

**UNITS 6 AND 10, BARTON
PARK, EASTLEIGH**

DRAINAGE STRATEGY

JOB No: 27270

REPORT PREPARED BY: M. CHUNG

DATE: FEBRUARY 2024

REV: 1

CONTENTS

1	INTRODUCTION	3
2	SOURCES OF INFORMATION	4
3	SITE DESCRIPTION	5
3.1	Site Location	5
3.2	Existing Site	6
3.3	Topography	8
3.4	Site Drainage	8
3.5	Hydrology	9
4	PROPOSALS	10
5	FLOOD RISKS	11
5.1	Fluvial and Tidal	11
5.2	Surface Water	11
5.3	Reservoir Flooding	11
6	SURFACE WATER RUN OFF	13
6.1	Comparison of impermeable Areas	13
6.2	SUDS Hierarchy	13
6.3	SUDS Choice	13
6.4	Allowable Discharge Rate	13
6.5	Qbar Calculation	13
6.6	Sizing of Attenuation Tank	13
7	PROPOSED DRAINAGE SOLUTION	16
7.1	SUDS Pollution Hazard and Mitigation Index Calculations	16
7.2	Eastleigh Borough Local Plan Policy DM6	17
7.3	SUDS Maintenance Schedule	17
7.4	Indicative Proposed Drainage Plan	17
8	CONCLUSIONS	18
9	APPENDIX A – NPPF CHECKLIST	19

1 INTRODUCTION

- 1.1.1 This Drainage Strategy has been prepared by Hurst Peirce and Malcolm LLP on behalf of JLL.
- 1.1.2 The site is located in Eastleigh, to the east of Eastleigh Railway Station.
- 1.1.3 The Drainage Strategy is required as part of the planning process to consider SUDS solution for the site. The Drainage Strategy is produced in line with the National Planning Policy Framework (NPPF) and Technical Note. The format of the Drainage Strategy follows the requirements of NPPF Technical Note, which identifies the criteria that a Drainage Strategy has to satisfy.
- 1.1.4 The purpose of the Drainage Strategy is also to assess the flood risks associated with the site by looking at various sources of flooding and to look at the drainage run-off rates from the site.
- 1.1.5 To make sure that this report complies with the requirements in NPPF, a checklist of the criteria is included in Appendix A.

2 SOURCES OF INFORMATION

2.1.1 The sources of information below have been used in the preparation of the Drainage Strategy.

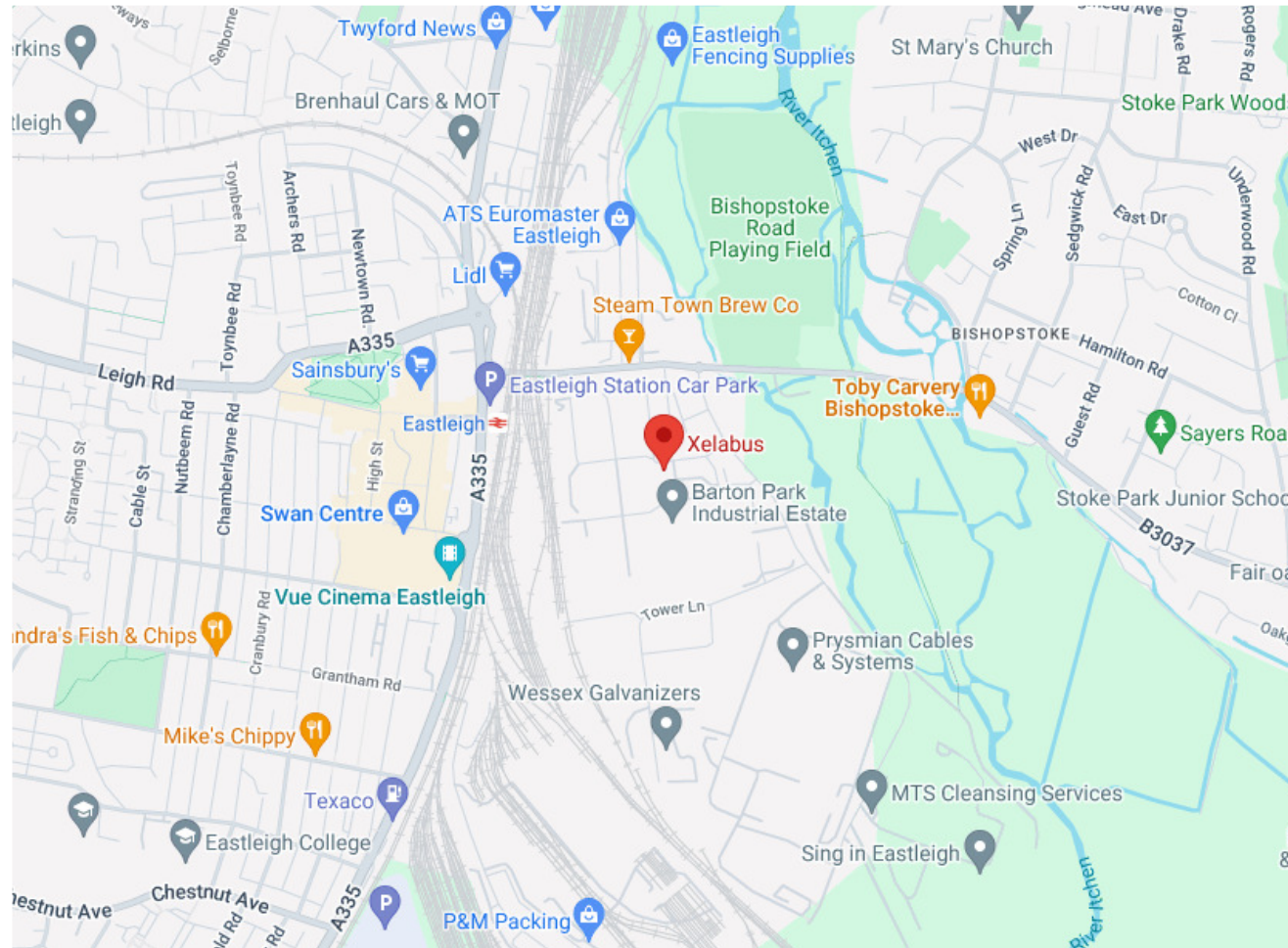
- (a) Satellite views of the site (Google maps) – Allow the site to be put into context in relation to its surrounding.
- (b) Existing site plan.
- (c) Proposed site plan.
- (d) Gov.uk Flood Map – Allows the site to be categorised in relation to its fluvial and coastal flood exposure.
- (e) National Planning Policy Framework (NPPF) and Technical Note

3 SITE DESCRIPTION

3.1 Site Location

3.1.1 The site is located just to the east of Eastleigh Train Station.

3.1.2 Site Location



3.1.3 The overall site is an industrial estate. Units 6 and 10 are two of the industrial units, used as warehouses.

3.1.4 The planning application site area is the footprint of Units 6 and 10 and partially the footprint of the adjacent unit. The sizes of the site and components are as follows:

- (a) Unit 6 = 0.563 Hectare
- (b) Unit 10 and included area of adjacent unit = 0.339 Hectare
- (c) Total planning application area size = 0.902 Hectare

3.1.5 Satellite View



3.2 Existing Site

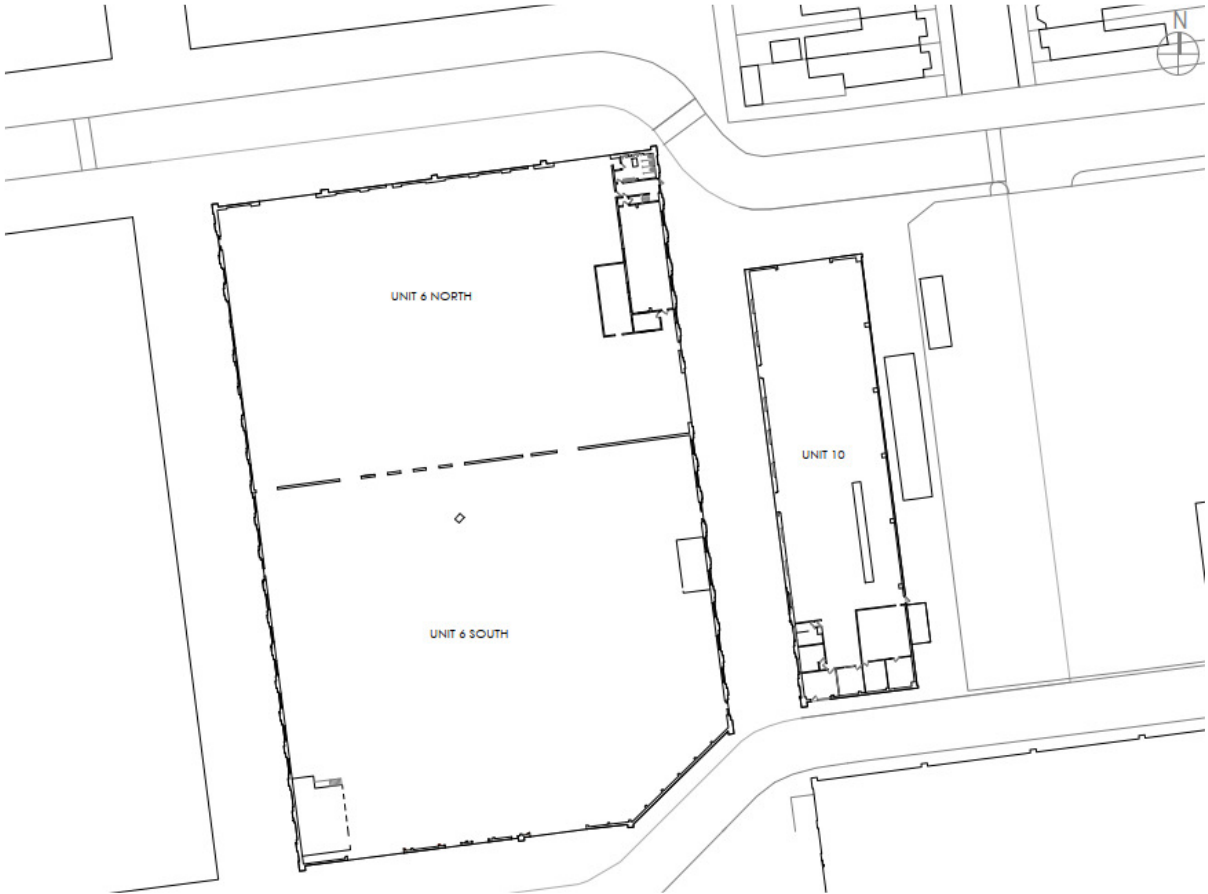
3.2.1 The existing site is used as warehouse buildings.

3.2.2 Site Photos are shown below.





3.2.3 Existing Site Plan and Location Plan (site shown in RED)





3.3 Topography

3.3.1 The site is generally flat around Unit 6. Unit 10 sits lower by around 200mm.

3.4 Site Drainage

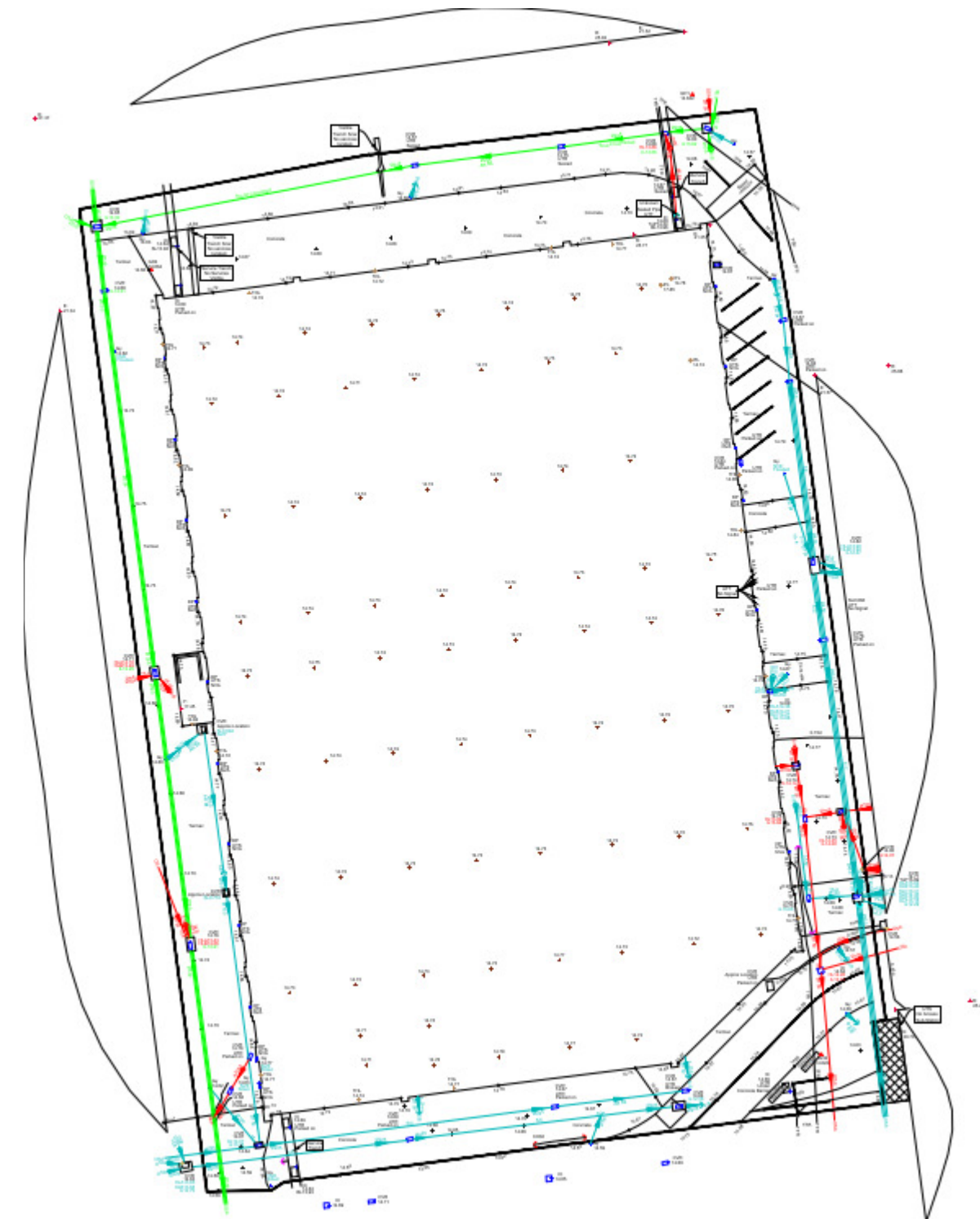
3.4.1 The drainage from the roof of Unit 6 is believed to connect to the existing sewers around the site. The buried services scan indicates the presence of the following sewers around Unit 6:

- (a) 225mm dia. combined drain to the north of Unit 6;
- (b) 300mm dia. combined drain to the west of Unit 6;
- (c) 450mm dia. surface water drain to the east of Unit 6;

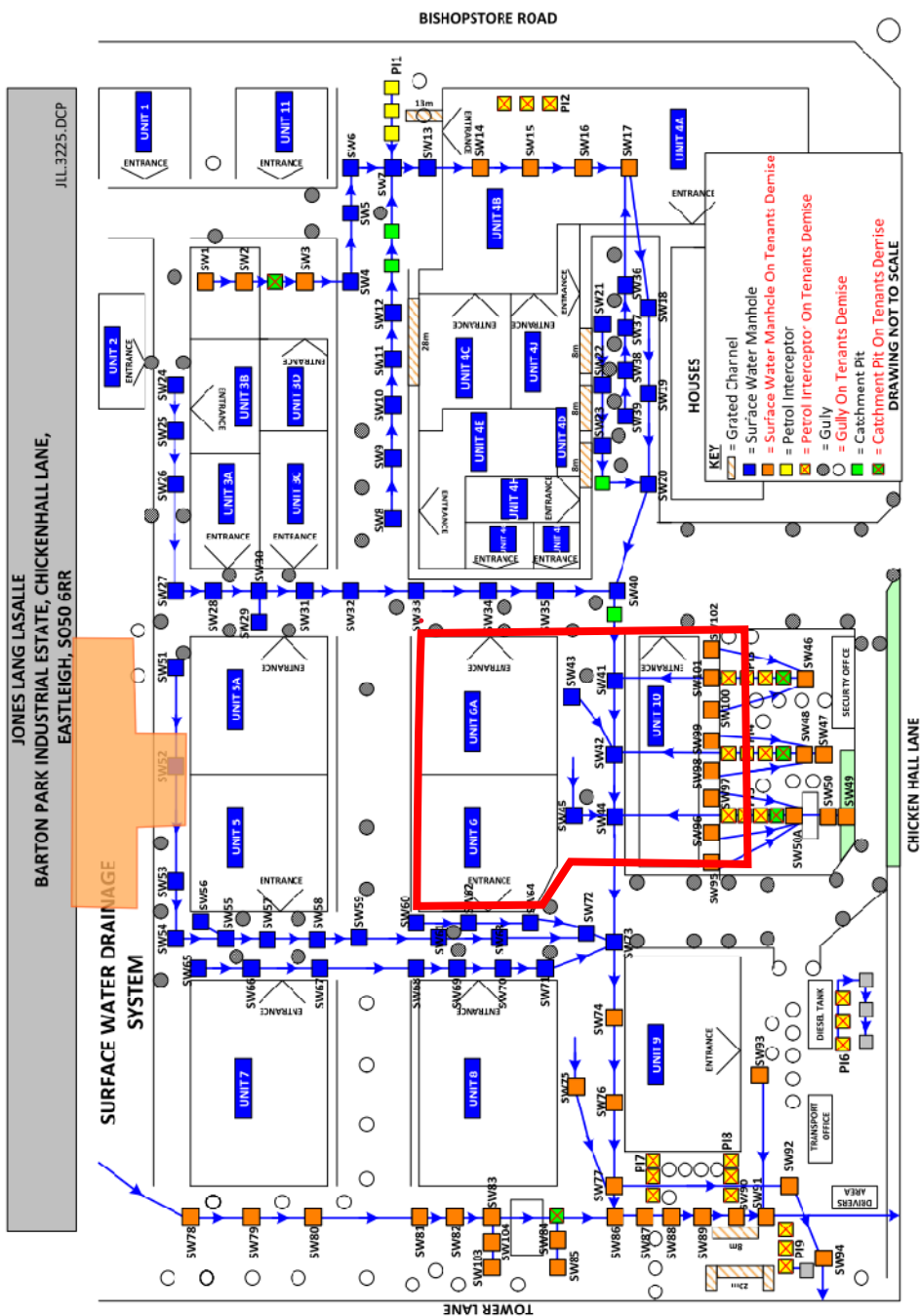
(d) 2x 225mm dia. surface water drain to the south of Unit 6.

3.4.2 The drainage from the roof and yards of Unit 10 is believed to discharge to the main drainage runs located between Units 6 and 10.

3.4.3 Below is a copy of the buried services scan showing these sewers. Also shown in RED is the foul drainage.



3.4.4 Existing surface water drainage for the estate, with the site highlighted roughly in RED (note: plan is not to scale). The surface water drainage is shown as leaving the site towards Chicken Hall Lane (to the east of the site) and towards Tower Lane (to the south of the site).

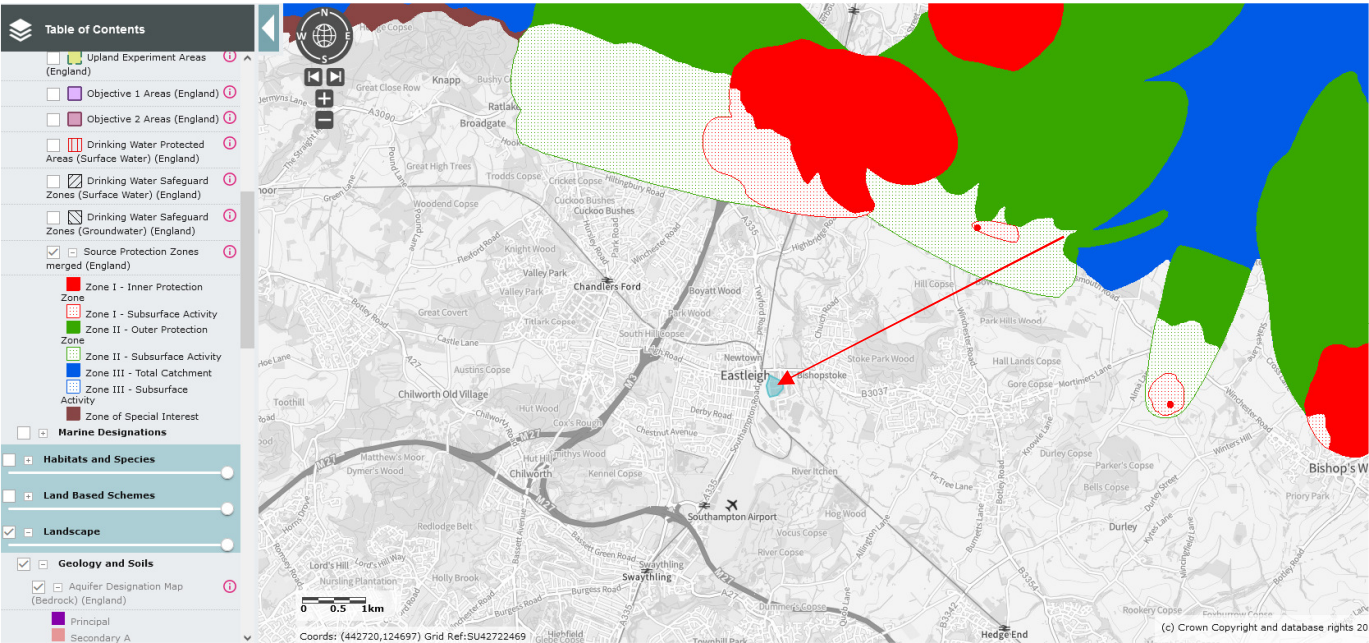


3.5 Hydrology

3.5.1 The nearest surface water is River Itchen, located 250 m north east, at its closest point, designated as a Site of Special Scientific Interest. The Superficial deposits are Secondary (Undifferentiated) Aquifers. The bedrock is Secondary (A) Aquifer. Groundwater flow direction is likely to be towards the north east, in the direction of River Itchen.

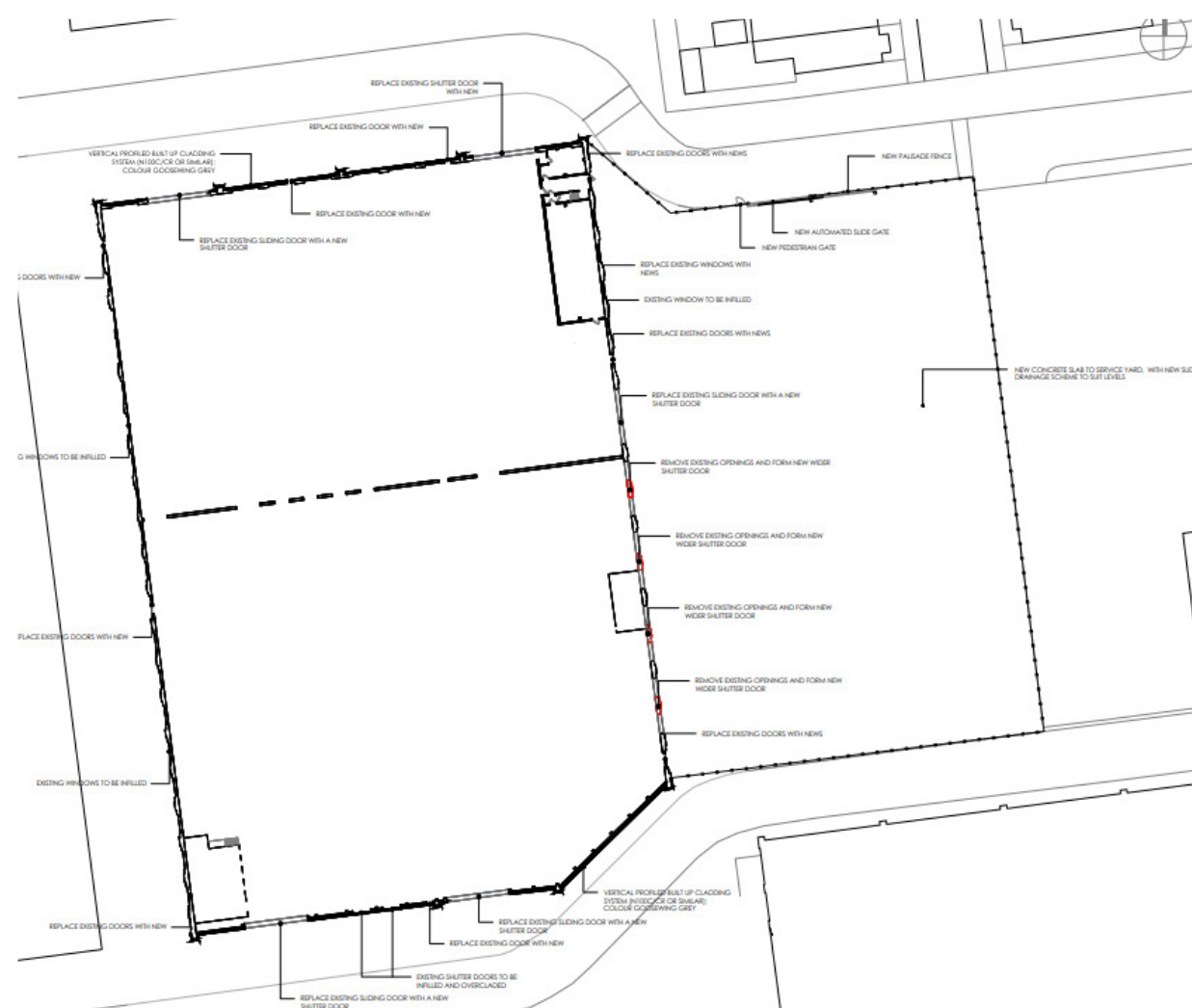
3.5.2 The site is not located within a groundwater Source Protection Zone (SPZ) for public water.

Groundwater Source Protection Zones



4 PROPOSALS

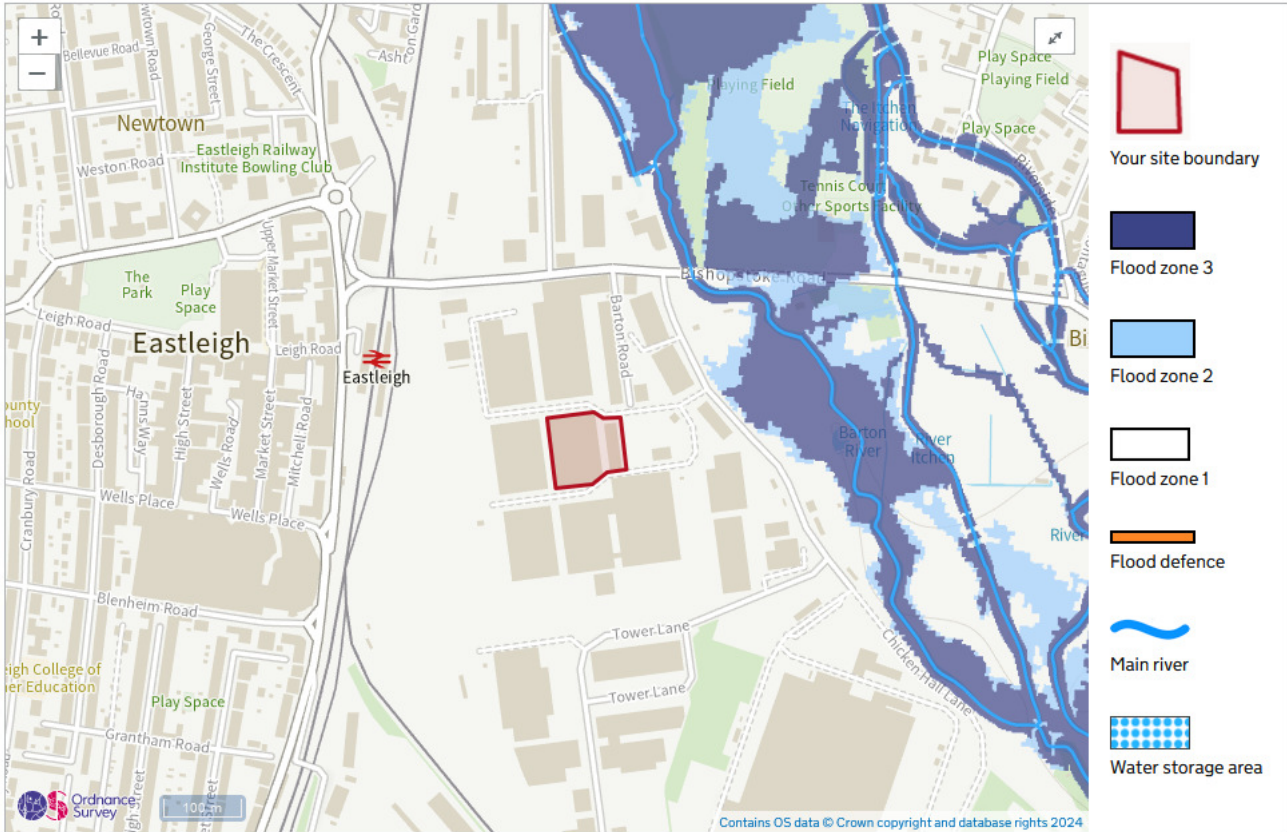
- 4.1.1 It is proposed to demolish Unit 10 and to install a new external service yard within the footprint of the Unit 10 site and partially within the footprint of the adjacent unit.
- 4.1.2 Proposed works.



5 FLOOD RISKS

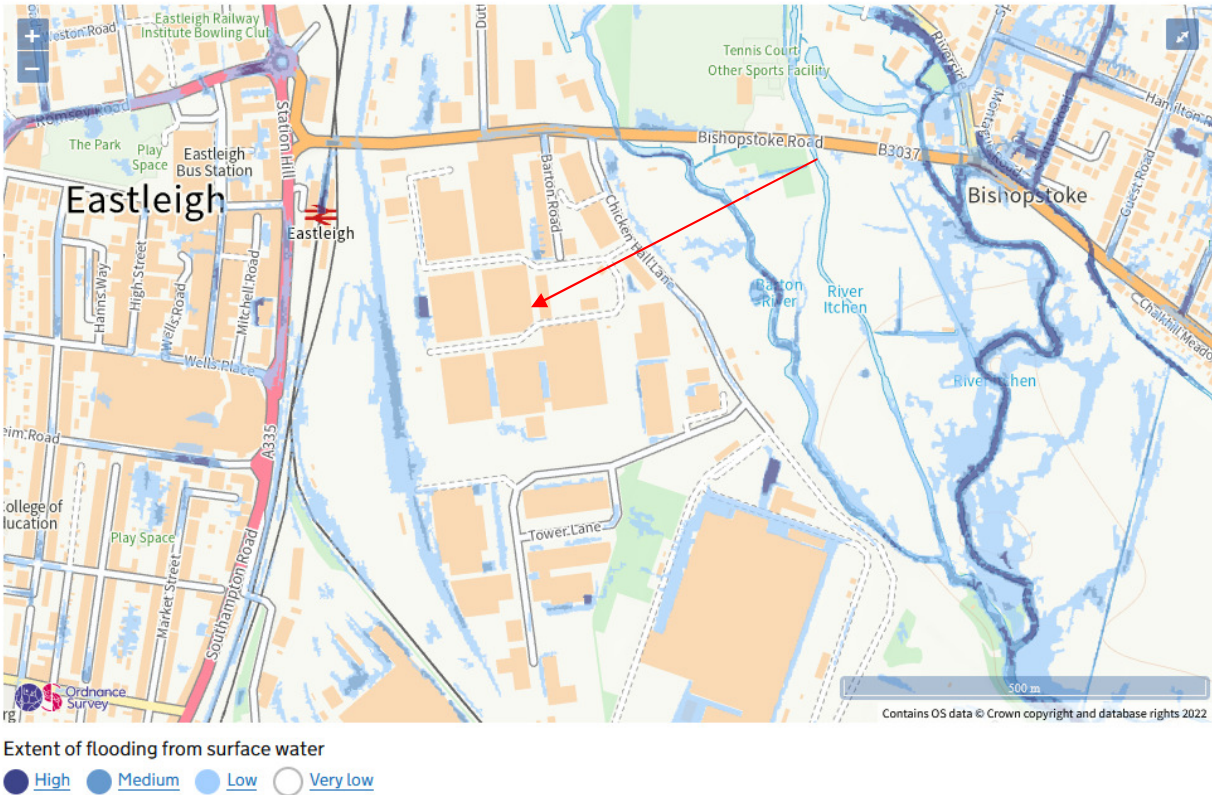
5.1 Fluvial and Tidal

- 5.1.1 The Gov.uk online mapping system identifies the site as being in a Flood Zone 1, i.e. outside zones with a 1 in 1000 or greater annual probability of river or sea flooding. The risk of fluvial and tidal flooding to the site is therefore low.
- 5.1.2 Gov.uk Flood Map



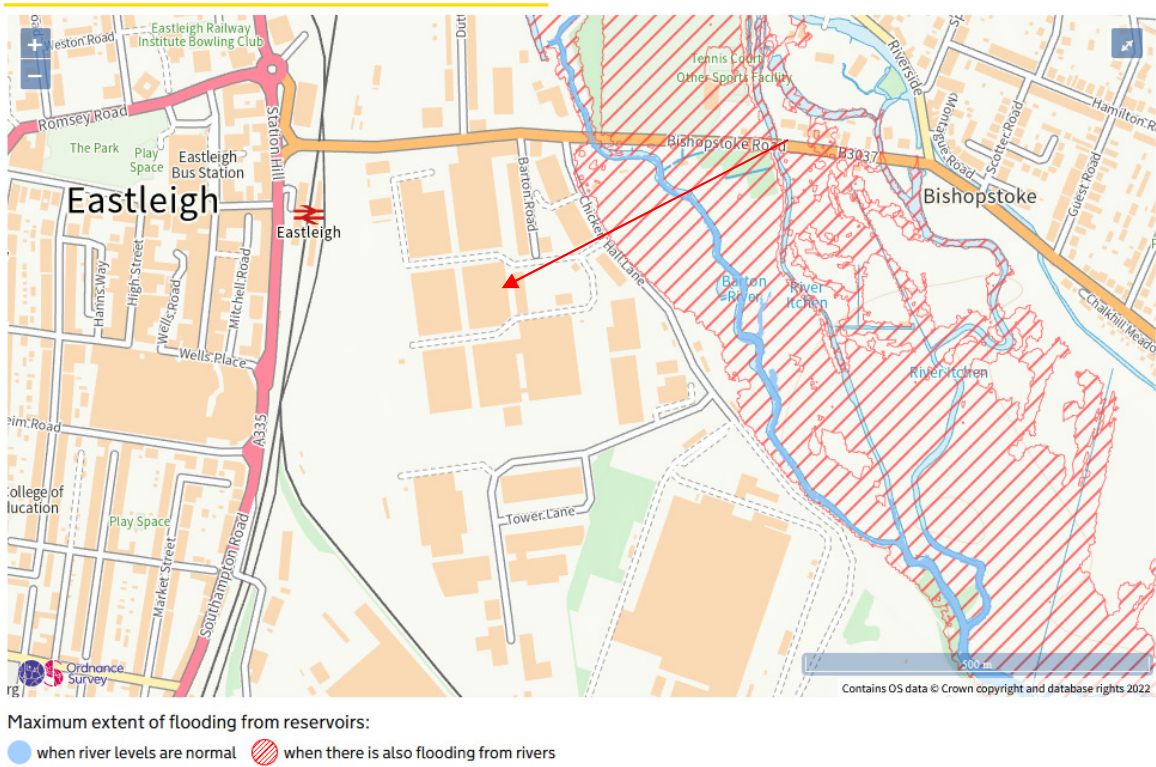
5.2 Surface Water

- 5.2.1 During periods of prolonged rainfall events and sudden intense downpours, overland flow from adjacent higher ground may 'pond' in low-lying areas of land without draining into watercourses, surface water drainage systems or the ground. Surface water flooding is most likely to occur in areas of poor permeability and limited drainage.
- 5.2.2 The Gov.uk map shows that the site is at a very low risk of surface water flooding:
- 5.2.3 Extracts of Gov.uk Map



5.3 Reservoir Flooding

- 5.3.1 The information from Gov.uk indicates that the site is outside the maximum extent of flooding from reservoirs. Extract of map below:



5.3.2 Therefore, the risk of reservoir flooding to the site is low.

6 SURFACE WATER RUN OFF

6.1 Comparison of impermeable Areas

6.1.1 The existing site is made up of the following:

- (a) Impermeable area = 9,020m2
- (b) Permeable area = nil
- (c) Total of impermeable and permeable areas = 9,020m2

6.2 SUDS Hierarchy

6.2.1 The SUDS Hierarchy has been considered and commented upon in the table below:

Most Sustainable	SUDS Technique	Examples	Comments
	Living Roofs		The existing roof structure is a lightweight structure that is not able to support additional loading
	Basins and Ponds	-Constructed Wetlands -Balancing Ponds -Detention Basins -Retention Ponds	Insufficient space within the site
	Filter Strips and Swales		Insufficient space within the site
	Infiltration Devices	-Soakaways -Infiltration trenches and basins	The ground is generally of clay, which is not suitable for infiltration
	Permeable surfaces and filter drains	-Gravelled areas -Solid Paving Blocks -Porous paviers	As above
Least Sustainable	Tanked systems	-Oversized pipes/tanks -Storm cells	Attenuation tanks are suitable and will be proposed.

6.3 SUDS Choice

6.3.1 As the other SUDS solutions in the SUDS Hierarchy are not suitable for this site, it is proposed to have an attenuation tank in the ground in order to limit the discharge from the site.

6.4 Allowable Discharge Rate

- 6.4.1 The impermeable area of 9,020m2 currently drains to the surface water drainage system. Of this area, the retained building (Unit 6) occupies an area of 5,630m2 and the new service yard area will be 3,390m2.
- 6.4.2 It is proposed to reduce the discharge from the new service yard area to greenfield run-off (i.e. Qbar) through the use of attenuation. The drainage from the retained building will be left untouched.

6.5 Qbar Calculation

- 6.5.1 Qbar has been calculated using ICP SUDS / IH 124 method in Infodrainage.
- 6.5.2 A copy of printout is on the next page. Qbar is 0.7L/s.

6.6 Sizing of Attenuation Tank

- 6.6.1 The size of the tank has been calculated using FSR rainfall data and using Infodrainage. The calculation below shows that for an area of 3,390m2, an allowable discharge rate of 0.7L/s and an allowance for rainfall of 1 in 100 years + 40% climate change, an attenuation tank size of 323m3 will be required.
- 6.6.2 Below is a copy of the calculations.

27270: Barton Park Eastleigh (REV02)		Date: 22/01/2024		
		Designed by:	Checked by:	
		VT	FT	
Report Title: UK and Ireland Rural Runoff Calculator		Company Address:		

ICP SUDS / IH 124					
Details					
Method		ICP SUDS			
Area (ha)		0.339			
SAAR (mm)		800.0			
Soil		0.3			
Region		Region 7			
Urban		0			
Return Period (years)		0			
Results					
Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	0.7	0.7	0.6	1.6	2.3

Qbar calculation

27270 Barton Park Eastleigh (REV02)	Date: 22/01/2024	Designed by: VT		Checked by: FT	Approved by:
Report Details: Type: Inflows Storm Phase: Phase		Company Address:			



 Catchment Area

Type : Catchment Area

Area (ha)0.339

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

27270 Barton Park Eastleigh (REV02)	Date: 22/01/2024	Designed by: VT		Checked by: FT	Approved by:
Report Title: Rainfall Analysis Criteria		Company Address:			



Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall	
FSR	Type: FSR
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.350
Summer	☒
Winter	☒

Return Period	
Return Period (years)	Increase Rainfall (%)
100.0	40.000

Storm Durations	
Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

27270 Barton Park Eastleigh (REV02)		Date: 22/01/2024		I DRN
		Designed by:	Checked by:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		VT	FT	
Company Address:				



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
Max. Outflow

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FSR: 100 years: +40 %: 1440 mins: Winter	99.999	99.999	0.934	0.934	10.6	322.296	0.000	0.000	0.7	94.934	0.057	OK

7 PROPOSED DRAINAGE SOLUTION

7.1 SUDS Pollution Hazard and Mitigation Index Calculations

7.1.1 In reference to the Ciria SUDS Manual Table 26.2, the site falls within the ‘High’ Pollution Hazard level.

7.1.2 A copy of Table 26.2 is shown below.

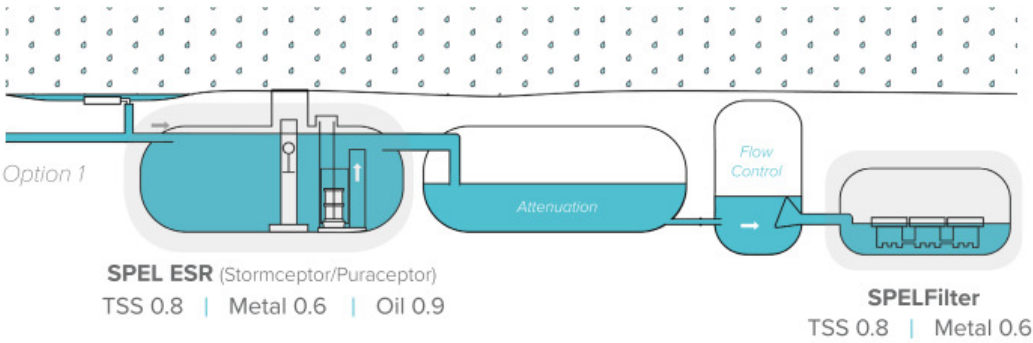
TABLE 26.2 Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

7.1.3 In reference to Table 26.3 of the same document (extracted below), a suitable proprietary treatment will be used as the other types of components will not work on this site.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters			
Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ⁵	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

7.1.4 In this case, a proprietary system consisting of a Spel Full Retention Separator and a Spel Filter will be used to achieve the required Mitigation Indices, as shown below extracted from the Spel SUDS Guide:

High Mitigation Index = TSS 0.8 | Metal 0.8 | Oil 0.9

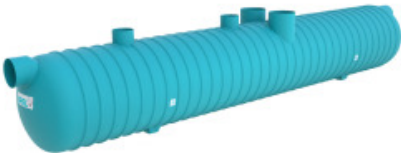


SPEL ESR + 50% of SPELFilter = TSS 1.0 | Metal 1.0 | Oil 0.9

SPEL ESR Puraceptor

Awaiting certification

	Product Certified Mitigation Index	Covers Low Risk Pollution Index	Covers Medium Risk Pollution Index	Covers High Risk Pollution Index
TSS	0.8	0.5 ✓	0.7 ✓	0.8 ✓
Metals	0.6	0.4 ✓	0.6 ✓	0.8 ✗
Hydrocarbon	0.9	0.4 ✓	0.7 ✓	0.9 ✓



SPELFilter

This product is not a primary hydrocarbon treatment system

	Product Certified Mitigation Index	Covers Low Risk Pollution Index	Covers Medium Risk Pollution Index	Covers High Risk Pollution Index
TSS	0.9	0.5 ✓	0.7 ✓	0.8 ✓
Metals*	0.8	0.4 ✓	0.6 ✓	0.8 ✓
Hydrocarbon	n/a	0.4 ✗	0.7 ✗	0.9 ✗

*Includes dissolved metals



7.3 SUDS Maintenance Schedule

- 7.3.1 The following maintenance schedule will apply:
- 7.3.2 Pipework – Inspect all pipework for silt accumulation and high pressure jet any pipe work which has silt accumulation. Care must be taken that any silts within the pipework are not flushed into the attenuation tank (use of bungs and jet-vac of chamber prior to removal of bungs). This is to be undertaken twice yearly or as required based on first inspection / clean.
- 7.3.3 Silt Traps – Remove litter and debris from all sump units (gullies, channel drains and silt traps) and manholes. This is to be undertaken six monthly (spring, start of winter), or as required.
- 7.3.4 Attenuation Tank - Ensure that ventilation pipework is free from obstructions and blockages. If jetting through the attenuation tank is required, this must be done following jet vac clearance of silt traps. This is to be undertaken six monthly or as required.
- 7.3.5 Pumps – The pumps will be alarmed, so in the event of failure, there will be a notification on the control panel. Pumps need to be serviced in line with the manufacturer’s recommendations, which is normally once a year.
- 7.3.6 Petrol Interceptor - Oil/petrol interceptor maintenance should be conducted by experienced personnel at least every 6 months. Usually an interceptor service will not be necessary every 6 months and an interceptor inspection will be sufficient to fulfil this requirement.
- 7.3.7 Spel Filter – The filters need to be inspected every 4 months. The lifespan of the cartridges is in excess of 5 years.

7.4 Indicative Proposed Drainage Plan

- 7.4.1 In Appendix B is an indicative proposed drainage plan.

7.2 Eastleigh Borough Local Plan Policy DM6

- 7.2.1 The Eastleigh Borough Local Plan Policy DM6 specifies requirements for development areas. There are specific criteria for planning application areas that exceed 10 dwellings or 0.5 Hectare and are within the Itchen or Hamble catchment. River Itchen is some 250m north east from the site and whilst this is remote from the site, it is possible that the sewers serving the site will eventually discharge to the river. As the size of the site is 0.902 Hectare, it is proposed to implement a number of the requirements:
- (a) Implementation of a SUDS scheme – The SUDS Hierarchy indicates that the only viable SUDS option is to have an attenuation tank, which will be part of the proposed solution.
- (b) On site Filtration – it is proposed to have three on-site filtration system types. Firstly, there will be silt traps in the manholes to catch silt before the drainage flow enters the attenuation tank. Secondly, there will be full retention separators that will catch oil and fuel spillages before discharge to the existing surface water system. Thirdly the filter system supplied by Spel will be used.

8 CONCLUSIONS

- 8.1.1 The site measures 0.902 Hectares in size and is used as warehouses.
- 8.1.2 The site is within the Flood Zone 1 with less than a 1 in 1000 annual probability of river or sea flooding and the risk of flooding from surface water is very low.
- 8.1.3 The proposed works will involve the demolition of one of the two buildings and the construction of a service yard in the footprint of the demolished building.
- 8.1.4 The proposed SUDS solution is to have an attenuation tank of 323m³ to limit the surface water discharge from the new service yard to Qbar, the mean annual greenfield peak flow. The drainage from the retained building will be unchanged.
- 8.1.5 Specialist filters will be used to maintain the quality of the surface water discharge.

9 APPENDIX A – NPPF CHECKLIST

9.1.1

The list below provides an easy cross-reference between the NPPF Practice Guide Pro-form and this Drainage Strategy.

NPPF Practice Guide section	DS ref.				
1a Development description and location?	3.1	3.2	3.3	3.4	3.5
1b EA vulnerability classification?	5.1				
1c Consistency with Local Development Documents?	7.1				
1d Evidence that the sequential test or exception test (NPPF) has been applied in the selection of this site for this development type.	n/a				
2 Definition of the flood hazard					
2a What are the sources of flooding that could affect the site?	5.1	5.2	5.3		
2b Description of flood mechanics for all sources and any historical flooding.	5.1	5.2	5.3		
2c Existing surface water drainage arrangements for the site?	3.4				
3 Probability					
3a EA Flood Zone classification?	5.1				
3b Reference to any Strategic Flood Risk Assessment covering this site?	n/a				
3c Probability of the site flooding taking account of the contents of the SFRA and of any further site-specific assessment?	n/a				
3d Existing rates of run-off generated by the site?	6.4				
4 Climate change					
4a Influence of climatic change on the site?	6.6				
5 Detailed development proposals					
5a Details of the development layout, referring to the relevant drawings.	4				
5b Where appropriate, demonstrate how land-uses most sensitive to flood damage have been placed in areas within the site that are at least risk of flooding.	n/a				
6 Flood risk management measures					
6a How will the site be protected from flooding, including the potential impacts of climate change, over the development's lifetime?	n/a				

7 Off site impacts

7a How will you ensure that the measures to protect your site from flooding will not increase flood risk elsewhere? n/a

7b How will you prevent run-off from the completed development causing an impact elsewhere? 6

8 Residual risks

8a What flood-related risks will remain after you have implemented the measures to protect the site from flooding? 5.1 5.2 5.3

8b How, and by whom, will these risks be managed over the lifetime of the development 5.1 5.2 5.3



10 APPENDIX B – INDICATIVE PROPOSED DRAINAGE PLAN