

This report describes work commissioned by Charles Stanton of Stanton Andrews Architects, dated 08th December 2017. Chris Vose and Donna Metcalf of The Flood Risk Consultancy carried out the work.

Prepared by.....Chris Vose (Flood Risk Consultant)

Reviewed by.....Donna Metcalf (Managing Director)

Approved by.....Donna Metcalf (Managing Director)

Disclaimer

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Executive Summary

Flood Risk Consultancy Ltd have been commissioned to undertake a Flood Risk Assessment for development of a car park / access road on land which currently comprises of a car sales/service business on Moor Lane, Clitheroe, Lancashire.

The Environment Agency flood map indicates that the proposed development site is located within Flood Zones 2 and 3, and as such is considered to have a medium to high risk from fluvial flooding.

The primary source of flood risk to the development site is identified to be from Mearley Brook which forms the southern and eastern boundary of the development site.

Modelled flood data provided by the Environment Agency has determined that the site will become inundated during all events from the 1 in 100 year event up to and including the 1 in 1000 year event, confirming the EA Flood Zones.

The danger to people classification is considered to be 'Danger for All', however the risk can be significantly reduced by implementing mitigation measures as described below.

Reducing the wall adjacent to Mearley Brook to 1.1 metres has been found to have a low impact on the flood regime on site and is therefore considered appropriate.

Following development the total impermeable area for the whole site will remain the same, inline with consultation with the EA surface water flows will be directed directly into Mearley Brook unchanged from the existing situation.

Following detailed appraisal of secondary flood sources i.e. pluvial; groundwater; infrastructure failure; blockage; overland flow; and ponding; it is concluded that overall they present a low risk to the development site.

It is recommended that proposed levels onsite are not increased compared to the existing to prevent the requirement for flood storage compensation.

Advisory mitigation measures include:

- The managers of the premise should sign up to the Environment Agency's free Flood Warning's Direct Service.
- Staff and patrons should be aware of the location and route to Evacuation Points following the issue of a severe flood warning from the Environment Agency.
- A safe place of refuge at first floor level must be provided in the event that evacuation is not possible.
- Appropriate warning signs are to be erected within the site.
- Drainage Management Plan produced by suitably qualified contractor

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1.0 Introduction

1.1 Terms of Reference

The Flood Risk Consultancy has been appointed by Stanton Andrews Architects, to provide a Flood Risk and Drainage Impact Assessment in support of detailed planning application for the redevelopment of a car sales/servicing plot on Moor Lane, to create a car parking area and access road to Holmes Mill on Greenacre Street in Clitheroe.

The total area associated with the car plot on Moor Lane is approximately 0.115 Hectares.

The proposed development site is shown to be located within Flood Zones 2 and 3 on the Environment Agency Flood Map.

Definitions of the different Flood Zones are provided within Section 2.2.2 of this report.

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 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 drainage and surface water runoff management.
- Increasing the risk of flooding elsewhere e.g. surface water flows; flood routing; and loss of floodplain storage.
- 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 (updated 2014)
- Planning Practice Guidance at www.gov.uk (March 2014)
- Building Regulations Approved Document H
- Environment Agency Flood Mapping
- Ribble Valley Borough Council Strategic Flood Risk Assessment (May 2010)
- Ribble Valley Borough Council Core Strategy 2008 – 2028 A Local Plan for Ribble Valley Adoption Version (December 2014)
- CIRIA C697 The SUDS Manual
- Microdrainage Windes
- Local Flood Plan for Mearley Brook 'District Response Forum' (April 2011)
- Chronology of British Hydrological Events (Dundee University)

2.0 Planning Policy Context

2.1 Approach to the Assessment

The project is currently at the planning stage and consequently a detailed site specific flood risk assessment is required.

A Level 2 Scoping Study is designed to provide a qualitative appraisal of flood risk both within the application site and any potential impact that the development will have on flood risk elsewhere; and provide recommendations for mitigation measures which may be included within the design of the development to reduce the overall risk of flooding.

An initial assessment indicates that the primary flood risk at the proposed development is from Mearley Brook.

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

2.2 National Planning Policy Framework (NPPF)

The requirements for undertaking site specific flood risk assessments are generally as set out in Guidance Point 10 from the Planning Practice Guide – Flood Risk & Coastal Change (www.gov.uk).

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 Sources of Flooding

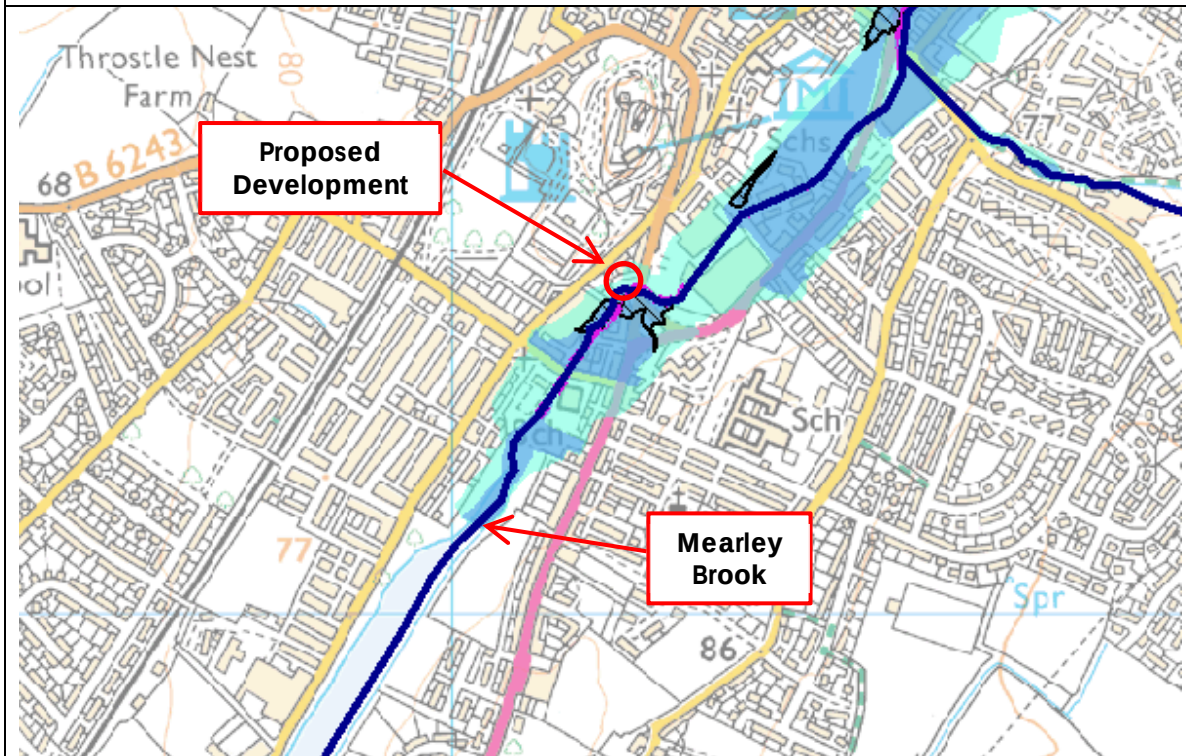
- **Rivers (fluvial):** Flooding occurs when flow within river channels exceeds capacity; and the type of flood event experienced e.g. flash flooding; depends upon the characteristics of the river catchment.
- **The Sea (tidal):** Flooding at low lying coastline and tidal estuaries is caused by storm 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.

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Figure 2.1: The Environment Agency Flood Map



Source: www.environment-agency.gov.uk

Key

-  Flooding from rivers or sea without defences (Flood Zone 3)
-  Extent of extreme flood (Flood Zone 2)
-  Flood defences
-  Areas benefiting from flood defences
-  Main rivers
-  COW Critical Ordinary Watercourse

2.2.2 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.

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2.2.3 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.

2.2.4 Sequential & Exceptions Test

As set out in the National Planning Policy Framework, the aim of the Sequential Test is to steer new development to areas at the lowest probability of flooding.

The Flood Zones are the starting point for the sequential approach.

The Environment Agency Flood Map shows the development site to be located within Flood Zones 2 and 3, which is defined as land with a greater than 1 in 100 (1% AEP) annual probability of river flooding in any one year.

Table 1: Flood Risk Vulnerability and Flood Zone 'Compatibility'¹

Flood Risk Vulnerability Classification		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	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

In accordance with Table 2 'Flood Risk Vulnerability Classification' of the Technical Guidance to the National Planning Policy Framework, car parking areas are defined as 'Less Vulnerable'.

As such there is no requirement to undertake Sequential or Exception tests for the application site.

¹ Extracted from Table 3 of the Technical Guidance to the National Planning Policy Framework Document (March 2012)

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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 19th February 2016, the Technical Guidance for NPPF has updated the climate change allowances based on the river basin district. The climate change allowance for the North West river basin district is tabulated below:

Table 2: North West Climate Change Allowances²

Parameter	Allowance Category	2010 - 2039	2040 - 2059	2060 - 2069	2070 - 2115
Peak Rainfall Intensity	Upper end	+ 10%	+ 20%	+ 40%	
	Central	+ 5%	+ 10%	+ 20%	
Peak River Flow	Upper end	+ 20%	+ 35%		+ 70%
	Higher Central	+ 20%	+ 30%		+ 35%
	Central	+ 15%	+ 25%		+ 30%
Offshore Wind Speed	N/a	+ 5%		+ 10%	
Extreme Wave Height	N/a	+ 5%		+ 10%	

The selection of climate change allowance should be chosen appropriate to the expected lifespan of the proposed development.

The temporary accommodation is expected to have a design life of approximately 100 years; as such an additional 20% and 40% should be applied to peak rainfall intensities to assess the range of impact for this development.

Due to the development being located within Flood Zones 2 and 3 an allowance for peak river flow an additional 70% must be applied.

2.2.6 Local Planning Policy

The following policy, relating to water management and flood risk have been taken from the Ribble Valley Borough Council Core Strategy 2008 – 2028 A Local Plan for Ribble Valley Adoption Version published in December 2014:

Policy DME6: Water Management

10.17 Development will not be permitted where the proposal would be at an unacceptable risk of flooding or exacerbate flooding elsewhere.

Applications for development should include appropriate measures for the conservation, protection and management of water such that development contributes to:

1. Preventing pollution of surface and/or groundwater

² Extracted from Tables 1-4 of the Technical Guidance for flood risk assessments: Climate change allowances Document (February 2016)

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2. Reducing water consumption
3. Reducing the risk of surface water flooding (for example the use of sustainable drainage systems (SUDS))

As part of the consideration of water management issues, and in parallel with flood management objectives, the authority will also seek the protection of the Borough's water courses for their biodiversity value.

All applications for planning permission should include details for surface water drainage and means of disposal based on sustainable drainage principles. The use of the public sewerage system is the least sustainable form of surface water drainage and therefore development proposals will be expected to investigate and identify more sustainable alternatives to help reduce the risk of surface water flooding and environmental impact.

It is important to ensure the water environment including the use of water, pollution and flood risk can be adequately controlled through the development strategy and its strategic framework as envisaged in the Core Strategy.

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3.0 Details of the Site

3.1 Site Details

Table 3: Development Location

Site Name:	Car Park/Access Road, Moor Lane
Purpose of Development:	Car Parking/Access Road
Existing Land Use:	Commercial
OS NGR:	SD 741 413
Country:	England
County:	Lancashire
Local Planning Authority:	Ribble Valley Borough Council
Internal Drainage Board:	Not Applicable
Other Authority (e.g. British Waterways/ Harbour Authority)	Not Applicable

Location Plan:

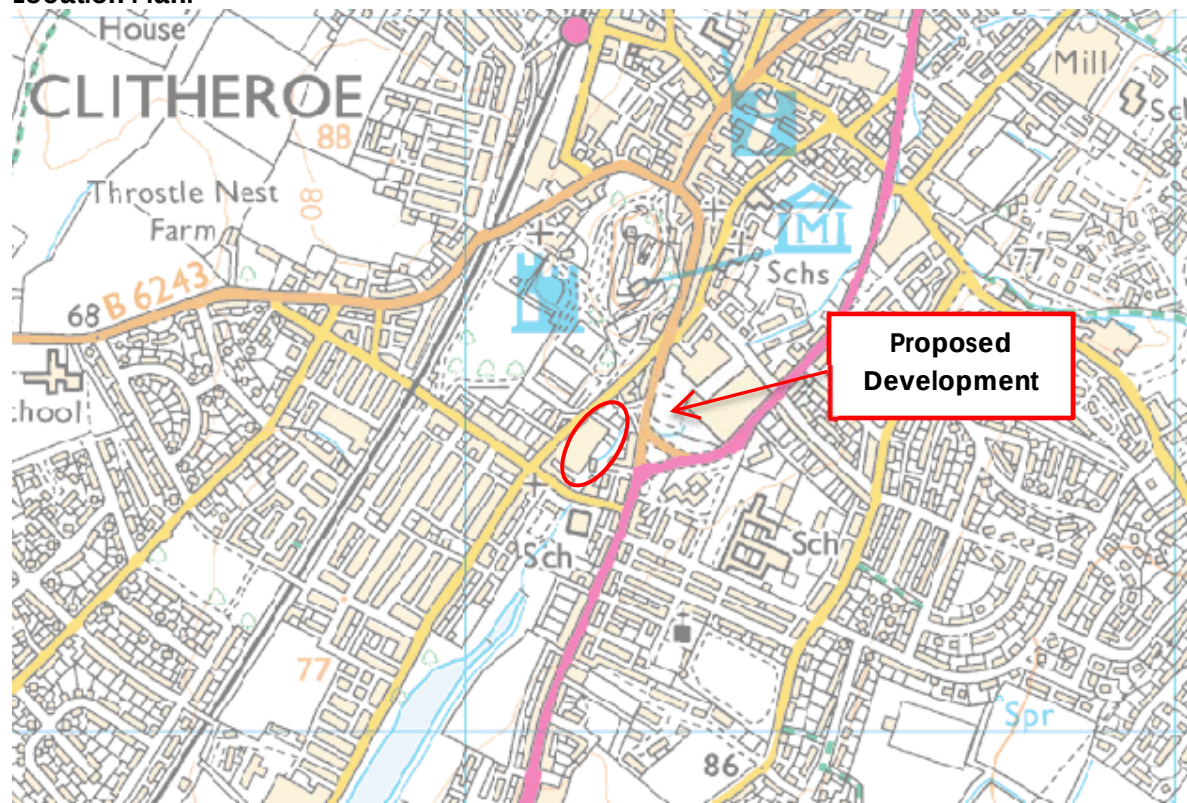


Image produced from the Ordnance Survey Get-a-map service.

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3.2 Site Description

The application site comprises of an existing car sales/servicing plot named 'Inside Track' on Moor Lane, Clitheroe. The site is located towards the south of the centre of the town of Clitheroe to the west of B6471 Moor Lane.

The site currently comprises a number of service building and an area of hardstanding currently used for car sales.

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The car service building is located in the west of the site and an area of hardstanding and access from the east.

Table 4: Boundaries

North	The site is bound to the north by residential properties on Woone Lane with green open space associated with the grounds of Clitheroe Castle. Clitheroe Train Station is located approximately 550m north of the development site.
East	The east of the site is bound by Moor Lane, to the east of the highway there are commercial properties located on Whalley Road A671 and the eastern areas of the town of Clitheroe.
South	The south of the site is bound by Mearley Brook, beyond which are residential properties associated with Moor Lane, beyond which is a large expanse of urbanised area associate with the south of Clitheroe.
West	The west of the site is bound by Woone Lane further to this is Clitheroe skate park and open space associated with Clitheroe castle.

Vehicular access to the site is currently available from the east boundary from Moor Lane, a vehicle bridge also crosses Mearly Brook directly south of the access to the east.

The nearest watercourse to the application site is Mearley Brook located immediately south of the development site.

Figure 3.1: Existing Buildings Within Development Site



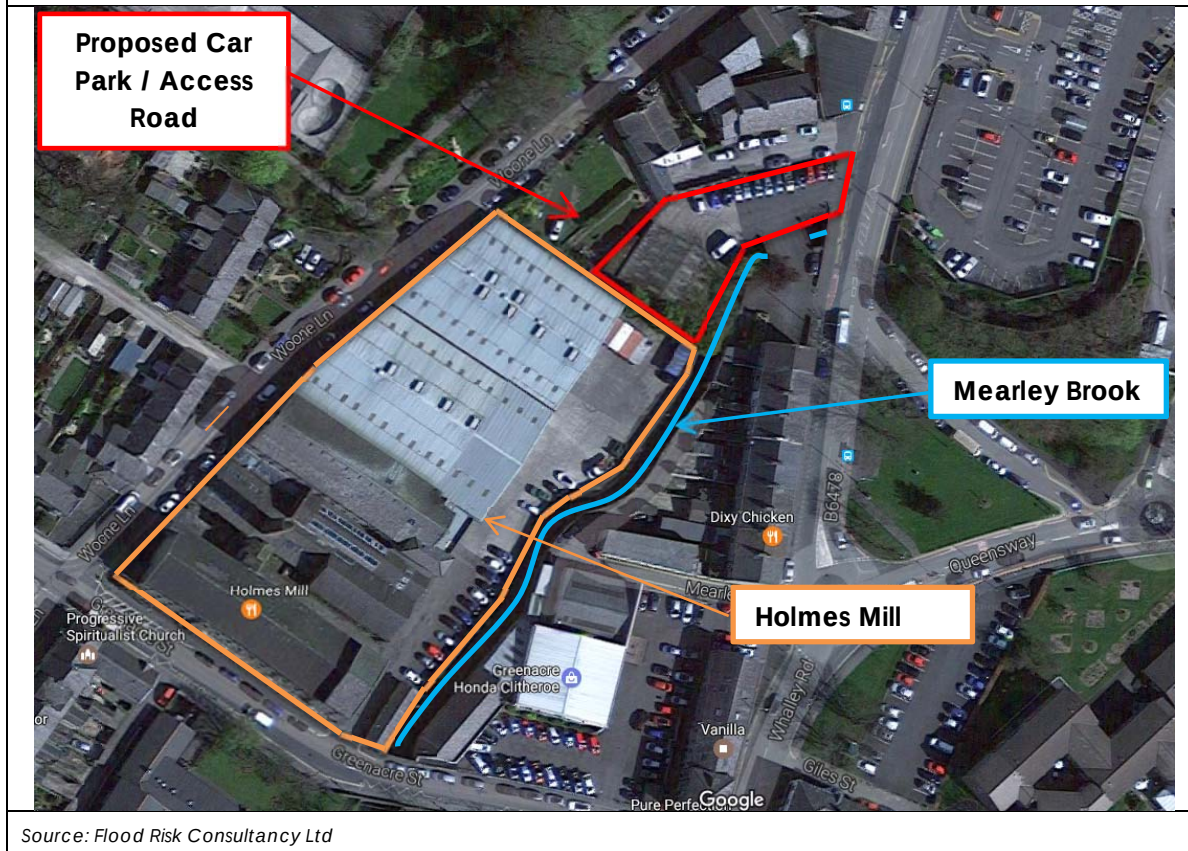
Source: Flood Risk Consultancy Ltd

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Figure 3.2: Aerial View of the Existing Site



The topographical survey indicates the site ranges from 73.300mAOD in the north east of the site to 71.550mAOD in the south of the site. The site generally falls from the north to the south.

3.3 Proposed Development Details

The proposed development plans are to demolish the existing car sales/servicing plot to make way for 32No space car parking area with access road to Holmes Mill directly from Moor Lane.

Furthermore, the client has expressed that they would like to reduce the height of the wall adjacent to the watercourse and Holmes Mill by approximately 0.6m.

4.0 Historic Flooding

4.1 British Hydrological Society Flood Event Records

A search on the British Hydrological Society (BHS) Chronology of British Hydrological Events website³ found 1No record of flooding incident that relates to Clitheroe from August 2004:

'The Clitheroe to Blackburn rail line was swamped at Wilpshire Tunnel and at Brownhill, while the East Lancashire line was also closed between Blackburn and Preston due to running flood water, delaying local and Transpennine Express services.'

It is noted that the Wilpshire Tunnel area is located approximately 10km south west of the development site as such it is not considered that this flood event would have affected the proposed development site.

4.2 Internet Search

An internet search of flooding in the Clitheroe area results in a news story from July 2012 on the Clitheroe Advertiser and Times webpage:

'Flash floods struck parts of Clitheroe and the Ribble Valley again on Thursday evening after torrential downpours.'

Heavy rain ran straight off ground already saturated after the wettest June on records and, with drains unable to cope, many roads were soon like rivers, making driving conditions difficult.

Flooding occurred at most of the usual hotspots such as beneath the Waddington Road railways bridge in Clitheroe, which was almost impassable for a time. Several parts of Chatburn and Whalley were also hit.'

It is noted that flooding during this event was caused by overland flow, additionally the Mearley Brook area of Clitheroe, where the development site is located, is not specified as experiencing flooding during this event.

4.3 Ribble Valley Strategic Flood Risk Assessment (Level 1) (2010)

A Strategic Flood Risk Assessment was completed by Ribble Valley Borough Council in May 2010.

Section 4.4 of the SFRA contains information on 9No historical floods in the Ribble catchment from 1771 to 2002;

Table 5: Historical Flood Records

Date	Catchments	Communities Affected
1771	Ribble	No information available
1775	Ribble	No information available
1866	Ribble, Calder	Whalley, Clitheroe, Ribchester
1881	Ribble, Calder, Hodder	Slaidburn

³ <http://www.dundee.ac.uk/geography/cbhe/>

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Table 5 Cont'd.

1923	Ribble, Calder	Clitheroe
1936	Ribble, Calder, Hodder	Slaidburn, Whalley, Clitheroe, Bolton-by-Bowland
1995	Ribble Calder, Darwen	Ribchester
2000	Ribble, Calder, Darwen	Ribchester
2002	Calder, Darwen	Whalley

Although there are records of flooding within Clitheroe in 1866, 1923 and 1936, the exact location of the flooding has not been provided therefore it is difficult to determine whether the proposed development site has been subject to historical flood incidents.

4.4 Environment Agency Data

The Environment Agency data does not include any information on historical flood events within the area or historical flood outlines associated with Mearley Brook.

4.5 Historic Flooding Post December 2016

An internet search has revealed that although some parts of rural Clitheroe were effected during the floods of December 2015, no reports of flooding within the vicinity of Moor Lane have been documented.

5.0 Initial Evaluation of Flood Risk

5.1 The Environment Agency Flood Map

The Environment Agency Flood Map illustrated within Figure 2.1, confirms that proposed development site is located in Flood Zone 2 and 3.

The definition for each of the flood zones highlighted above is provided for reference within Section 2.2.2 of this report.

Table 6: Possible Flooding Mechanisms

Source/Pathway	Significant?	Comment/Reason
Fluvial	Yes	EA flood maps indicate development site located within Flood Zones 2 and 3
Canal	No	No canals in the vicinity of the site
Tidal/Coastal	No	Outside the extents of tidal flooding from the Sea
Reservoir	No	EA Map shows that the site is outside flood extents
Pluvial (urban drainage)	Yes	LCC have expressed that they require outdoor drainage to be formalised
Surface Water Flooding	No	EA Surface Water Flood Maps indicate the site is not at risk of surface water flooding
Groundwater	No	SFRA indicates that there is no evidence of flooding from this source within Ribble Valley
Overland flow	No	Highly urbanised area and as such overland flow routes are anticipated to be intercepted by existing drainage in the vicinity of the site
Blockage	Yes	Mearley Brook culverted in the vicinity of the site and proposals include the creation of a new bridge over Mearley Brook
Infrastructure failure	Yes	United Utilities sewers located in the vicinity of the site
Rainfall Ponding	No	Redevelopment of existing Mill Buildings on the site as such there should be no depressed areas where ponding may occur

From the initial assessment, it is concluded that the primary source of flood risk will be from fluvial sources, i.e. Mearley Brook.

Fluvial: Mearley Brook

The nearest watercourse to the application site is Mearley Brook which forms the southern boundary of the development site.

The source of Mearley Brook is located north east of the village of Worston and flows in a westerly direction where it is known as Worston Brook. Worston Brook becomes Mearley Brook north east of the town of Clitheroe and then flows in a south and south east direction towards Primrose Reservoir before flowing into Pendleton Brook. Pendleton Brook is in turn a tributary to the River Ribble with the confluence of Pendleton Brook and River Ribble located a distance approximating 2km south west of the development site.

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Mearley Brook is classified as 'Main River' and therefore flood management of this watercourse is the responsibility of the Environment Agency.

The development site is located within Flood Zones 2 and 3, therefore the risk of fluvial flooding from this source is regarded to be medium and high, and has therefore been assessed in more detail as part of the quantitative assessment provided within Section 6 of this report.

Reservoir Flooding

The Environment Agency Risk of Flooding from Reservoirs map indicates the proposed development is located outside the maximum extent of flooding following a breach of a reservoir.

Figure 5.1: Environment Agency Risk of Flooding from Reservoirs Map



Source: Environment Agency

As such it is anticipated the risk of flooding from reservoirs to the development site is very low.

Pluvial: Surface Water Flooding

The Environment Agency's Flooding from Surface Water Map shows that the proposed development site is not affected by surface water flow routes.

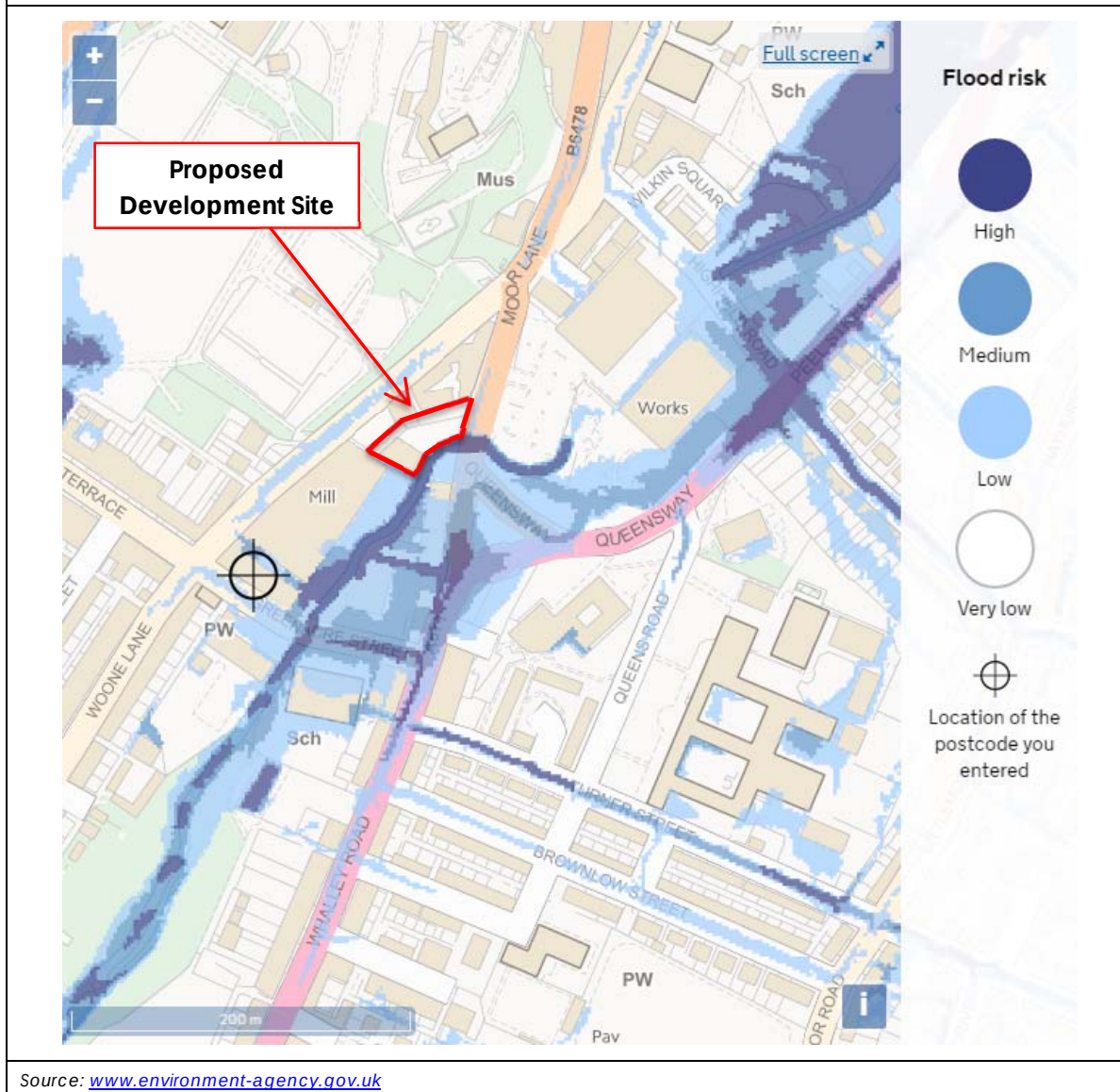
The site is shown overall to have a low risk from surface water flooding.

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Figure 5.2: Risk of Flooding from Surface Water



Pluvial: Overland Flow

Flooding from this source generally occurs when the infiltration capacity of land is exceeded and excess rainwater flows overland. Flooding from this source occurs as a result of an accumulation of water within topographic depressions and at areas where its flow route is impeded.

Severe rainfall events, steep slopes, soils, geology and land management all contribute to the effect and severity of flooding resulting from overland flow.

The area surrounding the application site generally falls towards the course of Mearley Brook with and is largely surrounded by urban areas.

As mentioned previously there are historical flood records of highway flooding within the Clitheroe area. The records state that flooding occurred at the Waddington Road area beneath the railway bridge which is located at a distance approximating 850m north of the

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proposed development site as such flooding of this area would not be expected to impact the proposed development site.

It is anticipated that the surrounding roads and impermeable areas in the vicinity of the site have positive drainage networks which would intercept the overland flow routes before inundating the development site. As such the risk of flooding to the site is considered to be low.

Pluvial: Exceedance

The following text has been extracted from CIRIA 2906 'Managing Extreme Events by Designing for Exceedance January 2013':

'Climate change and urbanisation is already contributing to increased surface water flooding, where the capacity of the existing drainage systems are overwhelmed (or exceeded).

The traditional approach to fixing the problem is to build bigger pipes or provide underground storage. Ofwat, the Environment Agency and others believe that this approach is unsustainable and unaffordable and are encouraging sewerage undertakers, Lead Local Flood Authorities and highway authorities to look at different approaches to managing sewer and surface water flooding.

One approach being promoted is "designing for exceedance".

Designing for exceedance is an approach to manage flood risk (particularly from extreme events) by planning, designing and retrofitting drainage schemes that can safely accommodate rainfall and flooding that exceeds their design capacity (normally a 1 in 30 rainfall event). This is often achieved by considering flood pathways (such as managing runoff on highways) or providing additional storage (preferably on the surface through car parks, or multifunctional detention basins).

In England and Wales Sewers for Adoption and the National Planning Policy Framework encourage the consideration of drainage exceedance, it is a flexible approach to manage extreme events that can be used to reduce the need for more traditional, expensive underground approaches to manage surface water and often complement sustainable drainage and other local urban design initiatives.'

The impact of extreme rainfall events will therefore need to be assessed as part of the overall surface water management strategy for the proposed development.

Groundwater

Raised groundwater levels caused by prolonged periods of rainfall can result in flooding. The Ribble Valley SFRA infers:

'Following consultation with the EA, no evidence of groundwater flooding in the area has been identified. While no risk has been demonstrated, this is not to say that unrecorded groundwater flooding events may have taken place or that groundwater flooding may not occur in the future, but using the best available information they are not considered to be a significant risk at this time.'

As such the risk of groundwater flooding to the proposed development is considered to be low.

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Ponding

On-site observations made during the site visit did not highlight any existing ponds or localised low points where ponding is likely to occur during heavy rainfall.

As such, this mechanism is deemed to present a low flood risk to the development.

Infrastructure Failure – Blockage/Structural Collapse

During flood conditions there is potential for debris to enter open channel sections of the watercourse, and be washed downstream.

There are 3 No bridges in the vicinity of the development site; one bridge upstream of the site known as Salford Bridge which provides a route over the Brook for the B6478, Greenacre Street Bridge is located immediately south of the development site and there is a small footbridge downstream of Greenacre Street which provides access to the Progressive Spiritualist Church from St James' Church of England Primary School.

An accumulation of debris at bridges and culverted sections of any watercourse may lead to blockages within structures located along the channel, causing flood water to backup.

Similarly should the existing bridges spanning a river fail, the capacity of the enclosed section of the watercourse is likely to be greatly reduced, which again is likely to cause flood water to backup within the channel upstream from the existing bridge crossing.

As such, in regard to Mearley Brook it is considered likely that the extent of flooding within the local vicinity of the affected structure will be exacerbated in the event of severe blockage or structural collapse.

The Ribble Catchment Flood Management Plan contains information relating to the bridges and culverted sections of Mearley Brook within the Clitheroe area. The Flood Management Plan Sub-area 4 section includes the following information:

'Policy option 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.'

Flood risk within Clitheroe is high and will rise significantly in the future if action is not taken. The culverted stretches of Mearley Brook need to be addressed to ensure that they are of a sufficient capacity, and the flood risk associated with the open stretches of Mearley Brook and the River Ribble requires further investigation. In addition, aspects such as sewer flooding and highways drainage flooding need to be considered, and we need to work with our partners to more fully understand and manage these aspects.'

As such it is considered that the culverted sections of Mearley Brook are recognised by the Environment Agency as areas where further action can be taken to reduce flood risk.

It is noted that Mearley Brook is designated as 'Main River' and therefore the Environment Agency are responsible for managing flood risk along the watercourse.

An extract from the Environment Agency's routine maintenance programme for 2014-2015 within the vicinity of the proposed development indicates the following:

'The system includes Waddington Brook, West Bradford Brook, the River Ribble, Pimlico Watercourse, Shaw Brook and Pendleton/Mearley Brook. We carry out maintenance of

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channel/defence, obstruction removal, environmental management and operational inspection.'

Road bridges over rivers such as Greenacre Street Bridge are managed and maintained by the Highways Agency and as such structural collapse of the bridge would not be anticipated to pose a significant risk of flooding to the development site.

As such, structural collapse of Greenacre Street Bridge and the new bridge over Mearley Brook is therefore considered to have a relatively low probability.

Figure 5.3: Greenacre Street Bridge (Looking downstream from the development site)



Source: Flood Risk Consultancy Ltd

6.0 Quantitative Flood Risk Assessment

6.1 National Planning Policy Framework

6.1.1 Site Specific Flood Risk Assessment Checklist

The following checklist has been extracted from Flood Risk & Coastal Change Section available from www.gov.uk, published in January 2016.

1. Development site and location

You can use this section to describe the site you are proposing to develop. It would be helpful to include, or make reference to, a location map which clearly indicates the development site.

- a. Where is the development site located? (eg postal address or national grid reference)
- b. What is the current use of the site? (eg undeveloped land, housing, shops, offices)
- c. Which Flood Zone (for river or sea flooding) is the site within? (ie Flood Zone 1, Flood Zone 2, Flood Zone 3). As a first step, you should check the Flood Map for Planning (Rivers and Sea). It is also a good idea to check the Strategic Flood Risk Assessment for the area available from the local planning authority.

2. Development proposals

You can use this section to provide a general summary of the development proposals. It would be helpful to include, or make 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? See Table 2 of this guidance for an explanation of the vulnerability classifications.
- c. What is the expected or estimated lifetime of the proposed development likely to be? (eg less than 20 years, 20-50 years, 50-100 years?). See paragraph 026 of this guidance for further advice on how to assess the lifetime of developments for flood risk and coastal change purposes. (It may also be advisable to seek advice from the local planning authority).

3. Sequential test

For developments in flood zones 2 or 3 only. (If the development site is wholly within flood zone 1, you can skip this section and go to section 4).

You can use this section to describe how you have applied the sequential test (if needed as set out in paragraphs 101-104 of the National Planning Policy Framework) to the proposed development, and the evidence to demonstrate how the requirements of the test have been met. See paragraph 033 of this guidance for further information. (You are advised to contact the local planning authority to confirm whether the sequential test should be applied and to ensure the appropriate level of information is provided).

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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. See Table 1 for definitions of the flood zones.

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?

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

You can use this section to 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 (eg 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? (eg tidal/sea, fluvial or rivers, surface water, groundwater, other?). You should consider the flood mapping available from the Environment 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 this guidance for information on what is meant by a "design flood". If possible, flood levels should be presented in metres above Ordnance Datum (ie, 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 this 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

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account the impacts of climate change, over the expected lifetime of the development? (eg 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? See paragraph 050 of this guidance for further advice.

6. Surface water management

You can use this section to 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 (eg of 10 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 – see paragraphs 079-086 of this guidance for further advice.

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

You can use this section to 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 (eg 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. Exception test

You can use this section to 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. See paragraph 035 of this guidance for further information on the exception test. It is advisable

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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? See paragraph 037 of this guidance for further information.

b. How can it be demonstrated that the proposed development will remain safe over its lifetime without increasing flood risk elsewhere? See paragraph 038 of this guidance for further information.

c. Will it be possible to for the development to reduce flood risk overall (eg through the provision of improved drainage)? See paragraph 050 for further advice.

9. Residual risk

You can use this section to 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. See paragraph 042 of this guidance for more information.

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? (eg putting in place flood warning and evacuation plans).

10. Flood risk assessment credentials

You can use this section to 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?

6.2 Fluvial: Mearley Brook

6.2.1 General

The proposed development is situated immediately north of Mearley Brook and is designated on the Environment Agency Flood Map as being located within Flood Zones 2 and 3; the medium to high flood risk area.

Mearley Brook is classified as 'Main River' and is therefore the responsibility of the Environment Agency. The Brook is an open channel as it passes by the development site; however it is highly channelised adjacent to the site and there are flood defences in the north of the development site as shown on the Environment Agency data.

Mearley Brook is culverted directly east of the development site apposite to Sainsbury's and Homebase.

The figure below shows the highly channelised nature of Mearley Brook adjacent to the development site.

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Figure 6.1: Channelised Section of Mearley Brook south to the Site (Looking Upstream)



Source: Flood Risk Consultancy Ltd

In order to suitably assess flood risk at the development site from this source; a comparison of flood levels for the watercourse against site levels is usually undertaken.

6.2.2 Flood Defences

The application site is not considered to benefit from flood defences due to the presence of wooden fences and open railings forming a raised barrier along the banks of Mearley Brook to the south of the site, see figure 6.2.

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Figure 6.2: Mearley Brook Viewed North of the South Boundary



Source: Flood Risk Consultancy Ltd

As such it is considered that there are no formal flood defences protecting the application site from Mearley Brook.

6.2.3 Mearley Brook: Modelled Flood Levels

The modelled flood data provided has been extracted from the Mearley SFRM Study 2007.

The nearest modelled nodes to the development site known with the Environment Agency data is Point 1.

Table 7: Modelled Flood Data for Mearley Brook

Map Ref	Modelled Fluvial Levels (mAOD)		
	1 in 100 year (Defended)	1 in 100 year plus climate change (Interpolated)	1 in 1000 year (Un defended)
Point 1 (upstream)	72.56	73.43	73.69

6.2.4 Climate Change

The Environment Agency data does not provide levels for the 1 in 100 year plus climate change flood event. However, using ReFH Rainfall Runoff Method a flow for the Mearley Brook catchment has been determined and the flood level for the 1 in 100 year plus climate change event has been interpolated from known levels and flows.

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The interpolated water level for the 1 in 100 year plus climate change flood event for Point 1 is 73.43mAOD and has been worked out using the following methodology:

Table 8: Interpolated Levels for Point 1

Return Period	Level (mAOD)	Flow (m³/s)
1 in 100 year	72.56	33.3
1 in 100 year plus CC	73.43	56.61
1 in 1000 year	73.69	63.4

Key

-  Known flood levels (EA Data)
-  20% added to 1 in 100 year flow
-  Flows estimated using ReFH Spreadsheet
-  Interpolated water level (1 in 100 plus Climate Change event)

100 year plus climate change flow = 1 in 100 year flow x 1.7 = 33.3 x 1.7 = **36.61m³/s**

Difference between 1 in 100 year flow and 1 in 100 year plus climate change flow = (63.40 – 33.3) = **30.1m³/s**

Difference between 1 in 100 year flood level and 1 in 1000 year flood level = (72.56 – 73.69) = **1.13m**

$1.13 / 30.1 = 0.0375 \times 23.31 = 0.874\text{m}$

Interpolated 1 in 100 year plus climate change flood level = 72.56 + 0.874 = **73.43m AOD**

6.2.5 Fluvial Overtopping – 1 in 100 year flood level

The Environment Agency modelled flood data indicates that the 1 in 100 year flood level for the development site is 72.56m AOD.

The lowest level at the site is at the south at a level of 71.55m AOD, the highest level onsite is located at the north east at a level of 73.3m AOD.

As such during the 1 in 100 year event the site will be flooded to a level of 1.01m at the south whilst the north of the site is elevated by 0.74m.

6.2.6 Fluvial Overtopping – 1 in 100 year flood level plus 70% climate change

The interpolated flood level for the 1 in 100 year plus 70% climate change event has been calculated as 73.43m AOD.

During this event the south of the site will be flooded to a depth of 1.88m, the north of the site will be flooded to a depth of 0.13m.

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6.2.7 Fluvial Overtopping – Extreme 1 in 1000 year flood level

The Environment Agency data suggests the 1 in 1000 year extreme flood level for the development site is 73.69m AOD.

During this event the south of the site will be flood to a depth of 2.12m, the north of the site will be flooded to a depth of 0.37m.

Table 4.3 of the Joint DEFRA/Environment Agency Flood Risks to People FD2321/TR2 Document indicates that overtopping of the gap in the wall would produce a 'danger for some' hazard rating during the 1 in 100 plus climate change event and 'danger for all' during the 1 in 1000 year extreme event. As shown in table 11 below:

Table 9: Danger to People from Overtopping Relative to Distance from overtopping

Distance from bank (m)	Head above crest level (m)			
	0.5	1	2	3
100		1 in 100 year plus CC	1 in 1000 year	
250				
500				
1000				
1500				
2000				
2500				
3000				
3500				

Key

	Danger for some
	Danger for most
	Danger for all

6.2.8 Fluvial Overtopping – Conclusion

A comparison of flood levels associated with Node 1 within Mearley Brook upstream of the site has determined that during all events up to and including the 1 in 1000 year event the site will experience flooding.

It has also been evaluated that the danger to people is considered to be 'danger for all', however it is worth noting that proposals are for less vulnerable development i.e. car park.

As such providing that appropriate signage is incorporated into the design the risk to people can be reduced.

6.2.9 Reducing the Height of the Wall Adjacent to Holmes Mill

It has been expressed by the client that they would like to reduce the height of the wall adjacent to Mearley Brook and Holmes Mill to 1.1m above ground level, on average the height of the wall at present is approximately 1.7m.

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The Flood Risk Assessment associated with the Holmes Mill Development Ref: 2015-028 identified that the wall along the east bank of the watercourse has various opening along its length, these include drainage holes and a gap in which a gate was once located.

It was concluded that the wall offered very little protection from the watercourse during the extreme events due to the fact that there are various openings along its length. As such a reduction in the height of the wall by approximately 0.6m would not impact the current flow routes through the site and is therefore considered appropriate.

6.3 Surface Water Runoff

6.3.1 General

The total area within the site boundary approximates 0.115Ha and currently comprises of a car sales plot with servicing building.

Proposals for the site include demolition of the existing building on-site developing the site into car parking and access road associated with Holmes Mill.

It is noted that the drainage strategy will also include the area of hardstanding adjacent the Mearley Brook and Holmes Mill to provide a holistic approach to surface water drainage management.

Figure 6.3: Additional Drained Area Adjacent to Mearley Brook



The impermeable area associated with the extra area of hardstanding is 0.156 Hectares, combining the 2No areas equates to a total drained area of 0.271Hectares.

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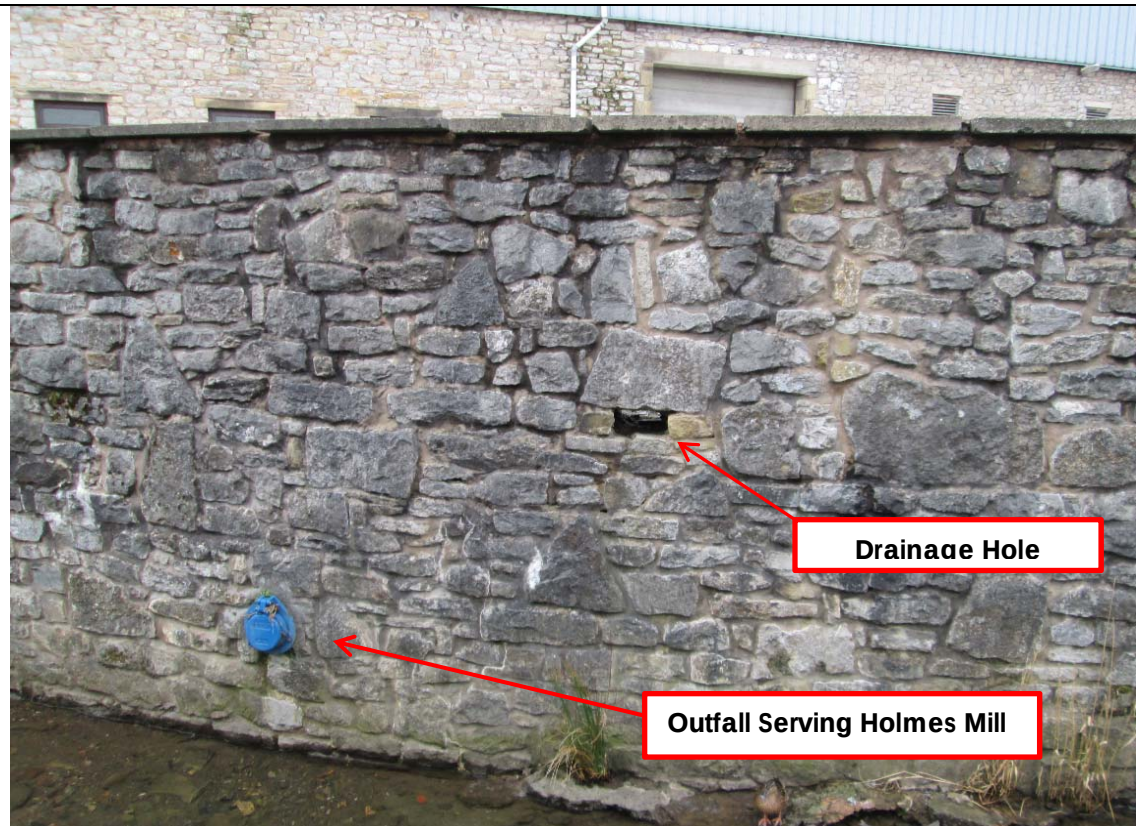
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6.3.2 Existing Drainage Regime

At present surface water from the car sales area discharges directly into the watercourse via overland flow discharging through the gaps within the railings, surface water from the area of hardstanding's adjacent to the watercourse discharges directly into Mearley Brook via drainage holes within the stone wall.

Figure 6.4: Existing Outfalls from Holmes Mill site to Mearley Brook



Source: Flood Risk Consultancy Ltd

6.3.3 Post Development Drainage

Following development, it has been estimated the impermeable area of the development site will remain the same.

It has been brought to out attention that the client has already undertaken consultation with the Environment Agency; which determined that surface water from the proposed development should be directed to Mearley Brook, due to the lack of capacity within the public combined sewer in which Holmes Mill once drained.

It has been expressed that formalising any drainage within that area would result in major disturbance to the Holmes Mill site which is currently operational, furthermore the development is consider to be Grade 2 listed therefore works to the outside of the building should be kept to a minimum.

It is emphasised that there will be no increase in impermeable area compared to the existing situation.

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6.4 Outline Drainage Strategy

Following development, it is anticipated that the impermeable area will remain the same as pre-development i.e. 100%.

The drainage from the area of hardstanding's will continue to discharge directly into Holmes Mill via openings within the wall, following the resurfacing of what is currently the car sales plot surface water flows will pass overland discharging directly into the watercourse through railings along the north banks, mimicking the current drainage arrangement,

6.4.1 Overland Flow Routes

The current area of hardstanding's adjacent to the watercourse and the proposed car parking area to the north fall in the direction of the watercourse, therefore the risk of overland flows leaving the site is considered to be low.

7.0 Mitigation Measures

7.1 Finished Levels

It is emphasised that any land raising within Flood Zone 3 requires the loss of storage volume to be offset by means of incorporating flood storage compensation on a level by level basis.

At the Holmes Mill site there is a lack of available space to provide flood storage compensation, therefore it is highly recommended that no levels within the site are raised and that levels should remain as close to existing as possible.

7.2 Signage

In order to make staff and visitors aware of the issues surrounding flooding at the proposed development, it is recommended that suitable signage is erected within visible areas of the site.

An example is provided within Figure 7.1 below.

Figure 7.1: Example Flood Warning Sign



Image courtesy of Mr John Cooper via www.pbase.com

7.3 Flood Warning

The development site at Moor Lane is situated within an area covered by the Environment Agency's Flood Warning's Direct Service.

Due to the close proximity of Mearley Brook, it is advised that managers are advised to sign up to receive flood warnings.

The Flood Warning's Direct Service is a free service which enables the Environment Agency to send a direct message when flooding is expected and may affect the development. Flood

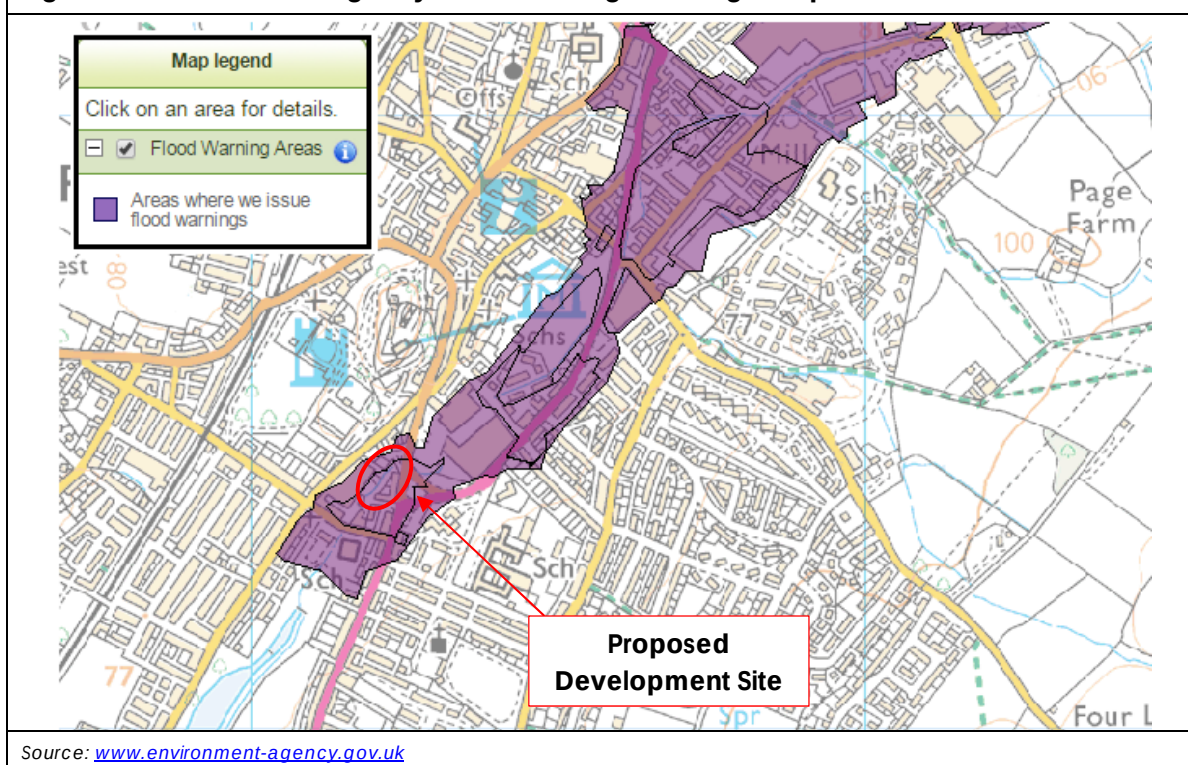
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warnings are designed to provide businesses the time to prepare for flooding. Flood warnings can be sent by telephone, mobile, email SMS text message or fax.

Figure 7.2: Environment Agency Flood Warning Coverage Map



The Environment Agency also provides the **Floodline 0845 988 1188** service, where occupants can listen to recorded flood warning information for the area or speak to an operator for advice 24 hours a day.

Should a flood event reach the level where development is at risk of inundation, then the Environment Agency will issue a Severe Flood Warning.

Using the latest available technology, the Environment Agency is able to monitor rainfall, river levels and sea conditions 24 hours a day and use this information to forecast the possibility of flooding.

If flooding is forecast, they are able to issue warnings using a set of three different warning types.

Table 10: Environment Agency Flood Warning Codes

Flood Warning Code	What it means	When it's used	What to do
	Flooding is possible. Be prepared.	2 hours – 2 days in advance of flooding.	• Be prepared to act on you flood plan • Prepare a flood kit • Monitor local water levels and the flood forecast of the EA website

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Table 13: Cont'd.

 FLOOD WARNING	Flooding is expected. Immediate action is required.	½ hour – 1 day in advance of flooding.	• Move people to a safe place • Turn off gas, electricity and water supplies if safe to do so • Put flood protection equipment in place
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life.	• Stay in a safe place with means of escape • Be ready to evacuate • Co-operate with the emergency services • Call 999 if you are in immediate danger
Warnings no longer in force	No further flooding is currently expected in your area	When river or sea conditions begin to return to normal	• Be careful as flood water may still be around for several days • If you have been flooded, ring your insurance company as soon as possible

How are Flood Warnings issued?

- **Direct to you** – receive warnings by phone, text, email or fax. Sign up for the Environment Agency's **FREE** Floodline Warnings Direct service via this website link: <https://fwd.environment-agency.gov.uk/app/olr/register> or by calling Floodline on **0845 988 1188**.
- **On the flood warnings website** – view up-to-date information about flood warnings in force, monitor the river or sea levels in your area and check out the latest flood risk forecast for your county.
- **By calling Floodline on 0845 988 1188** – you can listen to recorded information on the latest warnings and predictions or speak to an operator for more general information 24 hours a day. Environment Agency operators can also provide a quick dial number which gives you faster access to information for your area.
- **Through the media** – you may see or hear Environment Agency warnings on television and in radio broadcasts. You can also view the latest warnings on Digital Ceefax page 405.
- **Flood Wardens** – in some areas Flood Wardens are there to alert and support their local community when a flood warning is issued. Call Floodline on 0845 988 1188 to find out if this service is available in your area.
- **Sirens/loudhailers** – in some areas the Environment Agency uses loudhailer or siren systems to warn people that a flood warning has been issued. Call Floodline on 0845 988 1188 to find out if this type of service operates in your area.
- **Flood warning feeds** – Flood warning (RSS) feeds shows national and regional flood warnings in force and are updated every 15 minutes. The feeds contain a brief summary and link to the full information on the Environment Agency website.

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7.4 Evacuation Plan

For health and safety reasons there is a preference to evacuate, as failure to do so, would put the visitors, staff and others (e.g. rescuers) at risk of injury.

Due to the potential depths of flooding at the application site, it is highly recommended that a flood warning and evacuation plan from the proposed development to a safe area away from the flood zone is devised and practiced, in the event that a 'flood warning' is issued by the Environment Agency.

During evacuation, all persons should make their way away from the site towards an area outside of the floodplain i.e. Flood Zone 1.

The nearest location is at Woone Lane along the north west boundary of the site; and it has already been recommended that staff and visitors to the Holmes Mills site are directed to a new exit from the site to the public footpath at this location. This will prevent the need for people to walk through water to gain safe exit from the site during flood conditions.

The Ribble Valley Borough Council Local Flood Plan for Mearley Brook District Response Forum contains information regarding flooding on Mearley Brook and practical information on where to assemble in the case of an emergency evacuation. The District Response Forum indicates that:

'If you live north of Mearley Brook the Evacuation Point will be Tesco's Car Park and if you live south of Mearley Brook it will be the junction of Pendle Road and Hayhurst Street, where a coach will be provided to take you to the nearest Designated Reception Centre, Roefield Leisure Centre, Edisford Road, Clitheroe.'

As such the Evacuation Point for the proposed car park / access road will be Tesco's Car Park located at a distance approximating 800m north east of the development site.

The suggested muster point is approximately 800m north east of the development site and comprises the following route:

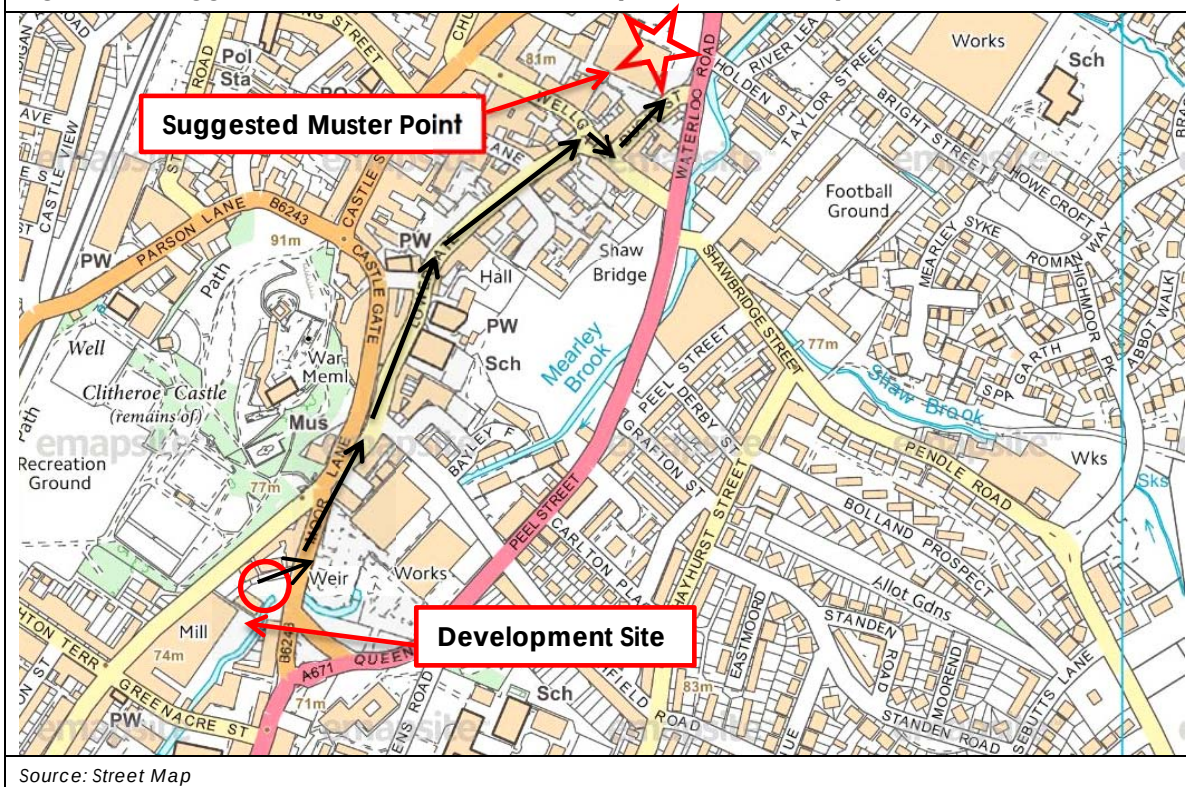
- Leave the development site via existing entrance/exit on to Moor Lane
- Turn right on Woone Lane and continue north east towards Lowergate
- Continue north east on Lowergate towards Wellgate
- Turn right at the junction with Wellgate and take the first left onto Duck Street and Tesco's car park

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Figure 7.3: Suggested Flood Evacuation Route (Tesco's Car Park)



Practical advice in developing a flood warning and evacuation plan is provided via the following:

- Ribble Valley Borough Council Local Flood Plan for Mearley Brook 'District Response Forum' (April 2011)
- Flood Preparation: a guide to householders
- During a Flood: practical advice on what to do to stay safe in a flood
- After a Flood: practical advice on recovering from a flood

8.0 Conclusions & Recommendations

The Environment Agency flood map indicates that the proposed development site is located within Flood Zones 2 and 3, and as such is considered to have a medium to high risk from fluvial flooding.

The primary source of flood risk to the development site is identified to be from Mearley Brook which forms the southern and eastern boundary of the development site.

Modelled flood data provided by the Environment Agency has determined that the site will become inundated during all events from the 1 in 100 year event up to and including the 1 in 1000 year event inline with the EA Flood Map.

The danger to people classification is considered to be 'Danger for All', however the risk can be significantly reduced by implementing mitigation measures as described below.

Reducing the wall adjacent to Mearley Brook to 1.1 metres has been found to have a low impact on the flood regime on site and is therefore considered appropriate.

Following development the total impermeable area for the whole site will remain the same, inline with consultation with the EA surface water flows will be directed directly into Mearley Brook unchanged from the existing situation.

Following detailed appraisal of secondary flood sources i.e. pluvial; groundwater; infrastructure failure; blockage; overland flow; and ponding; it is concluded that overall they present a low risk to the development site.

Advisory mitigation measures include:

- The managers of the premise should sign up to the Environment Agency's free Flood Warning's Direct Service.
- Staff and patrons should be aware of the location and route to Evacuation Points following the issue of a severe flood warning from the Environment Agency.
- A safe place of refuge at first floor level must be provided in the event that evacuation is not possible.
- Appropriate warning signs are to be erected within the site.
- Drainage Management Plan produced by suitably qualified contractor

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APPENDICES

Level 2 Scoping Study Flood Risk & Drainage Impact Assessment

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Appendix A: - Development Proposals

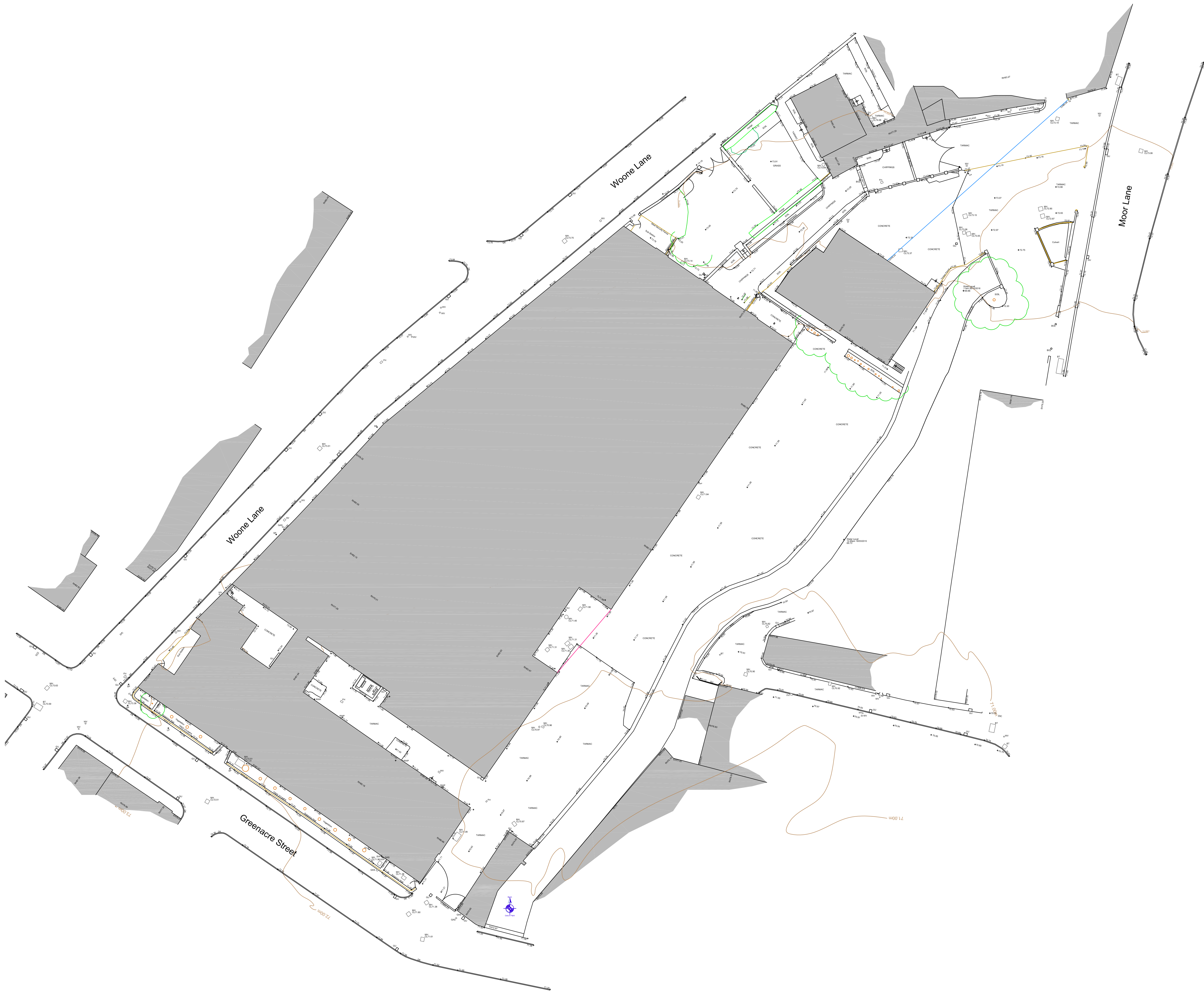
This architectural site plan illustrates a brewery complex and its surrounding infrastructure. The plan includes the following details:

- Buildings and Internal Layouts:**
 - Top Section:** Includes a retail unit 02, changing rooms, a leisure complex entrance, retail unit 01, and weaving sheds. Detailed plans 14/59 PL30-PL32 and detailed elevations 14/59 PL300-301 are noted.
 - Middle Section:** Features a pool plant room, brewery stores, kitchen, Spinning Mill New Mill, brewery, brewery tap, site office, Beam Engine House New Mill, Engine House New Mill, coffee shop, engine retained for display, Warehouse Extension New Mill, Warehouse New Mill, cold storage, barrel wash and racking, brewery tasting kitchen, and Bakery and deli. Detailed plans 14/59 PL20-PL23 and detailed elevations 14/59 PL200-PL202 are noted.
 - Bottom Section:** Includes a 3 Storey Spinning Mill 18th Century Spinning Mill, plant room, kitchen, bar and restaurant, hotel reception, and Gate House. Detailed plans 14/59 PL01-PL04 and detailed elevations 14/59 PL20-PL21 are noted.
- Parking and Access:**
 - 16 spaces (top right)
 - 16 spaces (middle right)
 - 4 no. accessible parking bays
 - 11 no. cycle parking bays
 - 21 no. standard parking bays
 - 4 no. motorcycle parking bays
 - 10 no. standard parking bays
 - min. 6000 (distance marker)
 - new foot/cycle bridge crossing from nearley street, access to garage unaltered
 - new boundary access 14/59 PL03
 - new boundary access
 - pedestrian access (multiple locations)
 - stone sets to mark out vehicle boundary to front of buildings
 - stone sets to mark out access to bridge
 - stone sets to mark out vehicle boundary to front of buildings
 - Bays to be line painted
 - Existing outlet
- Other Features:**
 - new foot/cycle bridge crossing from nearley street, access to garage unaltered
 - Gate House
 - hotel baggage drop off/collection
 - access ramp
 - Elec.

cs dec 2016 1 to 250 @A1
drawn date. scale.

cs dec 2016 1 to 250 @A1
drawn date. scale.

Appendix B: - Topographical Survey



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Appendix C: -EA Data

Fluvial Flood Level Map: Pendleton/ Mearley Brook, Clitheroe

Produced: 3 March 2015
Our Ref: CL3855
NGR: SD 74159 41329

Key

-  Main River
-  Areas Benefitting from Defences
-  Historic Flooding
-  Flood Zone 3
-  Flood Zone 2

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

ABDs (Areas Benefitting from Defences) show the area benefiting from defences during a 1 in 200 tidal, or 1 in 100 fluvial flood event.

