

Pell Frischmann

Company Shop, Wentworth Way Industrial
Estate, Tankersley, Barnsley S75 3DH

DRAINAGE TECHNICAL NOTE

July 2024

This report is to be regarded as confidential to our Client and is intended for their use only and may not be assigned except in accordance with the contract. Consequently, and in accordance with current practice, any liability to any third party in respect of the whole or any part of its contents is hereby expressly excluded, except to the extent that the report has been assigned in accordance with the contract. Before the report or any part of it is reproduced or referred to in any document, circular or statement and before its contents or the contents of any part of it are disclosed orally to any third party, our written approval as to the form and context of such a publication or disclosure must be obtained.

Report Ref.		109353-PEF-HDG-XX-RP-C-0001				
File Path		C:\Users\JTrolan\OneDrive\Pell Frischmann Consultants\Heaton Planning - Documents\10109353 - Biffa Wentworth\01 - WIP\Documents\Drainage				
Rev	Suit	Description	Date	Originator	Checker	Approver
P01	S2	Draft for Client Review	30/04/24	C. Mason	C.Mason	M.Willis
P02	S2	Clients comments incorporated	02/05/24	J.Trolan	C.Mason	M.Willis
P04	S4	Final Issue	11/07/24	J.Trolan	C.Mason	M.Willis
Ref. reference. Rev revision. Suit suitability.						

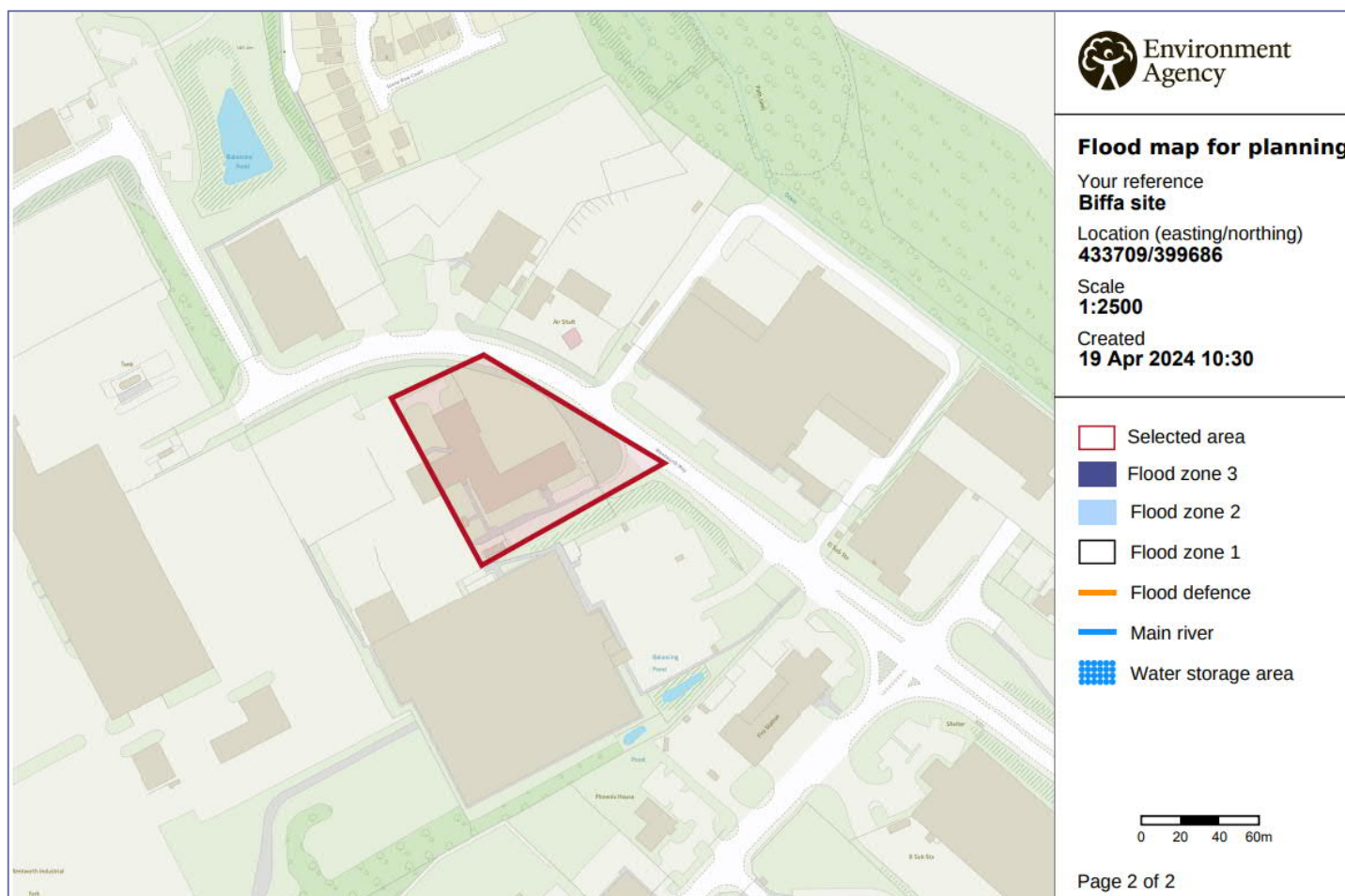
3 Flood Risk

According to Flood Risk Mapping for Planning provided by the EA, the site is located within Flood Zone 1. The classifications of flood zones can be seen in the table below:

Table 1 Flood Zones (EA Website)

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability 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 flood plain	This zone comprises land where water has to 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. (Not separately distinguished from Zone 3a on the Flood Map)

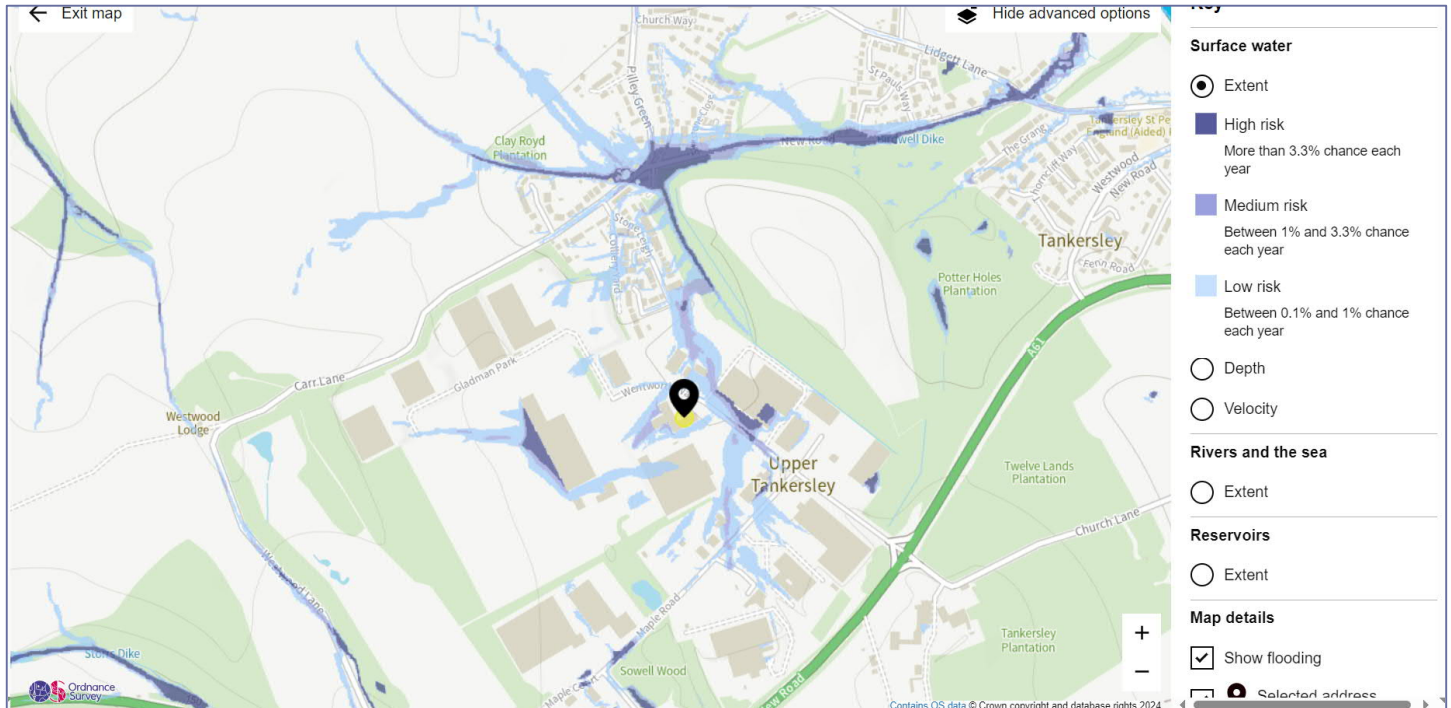
3.1 Fluvial Flood Risk



Environment Agency (EA) Data Review – Fluvial Flooding

3.2 Surface Water Flood Risk

Surface water flooding occurs where high rainfall events exceed the drainage capacity in an area (i.e. sewer system and/or watercourse), leading to flooding.



Environment Agency (EA) Data Review –Surface Water Flood Risk

An extract of the Environment Agency's (EA) Risk of Surface Water Flooding map is shown above. Whilst there is no evidence of surface water flooding on site, there are areas within proximity to the development shown to have a low risk of surface water flood risk. The flood risk drainage proposal below addresses this risk, and measures will be put in place to mitigate any additional surface water risk to the adjacent highway at Wentworth Road caused by the proposed development.

3.3 Groundwater Flooding

The Environment Agency's Area Susceptible to Groundwater Flooding national dataset, a coarse scale national mapping dataset, identifies the area as being within the Medium-High category of potential risk.

3.4 Sewer Flooding

Sewer flooding can occur due to sewer infrastructure failure or due to an increased flow and volume of water entering a sewer system which exceeds its hydraulic capacity, causing the system to surcharge. If sewer outfall points are either blocked or submerged due to high water levels, water can back up in a sewer system and cause flooding. These issues can result in water overflowing from gullies and manholes, causing flooding in the local area. Blockages caused by sediment or debris can further exacerbate the probability of sewer flooding on amenity grassland.

The development is proposed on a greenfield site however there is an existing private foul sewer shown to be located within the vicinity of the proposed car park and further investigation will be required in order to assess requirements of its diversion. There have been no historical incidents of sewer flooding within the site.

3.5 Artificial Sources

The Environment Agency's 'Maximum extent of flooding from reservoir' dataset indicates that the site is not at risk of reservoir flooding.

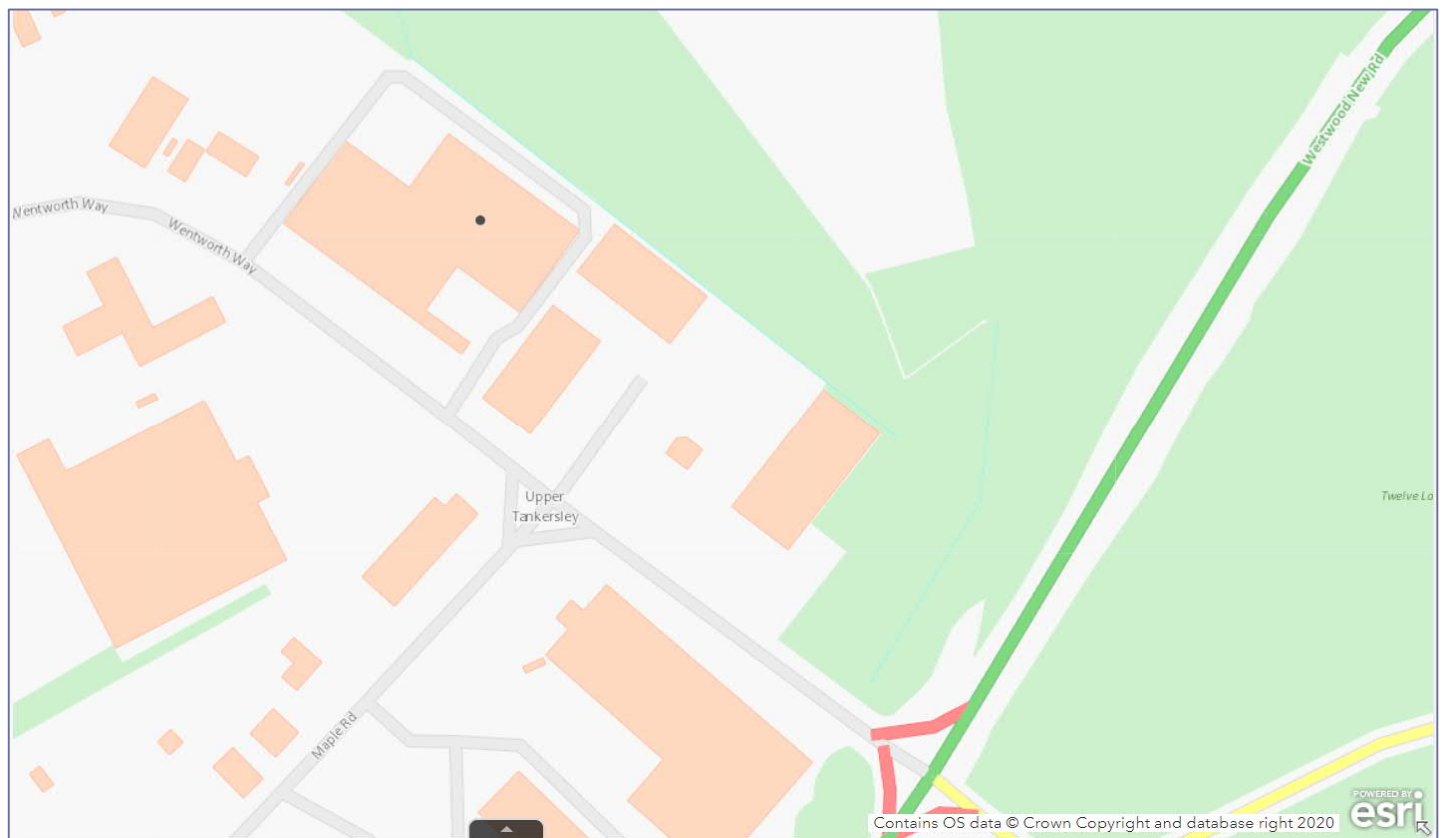
Table 2 Existing flood risk summary

Flood Sources	Flood Risk		
	Low	Medium	High
Fluvial	✓		
Pluvial	✓		
Groundwater		✓	
Sewers	✓		
Artificial	✓		

4 Drainage Proposals

4.1 Watercourses and Main River

There are no watercourses within close enough proximity to the development for this to be a viable option to dispose of the surface water from the development. There appears to be a section of ordinary watercourse/ditch behind buildings north of Wentworth Way. The nearest main river is approximately 1km to the South of the development area.



Environment Agency (EA)–Statutory Main river Map



Environment Agency (EA)—Statutory Main River Map

4.2 Proposed Layout

The proposed site layout has been developed to include open a storage feature for surface water runoff from the new proposed car park. Refer to Appendix A for proposed development layout and Appendix B for drainage strategy drawings.

4.2.1 Surface Water Discharge

In line with the Hierarchy of Drainage, if soakaway is not a viable option for drainage following testing, discharge into the existing surface water network will be restricted as close to Greenfield rates as practicably possible. The discharge rate from the proposed development will be 2l/s with 90m³ of above ground attenuation (Please refer to appendix C). The Greenfield rate for the development is less than 2l/s, however, in order to avoid siltation, it was decided that a restriction of no less than 2l/s should be considered in order to reduce the maintenance requirements for the flow control device.

Based on information obtained from BGS, it is likely that infiltration will be unsuitable due to high ground water levels and risk of other ground condition factors typical of made / cohesive ground. If a ground investigation finds that the water table is high, the above ground attenuation pond can be lined with impermeable material, prohibiting groundwater ingress occurring. There is also an option to allocate tanked permeable paving below car parking spaces should gaining the correct capacity become an issue following testing.

Before being released into the main network, the car park's discharge will be treated using a pond or permeable pavement that complies with the suds manual.

A boundary filter drain should also be considered for use along the boundary of the car park at Wentworth Road in order to contain any runoff from the site due to the level difference between the highway and the new proposed car parking area.

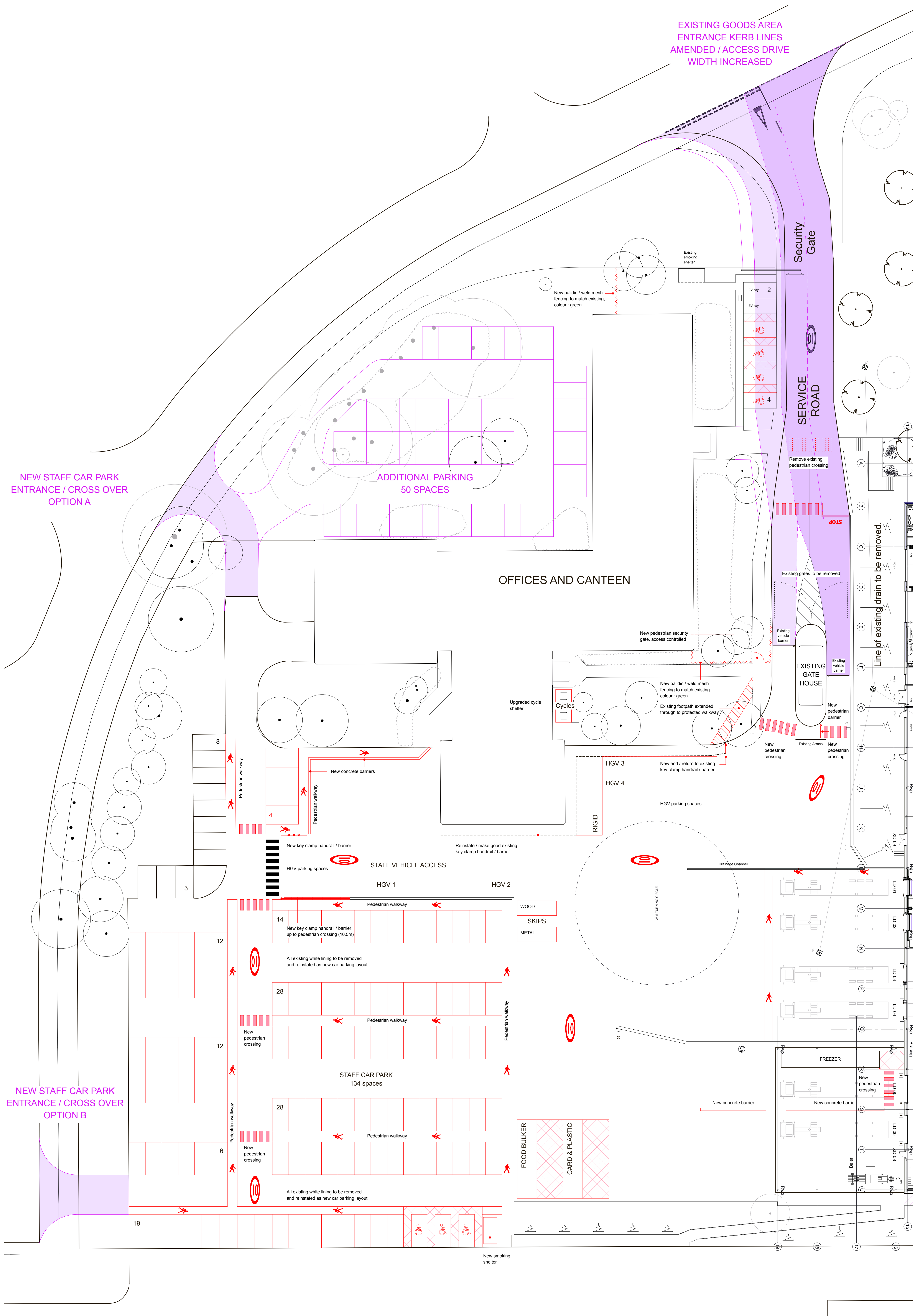
5 Conclusion

This assessment of flood risk information, undertaken within this report, has identified the following:

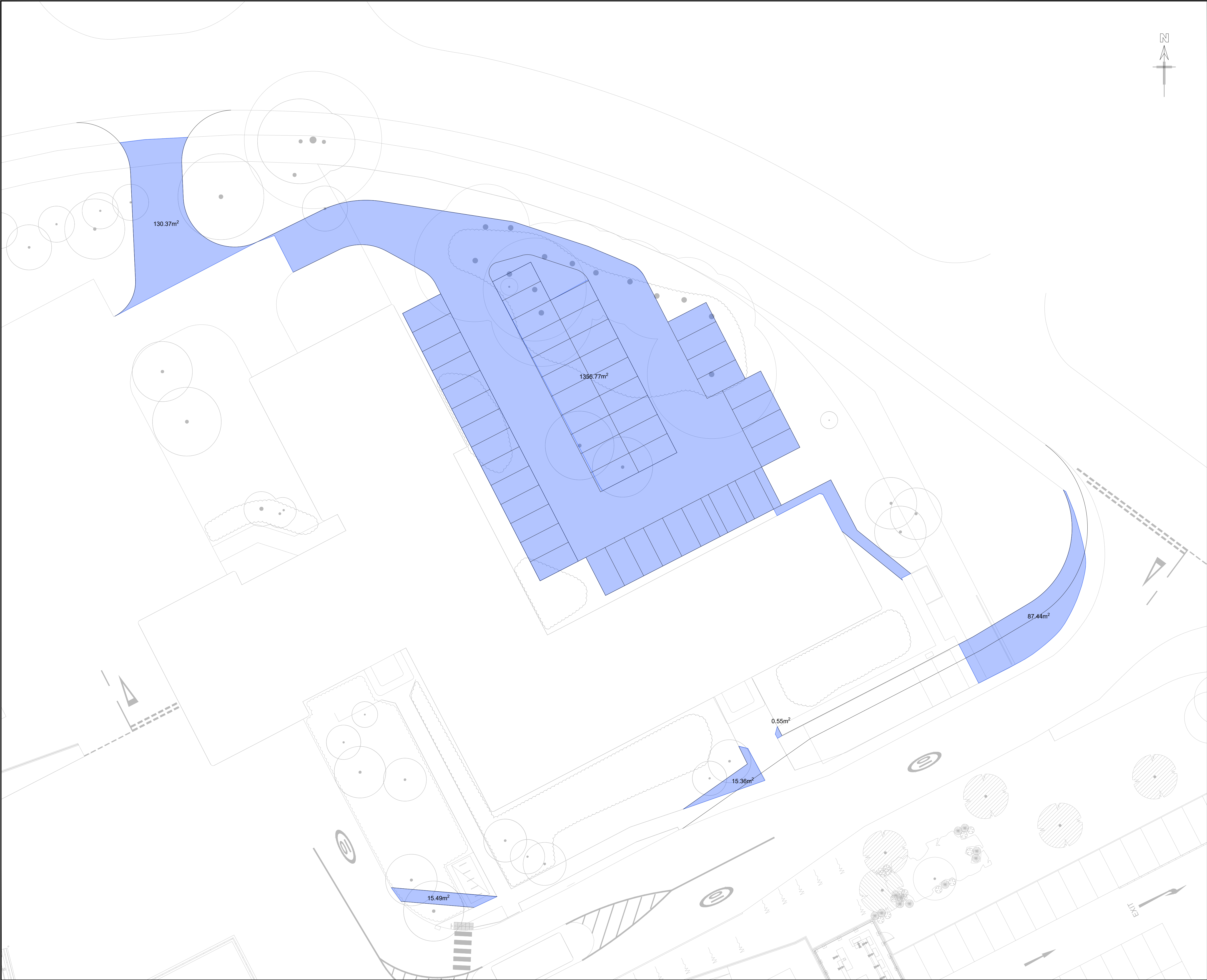
- The proposed development site is within Flood Zone 1.
- The development does not pose any additional flood risk to any land or neighbouring properties.
- The site is shown to be at medium to high risk of flooding from groundwater; it is therefore considered that soakaway will not be a viable option for surface water drainage disposal. This will be confirmed following further ground investigation.
- The development is classed as a 'low vulnerability' development and The Sequential Test and an Exceptional Tests are not required.

The site and proposed development are compatible with Planning Policy such as Barnsley Local Flood Risk Management Strategy 2017.

Appendix A - Proposed Development



Appendix B - Drainage Strategy Drawings



- GENERAL NOTES
- G1. DO NOT SCALE THIS DRAWING.
- G2. ANY DIMENSIONAL DISCREPANCIES SHOULD BE NOTIFIED TO THE ENGINEER IMMEDIATELY.
- G3. ALL DIMENSIONS ARE IN MILLIMETRES - (mm)
ALL LEVELS ARE IN METRES - (m) AND ARE ABOVE ORDNANCE DATUM AT NEWLYN, CORNWALL UNLESS NOTED OTHERWISE.
- G4. NORTH SHOWN INDICATIVE ONLY
- G5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT; SPECIFICATIONS; DRAWINGS; DETAILS AND OTHER DESIGN INFORMATION.
- G6. ALL DRAWINGS AND WRITTEN MATERIAL CONTAINED WITHIN, CONSTITUTE ORIGINAL AND UNPUBLISHED WORK OF THE ENGINEER AND MAY NOT BE DUPLICATED, USED, REPRODUCED OR DISCLOSED WITHOUT WRITTEN CONSENT OR EXPRESS PERMISSION FROM THE ENGINEER.
- G7. ALL INFORMATION CONTAINED IN THIS DOCUMENT IS COPYRIGHT ©
- G8. WHERE THE CONTRACTOR UNDERTAKES OR ENGAGES A THIRD PARTY TO UNDERTAKE TEMPORARY WORKS DESIGN, OR VARIES THE PELL FRISCHMANN DESIGN IN ANY WAY, THEN THE CONTRACTOR WILL TAKE FULL RESPONSIBILITY AND LIABILITY FOR ALL DESIGN ASPECTS, INCLUDING A DESIGN RISK ASSESSMENT. THE CONTRACTOR SHALL INFORM PELL FRISCHMANN OF ANY PROPOSED VARIANCES TO THE DESIGN.

KEY

PROPOSED IMPERMEABLE AREAS
(TOTAL = 1604.98m²)

P01	FIRST ISSUE	JT	CM	MW	24.04.24
REV	DESCRIPTION	DRN	CHK	APP	DATE

Pell Frischmann
4th FLOOR, ONE ST JAMES SQUARE, MANCHESTER, M2 6DN
Telephone +44 (0)161 826 9400
Email: pfmanchester@pellfrischmann.com
www.pellfrischmann.com

Architect/Client/Contractor

Project

**BIFFA
WENTWORTH**

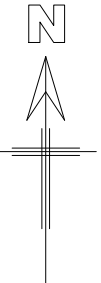
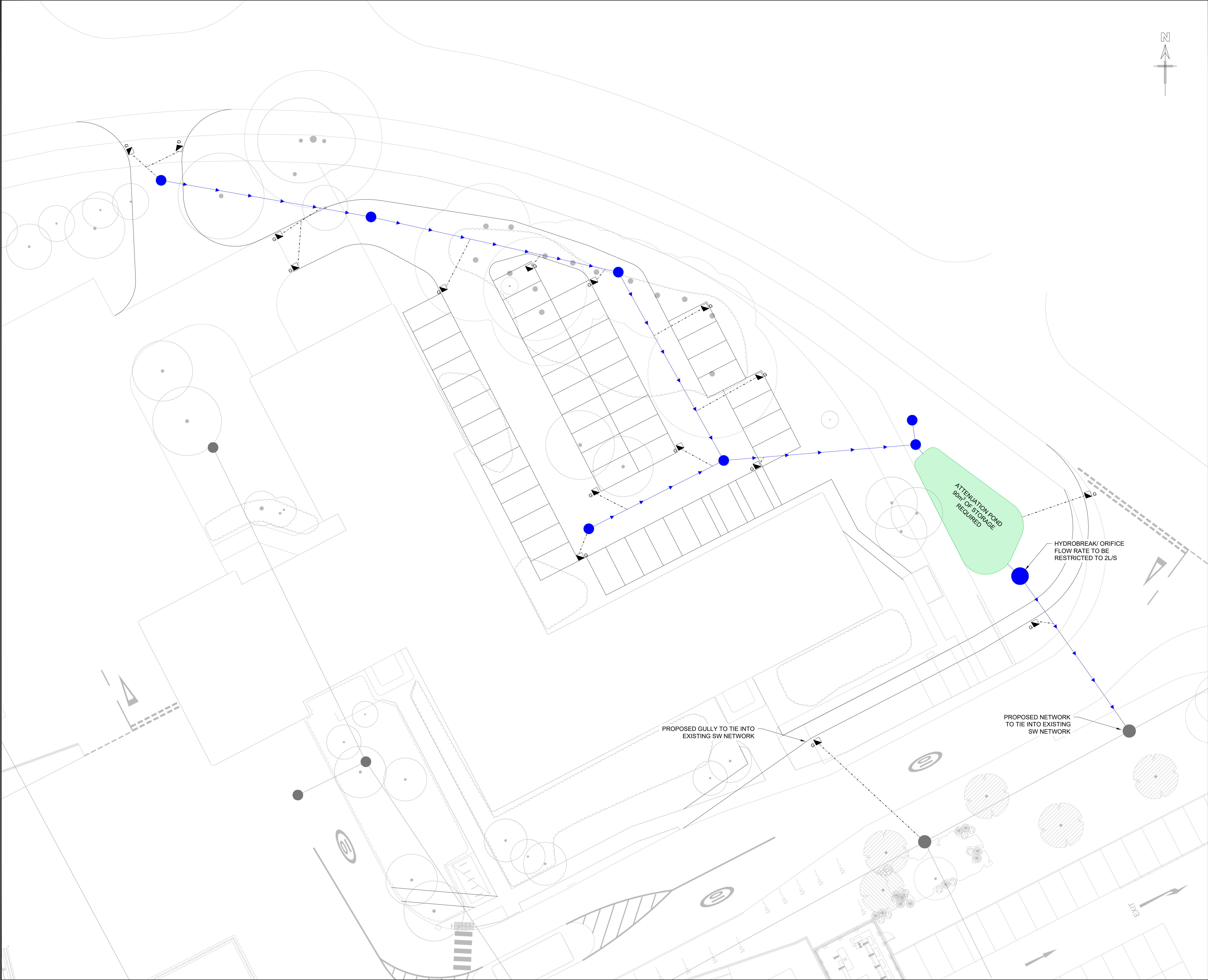
Drawing Title

**PROPOSED IMPERMEABLE
AREAS**

Drawing Status				
WORK IN PROGRESS				
Drawn	Name	Date	Status Code	S0
Designed	J.TROLAN	23.04.24	Scale	1:200 (m)
Eng Chk	C.MASON	23.04.24	Revision	P01
Approved	M.WILLIS	24.04.24		

Drawing No.

109353 - PEF - HDG - XX - DR - C - 00001



- GENERAL NOTES
- G1. DO NOT SCALE THIS DRAWING.
- G2. ANY DIMENSIONAL DISCREPANCIES SHOULD BE NOTIFIED TO THE ENGINEER IMMEDIATELY.
- G3. ALL DIMENSIONS ARE IN MILLIMETRES - (mm)
ALL LEVELS ARE IN METRES - (m) AND ARE ABOVE ORDNANCE DATUM AT NEWLYN, CORNWALL UNLESS NOTED OTHERWISE.
- G4. NORTH SHOWN INDICATIVE ONLY
- G5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT; SPECIFICATIONS; DRAWINGS; DETAILS AND OTHER DESIGN INFORMATION.
- G6. ALL DRAWINGS AND WRITTEN MATERIAL CONTAINED WITHIN, CONSTITUTE ORIGINAL AND UNPUBLISHED WORK OF THE ENGINEER AND MAY NOT BE DUPLICATED, USED, REPRODUCED OR DISCLOSED WITHOUT WRITTEN CONSENT OR EXPRESS PERMISSION FROM THE ENGINEER.
- G7. ALL INFORMATION CONTAINED IN THIS DOCUMENT IS COPYRIGHT ©
- G8. WHERE THE CONTRACTOR UNDERTAKES OR ENGAGES A THIRD PARTY TO UNDERTAKE TEMPORARY WORKS DESIGN, OR VARIES THE PELL FRISCHMANN DESIGN IN ANY WAY, THEN THE CONTRACTOR WILL TAKE FULL RESPONSIBILITY AND LIABILITY FOR ALL DESIGN ASPECTS, INCLUDING A DESIGN RISK ASSESSMENT. THE CONTRACTOR SHALL INFORM PELL FRISCHMANN OF ANY PROPOSED VARIANCES TO THE DESIGN.

- KEY
- EXISTING SURFACE WATER NETWORK
 - PROPOSED SURFACE WATER NETWORK
 - GULLY CONNECTION WITH 1500 CONNECTIONS SHOWN INDICATIVELY DUE TO LACK OF TOPOGRAPHICAL SURVEY INFORMATION. LOCATION TO BE SHOWN AS PART OF DETAILED DESIGN
 - PROPOSED ATTENUATION POND

P01	FIRST ISSUE	JT	CM	MW	24.04.24
REV	DESCRIPTION	DRN	CHK	APP	DATE

Pell Frischmann
4th FLOOR, ONE ST JAMES SQUARE, MANCHESTER, M2 6DN
Telephone +44 (0)161 826 9400
Email: pfmanchester@pellfrischmann.com
www.pellfrischmann.com

Architect/Client/Contractor

Project

**BIFFA
WENTWORTH**

Drawing Title

**DRAINAGE STRATEGY
OPTION**

Drawing Status				
WORK IN PROGRESS				
Drawn	Name	Date	Status Code	S0
Designed	J.TROLAN	23.04.24	Scale	1:200 (m)
Eng Chk	C.MASON	23.04.24	Revision	P01
Approved	M.WILLIS	24.04.24		

Drawing No.

109353 - PEF - HDG - XX - DR - C - 00002

Appendix C Quick Storage Estimate & Greenfield run-off Calculations

Calculated by:	Claire Mason
Site name:	Biffa Wentworth
Site location:	Yorkshire

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	53.49280° N
Longitude:	1.49315° W
Reference:	437559456
Date:	Apr 23 2024 13:42

Site characteristics

Total site area (ha):	0.13
Significant public open space (ha):	0
Area positively drained (ha):	0.13
Impermeable area (ha):	0.13
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.13
Net impermeable area for storage volume design (ha):	0.13
Pervious area contribution to runoff (%):	30

Methodology

esti	IH124
Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	70
Rainfall 100 yrs 12 hrs:	--	93.24
FEH / FSR conversion factor:	1.11	1.11
SAAR (mm):	736	736
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydrological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 10 year:	1.45	1.45
Growth curve factor 30 year:	1.75	1.75

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.4	Growth curve factor 100 years:	2.08	2.08
Urban creep allowance factor:	1.1	Q _{BAR} for total site area (l/s):	0.25	0.25
Volume control approach	Use long term storage	Q _{BAR} for net site area (l/s):	0.25	0.25
Interception rainfall depth (mm):	5			
Minimum flow rate (l/s):	2			

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	90	90
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	90	90

This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.