

# Paul Waite Associates

Consulting Civil, Structural & Geo-Environmental Engineers

## Flood Risk Assessment

Project:

Herschel Avenue, Burnley

Report Ref:

24030-PWA-00-XX-RP-C-1000-P01

Prepared For:

**campbelldriverpartnership**  
architects

Date:

March 2024

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Report Ref: 24030-PWA-00-XX-RP-C-1000  
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## EXECUTIVE SUMMARY

The predevelopment scenario and the post development scenario have been assessed in relation to the flood risk onsite, from various sources.

Primary River Flood Risk, which can be found as fluvial flood risk within [Section 6.1](#) of this report, has negligible risk of flooding in the predevelopment scenario and remains low in the post development scenario.

Surface Water Flood Risk, which can be found as pluvial flood risk in [Section 6.2](#) of this report, has a medium risk of flooding in the pre and has been reduced to low in the post development scenario.

Groundwater Flood Risk has been determined as low in the predevelopment scenario and remains as low in the post development.

The site has been assessed as having very low flood risk from new drainage system.

Reservoir & Artificial Waterbody flood risk has been assessed as negligible in both the pre and post development.

Climate change and Residual (Lifecycle) Primary River Flood Risk has been determined as low for the proposed development.

Further to this, the site has passed the exception and sequential test.

It is concluded that the proposed development will not adversely affect flood risk on-site or off-site.

## FOREWORD

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Paul Waite Associates Ltd reserves the right to amend their conclusions and recommendations in the light of further information that may become available.

This flood risk assessment report is prepared in accordance with the requirements generally set out in the 'Technical Guidance to the National Planning Policy Framework', updated in July 21 and following the standard section format and order of the GOV.UK – Flood risk and coastal change site specific flood risk assessment checklist.

## PWA CREDENTIALS

This Flood Risk Assessment has been carried out by Paul Waite Associates Ltd who have over 30 years' experience of civil engineering and flood risk assessment preparation. This Flood Risk Assessment has been carried out following the general requirements of the Nation Planning Policy Framework (2021), considering recently updated national climate change considerations.

## FLOOD RISK ASSESSMENT (FRA) APPROACH

The requirements for flood risk assessments are generally as set out in the 'Technical Guidance to the National Planning Policy Framework' Chapter 14, updated in July 21; and in more detail from the Government website 'Flood risk assessments if you're applying for planning permission'.

<https://www.gov.uk/government/publications/national-planning-policy-framework--2>

<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

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Appendix A	Site Location Plan - 24030-PWA-00-XX-DR-C-1001_P01_Site Location Plan
Appendix B	Proposed Site Layout – Campbell Driver Drawing 23.183_01_001_C_
Appendix C	Flood Maps for Planning
Appendix D	Existing Site Plan – Campbell Driver Drawing 23.183_01_003_C_
Appendix E	United Utilities Sewer Records
Appendix F	Drainage Layout PWA Drawing 24030-PWA-00-XX-DR-C-1000 P01

# 1. DEVELOPMENT SITE DETAILS

## 1.1. SITE LOCATION

Site Co-ordinates

OS X (Eastings): 382395  
 OS Y (Northings): 433730  
 National Grid Reference: SD823337  
 Nearest Post Code: BB12 0HR



Figure 1: Site Location Plan

Source: PWA Drawing via Bing Maps

Refer to [Appendix A](#) for full Site Location Plan

## 1.2. CURRENT AND FORMER LAND USE

A desk study of available historical Ordnance Survey (OS) maps has been undertaken to identify potentially significant changes of use for the site. Salient points relating to the history of the site and surrounding area are detailed in [Table 1](#) below:

Table 1: Site History Summary		
<p><b>Summary</b></p> <p>The earliest maps of the site in 1848 show the site as mixed use with greenfield areas and a building which has been expanded to become the building that present today. Now, the site has areas of made ground/waste material with the dwelling remaining onsite. The surrounding area comprises of housing estates with farmland to the north.</p>		
Date	Site	Surrounding Land
1848	The Site appears to have an existing building on it with a smaller building to the west.	At this time, the site appears to be mainly surrounded by field space with a Farm to the north and a main road to the west.
1891	No notable change.	Additional buildings can be seen to the south
1933	The building onsite appears to have gotten larger and an smaller building has been constructed on the east side of the site.	Additional buildings have been constructed on the farm to the north.
1950	The site appears to have the existing building which is situated onsite today. However, this is the only building onsite as the rest appears to be greenspace.	No notable change.
1961	No notable change.	No notable change.
No further historic maps were available at the time of undertaking this report.		
2023	The existing building onsite is still there in present day however there are now abandoned outbuildings onsite which are all overgrown. PWA Geo team identified multiple sources of possible contamination and have assumed some of the waste to be from fly tipping.	To the south, east and west of the site are housing estates. To the north of the site is a farmhouse and an abundance of field space.



### 1.3. CURRENT LAND USE

The land is currently being used as a dwelling with the rural areas of the site appearing to be used as storage/waste disposal. Refer to [Figure 2](#) below for aerial images.



Figure 2: Aerial Land View

Source: PWA Drawing via Google Maps

Refer to [Appendix A](#) for full Site Location Plan

### 1.4. TOPOGRAPHICAL REVIEW

A site plan with existing levels was made by Campbell Driver Partnership in February 2024, a copy of this drawing is presented within [Appendix D](#) of this report and an extract from this is shown in [Figure 3](#) below.

The site generally falls from west to east and north to south with the west portion of the site falling towards the site from the existing access road. There is a retaining wall around the west side of the existing building which separates the property from the high access road.

The portion to the east of the site is deemed the lowest as it falls off towards and existing footpath around the eastern boundary. Levels taken over here are approximately 136.98m AOD.

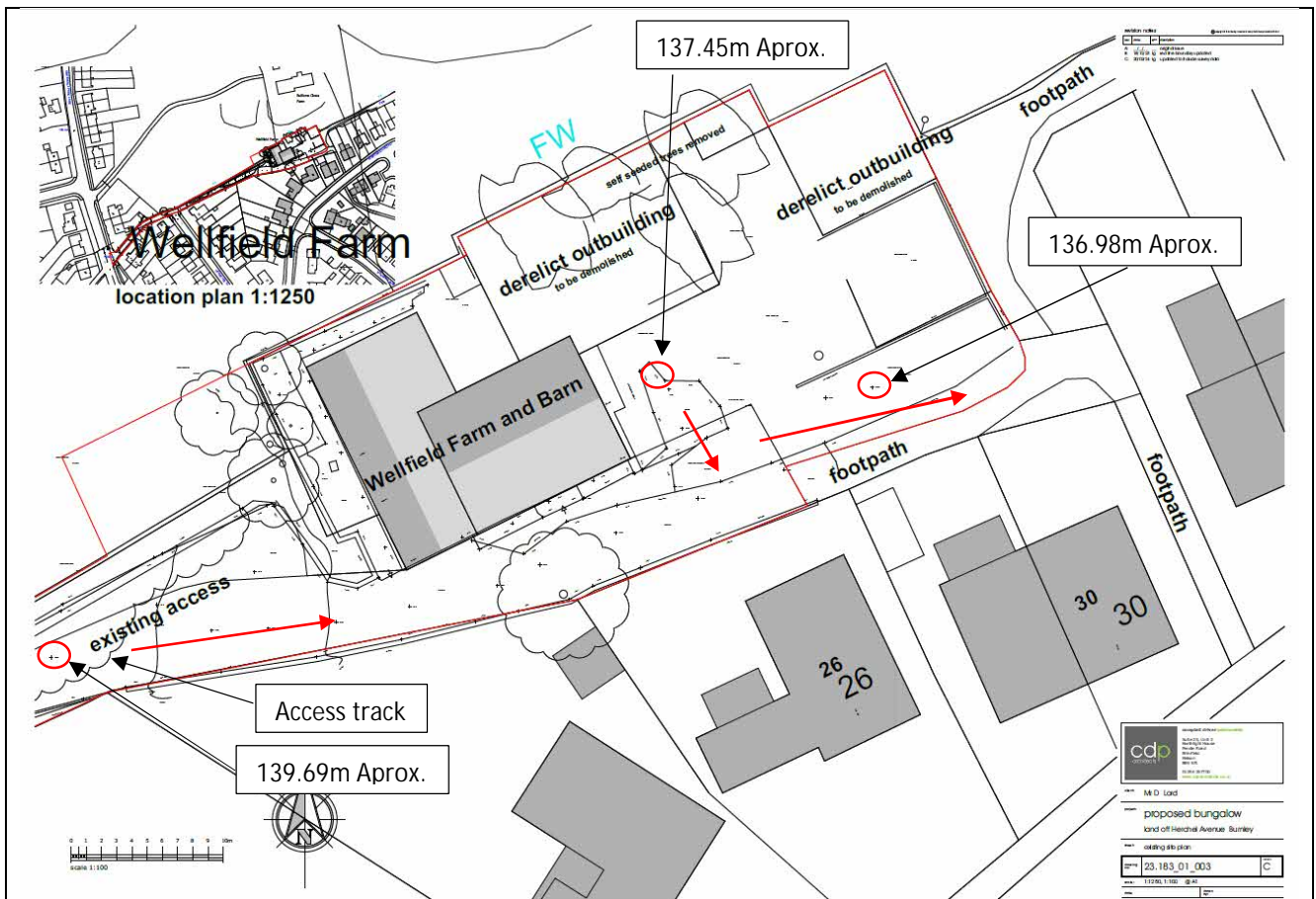


Figure 3: Topographical Survey

Source: Campbell Driver Partnership Drawing no: 23.183\_01\_03 Existing Site Plan

## 2. DEVELOPMENT PROPOSALS

### 2.1. SITE LAYOUT

The development proposals consist of a new bungalow being constructed on the east side of the site. Proposals also include the build-up of external areas such as a new turning head and parking spaces for residence. Refer to [Figure 4](#) below and [Appendix B](#) for the proposed preliminary site layout with associated hard-standing and landscaping.



Figure 4: Preliminary Site Layout

Source: Campbell Driver Partnership Drawing no: 23.183\_01\_001\_C\_Proposed Site Layout

## 2.2. VULNERABILITY CLASSIFICATION

With reference to the National Planning Policy Guidance GOV.UK Flood Risk and Coastal Change Site Specific Flood Assessment – Guidance Table 2, the primary development proposals can be regarded as:

More vulnerable e.g., buildings used for:

Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.

## 2.3. DEVELOPMENT LIFECYCLE

A 100-year lifecycle is assumed for educational developments when assessing in relation to flood risk.

### 3. FLOOD ZONE

A review of the flood maps for planning were undertaken to understand the flood zone classification for the proposed development. In line with Figure 5 below, the development is entirely within Flood Zone 1, this includes the proposed building and the entirety of the areas to be developed.

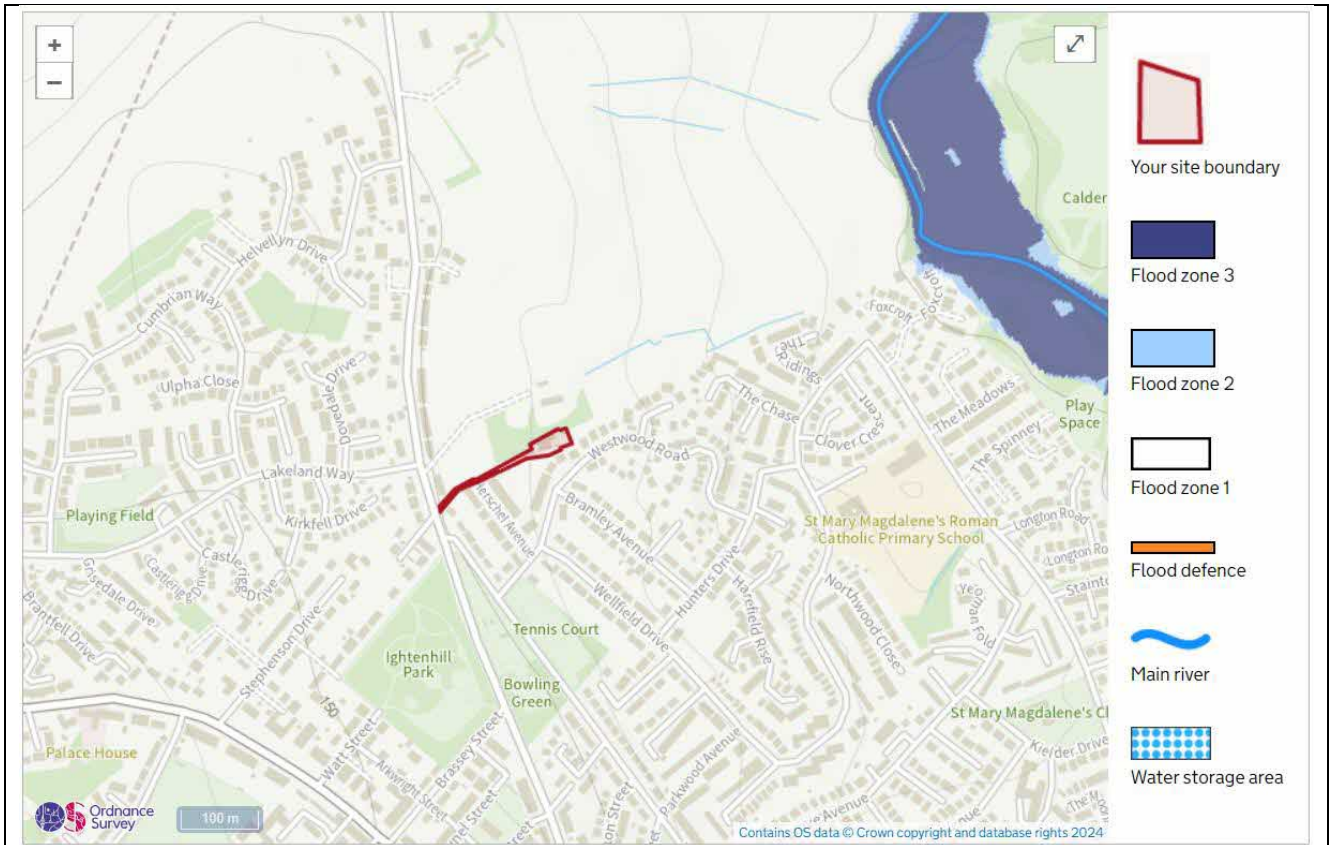


Figure 5: Flood Map for Planning

Source: <https://flood-map-for-planning.service.gov.uk>

Refer to Appendix C for Flood Maps for Planning.

Table 5: Site Specific Flood Risk	
FLOOD ZONE	DEFINITION
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probabilities of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b Functional Floodplain	Land where water must flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.). This is defined as land which would flood with an annual probability of 1 in 20 (5% AEP) or greater in any one year or is designed to flood in an extreme flood (0.1% AEP).  (Not separately distinguished from Zone 3a on the Flood Map)

The site lies within flood zone 1 meaning that it has a less than 1 in 1000 annual probability of flooding from fluvial sources.

#### 4. EXCEPTION TEST

In Line with the Flood risk vulnerability classification guidance, the proposed development is classified as more vulnerable due to it comprising of a building used as a dwelling. The proposed development area is also shown to be entirely within Flood Zone 1.

In line with [Table 2](#) below the site is permitted for development and has passed the exception test.

Table 2: Flood Risk Vulnerability and Flood Zone ‘Compatibility’						
Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	Π	Π	Π	Π	Π
	Zone 2	Π	Π	Exception Test required	Π	Π
	Zone 3a	Exception Test required	Π	X	Exception Test required	Π
	Zone 3b*	Exception Test required*	Π	X	X	X

Development is appropriate.  
 X Development is not appropriate

## 5. CLIMATE CHANGE

The impacts of climate change will be considered within each of the report sections on specific flood risk.

This will take into consideration current national climate change guidance published by the Government in February 2016 and last updated 2022. Climate change allowances are predictions of anticipated change for:

- peak river flow
- peak rainfall intensity
- sea level rise
- offshore wind speed and extreme wave height

Refer to [Tables 3 and 4](#) below for the required climate change allowances for both peak river flow and peak rainfall intensity which are to be applied within this report.

When assessing the peak river flows in relation to the development in relation to its vulnerability classification, an anticipated climate change allowance of 36% should be applied in line with [Table 3](#) below.

Table 3: Ribble Management Catchment Peak River Flow Allowances			
Allowance Category	'2020s' (2015 to 2039)	'2050s' (2040 to 2069)	'2080s' (2070 to 2115)
Upper End	27%	44%	71%
Higher	19%	29%	46%
Central	16%	23%	36%

When assessing the peak rainfall allowances in relation to the development, an anticipated climate change allowance of 40% should be applied to all 3.3% (1 in 30-year) annual events and 50% for all 1% (1 in 100-year) annual events should be applied in line with [Table 4](#) below:

Table 4: Ribble Management Catchment Peak Rainfall Allowances				
Allowance Category	3.3% annual exceedance rainfall event		1% annual exceedance rainfall event	
	'2050s' (2023 to 2060)	'2070s' (2061 to 2125)	'2050s' (2023 to 2060)	'2070s' (2061 to 2125)
Upper End	35%	40%	40%	50%
Central	25%	30%	25%	35%



## 6. SITE SPECIFIC FLOOD RISK

The environment Agency's website provides on-line mapping to identify flooding from multiple sources for planning purposes. A review of the potential sources of flooding are contained within section 6.1 to 6.5 below.

### 6.1. FLUVIAL FLOOD RISK

Fluvial flooding occurs when watercourses such as rivers, streams, and becks flood because of high or intense rainfall events.

An extract from the Environment Agency Indicative Flood Map is shown in Figure 6 below. The map shows the extent of fluvial and tidal flooding in the area surrounding the proposed development.

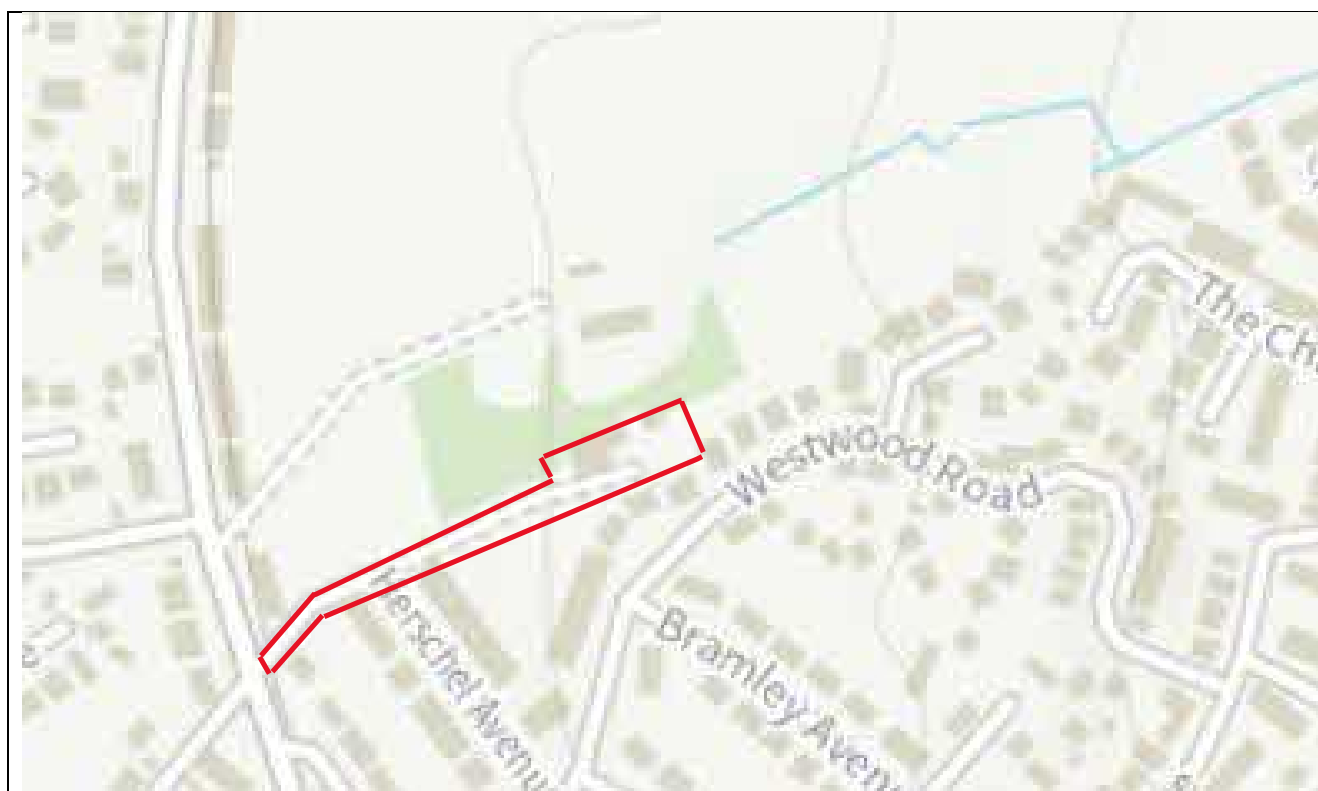


Figure 6: Fluvial Flood Map

Source: <https://check-long-term-flood-risk.service.gov.uk/map>

Based on the above flood map, there is no flooding on or around the site caused from fluvial sources, this is due to there being no watercourses within reasonable distance to the development. Therefore, the risk is assessed as negligible.

## 6.2. PLUVIAL FLOOD RISK

Pluvial flooding occurs when extreme rainfall events saturate drainage systems and excess surface water cannot be accommodated within existing drainage systems, leading to surcharging and flooding. This could also include the surcharge of watercourses and sewer systems as a result of blockages. Although it is usually the result of high rainfall intensities, pluvial flooding can occur from lower rainfall intensities and/or melting snow when ground is previously saturated or frozen.

The Environment Agency, working with Lead Local Flood Authorities (LLFA's) have produced a series of updated Flood Maps for Surface Water (UFMFSW). These updated flood maps are based upon the latest modelling techniques and flood data, superseding previous nationally produced surface water mapping products. Refer to [Figure 7](#) below for the pluvial flood map.

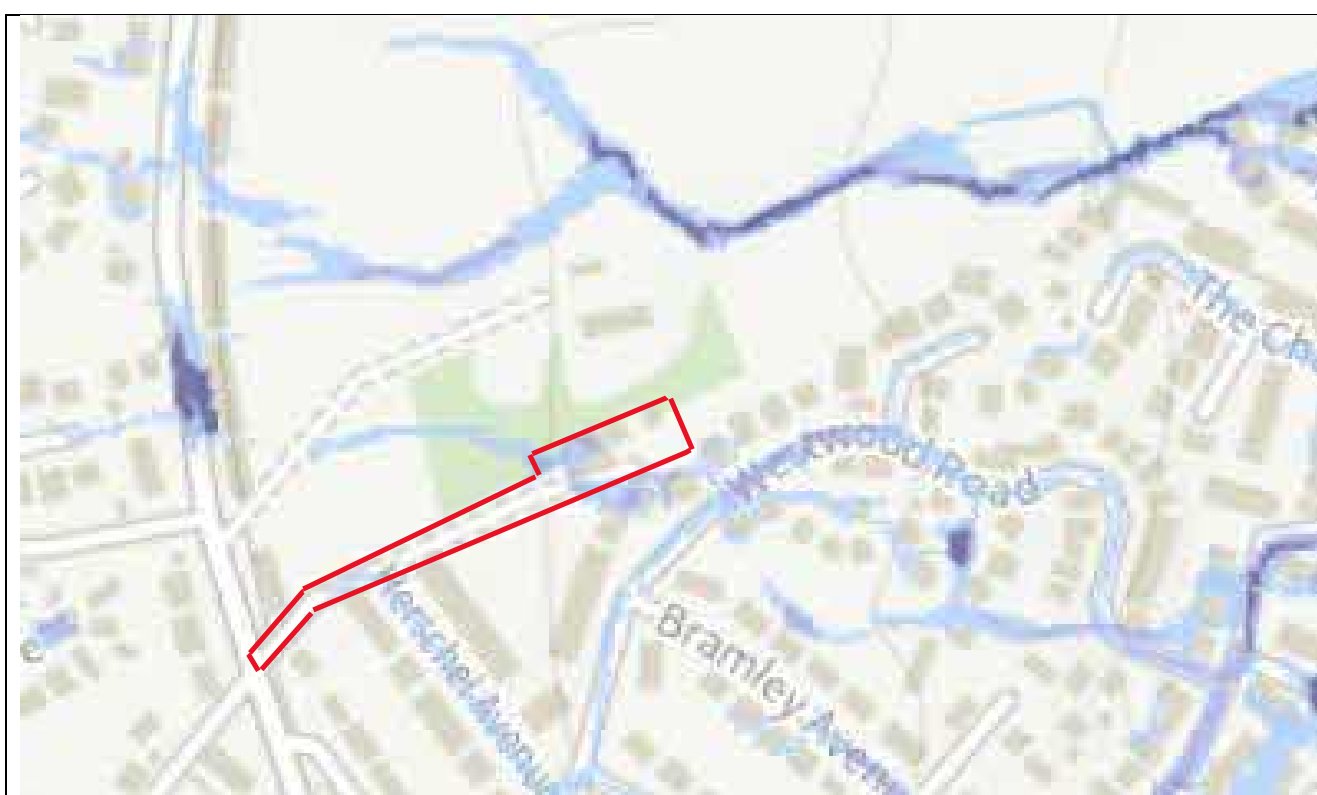


Figure 7: Pluvial Flood Map

Source: <https://check-long-term-flood-risk.service.gov.uk/map>

After reviewing the above flood map, the site appears to have an area of medium flood risk just east of the existing building. There are also areas of low flood risk down the access track and to the north and south boundary by the existing building. However, the area of site where the proposed building is to be situated appears to be at very low risk of surface water flooding. Because of areas of high risk within reasonable proximity to the development, the site is assessed as having a medium risk of flooding from pluvial sources.

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### 6.2.1. EXISTING SEWER FLOOD RISK

At the time of writing, no drainage surveys have been undertaken onsite, however utilities maps provided by united utilities show an existing combined sewer on the southern boundary. This appears to be within an area of possible flooding which may mean that the sewer is overflowing.

Following a site visit and the photos taken, the exiting building onsite doesn't appear to be positively drained as no downpipes or gullies have been identified. It is thought that water run-off from the roof flows onto the ground and runs off into the nearby greenspace.

From the surface water flooding map, Figure 7, we can see that around the existing building, there is a moderate risk of surface water flooding. This could be due to the surface water not running off properly and causing pooling/standing water.

Due to the proposed building being located over undeveloped greenspace with no surface water flooding recorded, it is unlikely that flooding from existing sewers will affect it. However, we must consider the rest of the site, therefore, it is concluded that the risk to the site from existing sewers is low.

### 6.3. GROUND WATER FLOOD RISK

Groundwater flooding often occurs over prolonged rainfall events, where ground becomes saturated within the underlying strata, causing the water table to rise above ground level. With continuous rainfall, this will prevent infiltration and proper drainage of pluvial water into the soil, disallowing it from draining appropriately and causing it to pool on the surface, creating flooding.

Following a review BGS borehole viewer, an exploratory hole has been dug just outside the southern boundary and ground water discovered to strike at 4.5m below ground level (bgl) and standing at 4.0m (bgl). Ground water flooding is unlikely to be an issue with a ground water level of 4.0m bgl.

Reviewing the available information as above, the risk to the site from ground water flooding has been assessed as low due to the deep ground water. This risk can't be reduced further as no actual onsite testing has occurred.

#### 6.4. RESERVOIR & ARTIFICIAL WATERBODY FLOOD RISK

The Environment Agency Flood Risk Maps for Planning have been reviewed to determine the risk of flooding from artificial sources such as reservoirs, canals, and flood defences, these maps will show any areas of potential risk of flooding due to failure of such structures.

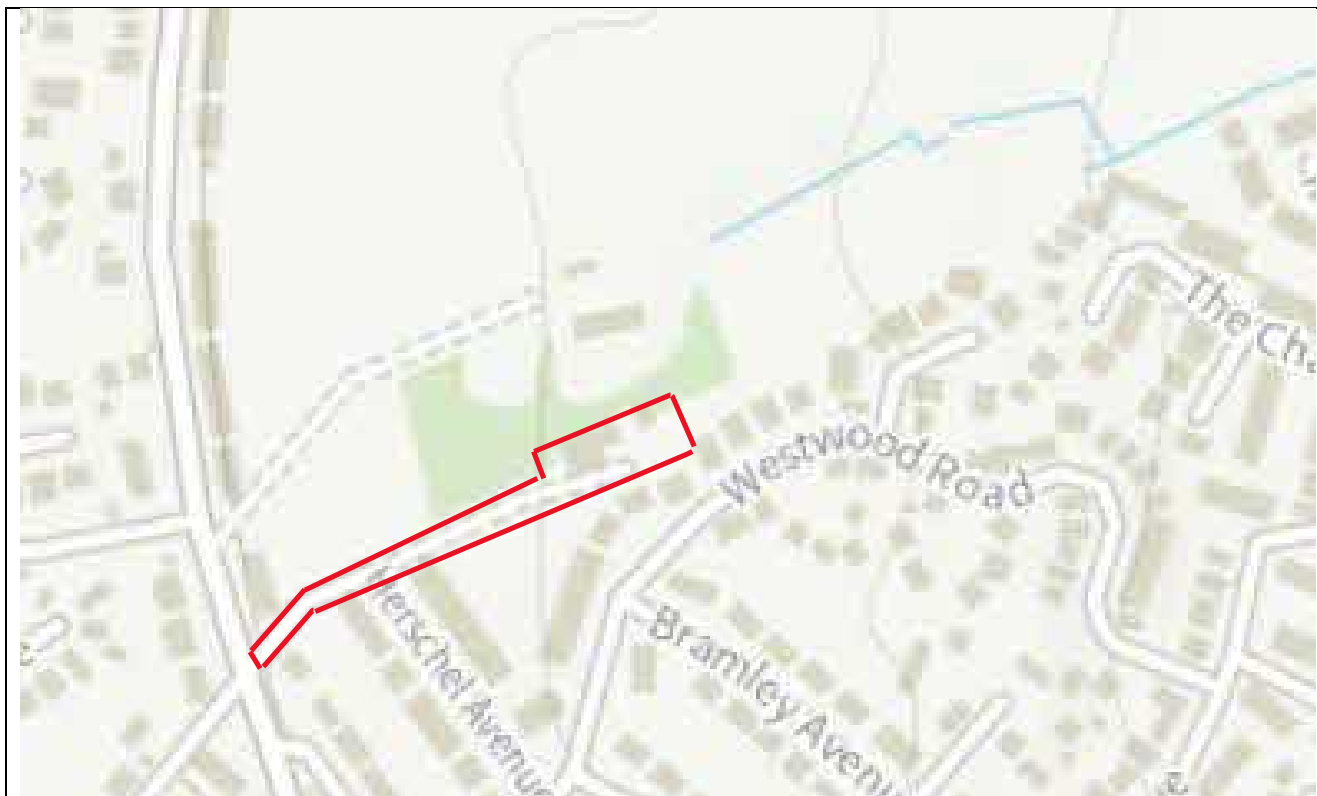


Figure 8: Reservoir & Artificial Waterbody Pluvial Flood Map

Source: <https://check-long-term-flood-risk.service.gov.uk/map>

The EA flood maps indicate that the entire site to be at minimal risk of flooding from reservoirs. As is evident from Figure 8, the proposed site is at negligible risk of flooding from artificial sources.

## 6.5. RISK FROM CLIMATE CHANGE

The impacts of climate change should be assessed upon all proposed developments for their anticipated lifecycle. Refer to Section 5 of this report for the climate change allowances that are to be considered within all site proposals. A summary of this section is presented below.

When assessing the peak river flows in relation to the development in relation to its vulnerability classification, an anticipated climate change allowance of 36% should be applied in line with Table 3 of this report. However, due to the site being located within Flood Zone 1, an assessment of this is not required as part of this report.

When assessing the peak rainfall allowances in relation to the development, an anticipated climate change allowance of 40% should be applied to all 3.3% (1 in 30-year) annual events and 50% for all 1% (1 in 100-year) annual events should be applied in line with Table 4 of this report.

Due to the proposed development considering climate change in line with the current Government guidance, the risk to the development from climate change is considered low.

## 6.6. PRE-DEVELOPMENT FLOOD RISK SUMMARY.

Following the review of available flood information, the following can therefore be summarised in terms of flood risk:

Primary River Flood Risk	NEGLIGIBLE
Surface Water Flood Risk	MEDIUM
Existing Drainage Flood Risk	LOW
Groundwater Flood Risk	LOW
Reservoir & Artificial Waterbody Flood Risk	NEGLIGIBLE
Risk from Climate Change	LOW

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## 7. SEQUENTIAL TEST

Paragraph 162 of the NPPF states ‘the aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any flooding.’

In line with the government guidance, sequential tests are not required for developments within Flood Zone 1.

## 8. OCCUPANTS AND USERS OF THE DEVELOPMENT (ACCESS & EGRESS)

The proposed development will increase the number of overall people entering and leaving the site due to a new 3-bedroom dwelling being constructed.

The majority of the site including the area where the building is proposed falls within Flood Zone 1 and is classed as more vulnerable. Therefore, no site-specific flood escape plan is required.

## 9. FLOOD MITIGATION MEASURES

### 9.1. GENERAL MITIGATION MEASURES

Although there is low risk of flooding in the immediate vicinity of the development, areas onsite are at medium risk, therefore it is proposed that a 150mm step is to be introduced between the finished floor level and the external ground level.

Where it is not possible to raise external ground levels to suit the raised finished floor level of the building, flood resilience measures should be incorporated into the design of the building.

Flooding from new drainage system can present a risk of flooding if systems are not designed to cater for the correct site area, storm duration or allowance for climate change.

Given that all new drainage should be designed in accordance with all relevant British Standards, Building Regulations and In line with the Essex SuDS Pro-forma which will be reviewed and approved through the planning process, the risk to the development from new drainage systems is considered very low.

## 10. RESIDUAL RISK

A flood risk assessment considers the residual risk to a proposed development for its intended lifecycle. In this case, with the development proposals consisting of residential properties, a 100-year design life is assumed.

The intended use and lifecycle have been considered throughout the assessment of various flood risk sources and it is considered that climate change will not impact on flood risk to the site over its intended lifecycle.

Therefore, the residual risk is considered to remain at low.

## 11. DRAINAGE STRATEGY

The proposed surface water drainage system should seek to meet the requirements of the NPPF. Additionally, the current building regulations, now requires disposal of new development surface water run off to discharge by infiltration (to ground), to water course or to surface water sewer, to combined sewer in that order of priority in relation to the preferred hierarchy for sustainable drainage.

Sustainable Drainage Systems (SuDS) should also be used wherever possible to mimic as far as practicable the natural run off regime, improve water quality, reduce run-off volume, and attenuate peak flows. These should be designed in accordance with the current guidance, CIRIA C753 'The SuD's Manual'. See [Appendix F](#) for drainage Strategy drawing.

### 11.1. SURFACE WATER

In accordance with National Planning Policy Framework (NPPF) and Building Regulations Approved Document H, options for disposal of surface water from new developments should follow the hierarchy below:

1. Discharge to ground via infiltration.
2. Discharge to watercourse.
3. Discharge to surface water sewer.
4. Discharge to a combined sewer.

### 11.2. INFILTRATION

Nearby borehole investigations encountered shallow clays which are recorded to go down as far as 7.5m. As clays are cohesive materials, water is unlikely to infiltrate and soakaway from the site.

Additionally, a site walkover undertaken by PWA Geo reveals the possibility of mass contaminants onsite, these possible contaminants include hydrocarbons and asbestos containing materials (acms). On top of soakaways being unlikely to successfully operate in clays, soakaways should not be installed in contaminated soils as this may promote the mobilization of contaminants and give rise to contamination of groundwater. Based on the presence of shallow clays and contaminants, we do not consider soakaways to be suitable for this site.

### 11.3. WATERCOURSE

If infiltration has been discounted as a viable solution, the next method in priority should be to discharge to a watercourse or surface water body.

An assessment of the Bing maps shows a watercourse within 75m of the site boundary. However, in order to make a connection to this, we would have to cross multiple ownership boundaries and a dense grove of trees which is stationed between the site and the watercourse. Attempting to make a connection to the watercourse would result in root damage of the adjacent landowners' trees.

Following the above assessment, outfall to a watercourse has been discounted as a method of discharge.



#### 11.4. SURFACE WATER SEWER

As the connection to a surface water body being is unavailable, a connection to a surface water sewer, must be explored.

United utilities sewer records show there to be no nearby surface water sewer that would provide a practicable connection point for the proposed drainage and therefore has been discounted as a method of discharge. Refer to [Appendix E](#) for United Utilities Sewer Records.

#### 11.5. COMBINED WATER SEWER

The united utilities sewer records show there to be an existing combined sewer located on the site's southern boundary.

As this sewer is within practicable distance to the development and all other discharge methods are discounted, the combined sewer is to be explored as an outfall option.

#### 11.6. SURFACE WATER DESIGN

Further to the assessment of the surface water hierarchy, the desired outfall for the surface water drainage is the existing combined sewer on the site's southern boundary.

In line with current national guidance and sustainable drainage systems guidance - 2022 update, section 4.2, the site is being treated as entirely greenfield for the purpose of the drainage design.

An assessment of the proposed impermeable areas for the development has resulted in a total drained area of 273m<sup>2</sup> (0.027ha). Based on this impermeable area, the existing qbar (1 in 2.33-year return period) greenfield rate for the development is 0.20l/s. Following hydraulic calculations, the calculated greenfield rate of 0.20l/s gives an extremely small orifice size for the flow control device (20mm). An orifice this small can result in blockages and system flooding. As a safety measure, we have increased the flow rate to provide an orifice size of 50mm.

Table 6: Surface Water Run-off Rates

Run-off Rates	
Existing Rate	0.2l/s
Proposed Rate	1.5l/s

The development must seek to restrict the proposed surface water flows to 1.5l/s for a 1 in 1-, 30- and 100-year return periods with an appropriate allowance for climate change.

To restrict proposed flows to a rate of 1.5l/s, the proposed drainage system should seek to implement source control SuDS methods where possible and attenuation system to store the restricted flows. This surface water system is to include a flow control manhole and cellular attenuation tank to minimise flows before they outfall to the existing sewer. Non return valves will be used to prevent the combined system backing up into the surface water sewers.

The Surface water system is to be designed to attenuate for a 1 in 30-year storm and 1 in 100-year storm plus a varying climate change percentage depending on which river catchment the site falls under. Refer to Table 4 for climate change allowances.

The proposed surface water drainage will be designed to cater for a 1 in 100-year storm + 50% climate change (CC) and a 1 in 30-year storm + 40% CC. Based off Impermeable areas, Table 7 shows the required attenuation for the site.

Table 7: Attenuation Storage Requirements

Storage Requirements	
Required Attenuation	12.16m <sup>3</sup>

Refer to [Appendix F](#) for Detailed Drainage Strategy

### 11.7. FOUL WATER

At the time of writing, no onsite drainage investigations have occurred so the condition and location of sewers serving the existing building are unknown. Photos taken from a site walkover show the building to have soil vents pipes so we can assume a foul sewer is present. United Utilities sewer records show no nearby adopted foul sewers.

In response to this, we propose to make a combined connection with the proposed surface water sewer into the existing combined sewer on the southern boundary. The existing combined sewer is located close to the development and provides a practicable connection point.

## 11.8. SUDS COMPONENTS

Table 8: SuDS Component Delivery of Design Criteria								
Component Type	Description	Collection mechanism	Design Criteria					
			Water Quantity			Water Quality	Amenity	Biodiversity
			Peak runoff rate	Runoff volumes				
				Small events	Large events			
Attenuation storage tank/structures	Large below ground voided spaces used to temporarily store runoff before infiltration, controlled runoff, or use.	P	X					

## 11.9. DRAINAGE MANAGEMENT AND MAINTENANCE

Table 9.1: Drainage Maintenance Responsibilities	
Drainage Feature	Maintenance Responsibility
Plot Drainage	Landowner/Maintenance company
Driveway/Turning Head	Landowner/Maintenance company
Attenuation Tank	Landowner/Maintenance company
Flow Control Device	Landowner/Maintenance company

<u>9.2 PRIVATE DRAINAGE SYSTEM</u>	
Regular Maintenance	Frequency
To be maintained by the End user/Maintenance company. Visually inspect gutters to ensure they are kept clear of leaves, debris etc. Lift covers of drainage to inspect chambers for debris and build-up of silts.	Annually. No triggers other than maintenance to be taken on regular schedule.
Occasional Tasks	Frequency
Remove leaves and debris from gutters. Remove debris from inspection chambers to ensure outlets are kept clear of debris to ensure adequate drainage.	As required. Indicator of problem/trigger for maintenance when surcharging or flooding of drains occurs or gutters and chambers full of debris and leaves etc.
Remedial Work	Frequency
Should drains be heavily blocked or damaged contact drainage maintenance company for unblocking / repair works.	As required. Indicator of problem/trigger for maintenance when drainage not functioning and unblocking pipes and chambers etc not effective.
<u>9.3 Channel Drains and Gullies</u>	
Regular Maintenance	Frequency
Lift covers of channels/gullies and visually inspect for the buildup of silt and debris.	Bi-annually
Occasional Tasks	Frequency
Remove debris from channels and gullies	Annually or as required
Remedial Work	Frequency
Should the channels/gullies be heavily blocked or damaged jet out/repair/replace them.	As required.
<u>9.4 Crown Vortex Valve flow control Unit</u>	
Regular Maintenance	Frequency
Lift cover of flow control chamber and visually inspect flow control for debris.	Bi-annually
Occasional Tasks	Frequency
Remove debris from flow control chamber and unit.	Annually or as required
Remedial Work	Frequency
Should flow control unit be heavily blocked or damaged jet out/repair/replace flow control unit.	As required
<u>9.5 Attenuation Tank</u>	
Regular Maintenance	Frequency
Inspect for any damage to tank or problems by checking area of surfacing above tank.	4 – 6 Times Annually.
Occasional Tasks	Frequency
CCTV to check tank and any silt build up and jet/clear tank as per manufacturer’s instructions from access points if required.	As required.
Remedial Work	Frequency
Reinstate or repair tank	As required.

---

## 12. POST DEVELOPMENT FLOOD RISK SUMMARY

Following the review of available flood maps, topographical information and the flood mitigation measures proposed, the following can therefore be summarised in terms of flood risk:

Primary River Flood Risk	NEGLIGIBLE
Surface Water Flood Risk	LOW
Existing Drainage Flood Risk	LOW
Groundwater Flood Risk	LOW
Reservoir & Artificial Waterbody Flood Risk	NEGLIGIBLE
New Drainage Flood Risk	VERY LOW
Risk from Climate Change	LOW
Residual (Lifecycle) Primary River Flood Risk	LOW

---

## 13. CONCLUSION

This Flood Risk Assessment has been conducted to assess flood risk to support the planning application for the development of a new 3-bedroom dwelling with associated external works. This report has been produced in general accordance with the requirements of National Planning Policy Framework (2019) to provide a sufficient level of detail on flood risk for the application.

The Environment Agency's Flood Map for Planning presents the site falling entirely within Flood Zone 1.

Flood risk from rivers and seas has been assessed in further detail and is considered to be at negligible, due to there being no primary rivers located near the development.

Surface water flood risk has been assessed and is deemed to be very low. This is due to there being no areas of pluvial flooding in the vicinity of the proposed building and the building being raised 150mm above external levels.

Proposed sewer flooding has also been assessed and the site is at very low risk from all other sources, post development.

Ground water flooding has also been assessed and the site is at very low risk from all other sources, pre and post development.

Climate change and the residual risk are to remain as low.

The risk from reservoir flooding is considered to remain negligible.

The bungalows surface water drainage is proposed to drain via a gravity system restricted to an agreed rate into the existing public combined water sewer on the southern boundary. This is to be achieved using a vortex flow control device and a cellular storage tank. The surface water is to flow into a private combined chamber before entering the existing manhole. A connection into the existing public sewer will be subject to United Utilities approval due to a new connection into a public sewer.

Foul water drainage is to drain via a gravity system which will connect into a private combined chamber with the surface water before flowing into the public combined manhole.

The findings of this report conclude that the proposed development of the application site involving the construction of a new 3-bedroom dwelling and associated infrastructure will have no adverse impact to flooding on-site or off-site. Areas of the site are to decrease in surface water flood risk post development due to the proposed floor levels being 150mm above external ground level.



Appendix A  
Site Location Plan  
24030-PWA-00-XX-DR-C-1001\_P01\_Site Location Plan



**SITE LOCATION**  
 OS X (EASTINGS) 382595  
 OS Y (NORTHINGS) 433750  
 NAT GRID SD823337  
 POSTCODE BB12 0HR

**NOTES:**

1. COPYRIGHT IN THIS DOCUMENT BELONGS TO PAUL WAITE ASSOCIATES LIMITED & ALL RIGHTS IN IT ARE RESERVED BY THE OWNER.
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3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS & SPECIFICATIONS.
4. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES.
5. NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.
6. ONLY PDF/HARD COPIES OF DRAWINGS SHOULD BE REFERRED TO FOR CONSTRUCTION USE. THE USE OF AUTOCAD DRAWINGS/DWG'S IS UNDERTAKEN ENTIRELY AT THE DEVELOPER'S RISK AND ALL DIMENSIONS AND SETTING OUT MUST BE CHECKED IN CONJUNCTION WITH THE ARCHITECT AND ENGINEERS CONSTRUCTION DRAWINGS. ALL DRAWINGS SHOULD BE CONFIRMED AS LATEST ISSUE ON THE DOCUMENT ISSUE SHEET PRIOR TO COMMENCEMENT OF WORKS AND SHOULD BE USED ONLY FOR THEIR DEFINED DRAWING STATUS. ANY DISCREPANCIES BETWEEN THE ARCHITECT AND ENGINEERS DRAWINGS ARE TO BE IMMEDIATELY NOTIFIED TO ALL PARTIES.

**KEY**

— SITE BOUNDARY

PO1	16/03/24	FIRST ISSUE	IB	LS
Rev	Date	Remarks	Drawn	Chk'd

**PWA / GROUP**

CIVIL SUMMIT HOUSE, RIPARIAN WAY,  
 STRUCTURAL THE CROSSINGS, CROSSHILLS,  
 GEO-ENVIRONMENTAL KEIGHLEY, BD20 7BW [www.pwagroup.co.uk](http://www.pwagroup.co.uk)



Project **HERSCHEL AVENUE  
 BURNLEY  
 LANCASHIRE**

Title **SITE LOCATION PLAN**

Size	Scale	Designed	Checked	Date
A1	1:500	IB	LS	MAR 23

Drawing Status **PRELIMINARY**

Job Number	Originator	Zone	Level	Type	Role	Drawing No.	Rev
24030	PWA	00	XX	DR	C	1001	PO1





Appendix B  
Proposed Site Layout  
Campbell Driver Drawing 23.183\_01\_001\_C\_

revision notes		
rev	date	description
A:	31/01/24	original issue
B:	31/01/24	bin store shown
C:	20/02/24	updated to include survey data

ADJACENT TREE BELT

self seeded trees removed and replaced with new tree planting

FOOTPATH

3 car spaces

NEW 3 bed BUNGALOW

new bin store

Wellfield Farm and barn  
buildings and residential use retained

turning head

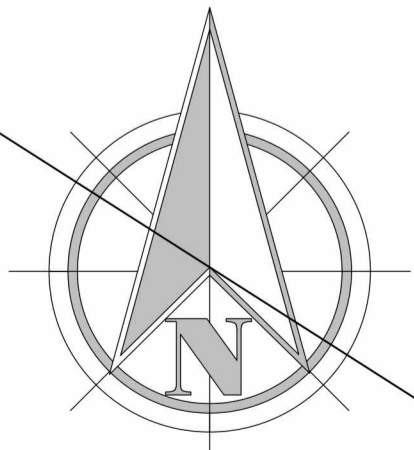
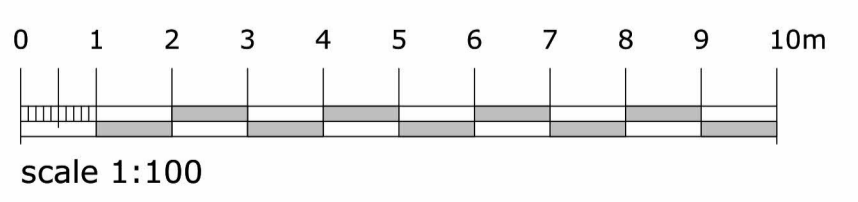
3 car spaces

turning head

FOOTPATH

30

26



**campbell driver partnership**  
architects

Suite 25, Unit 2  
Northlight House  
Pendle Road  
Brierfield  
Nelson  
BB9 5PL

client: Mr D Lord

project: proposed bungalow  
land off Herchel Avenue Burnley

sheet: proposed site layout

drawing no: 23.183\_01\_001 C

scale: @ A1 1:100

date: nov 23

WOOD



# Appendix C

## Flood Maps for Planning

# Flood map for planning

Your reference  
<Unspecified>

Location (easting/northing)  
382321/433688

Created  
15 Mar 2024 11:50

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

## Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

## Flood map for planning

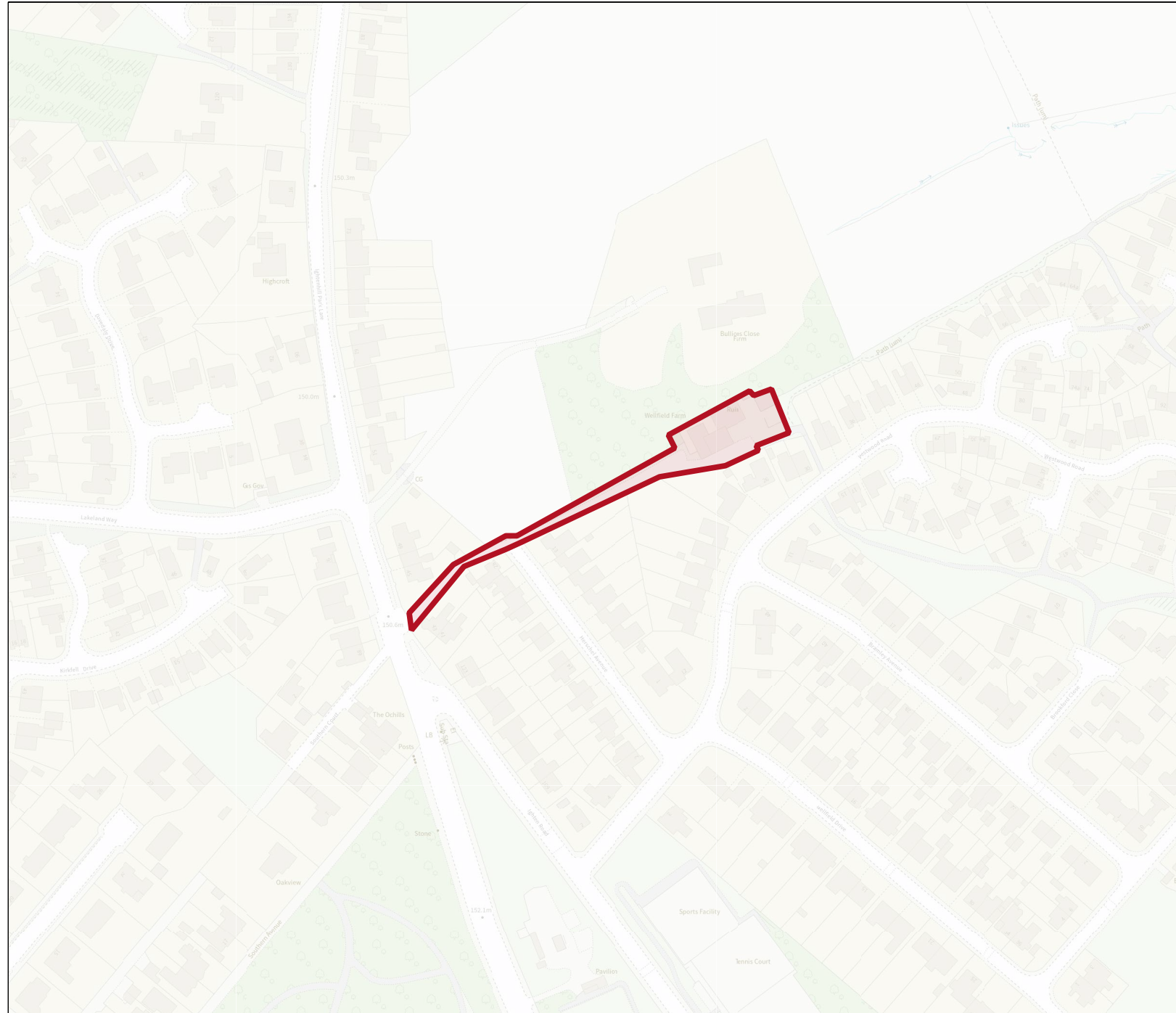
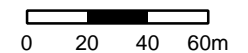
Your reference  
**<Unspecified>**

Location (easting/northing)  
**382321/433688**

Scale  
**1:2500**

Created  
**15 Mar 2024 11:50**

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



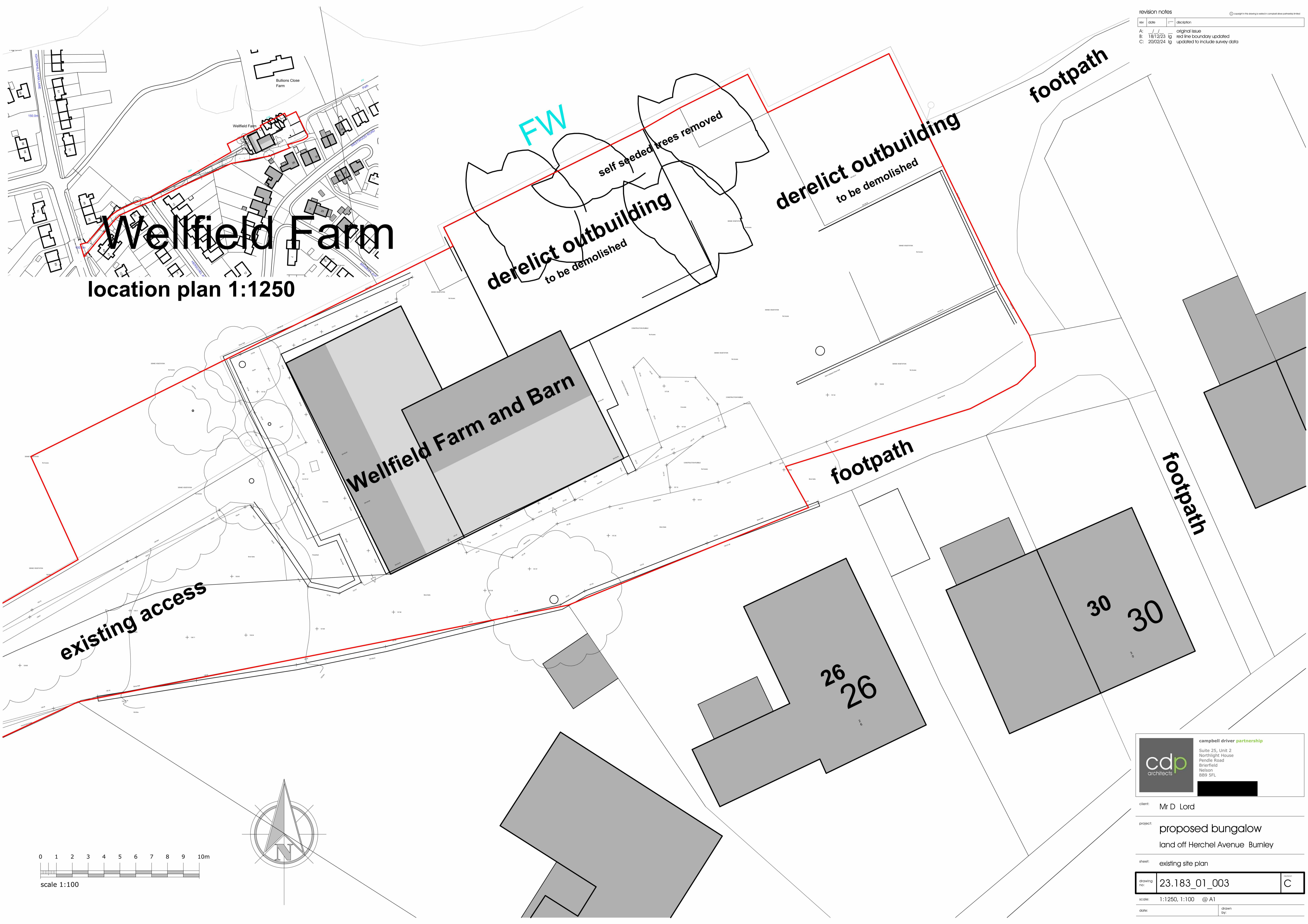


# APPENDIX D

## Existing Site Plan

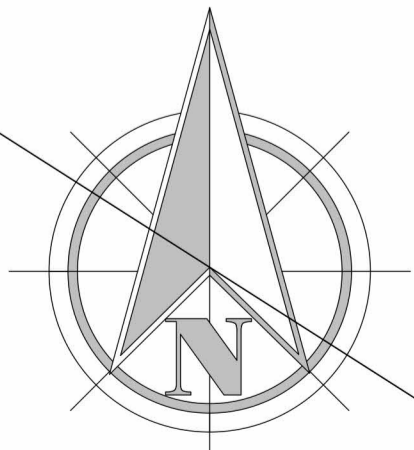
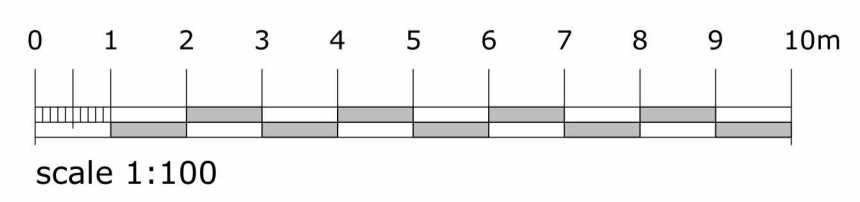
Campbell Driver Drawing 23.183\_01\_003\_C\_

rev	date	description
A:	/ /	original issue
B:	18/12/23	red line boundary updated
C:	20/02/24	updated to include survey data



# Wellfield Farm

location plan 1:1250



**cdp** architects  
campbell driver partnership  
Suite 25, Unit 2  
Northlight House  
Penslie Road  
Brierfield  
Nelson  
BB9 5PL

client:	Mr D Lord
project:	proposed bungalow land off Herchel Avenue Burnley
sheet:	existing site plan
drawing no:	23.183_01_003
scale:	1:1250, 1:100 @ A1
date:	
drawn by:	



## APPENDIX E

### United Utilities Sewer Records





Water for the North West

Paul Waite Associates Ltd

Summit House  
Riparian Way, Cross Hills  
Cross Hills, West Yorkshire  
BD20 7BW

FAO:

How to contact us:

United Utilities Water Limited  
Property Searches  
Haweswater House  
Lingley Mere Business Park  
Great Sankey  
Warrington  
WA5 3LP

Telephone [REDACTED]

E-mail: [propertysearches@uuplc.co.uk](mailto:propertysearches@uuplc.co.uk)

Your Ref: 24030  
Our Ref: UUPS-ORD-554169  
Date: 12/03/2024

Dear Sirs

**Location: 28 WESTWOOD ROAD, BURNLEY, BB12 0HR**

I acknowledge with thanks your request dated 06/03/2024 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

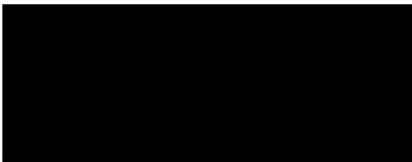
The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack  
Property Searches Manager

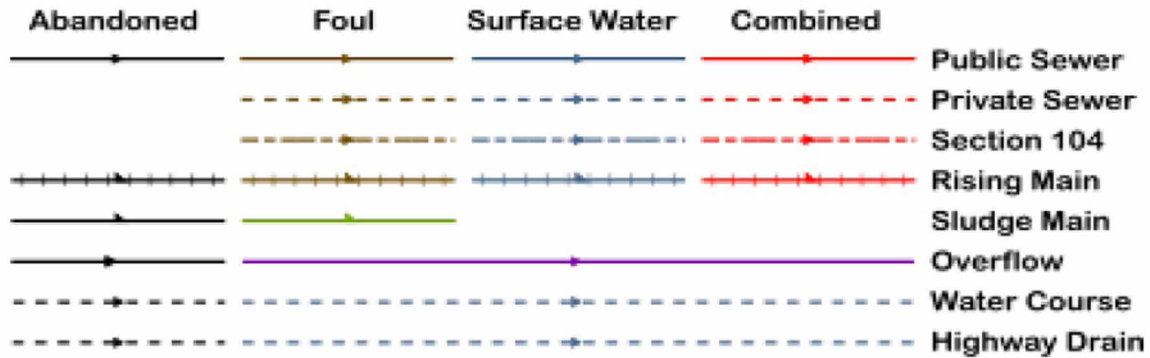
## **TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS**

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

### **TERMS AND CONDITIONS:**

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

## Wastewater Symbology



All point assets follow the standard colour convention: **red** – combined      **brown** - foul  
**blue** – surface water      **purple** - overflow

- |                  |                          |
|------------------|--------------------------|
| Manhole          | Side Entry Manhole       |
| Head of System   | Outfall                  |
| Extent of Survey | Screen Chamber           |
| Rodding Eye      | Inspection Chamber       |
| Inlet            | Bifurcation Chamber      |
| Discharge Point  | Lamp Hole                |
| Vortex           | T Junction / Saddle      |
| Penstock         | Catchpit                 |
| Washout Chamber  | Valve Chamber            |
| Valve            | Vent Column              |
| Air Valve        | Vortex Chamber           |
| Non Return Valve | Penstock Chamber         |
| Soakaway         | Network Storage Tank     |
| Gully            | Sewer Overflow           |
| Cascade          | Ww Treatment Works       |
| Flow Meter       | Ww Pumping Station       |
| Hatch Box        | Septic Tank              |
| Oil Interceptor  | Control Kiosk            |
| Summit           |                          |
| Drop Shaft       | Change of Characteristic |
| Orifice Plate    |                          |



Water for the North West

# SEWER RECORDS

## Address or Site Reference

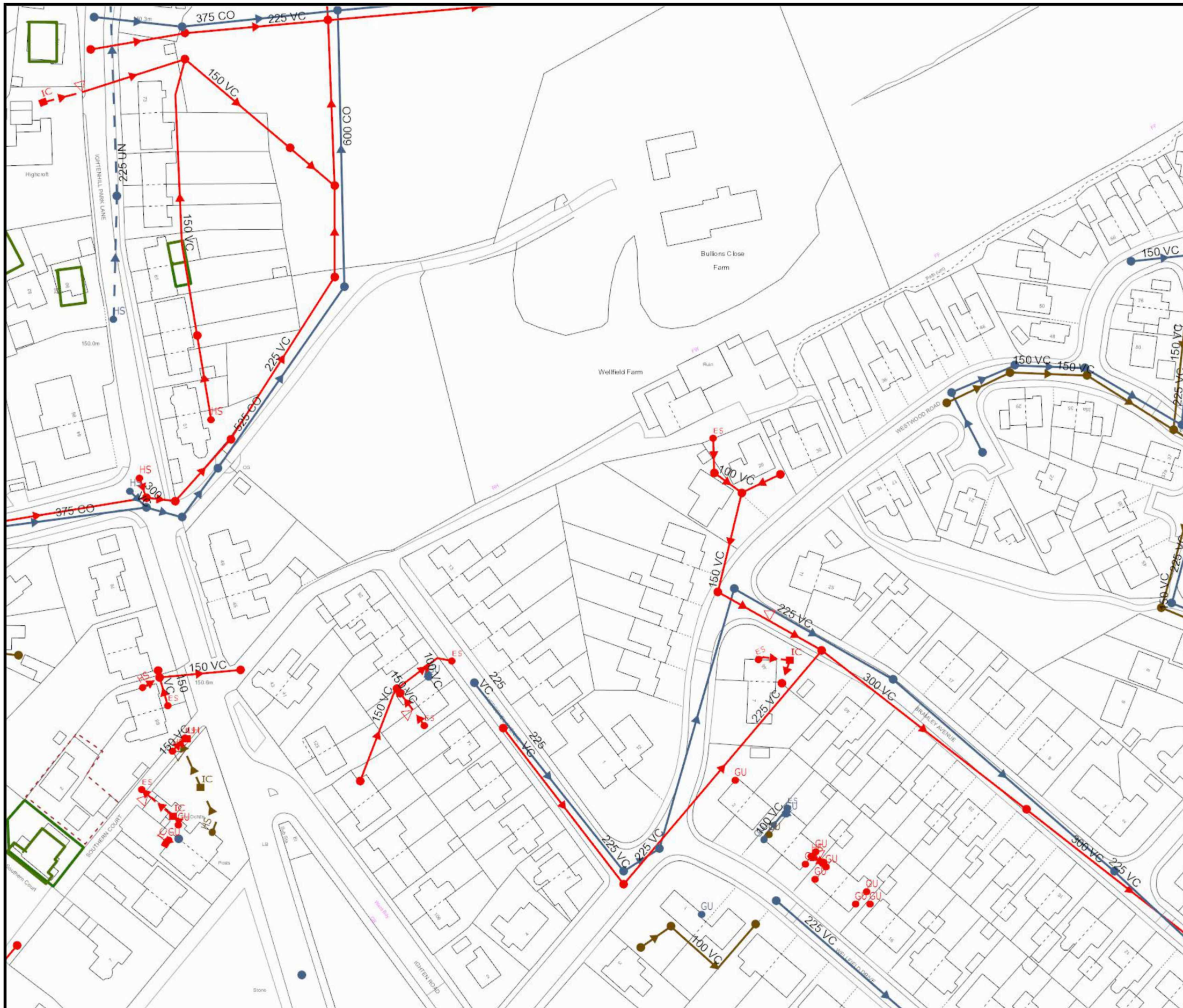
28 WESTWOOD ROAD,  
BURNLEY,  
BB12 0HR

Scale: 1:1250  
Date: 12/03/2024

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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**Appendix F**  
**Drainage Layout**  
24030-PWA-00-XX-DR-C-1000\_P01

**SURFACE WATER PRINCIPLES**

**NPPG HIERARCHY OF SURFACE WATER DRAINAGE**  
 THE NATIONAL PLANNING PRACTICE GUIDANCE ANY NYCC SUSTAINABLE DRAINAGE SYSTEMS GUIDANCE - 2022 UPDATE, SETS OUT THE HIERARCHY OF DRAINAGE TO PROMOTE THE USE OF SUSTAINABLE DRAINAGE SYSTEMS, BY ALIGNING MODERN DRAINAGE SYSTEMS WITH NATURAL WATER PROCESSES. THE AIM OF HIERARCHY OF DRAINAGE IS TO DRAIN SURFACE WATER RUN-OFF AS SUSTAINABLE, AS REASONABLY PRACTICABLE.  
 AS STATED IN THE NATIONAL PLANNING PRACTICE GUIDANCE, THE AIM SHOULD BE TO DISCHARGE SURFACE WATER RUN-OFF AS HIGH UP THE DRAINAGE HIERARCHY, AS REASONABLY PRACTICABLE:

- INTO THE GROUND (INFILTRATION).
- TO A SURFACE WATER BODY.
- TO A SURFACE WATER SEWER, HIGHWAY DRAIN, OR ANOTHER DRAINAGE SYSTEM.
- TO A COMBINED SEWER.

**INFILTRATION**  
 NEARBY BOREHOLE INVESTIGATIONS ENCOUNTERED SHALLOW CLAYS WHICH ARE RECORDED TO GO DOWN AS FAR AS 7.5m. ADDITIONALLY, A SITE WALKOVER UNDERTAKEN BY PWA GEO REVEALS THE POSSIBILITY OF MASS CONTAMINANTS ONSITE, THESE POSSIBLE CONTAMINANTS INCLUDE HYDROCARBONS AND ASBESTOS CONTAINING MATERIALS (ACMs). ON TOP OF SOAKAWAYS BEING UNLIKELY TO SUCCESSFULLY OPERATE IN CLAYS, SOAKAWAYS SHOULD NOT BE INSTALLED IN CONTAMINATED SOILS AS THIS MAY PROMOTE THE MOBILIZATION OF CONTAMINANTS AND GIVE RISE TO CONTAMINATION OF GROUNDWATER. BASED ON THE PRESENCE OF SHALLOW CLAYS AND CONTAMINANTS, WE DO NOT CONSIDER SOAKAWAYS TO BE SUITABLE FOR THIS SITE.

**WATERCOURSE**  
 IF INFILTRATION HAS BEEN DISCOUNTED AS A VIABLE SOLUTION, THE NEXT METHOD IN PRIORITY SHOULD BE TO DISCHARGE TO A WATERCOURSE OR SURFACE WATER BODY.  
 AN ASSESSMENT OF THE BING MAPS SHOWS A WATERCOURSE WITHIN 75m OF THE SITE BOUNDARY. HOWEVER, IN ORDER TO MAKE A CONNECTION TO THIS, WE WOULD HAVE TO CROSS MULTIPLE OWNERSHIP BOUNDARIES AND A DENSE GROVE OF TREES WHICH IS STATIONED BETWEEN THE SITE AND THE WATERCOURSE. ATTEMPTING TO MAKE A CONNECTION TO THE WATERCOURSE WOULD RESULT IN ROOT DAMAGE OF THE ADJACENT LAND OWNERS TREES.  
 FOLLOWING THE ABOVE ASSESSMENT, OUTFALL TO A WATERCOURSE HAS BEEN DISCOUNTED AS A METHOD OF DISCHARGE.

**SURFACE WATER SEWER**  
 AS THE CONNECTION TO A SURFACE WATER BODY BEING IS UNAVAILABLE, A CONNECTION TO A SURFACE WATER SEWER, MUST BE EXPLORED.  
 UNITED UTILITIES SEWER RECORDS SHOW THERE TO BE NO NEARBY SURFACE WATER SEWER THAT WOULD PROVIDE A PRACTICABLE CONNECTION POINT FOR THE PROPOSED DRAINAGE AND THEREFORE HAS BEEN DISCOUNTED AS A METHOD OF DISCHARGE.

**COMBINED SEWER**  
 THE UNITED UTILITIES SEWER RECORDS SHOW THERE TO BE AN EXISTING COMBINED SEWER LOCATED ON THE SITES SOUTHERN BOUNDARY.  
 AS THIS SEWER IS WITHIN PRACTICABLE DISTANCE TO THE DEVELOPMENT AND ALL OTHER DISCHARGE METHODS ARE DISCOUNTED, THE COMBINED SEWER IS TO BE EXPLORED AS AN OUTFALL OPTION.

**SURFACE WATER DESIGN**  
 FURTHER TO THE ASSESSMENT OF THE SURFACE WATER HIERARCHY, THE DESIRED OUTFALL FOR THE SURFACE WATER DRAINAGE IS THE EXISTING COMBINED SEWER ON THE SITES SOUTHERN BOUNDARY.

**RUN-OFF RATES**  
 IN LINE WITH CURRENT NATIONAL GUIDANCE AND SUSTAINABLE DRAINAGE SYSTEMS GUIDANCE - 2022 UPDATE, SECTION 4.2, THE SITE IS BEING TREATED AS ENTIRELY GREENFIELD FOR THE PURPOSE OF THE DRAINAGE DESIGN ONLY.

AN ASSESSMENT OF THE PROPOSED IMPERMEABLE AREAS FOR THE DEVELOPMENT HAS RESULTED IN A TOTAL DRAINED AREA OF 273m<sup>2</sup> (0.027ha). BASED ON THIS IMPERMEABLE AREA, THE EXISTING QBAR (1 IN 2.33 YEAR RETURN PERIOD) GREENFIELD RATE FOR THE DEVELOPMENT IS 0.20l/s. FOLLOWING HYDRAULIC CALCULATIONS, THE CALCULATED GREENFIELD RATE OF 0.20l/s GIVES AN EXTREMELY SMALL ORIFICE SIZE FOR THE FLOW CONTROL DEVICE (20mm). AN ORIFICE THIS SMALL CAN RESULT IN BLOCKAGES AND SYSTEM FLOODING. AS A SAFETY MEASURE, WE HAVE INCREASED THE FLOW RATE TO PROVIDE AN ORIFICE SIZE OF 50mm. THE DEVELOPMENT MUST SEEK TO RESTRICT THE PROPOSED SURFACE WATER FLOWS FOR A 1 IN 1, 30 AND 100 YEAR RETURN PERIODS WITH AN APPROPRIATE ALLOWANCE FOR CLIMATE CHANGE.

PROPOSED DISCHARGE RATE: 1.5l/s

**CLIMATE CHANGE**  
 IN LINE WITH THE LATEST WHICH GUIDANCE SETS CLIMATE CHANGE ALLOWANCES BASED ON RIVER BASIN MANAGEMENT CATCHMENTS. THE CLIMATE CHANGE ALLOWANCES FOR THE DEVELOPMENT SHOULD BE SET IN LINE WITH THE BELOW:

WHARFE AND LOWER OUSE MANAGEMENT CATCHMENT

2070S EPOCH - CENTRAL ALLOWANCE.

3.3% (1 IN 30 YEAR):	40%
1% (1 IN 100 YEAR):	50%

**PROPOSED DRAINAGE SYSTEM**  
 TO RESTRICT PROPOSED FLOWS TO A RATE OF 1.50 L/S, THE PROPOSED DRAINAGE SYSTEM SHOULD SEEK TO IMPLEMENT SOURCE CONTROL SUDS METHODS WHERE POSSIBLE AND AN ATTENUATION SYSTEM TO STORE THE RESTRICTED FLOWS. A CELLULAR ATTENUATION TANK HAS BEEN INCORPORATE TO MINIMIZE FLOWS, THE TANK HAS BEEN SIZED AS:  
 4.0m(W) X 4.0m(L) X 0.8m(d) PROVIDING 12.16m<sup>3</sup> OF STORAGE WITH A 95% VOID RATIO.

**FOUL WATER DESIGN**  
 AFTER A REVIEW OF THE UNITED UTILITY SEWER RECORDS, THERE ARE NO SUITABLE FOUL SEWERS WITHIN THE VICINITY OF THE SITE.  
 IN RESPONSE TO THIS, WE PROPOSE TO MAKE A COMBINED CONNECTION WITH THE PROPOSED SURFACE WATER SEWER INTO THE EXISTING COMBINED SEWER ON THE SOUTHERN BOUNDARY.

AREA	TOTAL AREA m <sup>2</sup> (ha)
PROPOSED IMPERMEABLE	273m <sup>2</sup> (0.027ha)
+10% URBAN CREEP	300m <sup>2</sup> (0.030ha)
AREA TO FREELY DRAIN	41m <sup>2</sup> (0.004ha)

\*TOTALS FOR HECTARES (ha) AND METERS SQUARED (m<sup>2</sup>) DIFFER SLIGHTLY DUE TO ROUNDING AND ACCUMULATION OF INDIVIDUAL AREAS.

**GREENFIELD RUNOFF RATES**

RETURN PERIOD (YEARS)	FLOW RATE (l/s)
1 IN 1 YEAR	0.20 l/s
1 IN 30 YEAR	0.39 l/s
1 IN 100 YEAR	0.48 l/s
1 IN 2.33 YEAR (QBAR)	0.23 l/s
PROPOSED RATE	1.50 l/s

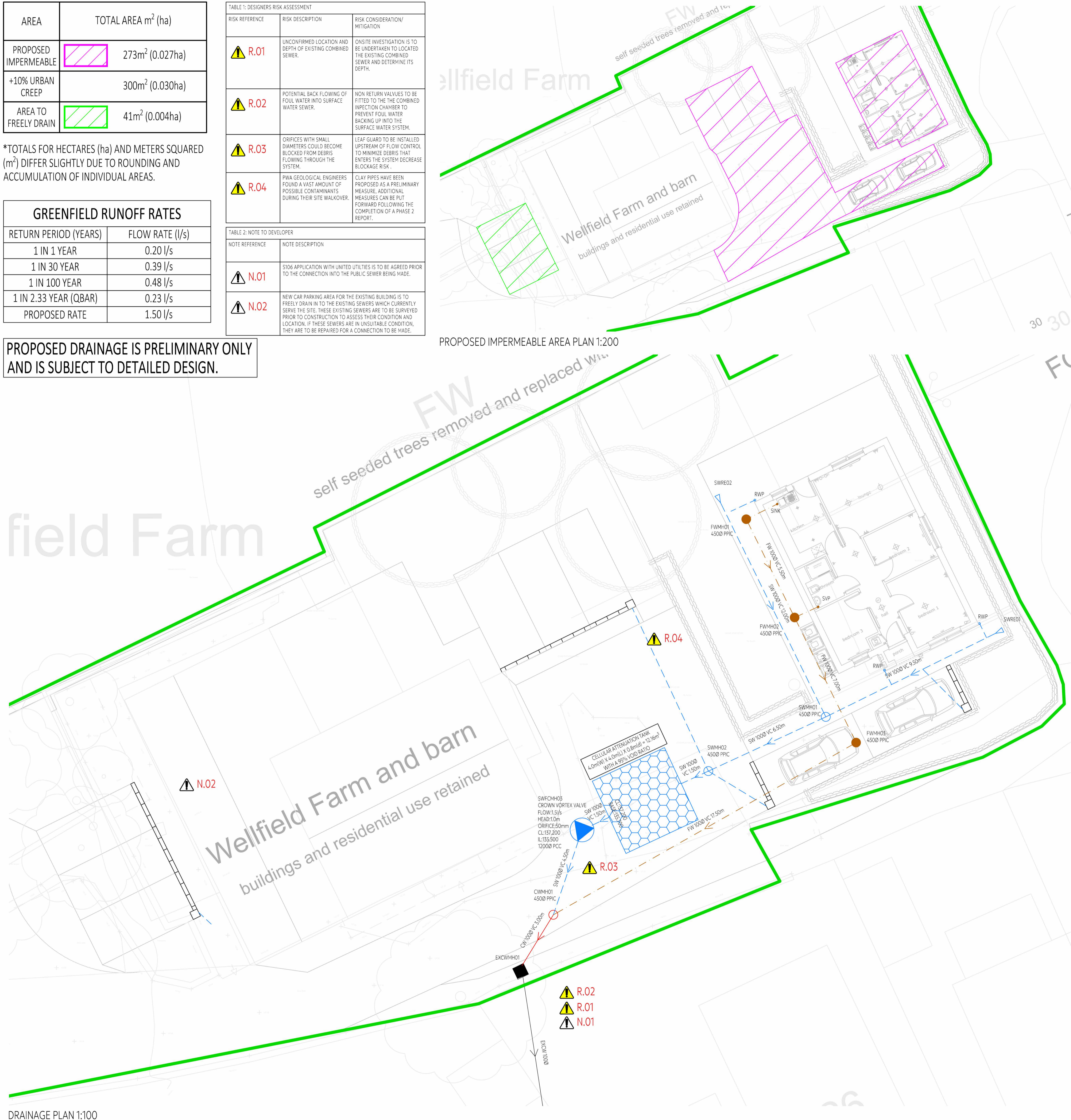
**PROPOSED DRAINAGE IS PRELIMINARY ONLY AND IS SUBJECT TO DETAILED DESIGN.**

TABLE 1: DESIGNERS RISK ASSESSMENT

RISK REFERENCE	RISK DESCRIPTION	RISK CONSIDERATION/ MITIGATION
R.01	UNCONFIRMED LOCATION AND DEPTH OF EXISTING COMBINED SEWER.	ONSITE INVESTIGATION IS TO BE UNDERTAKEN TO LOCATED THE EXISTING COMBINED SEWER AND DETERMINE ITS DEPTH.
R.02	POTENTIAL BACK FLOWING OF FOUL WATER INTO SURFACE WATER SEWER.	NON RETURN VALVES TO BE FITTED TO THE THE COMBINED INSPECTION CHAMBER TO PREVENT FOUL WATER BACKING UP INTO THE SURFACE WATER SYSTEM.
R.03	ORIFICES WITH SMALL DIAMETERS COULD BECOME BLOCKED FROM DEBRIS FLOWING THROUGH THE SYSTEM.	LEAF GUARD TO BE INSTALLED UPSTREAM OF FLOW CONTROL TO MINIMIZE DEBRIS THAT ENTERS THE SYSTEM DECREASE BLOCKAGE RISK.
R.04	PWA GEOLOGICAL ENGINEERS FOUND A VAST AMOUNT OF POSSIBLE CONTAMINANTS DURING THEIR SITE WALKOVER.	CLAY PIPES HAVE BEEN PROPOSED AS A PRELIMINARY MEASURE. ADDITIONAL MEASURES CAN BE PUT FORWARD FOLLOWING THE COMPLETION OF A PHASE 2 REPORT.

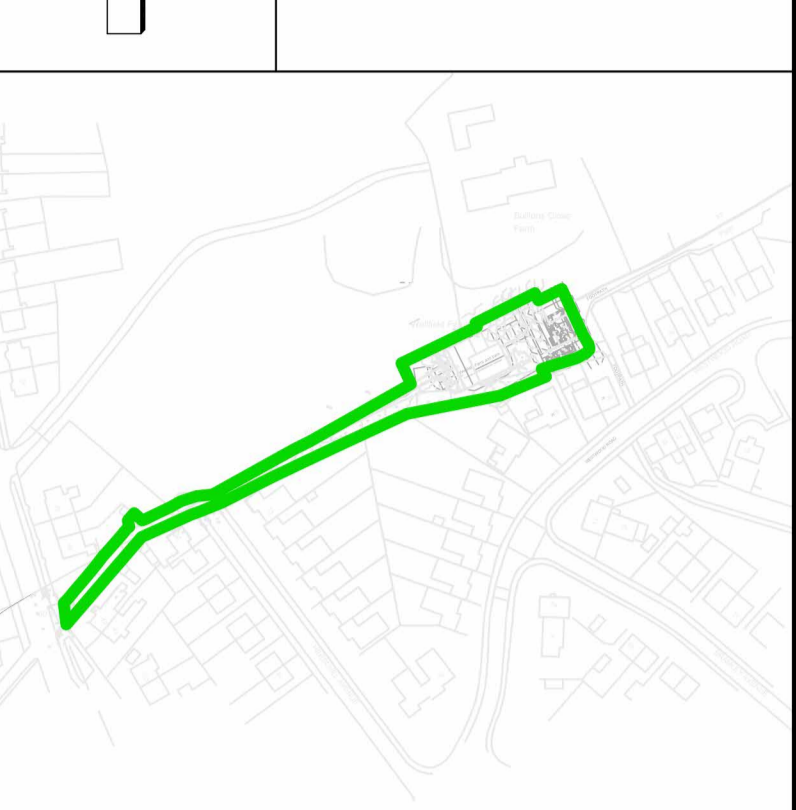
TABLE 2: NOTE TO DEVELOPER

NOTE REFERENCE	NOTE DESCRIPTION
N.01	S106 APPLICATION WITH UNITED UTILITIES IS TO BE AGREED PRIOR TO THE CONNECTION INTO THE PUBLIC SEWER BEING MADE.
N.02	NEW CAR PARKING AREA FOR THE EXISTING BUILDING IS TO FREELY DRAIN IN TO THE EXISTING SEWERS WHICH CURRENTLY SERVE THE SITE. THESE EXISTING SEWERS ARE TO BE SURVEYED PRIOR TO CONSTRUCTION TO ASSESS THEIR CONDITION AND LOCATION. IF THESE SEWERS ARE IN UNSUITABLE CONDITION, THEY ARE TO BE REPAIRED FOR A CONNECTION TO BE MADE.



DRAINAGE PLAN 1:100

**SITE LOCATION**  
 OS X (EASTINGS) 382395  
 OS Y (NORTHINGS) 433730  
 NAT GRID SDB23357  
 POSTCODE BB12 0HR



KEY PLAN - 1:2500

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**KEY**

—	EXISTING COMBINED WATER SEWER
■	EXISTING COMBINED WATER MANHOLE
—	PROPOSED SURFACE WATER SEWER
⊙	PROPOSED SURFACE WATER FLOW CONTROL MANHOLE
⊙	PROPOSED SURFACE WATER INSPECTION CHAMBER
⊙	PROPOSED CELLULAR STORAGE
—	PROPOSED CHANNEL
—	PROPOSED FOUL WATER SEWER
⊙	PROPOSED FOUL WATER INSPECTION CHAMBER
—	PROPOSED COMBINED WATER SEWER
⊙	PROPOSED COMBINED WATER INSPECTION CHAMBER
—	SITE BOUNDARY

Rev	Date	Remarks	By	LS
P01	14/03/24	FIRST ISSUE	IB	LS

**PWA / GROUP**

CIVIL: SUMMIT HOUSE, RIPARIAN WAY, [REDACTED]  
 STRUCTURAL: THE CROSSINGS, CROSSHILLS, [REDACTED]  
 GEO-ENVIRONMENTAL: KEIGHLEY, BD20 7BW www.pwagroup.co.uk

Client: **campbelldriverpartnership**

Project: **HERSCHEL AVENUE BURNLEY LANCAHIRE**

Title: **DRAINAGE LAYOUT**

Size	Scale	Designed	Checked	Date
A1	A.S	IB	LS	MAR 23

Drawing Status: **PRELIMINARY**

Job Number	Originator	Zone	Level	Type	Role	Drawing No.	Rev
24030	PWA	00	XX	DR	C	1000	P01



## End of Report

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