



Site Specific Flood Risk Assessment and Drainage Strategy for Miles Platting 3 Manchester M4 6LP

Client Name: Lovell

Our ref: LRD31457

Date: January 2021

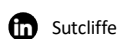
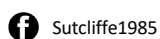
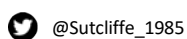
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FRA and Drainage Strategy

DOCUMENT VERIFICATION

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Revision History:

Rev	Date	Description	Prepared	Checked	Approved
1	Jan 2021	First Issue	SB	SB	MP

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Table of Contents

1. Introduction	1
2. Development Description and Location.....	1
3. Definition of the Flood Hazard	2
4. Probability	5
5. Climate Change	5
6. Detailed Development Proposals/Drainage Strategy	6
7. Flood Risk Management Measures.....	9
8. Off Site Impacts	9
9. Residual Risks	9
10. Conclusion	9
11. Appendices	11
11.1. Appendix A	12
11.2. Appendix B	13
11.3. Appendix C	14

1. Introduction

- 1.1 As part of the planning process it is necessary to prepare a site-specific flood risk assessment and drainage strategy for the development site off Butler Street, Miles Platting, Manchester.
- 1.2 The development area is less than 1 hectare and therefore a flood risk assessment is not a requirement of the National Planning Policy Framework (NPPF).
- 1.3 The proposed development site falls within the Conurbation Core Critical Drainage Area (CDA) which requires flood risk assessments for development sites greater than 0.50 hectare. The total proposed development site area is 0.76 hectares; a site-specific flood risk assessment is required to comply with the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA.
- 1.4 The site is situated in a zone of low flood risk as defined by the Environment Agency (see Environment Agency Flood Maps in Appendix C).
- 1.5 The National Planning Policy Framework (NPPF) Paragraph 079 seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development. This assessment will demonstrate that all sources of flooding have been considered and that development of the site is appropriate.
- 1.6 The drainage assessment will seek to demonstrate that consideration has been given to the discharge hierarchy as required in NPPF Paragraph 080.

2. Development Description and Location

- 2.1 The proposed development involves the construction of a 43 dwellings, associated infrastructure and new private roads.
- 2.2 The development site is located in Miles Platting, Manchester and is adjacent to Butler Street.

Grid Reference: SJ 85324 99067
x: 385324 y: 399067
Site area: 7,607m² (0.76 ha)

- 2.3 According to the NPPF Technical Guide, Table 2 the development falls within the 'more vulnerable' risk classification. The 'more vulnerable' classification covers buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels etc.
- 2.4 The site is in Flood Zone 1 and is therefore suitable for all vulnerability classifications.

- 2.5 The proposed development is consistent with Local Development Documents. It is in a low flood risk area and therefore satisfies the sequential test as it is in a zone with a low probability of flooding.
- 2.6 The site is located in Flood Zone 1 and therefore satisfies the requirements of the Sequential Test; whose aim is to direct development to these areas. The Exception Test is not required as all land uses are permitted in this zone.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate.
✗ Development should not be permitted.

Figure 1: Table 3 Flood risk vulnerability and flood zone 'compatibility' from NPPF Technical Guide

3. Definition of the Flood Hazard

- 3.1 The NPPF outlines the forms of flooding that may affect development as fluvial (rivers), tidal, surface water, ground water, and infrastructure failure. The following have been identified as potential sources of flooding that may affect the development: fluvial, surface water, groundwater, and infrastructure failure. Flooding from tidal sources will not affect the site as the site is not in close proximity to the sea.

3.2 Sources of Flooding

3.2.1 Fluvial (River) Flooding

The site is not close to any rivers, the nearest river is the River Irk which is approximately 725m North West of the site. The River Medlock is approximately 880m South East of the site. Both rivers are isolated from the site, the Irk by the A62 and the railway line to Manchester Victoria, the Medlock by the Rochdale canal. Flood maps provided on the Environment Agency website and in the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA (Figure 1.7B and 1.8B) indicate that the site is outside the 1 in 100 years plus climate change and the 1 in 1000 year plus climate change zones of flooding.

Based in this information the site is categorised as being in Flood Zone 1 and at low risk of fluvial flooding.

3.2.2 Surface Water

Sources of surface water flooding are typically sheet flow from adjacent land or surface flow caused by surcharged sewers and/or the inability of rainwater to drain off the surface through infiltration or traditional drainage systems. The Environment Agency surface water flood map (Figure 2) identifies that Butler Lane, within the site, is susceptible very low-risk zone of surface water flooding.



Figure 2: Extract of Environment Agency Surface Water Flood Map.

Proposed levels within the site should set so as to mitigate the risk of surface water flooding shown on the EA surface water flood risk map.

The risk from surface water flooding to the site can be considered low.

3.2.3 Flooding from Groundwater

The Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA confirms that the site is not in an area subject to ground water flooding (Groundwater Flooding drawing GW_2.1).

Careful consideration of proposed site levels and the general topography of the site will mitigate any future risk.

The risk from groundwater flooding to the site is low.

3.2.4 Flooding from Sewers

Flooding from the sewers occurs when surcharging during periods of excess flow breaks ground, typically at manholes or road gullies. The proposed development is not likely to increase the risk posed by sewer flooding as the surface water runoff, a primary cause of sewer surcharging, from the site is to be managed in accordance with the requirements of the NPPF and the Statutory Undertaker (United Utilities).

The sewers in the vicinity of the site are operated by United Utilities. The sewer records show that the area is serviced by a combined sewer network. There are existing sewers in Butler Lane (700x850 brick sewer) and Rigel Street (diameter unknown) within the development red line boundary. In Butler Street there are 300x450 brick and 225mm and 450mm vitrified clay sewers. A 450mm vitrified clay sewer runs behind the adopted footpath in Gunson Street. An extract from the public sewer record is included in Appendix A for reference.

There were no recorded DG5 incidents listed in the SFRA.

Surface water is often a major component of sewer flooding and the surface water from the site will be in line with the requirements of the LLFA and United Utilities to mitigate the surface water contribution from the development site to sewer flooding.

Careful consideration of proposed site levels and the general topography of the site will mitigate any future risk posed by sewer flooding.

The site is deemed to be at low risk of sewer flooding.

3.2.5 Flooding from Infrastructure

The Rochdale Canal, to the South East, is approximately 220m from the site.

The Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA (Figure MM_3.2) shows the flood risk from the canal. The plan indicates that the site is not at risk of flooding from the Canal.

The Reservoir Screening map (drawing MM_3.1) confirms the site is not at risk of reservoir flooding.

The site can be deemed to be at low risk of flooding from infrastructure failure.

- 3.3 The Environment Agency flood maps and the maps contained within the SFRA confirm the development sites are in flood zone 1. There are no recorded incidents of historic flooding in the SFRA that affect the site.

The NPPF requires the proposed drainage plan ensure that the runoff caused by the development does not contribute to flooding offsite; this approach will help reduce off site flooding that could be attributed to the site.

- 3.4 In line with current best practice and the requirement of the statutory undertaker the proposed drainage will be a separate system with the surface water and foul water drains on site discharging to the public combined sewer.
- 3.5 There are no other known risks to the site.

4. Probability

- 4.1 The site is located within flood zone 1, the lowest risk category and the zone to which development is directed by NPPF guidelines.
- 4.2 The area of the site is covered in the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA. The SFRA shows the site to be outside of any areas of historic flooding and surface water flooding but close to areas susceptible to surface water flooding. The site is outside areas susceptible to groundwater flooding, flooding from infrastructure failure and fluvial flooding. The risk of flooding from these sources is low.
- 4.3 The site is located in an area where topographic relief provides natural protection against any exceedance event.
- 4.4 The proposed drainage will be designed with future climate change in mind so the risk of flooding by run-off emanating from the development will be low.
- 4.5 The probability of the site flooding can be considered to be low.

5. Climate Change

- 5.1 The main risk from climate change is the projected increase in frequency of extreme rainfall events. These events will likely lead to short-term capacity exceedance of the gullies and roof outlets serving the site and surrounds.
- 5.2 Current guidance within the NPPF is to allow for a 30% increase in rainfall intensity over existing rainfall intensities for the design life of the dwellings. Current guidance from the Environment Agency states the impact of the upper end & central should be evaluated, the upper end allowance is 40% and the central allowance is 20%. These allowances should be considered in the design of the surface water management system for the proposed site.

- 5.3 Although the onsite drainage and attenuation will be designed to accommodate the increased runoff, building floor levels should be set to mitigate any residual risk from overland flow.

6. **Detailed Development Proposals/Drainage Strategy**

- 6.1 Details of the development layout are provided in Appendix A. The proposed development involves the construction of 43 dwellings and associated infrastructure. The development site is currently vacant but has previously been developed.



Figure 3: Previous development on the site in 2009 (Source: Google Earth)

- 6.2 A separate foul and surface water drainage system is proposed for the site.
- 6.3 The site is located in Flood Zone 1 and, is therefore, suitable for all types of development, no further evidence is required.
- 6.4 The site has been previously developed and can therefore be considered to be brownfield site.
- 6.5 The Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA provides the following guidance in relation to brownfield sites:

“Development should aim for a minimum reduction in surface water runoff rates of 50% for brownfield sites, with an aim of reducing runoff to greenfield rates up to the 1 in 100-year storm event, considering climate change.”

Although the site is classed a brownfield site insufficient data is available to model the runoff from the previous development. As such it will be necessary to limit surface water runoff, as close as reasonably practicable, to the greenfield runoff rates.

The greenfield runoff rates have been estimated using the HR Wallingford Greenfield Runoff Tool (www.uksuds.co.uk). Table 1 summarises the greenfield runoff rates for the cumulative site area.

Return Period	Greenfield Runoff Rate (l/s)
Q_{BAR}	4.95
1yr	4.31
30yr	8.42
100yr	10.31

Table 1: Greenfield Runoff Rates (from HR Wallingford, www.uksuds.com)

Surface water from the proposed development should be discharged in line with the surface water discharge hierarchy:

- i. Discharge to soakaway
- ii. Discharge to watercourse
- iii. Discharge to surface water sewer
- iv. Discharge to combined sewer.

Discharge to soakaway

The site investigation carried out by Betts Geo Consulting Engineers indicates that soakaways are likely not feasible due to the following reason:

- Cohesive strata and the presence of deep made ground.

Data available on the Soilsclapes website (www.landis.org.uk) supports the conclusion drawn in the Betts report indicating the soil is categorised as Soilscape 17, slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage.

Based on the ground conditions it is necessary to consider the level 2 and 3 of the discharge hierarchy.

Discharge to watercourse/surface water sewer

There are no water courses within the vicinity of the site the review of the public sewer records confirms there are no surface water sewers in the vicinity of the site.

In line with the hierarchy the final level will need to be considered for the discharge of surface water.

Discharge to combined sewer

There are combined sewers in Butler and Gunson Streets. A connection to these sewers is considered in the drainage strategy as the preceding tiers of the hierarchy are not suitable.

Connections to the combined sewer will need further consultation with United Utilities to confirm the discharge rate.

For the purpose of this FRA a discharge to the combined water sewer will be considered.

- 6.6 As the proposed surface water networks will discharge to the combined sewer it will be necessary to restrict surface water discharge as close as practicable to the greenfield rates identified in section 6.5.

The Q_{BAR} rate for the site area is 4.95 l/s.

To reduce the risk of blockage within the flow control device it is normally permitted to restrict the discharge rate to 5 l/s.

For the purpose of the drainage strategy a discharge rate of 5 l/s will be used to design the drainage proposal.

The proposed discharge rate complies with the SFRA and best practice requirements and is therefore deemed to offer the required improvements for discharges in critical drainage areas.

Since infiltration SuDS techniques have been ruled out through the presence of made-ground, clay sub-soils only non-infiltration SuDS remain an option. In achieving the required discharge rates offline attenuation in the form of cellular storage will be used in conjunction with a vortex flow control.

Small paths and patios are disconnected from the drainage network and will drain to adjacent landscaped areas where interception and surface infiltration will occur.

An indicative drainage plan and calculations are included within the Appendix to demonstrate how the aforementioned discharge rate can be achieved.

The final drainage layout and storage volumes will be dependent on the site layout approved through the planning process and consultation with the LLFA and United Utilities with regards the discharge rate.

- 6.7 Foul water discharge from the development site will be discharged to the combined sewer in Butler Street.

7. Flood Risk Management Measures

- 7.1 The site, specifically the buildings, are protected from flooding by providing a finished floor level higher than the ground level adjacent to the building except as required for level access. The general slope of the external ground levels is away from the building to ensure runoff is not directed towards the buildings; this provides flood routes around the buildings during exceedance events.
- 7.2 Attenuation is to be provided for storms up to and including the 100-year plus climate change return period event. The inclusion of this storage mitigates the flood risk, both on and off site, which results from the development.
- 7.3 As the site is in Flood Zone 1, as defined by the Environment Agency, no additional measures are required to mitigate flood risk.

8. Off Site Impacts

- 8.1 No offsite impacts are envisaged as a result of this development as no structural measures are required to defend the site against flooding. The development does not lead to displacement of potential floodwaters through the provision of physical barriers and therefore does not require compensatory storage to mitigate off-site flood risk.
- 8.2 Run-off from the proposed development is managed, therefore off-site impacts are mitigated by the redevelopment of the site.

9. Residual Risks

- 9.1 No residual flood risks are anticipated for the site following development.

10. Conclusion

- 10.1 The site-specific flood risk assessment for the development shows that the proposed development site is located within Zone 1 and is at low risk of flooding.
- 10.2 Based on this evaluation the development satisfies the requirements of the NPPF and has addressed the flood risk posed to and stemming from the development.

- 10.3 Discharge rates must be managed to comply, as close as reasonably practical, with those in Table 1 to satisfy the requirements of the SFRA.
- 10.4 Infiltration is deemed unsuitable due to the presence of made ground and clay sub-soils.
- 10.5 Flood risk from surface water, ground water and infrastructure failure can be considered low.
- 10.6 The site is at low risk of flooding and incorporation of runoff management within the proposed drainage system will alleviate any off-site risk that may have been associated with the development.
- 10.7 The proposed drainage layout complies with the requirements of the NPPF by mitigating flood risk and managing surface discharge from the site in line with the discharge hierarchy.

11. Appendices

11.1. Appendix A

Drawings:

Site Layout

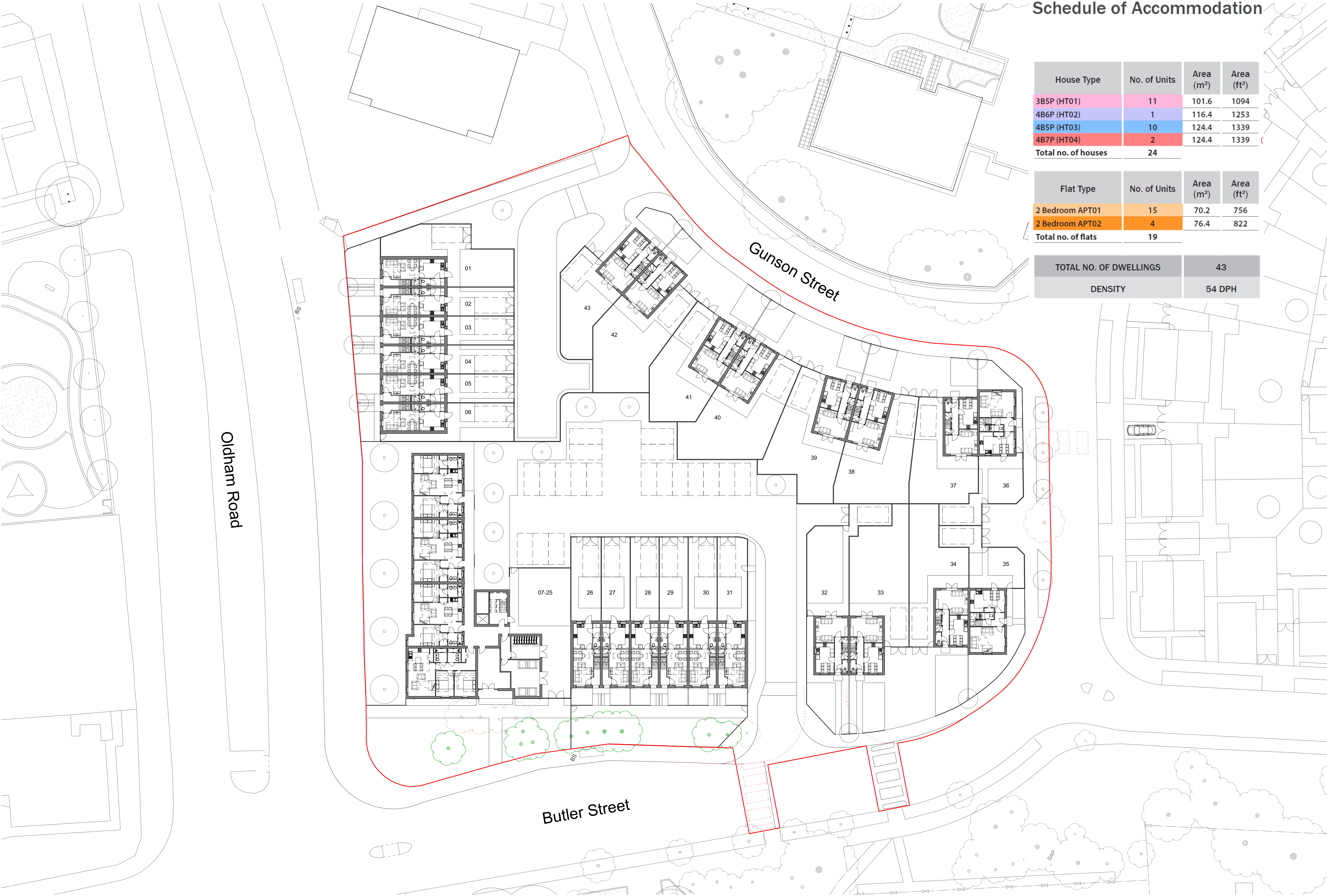
Existing Areas (Including Topographic Survey)

Proposed Areas

Flood Routing Plan

Drainage Strategy

United Utilities Sewer Records



Schedule of Accommodation

House Type	No. of Units	Area (m ²)	Area (ft ²)
3B5P (HT01)	11	101.6	1094
4B6P (HT02)	1	116.4	1253
4B5P (HT03)	10	124.4	1339
4B7P (HT04)	2	124.4	1339
Total no. of houses	24		

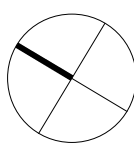
Flat Type	No. of Units	Area (m ²)	Area (ft ²)
2 Bedroom APT01	15	70.2	756
2 Bedroom APT02	4	76.4	822
Total no. of flats	19		

TOTAL NO. OF DWELLINGS	43
DENSITY	54 DPH

The contractor is responsible for checking dimensions, tolerances and references. Any discrepancy to be verified with the Architect before proceeding with the works. Where an item is covered by drawings to different scales the larger scale drawing is to be worked to.
Do not scale drawing. Figured dimensions to be worked to in all cases.

CDM REGULATIONS 2015. All current drawings and specifications for the project must be read in conjunction with the Designer's Hazard and Environment Assessment Record

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0m 5m 10m 15m 20m

Rev	Date	Description
-	07/12/20	First Issue
A	17/12/20	Site layout revised as per client feedback
B	18/12/20	Revised layout following client feedback

Dwn	Ckd
SJ	GIL
SJ	GIL
SJ	GIL

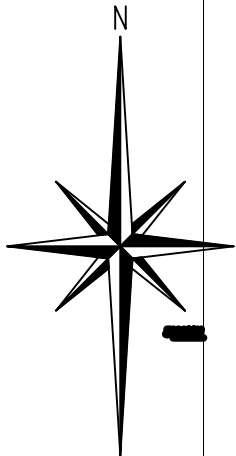
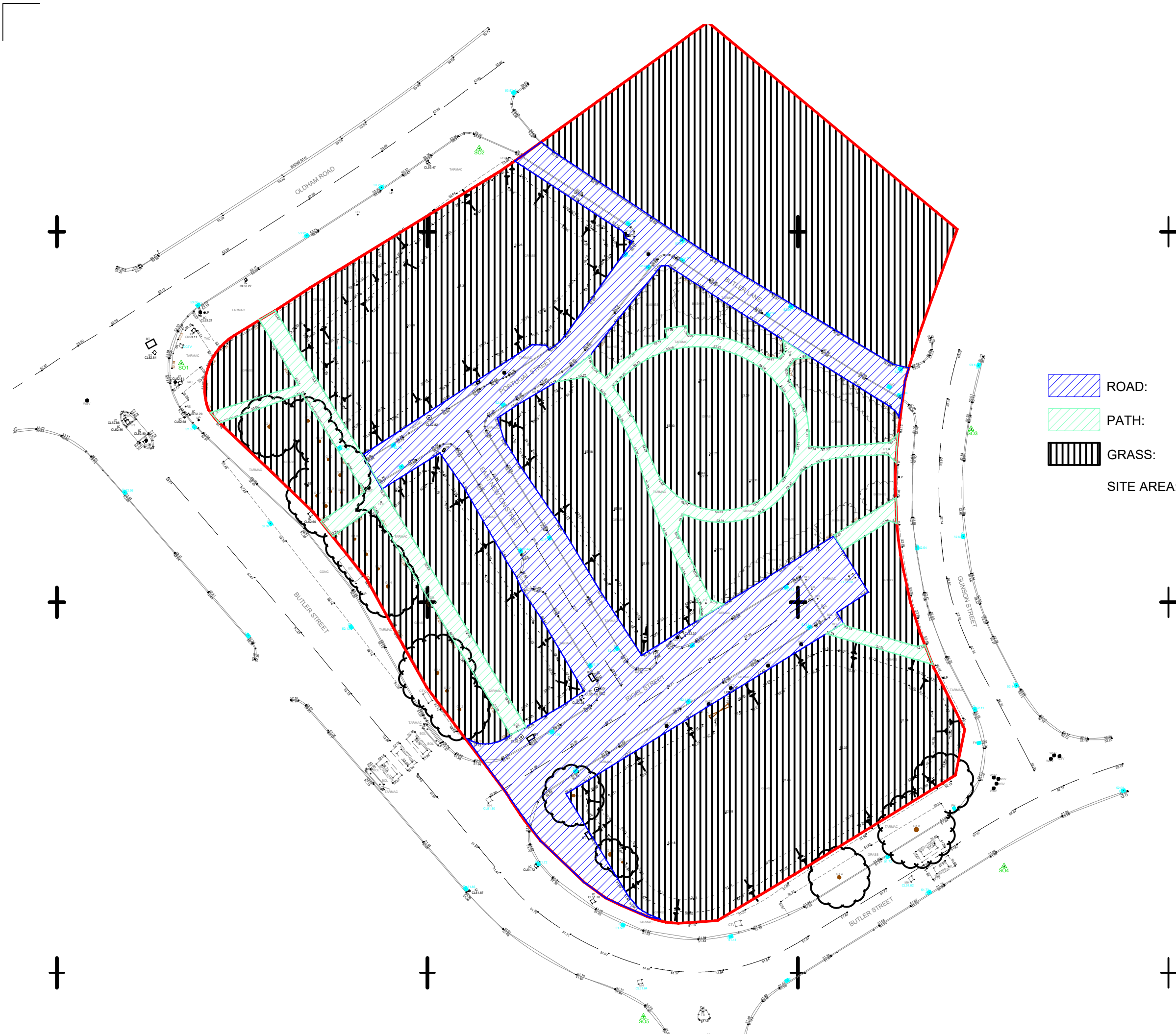
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Checked	GIL
Date	DEC 2020
Scale @ A1	1: 250

Cell 3.1, Miles Platting
Proposed Site Plan

AA6770-2004
REV B
FOR COMMENT

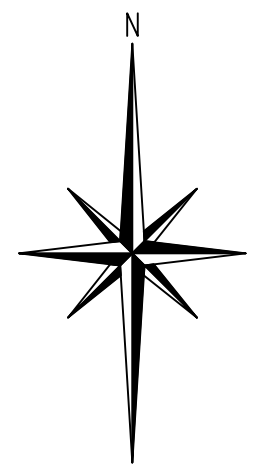
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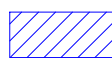
prp-co.uk
Manchester
0161 242 8950



ROAD: 1894m²
PATH: 452m²
GRASS: 5261m²
SITE AREA: 7607m²

P1	13.01.21	SB	PRELIMINARY DRAWING	AJB
Rev	Date	Checked	Description	By
PRELIMINARY DRAWING				
Sutcliffe 18-20 Harrington Street, Liverpool L2 9QA t: 0151 227 3155 f: 0151 227 3156 e: sutcliffe@sutcliffe.co.uk w: www.sutcliffe.co.uk				
Client LOVELL				
Project MILES PLATTING 3 MANCHESTER				
Drawing title EXISTING SITE AREAS				
Scale at A3	1:500	Manhole Reference 31457-6000		
Drawn by	AJB			
Date	JAN 2021	Revision suffix P1		



	ROOF:	1634m ²
	DRIVE:	990m ²
	ROAD:	1354m ²
	PATH:	794m ²
	GRASS:	2835m ²
		SITE AREA: 7607m ²

P1	13.01.21	SB	PRELIMINARY DRAWING	AJB
Rev	Date	Checked	Description	By

PRELIMINARY DRAWING



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Client

LOVELL

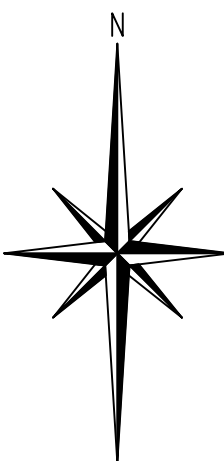
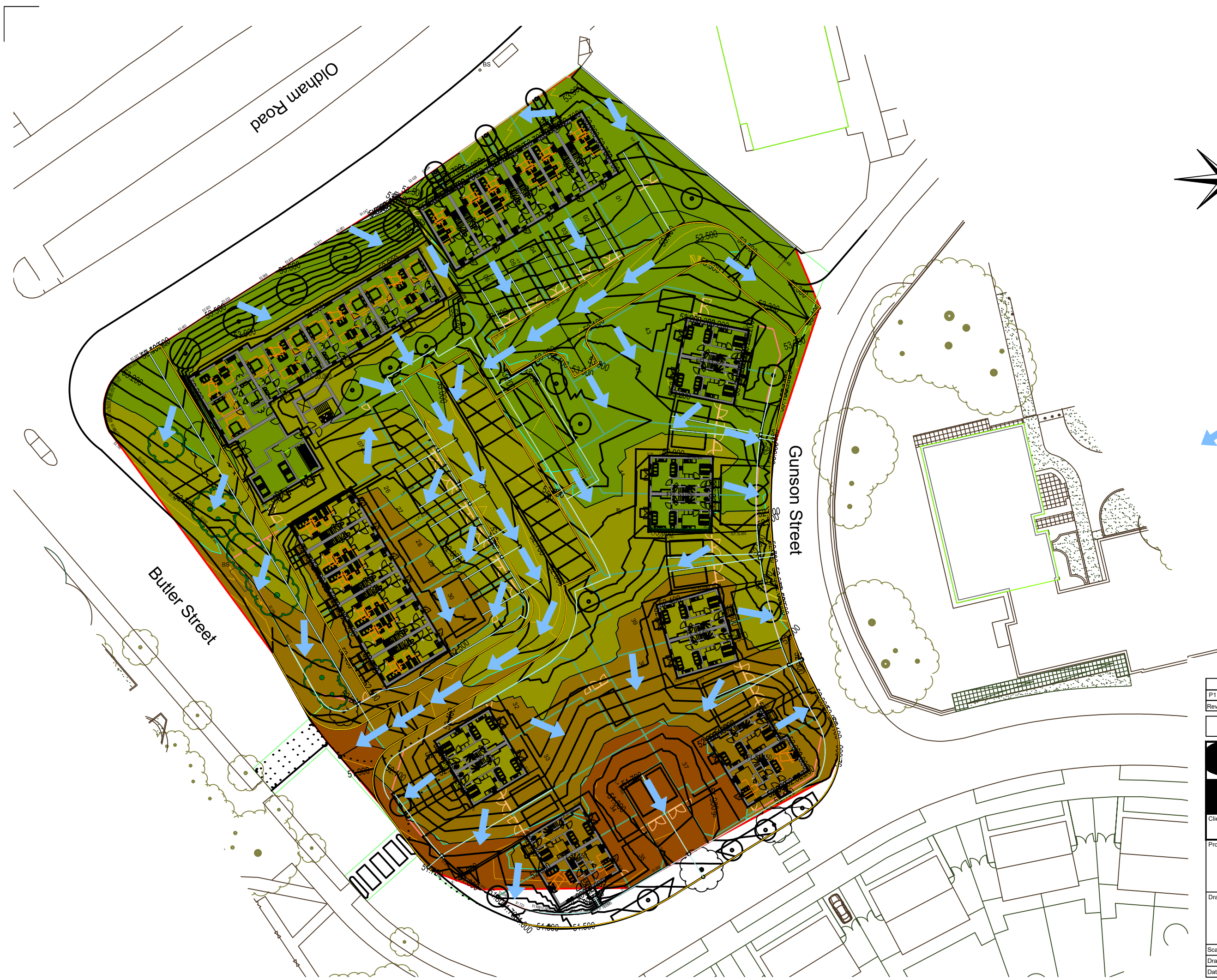
Project

MILES PLATTING 3
MANCHESTER

Drawing title

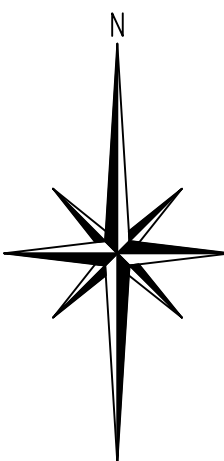
PROPOSED SITE AREAS

Scale at A3	1:500	Manhole Reference
Drawn by	AJB	31457-6001
Date	JAN 2021	Revision suffix P1



EXCEEDANCE FLOOD
ROUTE ARROW

P1	13.01.21	SB	PRELIMINARY DRAWING
Rev	Date	Checked	Description
			By
PRELIMINARY DRAWING			
Sutcliffe 18-20 Harrington Street, Liverpool L2 9QA t: 0151 227 3155 f: 0151 227 3156 e: sutcliffe@sutcliffe.co.uk w: www.sutcliffe.co.uk			
Client LOVELL			
Project MILES PLATTING 3 MANCHESTER			
Drawing title EXCEEDANCE FLOOD ROUTING			
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Drawn by	AJB		
Date	JAN 2021	Revision suffix	P1



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Rev	Date	Checked	Description	By

PRELIMINARY DRAWING

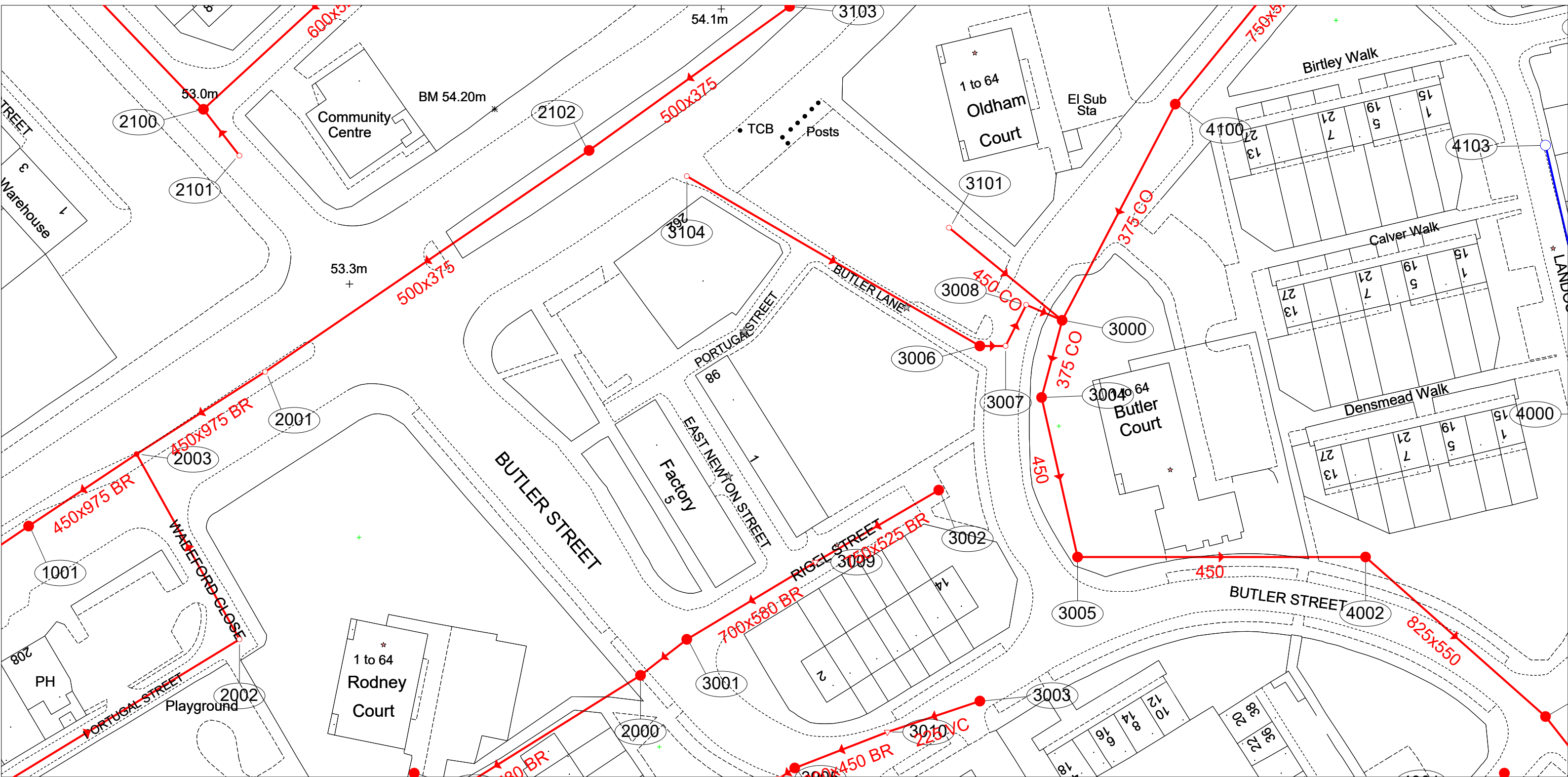


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Client	LOVELL		
Project	MILES PLATTING 3 MANCHESTER		
Drawing title	SURFACE WATER DRAINAGE STRATEGY		

Scale at A3	1:500	Manhole Reference	31457-6003
Drawn by	AJB	Revision suffix	P1
Date	JAN 2021		



11.2. Appendix B

Calculations

Calculated by:	Simon Brady
Site name:	Miles Platting 3
Site location:	Manchester

This is an estimation of the greenfield runoff rates that are used 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). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.48811° N
Longitude:	2.22263° W
Reference:	3988793618
Date:	Jan 07 2021 12:10

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	.756
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Methodology

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

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	909	909
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	4.95	4.95
1 in 1 year (l/s):	4.31	4.31
1 in 30 years (l/s):	8.42	8.42
1 in 100 year (l/s):	10.31	10.31
1 in 200 years (l/s):	11.74	11.74

This report was produced using the greenfield runoff tool developed by HR Wallingford 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. 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 this data in the design or operational characteristics of any drainage scheme.

Sutcliffe		Page 1
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	18.100	Add Flow / Climate Change (%)	0
Ratio R	0.356	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.600
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	400

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	10.501	0.180	58.3	0.002	6.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	11.663	0.116	100.6	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	10.504	0.180	58.5	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	6.986	0.069	100.6	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	10.497	0.179	58.5	0.002	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	12.878	0.128	100.6	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	10.564	0.181	58.5	0.008	6.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	6.13	52.046	0.002	0.0	0.0	0.0	1.32	23.3	0.3
1.001	50.00	6.33	51.866	0.011	0.0	0.0	0.0	1.00	17.7	1.5
2.000	50.00	6.17	52.219	0.003	0.0	0.0	0.0	1.01	7.9	0.3
1.002	50.00	6.44	51.750	0.022	0.0	0.0	0.0	1.00	17.7	3.0
3.000	50.00	6.17	52.483	0.002	0.0	0.0	0.0	1.01	7.9	0.3
1.003	50.00	6.66	51.681	0.032	0.0	0.0	0.0	1.00	17.7	4.4
4.000	50.00	6.17	52.550	0.008	0.0	0.0	0.0	1.01	7.9	1.1

Sutcliffe		Page 2
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.004	4.590	0.046	100.6	0.002	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	11.130	0.111	100.6	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	14.365	0.246	58.5	0.008	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	31.771	0.543	58.5	0.022	0.00	0.0	0.600	o	100	Pipe/Conduit	
6.000	14.596	0.250	58.5	0.008	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.002	12.445	0.213	58.5	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.006	43.349	0.431	100.6	0.029	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.000	27.511	0.470	58.5	0.015	6.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	9.970	0.170	58.5	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
7.002	8.520	0.146	58.5	0.006	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.000	20.891	0.357	58.5	0.015	6.00	0.0	0.600	o	100	Pipe/Conduit	
7.003	12.137	0.403	30.1	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
9.000	21.062	0.360	58.5	0.010	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.001	11.045	0.189	58.5	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.004	50.00	6.73	51.553	0.043	0.0	0.0	0.0	1.00	17.7	5.8
1.005	50.00	6.92	51.507	0.053	0.0	0.0	0.0	1.00	17.7	7.1
5.000	50.00	6.24	53.014	0.008	0.0	0.0	0.0	1.01	7.9	1.1
5.001	50.00	6.76	52.769	0.030	0.0	0.0	0.0	1.01	7.9	4.1
6.000	50.00	6.24	53.049	0.008	0.0	0.0	0.0	1.01	7.9	1.1
5.002	50.00	6.97	52.225	0.043	0.0	0.0	0.0	1.01	7.9	5.8
1.006	50.00	7.69	51.396	0.124	0.0	0.0	0.0	1.00	17.7	16.9
7.000	50.00	6.45	52.205	0.015	0.0	0.0	0.0	1.01	7.9	2.0
7.001	50.00	6.62	51.734	0.015	0.0	0.0	0.0	1.01	7.9	2.0
7.002	50.00	6.76	51.564	0.021	0.0	0.0	0.0	1.01	7.9	2.9
8.000	50.00	6.35	52.191	0.015	0.0	0.0	0.0	1.01	7.9	2.0
7.003	50.00	6.90	51.418	0.036	0.0	0.0	0.0	1.41	11.1	4.8
9.000	50.00	6.35	52.408	0.010	0.0	0.0	0.0	1.01	7.9	1.3
9.001	50.00	6.53	52.048	0.010	0.0	0.0	0.0	1.01	7.9	1.3

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File 31457 - Drainage Strate...

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Page 3



Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
9.002	19.566	0.335	58.5	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit		
1.007	31.736	0.189	167.9	0.056	0.00	0.0	0.600	o	225	Pipe/Conduit		
10.000	26.658	0.505	52.8	0.007	6.00	0.0	0.600	o	100	Pipe/Conduit		
10.001	12.573	0.238	52.8	0.037	0.00	0.0	0.600	o	150	Pipe/Conduit		
11.000	27.099	0.463	58.5	0.019	6.00	0.0	0.600	o	100	Pipe/Conduit		
10.002	10.000	0.101	99.3	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit		
10.003	7.010	0.071	99.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
1.008	5.425	0.034	158.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
12.000	12.047	0.206	58.5	0.006	6.00	0.0	0.600	o	100	Pipe/Conduit		
13.000	10.912	0.284	38.4	0.008	6.00	0.0	0.600	o	100	Pipe/Conduit		
12.001	9.303	0.159	58.5	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit		
14.000	10.875	0.186	58.5	0.008	6.00	0.0	0.600	o	100	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
9.002	50.00	6.85	51.859	0.017	0.0	0.0	0.0	1.01	7.9	2.4
1.007	50.00	8.21	50.890	0.233	0.0	0.0	0.0	1.01	40.0	31.6
10.000	50.00	6.42	52.026	0.007	0.0	0.0	0.0	1.06	8.3	1.0
10.001	50.00	6.57	51.471	0.044	0.0	0.0	0.0	1.39	24.5	6.0
11.000	50.00	6.45	51.948	0.019	0.0	0.0	0.0	1.01	7.9	2.6
10.002	50.00	6.73	51.233	0.070	0.0	0.0	0.0	1.01	17.8	9.5
10.003	50.00	6.85	51.132	0.070	0.0	0.0	0.0	1.01	17.8	9.5
1.008	50.00	8.30	50.701	0.303	0.0	0.0	0.0	1.04	41.3	41.1
12.000	50.00	6.20	51.274	0.006	0.0	0.0	0.0	1.01	7.9	0.8
13.000	50.00	6.15	51.352	0.008	0.0	0.0	0.0	1.25	9.8	1.1
12.001	50.00	6.35	51.068	0.016	0.0	0.0	0.0	1.01	7.9	2.2
14.000	50.00	6.18	51.677	0.008	0.0	0.0	0.0	1.01	7.9	1.1

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Sutcliffe											Page 4	
18-20 Harrington Street Liverpool L2 9QA						Miles Platting 3 Drainage Strategy						
Date 12/01/2021 23:59 File 31457 - Drainage Strate...						Designed by SB Checked by						
Innovyze						Network 2020.1.3						
Network Design Table for Storm												
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
12.002	11.372	0.194	58.5	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit		
15.000	11.078	0.189	58.5	0.009	6.00	0.0	0.600	o	100	Pipe/Conduit		
12.003	11.438	0.341	33.5	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit		
16.000	11.143	0.191	58.5	0.012	6.00	0.0	0.600	o	100	Pipe/Conduit		
16.001	7.331	0.125	58.5	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit		
17.000	4.450	0.076	58.5	0.006	6.00	0.0	0.600	o	100	Pipe/Conduit		
16.002	10.154	0.174	58.5	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit		
16.003	25.448	0.435	58.5	0.016	0.00	0.0	0.600	o	100	Pipe/Conduit		
18.000	11.423	0.195	58.5	0.012	6.00	0.0	0.600	o	100	Pipe/Conduit		
19.000	10.293	0.178	58.0	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit		
18.001	14.337	0.245	58.5	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit		
12.004	3.421	0.034	99.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Network Results Table												
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)		
12.002	50.00	6.54	50.909	0.027	0.0	0.0	0.0	1.01	7.9	3.6		
15.000	50.00	6.18	51.724	0.009	0.0	0.0	0.0	1.01	7.9	1.2		
12.003	50.00	6.68	50.714	0.038	0.0	0.0	0.0	1.34	10.5	5.1		
16.000	50.00	6.18	51.298	0.012	0.0	0.0	0.0	1.01	7.9	1.6		
16.001	50.00	6.31	51.107	0.012	0.0	0.0	0.0	1.01	7.9	1.6		
17.000	50.00	6.07	51.259	0.006	0.0	0.0	0.0	1.01	7.9	0.8		
16.002	50.00	6.47	50.982	0.018	0.0	0.0	0.0	1.01	7.9	2.4		
16.003	50.00	6.89	50.808	0.034	0.0	0.0	0.0	1.01	7.9	4.6		
18.000	50.00	6.19	51.667	0.012	0.0	0.0	0.0	1.01	7.9	1.7		
19.000	50.00	6.17	51.649	0.003	0.0	0.0	0.0	1.01	8.0	0.4		
18.001	50.00	6.43	51.472	0.017	0.0	0.0	0.0	1.01	7.9	2.3		
12.004	50.00	6.95	50.323	0.089	0.0	0.0	0.0	1.01	17.8	12.1		
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Sutcliffe	Page 5
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.009	33.265	0.138	241.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	👍
1.010	6.938	0.029	241.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	👍

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.009	50.00	6.86	50.289	0.000	5.0	0.0	0.0	0.64	11.4	5.0
1.010	50.00	7.04	50.151	0.000	5.0	0.0	0.0	0.64	11.3	5.0

Sutcliffe		Page 6																																																																																																																																																																																																																																																																																																																																																																													
18-20 Harrington Street Liverpool L2 9QA		Miles Platting 3 Drainage Strategy																																																																																																																																																																																																																																																																																																																																																																													
Date 12/01/2021 23:59 File 31457 - Drainage Strate...		Designed by SB Checked by																																																																																																																																																																																																																																																																																																																																																																													
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Area Summary for Storm <table><thead><tr><th>Pipe Number</th><th>PIMP Type</th><th>PIMP Name</th><th>PIMP (%)</th><th>Gross Area (ha)</th><th>Imp. Area (ha)</th><th>Pipe Total (ha)</th></tr></thead><tbody><tr><td>1.000</td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>1.001</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>2.000</td><td>User</td><td>-</td><td>100</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>1.002</td><td>User</td><td>-</td><td>100</td><td>0.009</td><td>0.009</td><td>0.009</td></tr><tr><td>3.000</td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>1.003</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>4.000</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>1.004</td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>1.005</td><td>User</td><td>-</td><td>100</td><td>0.010</td><td>0.010</td><td>0.010</td></tr><tr><td>5.000</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>5.001</td><td>User</td><td>-</td><td>100</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.014</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.016</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.018</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.020</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.022</td></tr><tr><td>6.000</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>5.002</td><td>User</td><td>-</td><td>100</td><td>0.005</td><td>0.005</td><td>0.005</td></tr><tr><td>1.006</td><td>User</td><td>-</td><td>100</td><td>0.029</td><td>0.029</td><td>0.029</td></tr><tr><td>7.000</td><td>User</td><td>-</td><td>100</td><td>0.015</td><td>0.015</td><td>0.015</td></tr><tr><td>7.001</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>7.002</td><td>User</td><td>-</td><td>100</td><td>0.006</td><td>0.006</td><td>0.006</td></tr><tr><td>8.000</td><td>User</td><td>-</td><td>100</td><td>0.015</td><td>0.015</td><td>0.015</td></tr><tr><td>7.003</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>9.000</td><td>User</td><td>-</td><td>100</td><td>0.010</td><td>0.010</td><td>0.010</td></tr><tr><td>9.001</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>9.002</td><td>User</td><td>-</td><td>100</td><td>0.007</td><td>0.007</td><td>0.007</td></tr><tr><td>1.007</td><td>User</td><td>-</td><td>100</td><td>0.056</td><td>0.056</td><td>0.056</td></tr><tr><td>10.000</td><td>User</td><td>-</td><td>100</td><td>0.007</td><td>0.007</td><td>0.007</td></tr><tr><td>10.001</td><td>User</td><td>-</td><td>100</td><td>0.007</td><td>0.007</td><td>0.007</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.029</td><td>0.029</td><td>0.037</td></tr><tr><td>11.000</td><td>User</td><td>-</td><td>100</td><td>0.006</td><td>0.006</td><td>0.006</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.009</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.011</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.013</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.015</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.018</td></tr><tr><td></td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.019</td></tr><tr><td>10.002</td><td>User</td><td>-</td><td>100</td><td>0.007</td><td>0.007</td><td>0.007</td></tr><tr><td>10.003</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.008</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>12.000</td><td>User</td><td>-</td><td>100</td><td>0.006</td><td>0.006</td><td>0.006</td></tr><tr><td>13.000</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>12.001</td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>14.000</td><td>User</td><td>-</td><td>100</td><td>0.008</td><td>0.008</td><td>0.008</td></tr><tr><td>12.002</td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>15.000</td><td>User</td><td>-</td><td>100</td><td>0.009</td><td>0.009</td><td>0.009</td></tr><tr><td>12.003</td><td>User</td><td>-</td><td>100</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>16.000</td><td>User</td><td>-</td><td>100</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td>16.001</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>17.000</td><td>User</td><td>-</td><td>100</td><td>0.006</td><td>0.006</td><td>0.006</td></tr></tbody></table>				Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)	1.000	User	-	100	0.002	0.002	0.002	1.001	User	-	100	0.008	0.008	0.008	2.000	User	-	100	0.003	0.003	0.003	1.002	User	-	100	0.009	0.009	0.009	3.000	User	-	100	0.002	0.002	0.002	1.003	User	-	100	0.008	0.008	0.008	4.000	User	-	100	0.008	0.008	0.008	1.004	User	-	100	0.002	0.002	0.002	1.005	User	-	100	0.010	0.010	0.010	5.000	User	-	100	0.008	0.008	0.008	5.001	User	-	100	0.012	0.012	0.012		User	-	100	0.002	0.002	0.014		User	-	100	0.002	0.002	0.016		User	-	100	0.002	0.002	0.018		User	-	100	0.002	0.002	0.020		User	-	100	0.002	0.002	0.022	6.000	User	-	100	0.008	0.008	0.008	5.002	User	-	100	0.005	0.005	0.005	1.006	User	-	100	0.029	0.029	0.029	7.000	User	-	100	0.015	0.015	0.015	7.001	-	-	100	0.000	0.000	0.000	7.002	User	-	100	0.006	0.006	0.006	8.000	User	-	100	0.015	0.015	0.015	7.003	-	-	100	0.000	0.000	0.000	9.000	User	-	100	0.010	0.010	0.010	9.001	-	-	100	0.000	0.000	0.000	9.002	User	-	100	0.007	0.007	0.007	1.007	User	-	100	0.056	0.056	0.056	10.000	User	-	100	0.007	0.007	0.007	10.001	User	-	100	0.007	0.007	0.007		User	-	100	0.029	0.029	0.037	11.000	User	-	100	0.006	0.006	0.006		User	-	100	0.002	0.002	0.009		User	-	100	0.002	0.002	0.011		User	-	100	0.002	0.002	0.013		User	-	100	0.002	0.002	0.015		User	-	100	0.002	0.002	0.018		User	-	100	0.002	0.002	0.019	10.002	User	-	100	0.007	0.007	0.007	10.003	-	-	100	0.000	0.000	0.000	1.008	-	-	100	0.000	0.000	0.000	12.000	User	-	100	0.006	0.006	0.006	13.000	User	-	100	0.008	0.008	0.008	12.001	User	-	100	0.002	0.002	0.002	14.000	User	-	100	0.008	0.008	0.008	12.002	User	-	100	0.002	0.002	0.002	15.000	User	-	100	0.009	0.009	0.009	12.003	User	-	100	0.002	0.002	0.002	16.000	User	-	100	0.012	0.012	0.012	16.001	-	-	100	0.000	0.000	0.000	17.000	User	-	100	0.006	0.006	0.006
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)																																																																																																																																																																																																																																																																																																																																																																									
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©1982-2020 Innovyze																																																																																																																																																																																																																																																																																																																																																																															

Sutcliffe	Page 7
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by
Innovyze	Network 2020.1.3



Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
16.002	-	-	100	0.000	0.000	0.000
16.003	User	-	100	0.011	0.011	0.011
	User	-	100	0.004	0.004	0.016
18.000	User	-	100	0.012	0.012	0.012
19.000	User	-	100	0.003	0.003	0.003
18.001	User	-	100	0.002	0.002	0.002
12.004	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.392	0.392	0.392

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010		51.800	50.122	49.710	1500	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Storm Duration (mins)	30
Ratio R	0.356		

Sutcliffe		Page 8
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 46, DS/PN: 1.009, Volume (m³): 4.4

Unit Reference	MD-SHE-0103-5000-1200-5000
Design Head (m)	1.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	50.289
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	5.0
Flush-Flo™	0.354	5.0
Kick-Flo®	0.745	4.0
Mean Flow over Head Range	-	4.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.4	1.200	5.0	3.000	7.7	7.000	11.5
0.200	4.7	1.400	5.4	3.500	8.3	7.500	11.8
0.300	5.0	1.600	5.7	4.000	8.8	8.000	12.2
0.400	5.0	1.800	6.0	4.500	9.3	8.500	12.6
0.500	4.9	2.000	6.3	5.000	9.8	9.000	12.9
0.600	4.7	2.200	6.6	5.500	10.2	9.500	13.3
0.800	4.1	2.400	6.9	6.000	10.7		
1.000	4.6	2.600	7.2	6.500	11.1		

Sutcliffe		Page 9
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

Storage Structures for Storm

Cellular Storage Manhole: 29, DS/PN: 1.008

Invert Level (m) 50.315 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	250.0	250.0	1.201	0.0	334.0
1.200	250.0	334.0			

Sutcliffe				Page 10																																																																																																																																																																																																																																																																																																	
18-20 Harrington Street Liverpool L2 9QA			Miles Platting 3 Drainage Strategy																																																																																																																																																																																																																																																																																																		
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<u>Volume Summary (Static)</u> Length Calculations based on Centre-Centre <table><tr><th>Pipe Number</th><th>USMH Name</th><th>Manhole Volume (m³)</th><th>Pipe Volume (m³)</th><th>Storage Structure Volume (m³)</th><th>Total Volume (m³)</th></tr><tr><td>1.000</td><td>1</td><td>0.111</td><td>0.186</td><td>0.000</td><td>0.297</td></tr><tr><td>1.001</td><td>2</td><td>0.146</td><td>0.206</td><td>0.000</td><td>0.352</td></tr><tr><td>2.000</td><td>3</td><td>0.111</td><td>0.082</td><td>0.000</td><td>0.194</td></tr><tr><td>1.002</td><td>4</td><td>0.191</td><td>0.123</td><td>0.000</td><td>0.315</td></tr><tr><td>3.000</td><td>5</td><td>0.111</td><td>0.082</td><td>0.000</td><td>0.194</td></tr><tr><td>1.003</td><td>6</td><td>0.245</td><td>0.228</td><td>0.000</td><td>0.473</td></tr><tr><td>4.000</td><td>7</td><td>0.111</td><td>0.083</td><td>0.000</td><td>0.194</td></tr><tr><td>1.004</td><td>8</td><td>0.280</td><td>0.081</td><td>0.000</td><td>0.361</td></tr><tr><td>1.005</td><td>9</td><td>3.271</td><td>0.197</td><td>0.000</td><td>3.467</td></tr><tr><td>5.000</td><td>10</td><td>0.111</td><td>0.113</td><td>0.000</td><td>0.224</td></tr><tr><td>5.001</td><td>11</td><td>0.112</td><td>0.250</td><td>0.000</td><td>0.361</td></tr><tr><td>6.000</td><td>12</td><td>0.111</td><td>0.115</td><td>0.000</td><td>0.226</td></tr><tr><td>5.002</td><td>13</td><td>0.222</td><td>0.098</td><td>0.000</td><td>0.320</td></tr><tr><td>1.006</td><td>14</td><td>3.725</td><td>0.766</td><td>0.000</td><td>4.491</td></tr><tr><td>7.000</td><td>15</td><td>0.111</td><td>0.216</td><td>0.000</td><td>0.327</td></tr><tr><td>7.001</td><td>16</td><td>0.213</td><td>0.078</td><td>0.000</td><td>0.291</td></tr><tr><td>7.002</td><td>17</td><td>0.246</td><td>0.067</td><td>0.000</td><td>0.313</td></tr><tr><td>8.000</td><td>18</td><td>0.111</td><td>0.164</td><td>0.000</td><td>0.275</td></tr><tr><td>7.003</td><td>19</td><td>0.242</td><td>0.095</td><td>0.000</td><td>0.337</td></tr><tr><td>9.000</td><td>20</td><td>0.111</td><td>0.165</td><td>0.000</td><td>0.277</td></tr><tr><td>9.001</td><td>21</td><td>0.132</td><td>0.087</td><td>0.000</td><td>0.218</td></tr><tr><td>9.002</td><td>22</td><td>0.156</td><td>0.154</td><td>0.000</td><td>0.310</td></tr><tr><td>1.007</td><td>23</td><td>3.708</td><td>1.262</td><td>0.000</td><td>4.970</td></tr><tr><td>10.000</td><td>24</td><td>0.111</td><td>0.209</td><td>0.000</td><td>0.321</td></tr><tr><td>10.001</td><td>25</td><td>0.119</td><td>0.222</td><td>0.000</td><td>0.341</td></tr><tr><td>11.000</td><td>26</td><td>0.792</td><td>0.213</td><td>0.000</td><td>1.005</td></tr><tr><td>10.002</td><td>27</td><td>0.201</td><td>0.177</td><td>0.000</td><td>0.378</td></tr><tr><td>10.003</td><td>28</td><td>0.241</td><td>0.124</td><td>0.000</td><td>0.365</td></tr><tr><td>1.008</td><td>29</td><td>3.473</td><td>0.216</td><td>285.079</td><td>288.768</td></tr><tr><td>12.000</td><td>30</td><td>0.111</td><td>0.095</td><td>0.000</td><td>0.206</td></tr><tr><td>13.000</td><td>31</td><td>0.111</td><td>0.086</td><td>0.000</td><td>0.197</td></tr><tr><td>12.001</td><td>32</td><td>0.142</td><td>0.073</td><td>0.000</td><td>0.215</td></tr><tr><td>14.000</td><td>33</td><td>0.111</td><td>0.085</td><td>0.000</td><td>0.197</td></tr><tr><td>12.002</td><td>34</td><td>0.219</td><td>0.089</td><td>0.000</td><td>0.308</td></tr><tr><td>15.000</td><td>35</td><td>0.111</td><td>0.087</td><td>0.000</td><td>0.198</td></tr><tr><td>12.003</td><td>36</td><td>0.276</td><td>0.090</td><td>0.000</td><td>0.366</td></tr><tr><td>16.000</td><td>37</td><td>0.111</td><td>0.088</td><td>0.000</td><td>0.199</td></tr><tr><td>16.001</td><td>38</td><td>0.135</td><td>0.058</td><td>0.000</td><td>0.193</td></tr><tr><td>17.000</td><td>39</td><td>0.111</td><td>0.035</td><td>0.000</td><td>0.146</td></tr><tr><td>16.002</td><td>40</td><td>0.155</td><td>0.080</td><td>0.000</td><td>0.235</td></tr><tr><td>16.003</td><td>41</td><td>0.152</td><td>0.200</td><td>0.000</td><td>0.352</td></tr><tr><td>18.000</td><td>42</td><td>0.111</td><td>0.090</td><td>0.000</td><td>0.201</td></tr><tr><td>19.000</td><td>43</td><td>0.111</td><td>0.081</td><td>0.000</td><td>0.192</td></tr><tr><td>18.001</td><td>44</td><td>0.163</td><td>0.113</td><td>0.000</td><td>0.275</td></tr><tr><td>12.004</td><td>45</td><td>0.364</td><td>0.060</td><td>0.000</td><td>0.425</td></tr><tr><td>1.009</td><td>46</td><td>4.206</td><td>0.588</td><td>0.000</td><td>4.794</td></tr><tr><td>1.010</td><td>47</td><td>3.235</td><td>0.123</td><td>0.000</td><td>3.358</td></tr></table>						Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)	1.000	1	0.111	0.186	0.000	0.297	1.001	2	0.146	0.206	0.000	0.352	2.000	3	0.111	0.082	0.000	0.194	1.002	4	0.191	0.123	0.000	0.315	3.000	5	0.111	0.082	0.000	0.194	1.003	6	0.245	0.228	0.000	0.473	4.000	7	0.111	0.083	0.000	0.194	1.004	8	0.280	0.081	0.000	0.361	1.005	9	3.271	0.197	0.000	3.467	5.000	10	0.111	0.113	0.000	0.224	5.001	11	0.112	0.250	0.000	0.361	6.000	12	0.111	0.115	0.000	0.226	5.002	13	0.222	0.098	0.000	0.320	1.006	14	3.725	0.766	0.000	4.491	7.000	15	0.111	0.216	0.000	0.327	7.001	16	0.213	0.078	0.000	0.291	7.002	17	0.246	0.067	0.000	0.313	8.000	18	0.111	0.164	0.000	0.275	7.003	19	0.242	0.095	0.000	0.337	9.000	20	0.111	0.165	0.000	0.277	9.001	21	0.132	0.087	0.000	0.218	9.002	22	0.156	0.154	0.000	0.310	1.007	23	3.708	1.262	0.000	4.970	10.000	24	0.111	0.209	0.000	0.321	10.001	25	0.119	0.222	0.000	0.341	11.000	26	0.792	0.213	0.000	1.005	10.002	27	0.201	0.177	0.000	0.378	10.003	28	0.241	0.124	0.000	0.365	1.008	29	3.473	0.216	285.079	288.768	12.000	30	0.111	0.095	0.000	0.206	13.000	31	0.111	0.086	0.000	0.197	12.001	32	0.142	0.073	0.000	0.215	14.000	33	0.111	0.085	0.000	0.197	12.002	34	0.219	0.089	0.000	0.308	15.000	35	0.111	0.087	0.000	0.198	12.003	36	0.276	0.090	0.000	0.366	16.000	37	0.111	0.088	0.000	0.199	16.001	38	0.135	0.058	0.000	0.193	17.000	39	0.111	0.035	0.000	0.146	16.002	40	0.155	0.080	0.000	0.235	16.003	41	0.152	0.200	0.000	0.352	18.000	42	0.111	0.090	0.000	0.201	19.000	43	0.111	0.081	0.000	0.192	18.001	44	0.163	0.113	0.000	0.275	12.004	45	0.364	0.060	0.000	0.425	1.009	46	4.206	0.588	0.000	4.794	1.010	47	3.235	0.123	0.000	3.358
Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)																																																																																																																																																																																																																																																																																																
1.000	1	0.111	0.186	0.000	0.297																																																																																																																																																																																																																																																																																																
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2.000	3	0.111	0.082	0.000	0.194																																																																																																																																																																																																																																																																																																
1.002	4	0.191	0.123	0.000	0.315																																																																																																																																																																																																																																																																																																
3.000	5	0.111	0.082	0.000	0.194																																																																																																																																																																																																																																																																																																
1.003	6	0.245	0.228	0.000	0.473																																																																																																																																																																																																																																																																																																
4.000	7	0.111	0.083	0.000	0.194																																																																																																																																																																																																																																																																																																
1.004	8	0.280	0.081	0.000	0.361																																																																																																																																																																																																																																																																																																
1.005	9	3.271	0.197	0.000	3.467																																																																																																																																																																																																																																																																																																
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5.001	11	0.112	0.250	0.000	0.361																																																																																																																																																																																																																																																																																																
6.000	12	0.111	0.115	0.000	0.226																																																																																																																																																																																																																																																																																																
5.002	13	0.222	0.098	0.000	0.320																																																																																																																																																																																																																																																																																																
1.006	14	3.725	0.766	0.000	4.491																																																																																																																																																																																																																																																																																																
7.000	15	0.111	0.216	0.000	0.327																																																																																																																																																																																																																																																																																																
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10.001	25	0.119	0.222	0.000	0.341																																																																																																																																																																																																																																																																																																
11.000	26	0.792	0.213	0.000	1.005																																																																																																																																																																																																																																																																																																
10.002	27	0.201	0.177	0.000	0.378																																																																																																																																																																																																																																																																																																
10.003	28	0.241	0.124	0.000	0.365																																																																																																																																																																																																																																																																																																
1.008	29	3.473	0.216	285.079	288.768																																																																																																																																																																																																																																																																																																
12.000	30	0.111	0.095	0.000	0.206																																																																																																																																																																																																																																																																																																
13.000	31	0.111	0.086	0.000	0.197																																																																																																																																																																																																																																																																																																
12.001	32	0.142	0.073	0.000	0.215																																																																																																																																																																																																																																																																																																
14.000	33	0.111	0.085	0.000	0.197																																																																																																																																																																																																																																																																																																
12.002	34	0.219	0.089	0.000	0.308																																																																																																																																																																																																																																																																																																
15.000	35	0.111	0.087	0.000	0.198																																																																																																																																																																																																																																																																																																
12.003	36	0.276	0.090	0.000	0.366																																																																																																																																																																																																																																																																																																
16.000	37	0.111	0.088	0.000	0.199																																																																																																																																																																																																																																																																																																
16.001	38	0.135	0.058	0.000	0.193																																																																																																																																																																																																																																																																																																
17.000	39	0.111	0.035	0.000	0.146																																																																																																																																																																																																																																																																																																
16.002	40	0.155	0.080	0.000	0.235																																																																																																																																																																																																																																																																																																
16.003	41	0.152	0.200	0.000	0.352																																																																																																																																																																																																																																																																																																
18.000	42	0.111	0.090	0.000	0.201																																																																																																																																																																																																																																																																																																
19.000	43	0.111	0.081	0.000	0.192																																																																																																																																																																																																																																																																																																
18.001	44	0.163	0.113	0.000	0.275																																																																																																																																																																																																																																																																																																
12.004	45	0.364	0.060	0.000	0.425																																																																																																																																																																																																																																																																																																
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1.010	47	3.235	0.123	0.000	3.358																																																																																																																																																																																																																																																																																																
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Sutcliffe		Page 11
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

Volume Summary (Static)

Pipe Number	USMH Name	Manhole Volume (m ³)	Pipe Volume (m ³)	Storage Structure Volume (m ³)	Total Volume (m ³)
Total		28.766	8.177	285.079	322.022

Sutcliffe				Page 12																																																																																																																																																																																																																																																																																																	
18-20 Harrington Street Liverpool L2 9QA			Miles Platting 3 Drainage Strategy																																																																																																																																																																																																																																																																																																		
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Innovyze			Network 2020.1.3																																																																																																																																																																																																																																																																																																		
Volume Summary (Static) Length Calculations based on True Length <table><thead><tr><th>Pipe Number</th><th>USMH Name</th><th>Manhole Volume (m³)</th><th>Pipe Volume (m³)</th><th>Storage Structure Volume (m³)</th><th>Total Volume (m³)</th></tr></thead><tbody><tr><td>1.000</td><td>1</td><td>0.111</td><td>0.178</td><td>0.000</td><td>0.289</td></tr><tr><td>1.001</td><td>2</td><td>0.146</td><td>0.198</td><td>0.000</td><td>0.344</td></tr><tr><td>2.000</td><td>3</td><td>0.111</td><td>0.079</td><td>0.000</td><td>0.190</td></tr><tr><td>1.002</td><td>4</td><td>0.191</td><td>0.116</td><td>0.000</td><td>0.307</td></tr><tr><td>3.000</td><td>5</td><td>0.111</td><td>0.079</td><td>0.000</td><td>0.190</td></tr><tr><td>1.003</td><td>6</td><td>0.245</td><td>0.220</td><td>0.000</td><td>0.465</td></tr><tr><td>4.000</td><td>7</td><td>0.111</td><td>0.079</td><td>0.000</td><td>0.191</td></tr><tr><td>1.004</td><td>8</td><td>0.280</td><td>0.064</td><td>0.000</td><td>0.344</td></tr><tr><td>1.005</td><td>9</td><td>3.271</td><td>0.170</td><td>0.000</td><td>3.441</td></tr><tr><td>5.000</td><td>10</td><td>0.111</td><td>0.109</td><td>0.000</td><td>0.221</td></tr><tr><td>5.001</td><td>11</td><td>0.112</td><td>0.246</td><td>0.000</td><td>0.358</td></tr><tr><td>6.000</td><td>12</td><td>0.111</td><td>0.111</td><td>0.000</td><td>0.222</td></tr><tr><td>5.002</td><td>13</td><td>0.222</td><td>0.090</td><td>0.000</td><td>0.312</td></tr><tr><td>1.006</td><td>14</td><td>3.725</td><td>0.740</td><td>0.000</td><td>4.465</td></tr><tr><td>7.000</td><td>15</td><td>0.111</td><td>0.213</td><td>0.000</td><td>0.324</td></tr><tr><td>7.001</td><td>16</td><td>0.213</td><td>0.075</td><td>0.000</td><td>0.288</td></tr><tr><td>7.002</td><td>17</td><td>0.246</td><td>0.063</td><td>0.000</td><td>0.309</td></tr><tr><td>8.000</td><td>18</td><td>0.111</td><td>0.161</td><td>0.000</td><td>0.272</td></tr><tr><td>7.003</td><td>19</td><td>0.242</td><td>0.088</td><td>0.000</td><td>0.329</td></tr><tr><td>9.000</td><td>20</td><td>0.111</td><td>0.162</td><td>0.000</td><td>0.273</td></tr><tr><td>9.001</td><td>21</td><td>0.132</td><td>0.083</td><td>0.000</td><td>0.215</td></tr><tr><td>9.002</td><td>22</td><td>0.156</td><td>0.146</td><td>0.000</td><td>0.302</td></tr><tr><td>1.007</td><td>23</td><td>3.708</td><td>1.202</td><td>0.000</td><td>4.911</td></tr><tr><td>10.000</td><td>24</td><td>0.111</td><td>0.206</td><td>0.000</td><td>0.317</td></tr><tr><td>10.001</td><td>25</td><td>0.119</td><td>0.214</td><td>0.000</td><td>0.334</td></tr><tr><td>11.000</td><td>26</td><td>0.792</td><td>0.206</td><td>0.000</td><td>0.998</td></tr><tr><td>10.002</td><td>27</td><td>0.201</td><td>0.169</td><td>0.000</td><td>0.370</td></tr><tr><td>10.003</td><td>28</td><td>0.241</td><td>0.107</td><td>0.000</td><td>0.347</td></tr><tr><td>1.008</td><td>29</td><td>3.473</td><td>0.156</td><td>285.079</td><td>288.709</td></tr><tr><td>12.000</td><td>30</td><td>0.111</td><td>0.091</td><td>0.000</td><td>0.202</td></tr><tr><td>13.000</td><td>31</td><td>0.111</td><td>0.082</td><td>0.000</td><td>0.193</td></tr><tr><td>12.001</td><td>32</td><td>0.142</td><td>0.070</td><td>0.000</td><td>0.211</td></tr><tr><td>14.000</td><td>33</td><td>0.111</td><td>0.082</td><td>0.000</td><td>0.193</td></tr><tr><td>12.002</td><td>34</td><td>0.219</td><td>0.086</td><td>0.000</td><td>0.305</td></tr><tr><td>15.000</td><td>35</td><td>0.111</td><td>0.083</td><td>0.000</td><td>0.195</td></tr><tr><td>12.003</td><td>36</td><td>0.276</td><td>0.086</td><td>0.000</td><td>0.362</td></tr><tr><td>16.000</td><td>37</td><td>0.111</td><td>0.084</td><td>0.000</td><td>0.195</td></tr><tr><td>16.001</td><td>38</td><td>0.135</td><td>0.054</td><td>0.000</td><td>0.189</td></tr><tr><td>17.000</td><td>39</td><td>0.111</td><td>0.031</td><td>0.000</td><td>0.143</td></tr><tr><td>16.002</td><td>40</td><td>0.155</td><td>0.076</td><td>0.000</td><td>0.231</td></tr><tr><td>16.003</td><td>41</td><td>0.152</td><td>0.196</td><td>0.000</td><td>0.348</td></tr><tr><td>18.000</td><td>42</td><td>0.111</td><td>0.086</td><td>0.000</td><td>0.198</td></tr><tr><td>19.000</td><td>43</td><td>0.111</td><td>0.077</td><td>0.000</td><td>0.189</td></tr><tr><td>18.001</td><td>44</td><td>0.163</td><td>0.109</td><td>0.000</td><td>0.272</td></tr><tr><td>12.004</td><td>45</td><td>0.364</td><td>0.043</td><td>0.000</td><td>0.408</td></tr><tr><td>1.009</td><td>46</td><td>4.206</td><td>0.561</td><td>0.000</td><td>4.767</td></tr><tr><td>1.010</td><td>47</td><td>3.235</td><td>0.096</td><td>0.000</td><td>3.331</td></tr></tbody></table>						Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)	1.000	1	0.111	0.178	0.000	0.289	1.001	2	0.146	0.198	0.000	0.344	2.000	3	0.111	0.079	0.000	0.190	1.002	4	0.191	0.116	0.000	0.307	3.000	5	0.111	0.079	0.000	0.190	1.003	6	0.245	0.220	0.000	0.465	4.000	7	0.111	0.079	0.000	0.191	1.004	8	0.280	0.064	0.000	0.344	1.005	9	3.271	0.170	0.000	3.441	5.000	10	0.111	0.109	0.000	0.221	5.001	11	0.112	0.246	0.000	0.358	6.000	12	0.111	0.111	0.000	0.222	5.002	13	0.222	0.090	0.000	0.312	1.006	14	3.725	0.740	0.000	4.465	7.000	15	0.111	0.213	0.000	0.324	7.001	16	0.213	0.075	0.000	0.288	7.002	17	0.246	0.063	0.000	0.309	8.000	18	0.111	0.161	0.000	0.272	7.003	19	0.242	0.088	0.000	0.329	9.000	20	0.111	0.162	0.000	0.273	9.001	21	0.132	0.083	0.000	0.215	9.002	22	0.156	0.146	0.000	0.302	1.007	23	3.708	1.202	0.000	4.911	10.000	24	0.111	0.206	0.000	0.317	10.001	25	0.119	0.214	0.000	0.334	11.000	26	0.792	0.206	0.000	0.998	10.002	27	0.201	0.169	0.000	0.370	10.003	28	0.241	0.107	0.000	0.347	1.008	29	3.473	0.156	285.079	288.709	12.000	30	0.111	0.091	0.000	0.202	13.000	31	0.111	0.082	0.000	0.193	12.001	32	0.142	0.070	0.000	0.211	14.000	33	0.111	0.082	0.000	0.193	12.002	34	0.219	0.086	0.000	0.305	15.000	35	0.111	0.083	0.000	0.195	12.003	36	0.276	0.086	0.000	0.362	16.000	37	0.111	0.084	0.000	0.195	16.001	38	0.135	0.054	0.000	0.189	17.000	39	0.111	0.031	0.000	0.143	16.002	40	0.155	0.076	0.000	0.231	16.003	41	0.152	0.196	0.000	0.348	18.000	42	0.111	0.086	0.000	0.198	19.000	43	0.111	0.077	0.000	0.189	18.001	44	0.163	0.109	0.000	0.272	12.004	45	0.364	0.043	0.000	0.408	1.009	46	4.206	0.561	0.000	4.767	1.010	47	3.235	0.096	0.000	3.331
Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)																																																																																																																																																																																																																																																																																																
1.000	1	0.111	0.178	0.000	0.289																																																																																																																																																																																																																																																																																																
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1.004	8	0.280	0.064	0.000	0.344																																																																																																																																																																																																																																																																																																
1.005	9	3.271	0.170	0.000	3.441																																																																																																																																																																																																																																																																																																
5.000	10	0.111	0.109	0.000	0.221																																																																																																																																																																																																																																																																																																
5.001	11	0.112	0.246	0.000	0.358																																																																																																																																																																																																																																																																																																
6.000	12	0.111	0.111	0.000	0.222																																																																																																																																																																																																																																																																																																
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9.002	22	0.156	0.146	0.000	0.302																																																																																																																																																																																																																																																																																																
1.007	23	3.708	1.202	0.000	4.911																																																																																																																																																																																																																																																																																																
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10.001	25	0.119	0.214	0.000	0.334																																																																																																																																																																																																																																																																																																
11.000	26	0.792	0.206	0.000	0.998																																																																																																																																																																																																																																																																																																
10.002	27	0.201	0.169	0.000	0.370																																																																																																																																																																																																																																																																																																
10.003	28	0.241	0.107	0.000	0.347																																																																																																																																																																																																																																																																																																
1.008	29	3.473	0.156	285.079	288.709																																																																																																																																																																																																																																																																																																
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17.000	39	0.111	0.031	0.000	0.143																																																																																																																																																																																																																																																																																																
16.002	40	0.155	0.076	0.000	0.231																																																																																																																																																																																																																																																																																																
16.003	41	0.152	0.196	0.000	0.348																																																																																																																																																																																																																																																																																																
18.000	42	0.111	0.086	0.000	0.198																																																																																																																																																																																																																																																																																																
19.000	43	0.111	0.077	0.000	0.189																																																																																																																																																																																																																																																																																																
18.001	44	0.163	0.109	0.000	0.272																																																																																																																																																																																																																																																																																																
12.004	45	0.364	0.043	0.000	0.408																																																																																																																																																																																																																																																																																																
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Sutcliffe		Page 13
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

Volume Summary (Static)

Pipe Number	USMH Name	Manhole Volume (m ³)	Pipe Volume (m ³)	Storage Structure Volume (m ³)	Total Volume (m ³)
Total		28.766	7.724	285.079	321.569

Sutcliffe

Page 14

18-20 Harrington Street
Liverpool
L2 9QA

Date 12/01/2021 23:59
File 31457 - Drainage Strate...

Innovyze

Miles Platting 3
Drainage Strategy

Designed by SB
Checked by

Network 2020.1.3

Micro
Drainage

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)

for Storm

Simulation Criteria

Areal Reduction Factor 1.000

Hot Start (mins) 0

Hot Start Level (mm) 0

Manhole Headloss Coeff (Global) 0.500

Foul Sewage per hectare (l/s) 0.000

Additional Flow - % of Total Flow 0.000

MADD Factor * 10m³/ha Storage 2.000

Inlet Coeffiecient 0.800

Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model

Region England and Wales

M5-60 (mm)

FSR

Cv (Summer)

18.100 Cv (Winter)

Ratio R 0.356

0.750

0.840

Margin for Flood Risk Warning (mm)

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

DVD Status

Inertia Status

300.0

OFF

ON

ON

Profile(s)

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years)

Climate Change (%)

Summer and Winter

1, 30, 100

0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 15	Winter	1	+0%	100/15	Summer	100/15	Summer
1.001	2 15	Winter	1	+0%	30/15	Summer		
2.000	3 15	Winter	1	+0%	100/15	Summer		
1.002	4 15	Winter	1	+0%	30/15	Summer		
3.000	5 15	Winter	1	+0%	100/15	Summer		
1.003	6 15	Winter	1	+0%	30/15	Summer		
4.000	7 15	Winter	1	+0%	100/15	Summer		
1.004	8 15	Winter	1	+0%	30/15	Summer		
1.005	9 15	Winter	1	+0%	30/15	Summer		
5.000	10 15	Winter	1	+0%	100/15	Summer		
5.001	11 15	Winter	1	+0%	30/15	Summer		
6.000	12 15	Winter	1	+0%	100/15	Summer		
5.002	13 15	Winter	1	+0%	30/15	Summer		
1.006	14 15	Winter	1	+0%	30/15	Summer		
7.000	15 15	Winter	1	+0%	100/15	Summer		
7.001	16 15	Winter	1	+0%	100/15	Summer		

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Sutcliffe							Page 16		
18-20 Harrington Street Liverpool L2 9QA				Miles Platting 3 Drainage Strategy					
Date 12/01/2021 23:59 File 31457 - Drainage Strate...				Designed by SB Checked by					
Innovyze				Network 2020.1.3					
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	
7.002	17	15 Winter	1	+0%	30/15 Winter				
8.000	18	15 Winter	1	+0%	100/15 Summer				
7.003	19	15 Winter	1	+0%	30/15 Summer				
9.000	20	15 Winter	1	+0%					
9.001	21	15 Winter	1	+0%					
9.002	22	15 Winter	1	+0%	100/15 Summer				
1.007	23	15 Winter	1	+0%	30/15 Summer				
10.000	24	15 Winter	1	+0%	100/15 Summer				
10.001	25	15 Winter	1	+0%	100/15 Summer				
11.000	26	15 Winter	1	+0%	100/15 Summer				
10.002	27	15 Winter	1	+0%	30/15 Summer				
10.003	28	15 Winter	1	+0%	30/15 Summer				
1.008	29	1440 Winter	1	+0%	100/60 Winter				
12.000	30	15 Winter	1	+0%	30/15 Summer	100/15 Summer			
13.000	31	15 Winter	1	+0%	30/15 Winter				
12.001	32	15 Winter	1	+0%	30/15 Summer				
14.000	33	15 Winter	1	+0%	100/15 Summer				
12.002	34	15 Winter	1	+0%	30/15 Summer				
15.000	35	15 Winter	1	+0%					
12.003	36	15 Winter	1	+0%	1/15 Winter				
16.000	37	15 Winter	1	+0%	30/15 Summer	100/15 Summer			
16.001	38	15 Winter	1	+0%	30/15 Summer				
17.000	39	15 Winter	1	+0%	30/15 Summer				
16.002	40	15 Winter	1	+0%	30/15 Summer				
16.003	41	15 Winter	1	+0%	30/15 Summer				
18.000	42	15 Winter	1	+0%					
19.000	43	15 Winter	1	+0%					
18.001	44	15 Winter	1	+0%	100/15 Summer				
12.004	45	15 Winter	1	+0%	1/15 Summer				
1.009	46	15 Winter	1	+0%	1/15 Summer				
1.010	47	60 Summer	1	+0%					
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
7.002	17	51.602	-0.062	0.000	0.31			2.3	OK
8.000	18	52.222	-0.069	0.000	0.21			1.6	OK
7.003	19	51.460	-0.058	0.000	0.37			3.9	OK
9.000	20	52.433	-0.075	0.000	0.15			1.1	OK
9.001	21	52.073	-0.074	0.000	0.15			1.1	OK
9.002	22	51.892	-0.067	0.000	0.24			1.9	OK
1.007	23	51.021	-0.095	0.000	0.63			23.6	OK
10.000	24	52.047	-0.079	0.000	0.10			0.8	OK
10.001	25	51.517	-0.104	0.000	0.20			4.5	OK
11.000	26	51.984	-0.064	0.000	0.28			2.2	OK
10.002	27	51.305	-0.078	0.000	0.46			7.4	OK
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Sutcliffe		Page 18
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Level Exceeded
17.000		39
16.002		40
16.003		41
18.000		42
19.000		43
18.001		44
12.004		45
1.009		46
1.010		47

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Sutcliffe		Page 20
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	
1.000	1	52.146	-0.050	0.000	0.03		0.7	OK
1.001	2	52.144	0.128	0.000	0.20		3.1	SURCHARGED
2.000	3	52.240	-0.080	0.000	0.09		0.7	OK
1.002	4	52.138	0.238	0.000	0.39		5.8	SURCHARGED
3.000	5	52.503	-0.080	0.000	0.09		0.7	OK
1.003	6	52.128	0.297	0.000	0.48		7.8	SURCHARGED
4.000	7	52.587	-0.063	0.000	0.29		2.2	OK
1.004	8	52.106	0.403	0.000	0.66		8.8	SURCHARGED
1.005	9	52.091	0.434	0.000	0.80		12.8	SURCHARGED
5.000	10	53.073	-0.041	0.000	0.30		2.3	OK
5.001	11	53.053	0.184	0.000	0.95		7.4	SURCHARGED
6.000	12	53.087	-0.063	0.000	0.30		2.2	OK
5.002	13	52.551	0.225	0.000	1.43		10.7	SURCHARGED
1.006	14	52.058	0.512	0.000	1.40		24.0	SURCHARGED
7.000	15	52.256	-0.048	0.000	0.53		4.1	OK
7.001	16	51.787	-0.047	0.000	0.55		4.0	OK

PN	US/MH		Level Exceeded
	Name		
1.000	1		4
1.001	2		
2.000	3		
1.002	4		
3.000	5		
1.003	6		
4.000	7		
1.004	8		
1.005	9		
5.000	10		
5.001	11		
6.000	12		
5.002	13		
1.006	14		
7.000	15		
7.001	16		

Sutcliffe		Page 21
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.002	17	15 Winter	30	+0%	30/15 Winter			
8.000	18	15 Winter	30	+0%	100/15 Summer			
7.003	19	15 Winter	30	+0%	30/15 Summer			
9.000	20	15 Winter	30	+0%				
9.001	21	15 Winter	30	+0%				
9.002	22	15 Winter	30	+0%	100/15 Summer			
1.007	23	15 Winter	30	+0%	30/15 Summer			
10.000	24	15 Winter	30	+0%	100/15 Summer			
10.001	25	15 Winter	30	+0%	100/15 Summer			
11.000	26	15 Winter	30	+0%	100/15 Summer			
10.002	27	15 Winter	30	+0%	30/15 Summer			
10.003	28	15 Winter	30	+0%	30/15 Summer			
1.008	29	960 Winter	30	+0%	100/60 Winter			
12.000	30	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
13.000	31	15 Winter	30	+0%	30/15 Winter			
12.001	32	15 Winter	30	+0%	30/15 Summer			
14.000	33	15 Winter	30	+0%	100/15 Summer			
12.002	34	15 Winter	30	+0%	30/15 Summer			
15.000	35	15 Winter	30	+0%				
12.003	36	15 Winter	30	+0%	1/15 Winter			
16.000	37	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
16.001	38	15 Winter	30	+0%	30/15 Summer			
17.000	39	15 Winter	30	+0%	30/15 Summer			
16.002	40	15 Winter	30	+0%	30/15 Summer			
16.003	41	15 Winter	30	+0%	30/15 Summer			
18.000	42	15 Winter	30	+0%				
19.000	43	15 Winter	30	+0%				
18.001	44	15 Winter	30	+0%	100/15 Summer			
12.004	45	15 Winter	30	+0%	1/15 Summer			
1.009	46	15 Winter	30	+0%	1/15 Summer			
1.010	47	240 Winter	30	+0%				

PN	US/MH Name	Water		Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Time (mins)			Flow (l/s)		
7.002	17	51.668	0.004	0.000	0.77			5.6		SURCHARGED
8.000	18	52.242	-0.049	0.000	0.52			4.0		OK
7.003	19	51.581	0.063	0.000	0.91			9.5		SURCHARGED
9.000	20	52.449	-0.059	0.000	0.36			2.7		OK
9.001	21	52.089	-0.058	0.000	0.37			2.7		OK
9.002	22	51.918	-0.041	0.000	0.63			4.8		OK
1.007	23	51.255	0.140	0.000	1.33			50.0		SURCHARGED
10.000	24	52.059	-0.066	0.000	0.25			2.0		OK
10.001	25	51.573	-0.048	0.000	0.59			13.1		OK
11.000	26	52.009	-0.039	0.000	0.68			5.3		OK
10.002	27	51.490	0.108	0.000	1.26			20.0		SURCHARGED

Sutcliffe	Page 22
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by
Innovyze	Network 2020.1.3



30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
10.003	28	51.327	0.045	0.000	1.32		20.0	SURCHARGED
1.008	29	50.755	-0.171	0.000	0.13		3.9	OK
12.000	30	51.492	0.118	0.000	0.20		1.5	SURCHARGED
13.000	31	51.496	0.044	0.000	0.24		2.2	SURCHARGED
12.001	32	51.480	0.312	0.000	0.56		4.1	SURCHARGED
14.000	33	51.715	-0.063	0.000	0.30		2.2	OK
12.002	34	51.439	0.430	0.000	0.82		6.1	SURCHARGED
15.000	35	51.762	-0.062	0.000	0.31		2.3	OK
12.003	36	51.307	0.493	0.000	0.87		8.5	SURCHARGED
16.000	37	51.507	0.109	0.000	0.38		2.8	SURCHARGED
16.001	38	51.479	0.272	0.000	0.40		2.9	SURCHARGED
17.000	39	51.466	0.108	0.000	0.21		1.5	SURCHARGED
16.002	40	51.460	0.377	0.000	0.61		4.5	SURCHARGED
16.003	41	51.405	0.496	0.000	0.90		6.9	SURCHARGED
18.000	42	51.714	-0.053	0.000	0.45		3.4	OK
19.000	43	51.670	-0.079	0.000	0.10		0.7	OK
18.001	44	51.530	-0.042	0.000	0.63		4.8	OK
12.004	45	51.049	0.575	0.000	1.71		19.8	SURCHARGED
1.009	46	50.946	0.508	0.000	0.45		5.0	SURCHARGED
1.010	47	50.227	-0.074	0.000	0.51		5.0	OK

PN	US/MH Name	Level Exceeded
7.002	17	
8.000	18	
7.003	19	
9.000	20	
9.001	21	
9.002	22	
1.007	23	
10.000	24	
10.001	25	
11.000	26	
10.002	27	
10.003	28	
1.008	29	
12.000	30	4
13.000	31	
12.001	32	
14.000	33	
12.002	34	
15.000	35	
12.003	36	
16.000	37	4
16.001	38	

Sutcliffe		Page 23
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>		
	US/MH Level	
PN	Name	Exceeded
17.000		39
16.002		40
16.003		41
18.000		42
19.000		43
18.001		44
12.004		45
1.009		46
1.010		47
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Sutcliffe				Page 1																																																																																																																																																																																																			
18-20 Harrington Street Liverpool L2 9QA				Miles Platting 3 Drainage Strategy																																																																																																																																																																																																			
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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>																																																																																																																																																																																																							
<u>Simulation Criteria</u>																																																																																																																																																																																																							
Areal Reduction Factor		1.000		Additional Flow - % of Total Flow		0.000																																																																																																																																																																																																	
Hot Start (mins)		0		MADD Factor * 10m³/ha Storage		2.000																																																																																																																																																																																																	
Hot Start Level (mm)		0		Inlet Coeffiecient		0.800																																																																																																																																																																																																	
Manhole Headloss Coeff (Global)		0.500		Flow per Person per Day (l/per/day)		0.000																																																																																																																																																																																																	
Foul Sewage per hectare (l/s)		0.000																																																																																																																																																																																																					
Number of Input Hydrographs		0		Number of Storage Structures		1																																																																																																																																																																																																	
Number of Online Controls		1		Number of Time/Area Diagrams		0																																																																																																																																																																																																	
Number of Offline Controls		0		Number of Real Time Controls		0																																																																																																																																																																																																	
<u>Synthetic Rainfall Details</u>																																																																																																																																																																																																							
Rainfall Model		FSR		Ratio R		0.356																																																																																																																																																																																																	
Region England and Wales		Cv (Summer)				0.750																																																																																																																																																																																																	
M5-60 (mm)		18.100		Cv (Winter)		0.840																																																																																																																																																																																																	
Margin for Flood Risk Warning (mm)		300.0																																																																																																																																																																																																					
Analysis Timestep		2.5 Second Increment (Extended)																																																																																																																																																																																																					
DTS Status		OFF																																																																																																																																																																																																					
DVD Status		ON																																																																																																																																																																																																					
Inertia Status		ON																																																																																																																																																																																																					
Profile(s)		Summer and Winter																																																																																																																																																																																																					
Duration(s) (mins)		15, 30, 60, 120, 240, 360, 480, 960, 1440																																																																																																																																																																																																					
Return Period(s) (years)		100																																																																																																																																																																																																					
Climate Change (%)		0																																																																																																																																																																																																					
WARNING: Half Drain Time has not been calculated as the structure is too full.																																																																																																																																																																																																							
<table><tr><th></th><th>US/MH</th><th></th><th>Return</th><th>Climate</th><th>First (X)</th><th>First (Y)</th><th>First (Z)</th><th>Overflow</th><th>Water</th></tr><tr><th>PN</th><th>Name</th><th>Storm</th><th>Period</th><th>Change</th><th>Surcharge</th><th>Flood</th><th>Overflow</th><th>Act.</th><th>Level</th></tr><tr><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>(m)</th></tr><tr><td>1.000</td><td>1 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.491</td></tr><tr><td>1.001</td><td>2 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.488</td></tr><tr><td>2.000</td><td>3 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.486</td></tr><tr><td>1.002</td><td>4 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.480</td></tr><tr><td>3.000</td><td>5 15</td><td>Winter</td><td>100</td><td>+0%</td><td></td><td></td><td></td><td></td><td>52.506</td></tr><tr><td>1.003</td><td>6 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.469</td></tr><tr><td>4.000</td><td>7 15</td><td>Winter</td><td>100</td><td>+0%</td><td></td><td></td><td></td><td></td><td>52.593</td></tr><tr><td>1.004</td><td>8 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.443</td></tr><tr><td>1.005</td><td>9 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.425</td></tr><tr><td>5.000</td><td>10 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>53.424</td></tr><tr><td>5.001</td><td>11 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>53.398</td></tr><tr><td>6.000</td><td>12 15</td><td>Winter</td><td>100</td><td>+0%</td><td></td><td></td><td></td><td></td><td>53.092</td></tr><tr><td>5.002</td><td>13 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.856</td></tr><tr><td>1.006</td><td>14 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.378</td></tr><tr><td>7.000</td><td>15 15</td><td>Winter</td><td>100</td><td>+0%</td><td></td><td></td><td></td><td></td><td>52.265</td></tr><tr><td>7.001</td><td>16 15</td><td>Winter</td><td>100</td><td>+0%</td><td>100/15</td><td>Summer</td><td></td><td></td><td>52.030</td></tr></table>											US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water	PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level										(m)	1.000	1 15	Winter	100	+0%	100/15	Summer			52.491	1.001	2 15	Winter	100	+0%	100/15	Summer			52.488	2.000	3 15	Winter	100	+0%	100/15	Summer			52.486	1.002	4 15	Winter	100	+0%	100/15	Summer			52.480	3.000	5 15	Winter	100	+0%					52.506	1.003	6 15	Winter	100	+0%	100/15	Summer			52.469	4.000	7 15	Winter	100	+0%					52.593	1.004	8 15	Winter	100	+0%	100/15	Summer			52.443	1.005	9 15	Winter	100	+0%	100/15	Summer			52.425	5.000	10 15	Winter	100	+0%	100/15	Summer			53.424	5.001	11 15	Winter	100	+0%	100/15	Summer			53.398	6.000	12 15	Winter	100	+0%					53.092	5.002	13 15	Winter	100	+0%	100/15	Summer			52.856	1.006	14 15	Winter	100	+0%	100/15	Summer			52.378	7.000	15 15	Winter	100	+0%					52.265	7.001	16 15	Winter	100	+0%	100/15	Summer			52.030
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water																																																																																																																																																																																														
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level																																																																																																																																																																																														
									(m)																																																																																																																																																																																														
1.000	1 15	Winter	100	+0%	100/15	Summer			52.491																																																																																																																																																																																														
1.001	2 15	Winter	100	+0%	100/15	Summer			52.488																																																																																																																																																																																														
2.000	3 15	Winter	100	+0%	100/15	Summer			52.486																																																																																																																																																																																														
1.002	4 15	Winter	100	+0%	100/15	Summer			52.480																																																																																																																																																																																														
3.000	5 15	Winter	100	+0%					52.506																																																																																																																																																																																														
1.003	6 15	Winter	100	+0%	100/15	Summer			52.469																																																																																																																																																																																														
4.000	7 15	Winter	100	+0%					52.593																																																																																																																																																																																														
1.004	8 15	Winter	100	+0%	100/15	Summer			52.443																																																																																																																																																																																														
1.005	9 15	Winter	100	+0%	100/15	Summer			52.425																																																																																																																																																																																														
5.000	10 15	Winter	100	+0%	100/15	Summer			53.424																																																																																																																																																																																														
5.001	11 15	Winter	100	+0%	100/15	Summer			53.398																																																																																																																																																																																														
6.000	12 15	Winter	100	+0%					53.092																																																																																																																																																																																														
5.002	13 15	Winter	100	+0%	100/15	Summer			52.856																																																																																																																																																																																														
1.006	14 15	Winter	100	+0%	100/15	Summer			52.378																																																																																																																																																																																														
7.000	15 15	Winter	100	+0%					52.265																																																																																																																																																																																														
7.001	16 15	Winter	100	+0%	100/15	Summer			52.030																																																																																																																																																																																														
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Sutcliffe		Page 2
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:04 File 31457 - Drainage Strate...	Designed by SB Checked by	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	1	0.295	0.000	0.04		0.8	FLOOD RISK	
1.001	2	0.472	0.000	0.24		3.8	FLOOD RISK	
2.000	3	0.167	0.000	0.12		0.9	SURCHARGED	
1.002	4	0.580	0.000	0.42		6.3	SURCHARGED	
3.000	5	-0.077	0.000	0.12		0.9	OK	
1.003	6	0.638	0.000	0.52		8.4	SURCHARGED	
4.000	7	-0.057	0.000	0.38		2.8	OK	
1.004	8	0.741	0.000	0.73		9.7	SURCHARGED	
1.005	9	0.768	0.000	0.87		13.8	SURCHARGED	
5.000	10	0.310	0.000	0.36		2.7	FLOOD RISK	
5.001	11	0.529	0.000	1.05		8.1	FLOOD RISK	
6.000	12	-0.057	0.000	0.38		2.9	OK	
5.002	13	0.531	0.000	1.53		11.4	SURCHARGED	
1.006	14	0.832	0.000	1.57		27.1	SURCHARGED	
7.000	15	-0.039	0.000	0.68		5.2	OK	
7.001	16	0.196	0.000	0.71		5.2	SURCHARGED	

Sutcliffe		Page 3
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:04 File 31457 - Drainage Strate...	Designed by SB Checked by	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
7.002	17	15 Winter	100	+0%	100/15 Summer				51.950
8.000	18	15 Winter	100	+0%					52.251
7.003	19	15 Winter	100	+0%	100/15 Summer				51.837
9.000	20	15 Winter	100	+0%					52.455
9.001	21	15 Winter	100	+0%					52.096
9.002	22	15 Winter	100	+0%					51.930
1.007	23	15 Winter	100	+0%	100/15 Summer				51.382
10.000	24	15 Winter	100	+0%					52.065
10.001	25	15 Winter	100	+0%	100/15 Summer				51.743
11.000	26	15 Winter	100	+0%					52.021
10.002	27	15 Winter	100	+0%	100/15 Summer				51.628
10.003	28	15 Winter	100	+0%	100/15 Summer				51.388
1.008	29	480 Winter	100	+0%					50.860
12.000	30	15 Winter	100	+0%	100/15 Summer				51.777
13.000	31	15 Winter	100	+0%	100/15 Summer				51.781
12.001	32	15 Winter	100	+0%	100/15 Summer				51.761
14.000	33	15 Winter	100	+0%					51.720
12.002	34	15 Winter	100	+0%	100/15 Summer				51.699
15.000	35	15 Winter	100	+0%					51.768
12.003	36	15 Winter	100	+0%	100/15 Summer				51.506
16.000	37	15 Winter	100	+0%	100/15 Summer				51.810
16.001	38	15 Winter	100	+0%	100/15 Summer				51.767
17.000	39	15 Winter	100	+0%	100/15 Summer				51.747
16.002	40	15 Winter	100	+0%	100/15 Summer				51.738
16.003	41	15 Winter	100	+0%	100/15 Summer				51.657
18.000	42	15 Winter	100	+0%					51.722
19.000	43	15 Winter	100	+0%					51.672
18.001	44	15 Winter	100	+0%					51.541
12.004	45	15 Winter	100	+0%	100/15 Summer				51.112
1.009	46	15 Summer	100	+0%	100/15 Summer				50.963
1.010	47	360 Winter	100	+0%					50.227

Surcharged Flooded					Half Drain Pipe				Level
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Exceeded
7.002	17	0.286	0.000	0.93			6.8	SURCHARGED	
8.000	18	-0.040	0.000	0.67			5.1	OK	
7.003	19	0.318	0.000	1.08			11.2	SURCHARGED	
9.000	20	-0.053	0.000	0.46			3.5	OK	
9.001	21	-0.052	0.000	0.47			3.5	OK	
9.002	22	-0.029	0.000	0.82			6.3	OK	
1.007	23	0.266	0.000	1.56			58.5	SURCHARGED	
10.000	24	-0.061	0.000	0.32			2.6	OK	
10.001	25	0.122	0.000	0.69			15.5	SURCHARGED	
11.000	26	-0.027	0.000	0.88			6.8	OK	
10.002	27	0.246	0.000	1.54			24.4	SURCHARGED	

Sutcliffe		Page 4
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:04 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged		Flooded		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
10.003	28	0.106	0.000	1.59			24.3	SURCHARGED	
1.008	29	-0.067	0.000	0.16			4.8	OK	
12.000	30	0.403	0.000	0.24			1.8	FLOOD RISK	
13.000	31	0.329	0.000	0.26			2.3	FLOOD RISK	
12.001	32	0.593	0.000	0.66			4.9	FLOOD RISK	
14.000	33	-0.057	0.000	0.39			2.9	OK	
12.002	34	0.690	0.000	1.03			7.7	SURCHARGED	
15.000	35	-0.056	0.000	0.41			3.0	OK	
12.003	36	0.692	0.000	1.07			10.5	SURCHARGED	
16.000	37	0.412	0.000	0.46			3.4	FLOOD RISK	
16.001	38	0.560	0.000	0.50			3.6	FLOOD RISK	
17.000	39	0.388	0.000	0.27			1.8	FLOOD RISK	
16.002	40	0.656	0.000	0.75			5.6	FLOOD RISK	
16.003	41	0.749	0.000	1.11			8.5	FLOOD RISK	
18.000	42	-0.045	0.000	0.59			4.4	OK	
19.000	43	-0.077	0.000	0.12			0.9	OK	
18.001	44	-0.030	0.000	0.82			6.1	OK	
12.004	45	0.639	0.000	2.11			24.6	SURCHARGED	
1.009	46	0.525	0.000	0.45			5.0	SURCHARGED	
1.010	47	-0.074	0.000	0.51			5.0	OK	

Sutcliffe				Page 1					
18-20 Harrington Street Liverpool L2 9QA				Miles Platting 3 Drainage Strategy					
Date 13/01/2021 00:02 File 31457 - Drainage Strate...				Designed by SB Checked by					
Innovyze				Network 2020.1.3					
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
<u>Simulation Criteria</u>									
Areal Reduction Factor		1.000		Additional Flow - % of Total Flow		0.000			
Hot Start (mins)		0		MADD Factor * 10m³/ha Storage		2.000			
Hot Start Level (mm)		0		Inlet Coeffiecient		0.800			
Manhole Headloss Coeff (Global)		0.500		Flow per Person per Day (l/per/day)		0.000			
Foul Sewage per hectare (l/s)		0.000							
Number of Input Hydrographs		0		Number of Storage Structures		1			
Number of Online Controls		1		Number of Time/Area Diagrams		0			
Number of Offline Controls		0		Number of Real Time Controls		0			
<u>Synthetic Rainfall Details</u>									
Rainfall Model		FSR		Ratio R		0.356			
Region England and Wales		Cv (Summer)		0.750					
M5-60 (mm)		18.100		Cv (Winter)		0.840			
Margin for Flood Risk Warning (mm)				300.0					
Analysis Timestep		2.5 Second Increment (Extended)							
DTS Status				OFF					
DVD Status				ON					
Inertia Status				ON					
Profile(s)				Summer and Winter					
Duration(s) (mins)		15, 30, 60, 120, 240, 360, 480, 960, 1440							
Return Period(s) (years)				100					
Climate Change (%)				20					
WARNING: Half Drain Time has not been calculated as the structure is too full.									
Water									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
1.000	1 15	Winter	100	+20%	100/15	Summer			52.742
1.001	2 15	Winter	100	+20%	100/15	Summer			52.766
2.000	3 15	Winter	100	+20%	100/15	Summer			52.775
1.002	4 15	Winter	100	+20%	100/15	Summer			52.766
3.000	5 15	Winter	100	+20%	100/15	Summer			52.764
1.003	6 15	Winter	100	+20%	100/15	Summer			52.757
4.000	7 15	Winter	100	+20%	100/15	Winter			52.753
1.004	8 15	Winter	100	+20%	100/15	Summer			52.729
1.005	9 15	Winter	100	+20%	100/15	Summer			52.703
5.000	10 15	Winter	100	+20%	100/15	Summer			53.538
5.001	11 15	Winter	100	+20%	100/15	Summer			53.469
6.000	12 15	Winter	100	+20%					53.127
5.002	13 15	Winter	100	+20%	100/15	Summer			53.086
1.006	14 15	Winter	100	+20%	100/15	Summer			52.646
7.000	15 15	Winter	100	+20%	100/15	Summer			52.488
7.001	16 15	Winter	100	+20%	100/15	Summer			52.270
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Sutcliffe		Page 2
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:02 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Surcharged		Flooded		Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow	Overflow					
1.000	1	0.546	0.000	0.18				3.8	FLOOD RISK	
1.001	2	0.750	0.000	0.32				5.1	FLOOD RISK	
2.000	3	0.455	0.000	0.13				0.9	FLOOD RISK	
1.002	4	0.866	0.000	0.43				6.5	FLOOD RISK	
3.000	5	0.181	0.000	0.14				1.0	SURCHARGED	
1.003	6	0.927	0.000	0.49				7.9	SURCHARGED	
4.000	7	0.103	0.000	0.45				3.3	SURCHARGED	
1.004	8	1.027	0.000	0.78				10.5	SURCHARGED	
1.005	9	1.046	0.000	0.87				13.9	SURCHARGED	
5.000	10	0.424	0.000	0.47				3.5	FLOOD RISK	
5.001	11	0.601	0.000	1.06				8.2	FLOOD RISK	
6.000	12	-0.022	0.000	0.46				3.5	OK	
5.002	13	0.760	0.000	1.57				11.7	SURCHARGED	
1.006	14	1.100	0.000	1.69				29.0	SURCHARGED	
7.000	15	0.183	0.000	0.74				5.7	SURCHARGED	
7.001	16	0.436	0.000	0.86				6.4	SURCHARGED	

Sutcliffe		Page 3
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:02 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.002	17	15 Winter	100	+20%	100/15 Summer			
8.000	18	15 Winter	100	+20%				
7.003	19	15 Winter	100	+20%	100/15 Summer			
9.000	20	15 Winter	100	+20%				
9.001	21	15 Winter	100	+20%				
9.002	22	15 Winter	100	+20%				
1.007	23	15 Winter	100	+20%	100/15 Summer			
10.000	24	15 Winter	100	+20%				
10.001	25	15 Winter	100	+20%	100/15 Summer			
11.000	26	15 Winter	100	+20%	100/15 Summer			
10.002	27	15 Winter	100	+20%	100/15 Summer			
10.003	28	15 Winter	100	+20%	100/15 Summer			
1.008	29	960 Winter	100	+20%	100/120 Winter			
12.000	30	15 Winter	100	+20%	100/15 Summer	100/15 Winter		
13.000	31	15 Winter	100	+20%	100/15 Summer			
12.001	32	15 Winter	100	+20%	100/15 Summer			
14.000	33	15 Winter	100	+20%	100/15 Summer			
12.002	34	15 Winter	100	+20%	100/15 Summer			
15.000	35	15 Winter	100	+20%				
12.003	36	15 Winter	100	+20%	100/15 Summer			
16.000	37	15 Winter	100	+20%	100/15 Summer	100/15 Winter		
16.001	38	15 Winter	100	+20%	100/15 Summer			
17.000	39	15 Winter	100	+20%	100/15 Summer			
16.002	40	15 Winter	100	+20%	100/15 Summer			
16.003	41	15 Winter	100	+20%	100/15 Summer			
18.000	42	15 Winter	100	+20%				
19.000	43	15 Winter	100	+20%				
18.001	44	15 Winter	100	+20%				
12.004	45	15 Winter	100	+20%	100/15 Summer			
1.009	46	960 Winter	100	+20%	100/15 Summer			
1.010	47	960 Summer	100	+20%				

PN	US/MH Name	Water		Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Time (mins)			Flow (l/s)		
7.002	17	52.186	0.522	0.000	1.07			7.8	SURCHARGED	
8.000	18	52.261	-0.030	0.000	0.80			6.2		OK
7.003	19	52.050	0.532	0.000	1.21			12.6	SURCHARGED	
9.000	20	52.461	-0.047	0.000	0.55			4.2		OK
9.001	21	52.101	-0.046	0.000	0.57			4.2		OK
9.002	22	51.945	-0.013	0.000	0.98			7.5		OK
1.007	23	51.509	0.394	0.000	1.76			65.8	SURCHARGED	
10.000	24	52.069	-0.057	0.000	0.38			3.1		OK
10.001	25	51.917	0.296	0.000	0.83			18.5	SURCHARGED	
11.000	26	52.137	0.089	0.000	0.99			7.6	SURCHARGED	
10.002	27	51.755	0.372	0.000	1.75			27.7	SURCHARGED	

Sutcliffe		Page 4
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:02 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
10.003	28	51.443	0.160	0.000	1.82			27.7	SURCHARGED
1.008	29	51.002	0.076	0.000	0.16			4.8	SURCHARGED
12.000	30	51.974	0.600	0.027	0.28			2.1	FLOOD
13.000	31	51.995	0.543	0.000	0.30			2.8	FLOOD RISK
12.001	32	51.958	0.790	0.000	0.76			5.5	FLOOD RISK
14.000	33	51.938	0.161	0.000	0.44			3.2	SURCHARGED
12.002	34	51.903	0.895	0.000	1.16			8.7	SURCHARGED
15.000	35	51.773	-0.051	0.000	0.49			3.6	OK
12.003	36	51.668	0.853	0.000	1.22			12.0	SURCHARGED
16.000	37	51.998	0.600	0.020	0.57			4.3	FLOOD
16.001	38	51.938	0.731	0.000	0.59			4.3	FLOOD RISK
17.000	39	51.908	0.550	0.000	0.33			2.3	FLOOD RISK
16.002	40	51.897	0.814	0.000	0.87			6.4	FLOOD RISK
16.003	41	51.759	0.851	0.000	1.23			9.4	FLOOD RISK
18.000	42	51.729	-0.038	0.000	0.70			5.2	OK
19.000	43	51.675	-0.074	0.000	0.15			1.1	OK
18.001	44	51.553	-0.019	0.000	0.98			7.4	OK
12.004	45	51.163	0.689	0.000	2.38			27.7	SURCHARGED
1.009	46	50.999	0.560	0.000	0.45			5.0	SURCHARGED
1.010	47	50.227	-0.074	0.000	0.51			5.0	OK

PN	US/MH Name	Level Exceeded
7.002	17	
8.000	18	
7.003	19	
9.000	20	
9.001	21	
9.002	22	
1.007	23	
10.000	24	
10.001	25	
11.000	26	
10.002	27	
10.003	28	
1.008	29	
12.000	30	1
13.000	31	
12.001	32	
14.000	33	
12.002	34	
15.000	35	
12.003	36	
16.000	37	1
16.001	38	

Sutcliffe		Page 5
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:02 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>		
	US/MH	Level
PN	Name	Exceeded
17.000		39
16.002		40
16.003		41
18.000		42
19.000		43
18.001		44
12.004		45
1.009		46
1.010		47
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Sutcliffe		Page 1					
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy						
Date 13/01/2021 00:01 File 31457 - Drainage Strate...	Designed by SB Checked by						
Innovyze	Network 2020.1.3						
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>							
<u>Simulation Criteria</u>							
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000							
Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0							
<u>Synthetic Rainfall Details</u>							
Rainfall Model FSR Ratio R 0.356 Region England and Wales Cv (Summer) 0.750 M5-60 (mm) 18.100 Cv (Winter) 0.840							
Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON							
Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 100 Climate Change (%) 30							
PN	US/MH Name Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 15 Winter	100	+30%	100/15 Summer	100/15 Winter		
1.001	2 15 Winter	100	+30%	100/15 Summer			
2.000	3 15 Winter	100	+30%	100/15 Summer			
1.002	4 15 Winter	100	+30%	100/15 Summer			
3.000	5 15 Winter	100	+30%	100/15 Summer			
1.003	6 15 Winter	100	+30%	100/15 Summer			
4.000	7 15 Winter	100	+30%	100/15 Summer			
1.004	8 15 Winter	100	+30%	100/15 Summer			
1.005	9 15 Winter	100	+30%	100/15 Summer			
5.000	10 15 Winter	100	+30%	100/15 Summer			
5.001	11 15 Winter	100	+30%	100/15 Summer			
6.000	12 15 Winter	100	+30%	100/15 Winter			
5.002	13 15 Winter	100	+30%	100/15 Summer			
1.006	14 15 Winter	100	+30%	100/15 Summer			
7.000	15 15 Winter	100	+30%	100/15 Summer			
7.001	16 15 Winter	100	+30%	100/15 Summer			
7.002	17 15 Winter	100	+30%	100/15 Summer			
8.000	18 15 Winter	100	+30%	100/15 Winter			
7.003	19 15 Winter	100	+30%	100/15 Summer			
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Sutcliffe		Page 2
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:01 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water		Surcharged		Flooded		Half Drain		Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)				
1.000	1	52.747	0.551	0.988	0.37			7.8		FLOOD	
1.001	2	52.777	0.761	0.000	0.59			9.4		FLOOD RISK	
2.000	3	52.828	0.508	0.000	0.14			1.0		FLOOD RISK	
1.002	4	52.819	0.919	0.000	0.69			10.4		FLOOD RISK	
3.000	5	52.836	0.253	0.000	0.14			1.0		SURCHARGED	
1.003	6	52.827	0.997	0.000	0.69			11.2		SURCHARGED	
4.000	7	52.857	0.206	0.000	0.48			3.6		SURCHARGED	
1.004	8	52.819	1.116	0.000	0.93			12.4		SURCHARGED	
1.005	9	52.807	1.150	0.000	0.96			15.3		SURCHARGED	
5.000	10	53.549	0.435	0.000	0.53			4.0		FLOOD RISK	
5.001	11	53.470	0.602	0.000	1.13			8.8		FLOOD RISK	
6.000	12	53.224	0.075	0.000	0.49			3.7		SURCHARGED	
5.002	13	53.181	0.856	0.000	1.57			11.8		SURCHARGED	
1.006	14	52.765	1.219	0.000	1.70			29.2		SURCHARGED	
7.000	15	52.632	0.327	0.000	0.73			5.6		FLOOD RISK	
7.001	16	52.388	0.553	0.000	0.89			6.6		SURCHARGED	
7.002	17	52.294	0.631	0.000	1.12			8.2		SURCHARGED	
8.000	18	52.361	0.070	0.000	0.84			6.4		SURCHARGED	
7.003	19	52.147	0.629	0.000	1.28			13.4		SURCHARGED	

PN	US/MH		Level Exceeded
	Name		
1.000	1		2
1.001	2		
2.000	3		
1.002	4		
3.000	5		
1.003	6		
4.000	7		
1.004	8		
1.005	9		
5.000	10		
5.001	11		
6.000	12		
5.002	13		
1.006	14		
7.000	15		
7.001	16		
7.002	17		
8.000	18		
7.003	19		

Sutcliffe		Page 3
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:01 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
9.000	20	15 Winter	100	+30%				
9.001	21	15 Winter	100	+30%				
9.002	22	15 Winter	100	+30%	100/15 Summer			
1.007	23	15 Winter	100	+30%	100/15 Summer			
10.000	24	15 Winter	100	+30%				
10.001	25	15 Winter	100	+30%	100/15 Summer			
11.000	26	15 Winter	100	+30%	100/15 Summer			
10.002	27	15 Winter	100	+30%	100/15 Summer			
10.003	28	15 Winter	100	+30%	100/15 Summer			
1.008	29	960 Winter	100	+30%	100/120 Winter			
12.000	30	15 Winter	100	+30%	100/15 Summer	100/15 Summer		
13.000	31	15 Winter	100	+30%	100/15 Summer			
12.001	32	15 Winter	100	+30%	100/15 Summer			
14.000	33	15 Winter	100	+30%	100/15 Summer			
12.002	34	15 Winter	100	+30%	100/15 Summer			
15.000	35	15 Winter	100	+30%				
12.003	36	15 Winter	100	+30%	100/15 Summer			
16.000	37	15 Winter	100	+30%	100/15 Summer	100/15 Summer		
16.001	38	15 Winter	100	+30%	100/15 Summer			
17.000	39	15 Winter	100	+30%	100/15 Summer			
16.002	40	15 Winter	100	+30%	100/15 Summer			
16.003	41	15 Winter	100	+30%	100/15 Summer			
18.000	42	15 Winter	100	+30%				
19.000	43	15 Winter	100	+30%				
18.001	44	15 Winter	100	+30%	100/15 Winter			
12.004	45	15 Winter	100	+30%	100/15 Summer			
1.009	46	960 Winter	100	+30%	100/15 Summer			
1.010	47	360 Winter	100	+30%				

PN	US/MH Name	Water			Surcharged		Flooded Volume (m³)	Flow / Overflow		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Flow (m³/s)	Cap.	Overflow (l/s)		Cap.	Overflow (l/s)			
9.000	20	52.463	-0.044	0.000	0.60						4.6	OK
9.001	21	52.104	-0.043	0.000	0.61						4.6	OK
9.002	22	51.990	0.031	0.000	1.05						8.0	SURCHARGED
1.007	23	51.575	0.459	0.000	1.85						69.3	SURCHARGED
10.000	24	52.090	-0.036	0.000	0.41						3.3	OK
10.001	25	52.004	0.383	0.000	0.89						19.9	FLOOD RISK
11.000	26	52.227	0.179	0.000	1.06						8.2	SURCHARGED
10.002	27	51.818	0.435	0.000	1.84						29.2	SURCHARGED
10.003	28	51.470	0.187	0.000	1.92						29.2	SURCHARGED
1.008	29	51.084	0.158	0.000	0.16					1031	4.8	SURCHARGED
12.000	30	51.974	0.600	0.097	0.35						2.6	FLOOD
13.000	31	52.016	0.564	0.000	0.39						3.6	FLOOD RISK
12.001	32	51.958	0.790	0.000	0.90						6.6	FLOOD RISK
14.000	33	51.979	0.202	0.000	0.47						3.5	SURCHARGED

Sutcliffe		Page 4
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 13/01/2021 00:01 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Water		Surcharged		Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m³)	Flow	Volume	Flow					
12.002	34	51.932	0.923	0.000	1.22						9.0	SURCHARGED
15.000	35	51.775	-0.048	0.000	0.53						3.9	OK
12.003	36	51.716	0.902	0.000	1.25						12.3	SURCHARGED
16.000	37	51.998	0.600	0.114	0.59						4.4	FLOOD
16.001	38	51.946	0.738	0.000	0.61						4.4	FLOOD RISK
17.000	39	51.923	0.565	0.000	0.39						2.7	FLOOD RISK
16.002	40	51.909	0.827	0.000	0.91						6.7	FLOOD RISK
16.003	41	51.760	0.851	0.000	1.24						9.6	FLOOD RISK
18.000	42	51.732	-0.034	0.000	0.76						5.7	OK
19.000	43	51.676	-0.073	0.000	0.16						1.2	OK
18.001	44	51.592	0.020	0.000	1.04						7.8	SURCHARGED
12.004	45	51.180	0.707	0.000	2.49						29.0	SURCHARGED
1.009	46	51.081	0.642	0.000	0.45						5.0	SURCHARGED
1.010	47	50.227	-0.074	0.000	0.51						5.0	OK

PN	US/MH		Level Exceeded
	Name		
9.000	20		
9.001	21		
9.002	22		
1.007	23		
10.000	24		
10.001	25		
11.000	26		
10.002	27		
10.003	28		
1.008	29		
12.000	30	4	
13.000	31		
12.001	32		
14.000	33		
12.002	34		
15.000	35		
12.003	36		
16.000	37	3	
16.001	38		
17.000	39		
16.002	40		
16.003	41		
18.000	42		
19.000	43		
18.001	44		
12.004	45		
1.009	46		
1.010	47		

Sutcliffe		Page 24					
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy						
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by						
Innovyze	Network 2020.1.3						
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>							
<u>Simulation Criteria</u>							
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000							
Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0							
<u>Synthetic Rainfall Details</u>							
Rainfall Model FSR Ratio R 0.356 Region England and Wales Cv (Summer) 0.750 M5-60 (mm) 18.100 Cv (Winter) 0.840							
Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON							
Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 0, 40							
PN	US/MH Name Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 15 Winter	100	+40%	100/15 Summer	100/15 Summer		
1.001	2 15 Winter	100	+40%	30/15 Summer			
2.000	3 15 Winter	100	+40%	100/15 Summer			
1.002	4 15 Winter	100	+40%	30/15 Summer			
3.000	5 15 Winter	100	+40%	100/15 Summer			
1.003	6 15 Winter	100	+40%	30/15 Summer			
4.000	7 15 Winter	100	+40%	100/15 Summer			
1.004	8 15 Winter	100	+40%	30/15 Summer			
1.005	9 15 Winter	100	+40%	30/15 Summer			
5.000	10 15 Winter	100	+40%	100/15 Summer			
5.001	11 15 Winter	100	+40%	30/15 Summer			
6.000	12 15 Winter	100	+40%	100/15 Summer			
5.002	13 15 Winter	100	+40%	30/15 Summer			
1.006	14 15 Winter	100	+40%	30/15 Summer			
7.000	15 15 Winter	100	+40%	100/15 Summer			
7.001	16 15 Winter	100	+40%	100/15 Summer			
7.002	17 15 Winter	100	+40%	30/15 Winter			
8.000	18 15 Winter	100	+40%	100/15 Summer			
7.003	19 15 Winter	100	+40%	30/15 Summer			
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Sutcliffe		Page 25
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	
1.000	1	52.747	0.551	1.578	0.53		11.2	FLOOD
1.001	2	52.779	0.763	0.000	0.70		11.2	FLOOD RISK
2.000	3	52.864	0.544	0.000	0.16		1.2	FLOOD RISK
1.002	4	52.854	0.954	0.000	0.77		11.6	FLOOD RISK
3.000	5	52.886	0.303	0.000	0.16		1.2	FLOOD RISK
1.003	6	52.877	1.047	0.000	0.82		13.2	SURCHARGED
4.000	7	52.929	0.279	0.000	0.49		3.6	SURCHARGED
1.004	8	52.883	1.180	0.000	1.05		14.0	SURCHARGED
1.005	9	52.875	1.218	0.000	1.00		15.9	SURCHARGED
5.000	10	53.550	0.436	0.000	0.56		4.2	FLOOD RISK
5.001	11	53.471	0.602	0.000	1.18		9.2	FLOOD RISK
6.000	12	53.314	0.165	0.000	0.51		3.8	SURCHARGED
5.002	13	53.257	0.932	0.000	1.59		11.9	SURCHARGED
1.006	14	52.849	1.303	0.000	1.71		29.3	SURCHARGED
7.000	15	52.785	0.480	0.000	0.76		5.9	FLOOD RISK
7.001	16	52.515	0.681	0.000	0.92		6.8	SURCHARGED
7.002	17	52.414	0.750	0.000	1.13		8.2	SURCHARGED
8.000	18	52.489	0.198	0.000	0.86		6.5	SURCHARGED
7.003	19	52.254	0.736	0.000	1.35		14.0	SURCHARGED

PN	US/MH Level	
	Name	Exceeded
1.000	1	4
1.001	2	
2.000	3	
1.002	4	
3.000	5	
1.003	6	
4.000	7	
1.004	8	
1.005	9	
5.000	10	
5.001	11	
6.000	12	
5.002	13	
1.006	14	
7.000	15	
7.001	16	
7.002	17	
8.000	18	
7.003	19	

Sutcliffe		Page 26
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
9.000	20	15 Winter	100	+40%				
9.001	21	15 Winter	100	+40%				
9.002	22	15 Winter	100	+40%	100/15 Summer			
1.007	23	15 Winter	100	+40%	30/15 Summer			
10.000	24	15 Winter	100	+40%	100/15 Summer			
10.001	25	15 Winter	100	+40%	100/15 Summer			
11.000	26	15 Winter	100	+40%	100/15 Summer			
10.002	27	15 Winter	100	+40%	30/15 Summer			
10.003	28	15 Winter	100	+40%	30/15 Summer			
1.008	29	960 Winter	100	+40%	100/60 Winter			
12.000	30	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
13.000	31	15 Summer	100	+40%	30/15 Winter			
12.001	32	15 Winter	100	+40%	30/15 Summer			
14.000	33	15 Winter	100	+40%	100/15 Summer			
12.002	34	15 Winter	100	+40%	30/15 Summer			
15.000	35	15 Winter	100	+40%				
12.003	36	15 Winter	100	+40%	1/15 Winter			
16.000	37	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
16.001	38	15 Winter	100	+40%	30/15 Summer			
17.000	39	15 Winter	100	+40%	30/15 Summer			
16.002	40	15 Winter	100	+40%	30/15 Summer			
16.003	41	15 Winter	100	+40%	30/15 Summer			
18.000	42	15 Winter	100	+40%				
19.000	43	15 Winter	100	+40%				
18.001	44	15 Winter	100	+40%	100/15 Summer			
12.004	45	15 Winter	100	+40%	1/15 Summer			
1.009	46	960 Winter	100	+40%	1/15 Summer			
1.010	47	30 Summer	100	+40%				

PN	US/MH Name	Water		Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Time (mins)			Flow (l/s)		
9.000	20	52.466	-0.042	0.000	0.64				4.9	OK
9.001	21	52.119	-0.028	0.000	0.65				4.8	OK
9.002	22	52.038	0.079	0.000	1.11				8.4	SURCHARGED
1.007	23	51.635	0.520	0.000	1.93				72.5	SURCHARGED
10.000	24	52.185	0.059	0.000	0.46				3.7	SURCHARGED
10.001	25	52.088	0.467	0.000	0.94				21.0	FLOOD RISK
11.000	26	52.317	0.269	0.000	1.10				8.5	SURCHARGED
10.002	27	51.878	0.495	0.000	1.93				30.6	SURCHARGED
10.003	28	51.495	0.213	0.000	2.01				30.6	SURCHARGED
1.008	29	51.159	0.233	0.000	0.16			558	4.8	SURCHARGED
12.000	30	51.974	0.600	0.170	0.37				2.7	FLOOD
13.000	31	52.016	0.564	0.000	0.40				3.6	FLOOD RISK
12.001	32	51.959	0.791	0.000	1.01				7.4	FLOOD RISK
14.000	33	52.006	0.229	0.000	0.53				4.0	SURCHARGED

Sutcliffe		Page 27
18-20 Harrington Street Liverpool L2 9QA	Miles Platting 3 Drainage Strategy	
Date 12/01/2021 23:59 File 31457 - Drainage Strate...	Designed by SB Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm

PN	US/MH Name	Water		Surcharged		Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m³)	Flow	Volume	Flow					
12.002	34	51.945	0.936	0.000	1.24						9.2	SURCHARGED
15.000	35	51.814	-0.010	0.000	0.56						4.1	OK
12.003	36	51.749	0.935	0.000	1.27						12.5	SURCHARGED
16.000	37	51.998	0.600	0.241	0.62						4.6	FLOOD
16.001	38	51.948	0.741	0.000	0.63						4.6	FLOOD RISK
17.000	39	51.928	0.570	0.000	0.42						2.9	FLOOD RISK
16.002	40	51.913	0.831	0.000	0.92						6.8	FLOOD RISK
16.003	41	51.760	0.852	0.000	1.26						9.7	FLOOD RISK
18.000	42	51.753	-0.014	0.000	0.80						6.0	OK
19.000	43	51.677	-0.072	0.000	0.17						1.3	OK
18.001	44	51.624	0.053	0.000	1.10						8.3	SURCHARGED
12.004	45	51.193	0.720	0.000	2.55						29.7	SURCHARGED
1.009	46	51.156	0.717	0.000	0.45						5.0	SURCHARGED
1.010	47	50.227	-0.074	0.000	0.51						5.0	OK

PN	US/MH Level	
	Name	Exceeded
9.000	20	
9.001	21	
9.002	22	
1.007	23	
10.000	24	
10.001	25	
11.000	26	
10.002	27	
10.003	28	
1.008	29	
12.000	30	4
13.000	31	
12.001	32	
14.000	33	
12.002	34	
15.000	35	
12.003	36	
16.000	37	4
16.001	38	
17.000	39	
16.002	40	
16.003	41	
18.000	42	
19.000	43	
18.001	44	
12.004	45	
1.009	46	
1.010	47	

11.3. Appendix C

Environment Agency Flood Maps

(source: <https://flood-warning-information.service.gov.uk/>)

Flood map for planning

Your reference
31457

Location (easting/northing)
385317/399068

Created
7 Jan 2021 17:11

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

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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.

The Open Government Licence sets out the terms and conditions for using government data.
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference

31457

Location (easting/northing)

385317/399068

Scale

1:2500

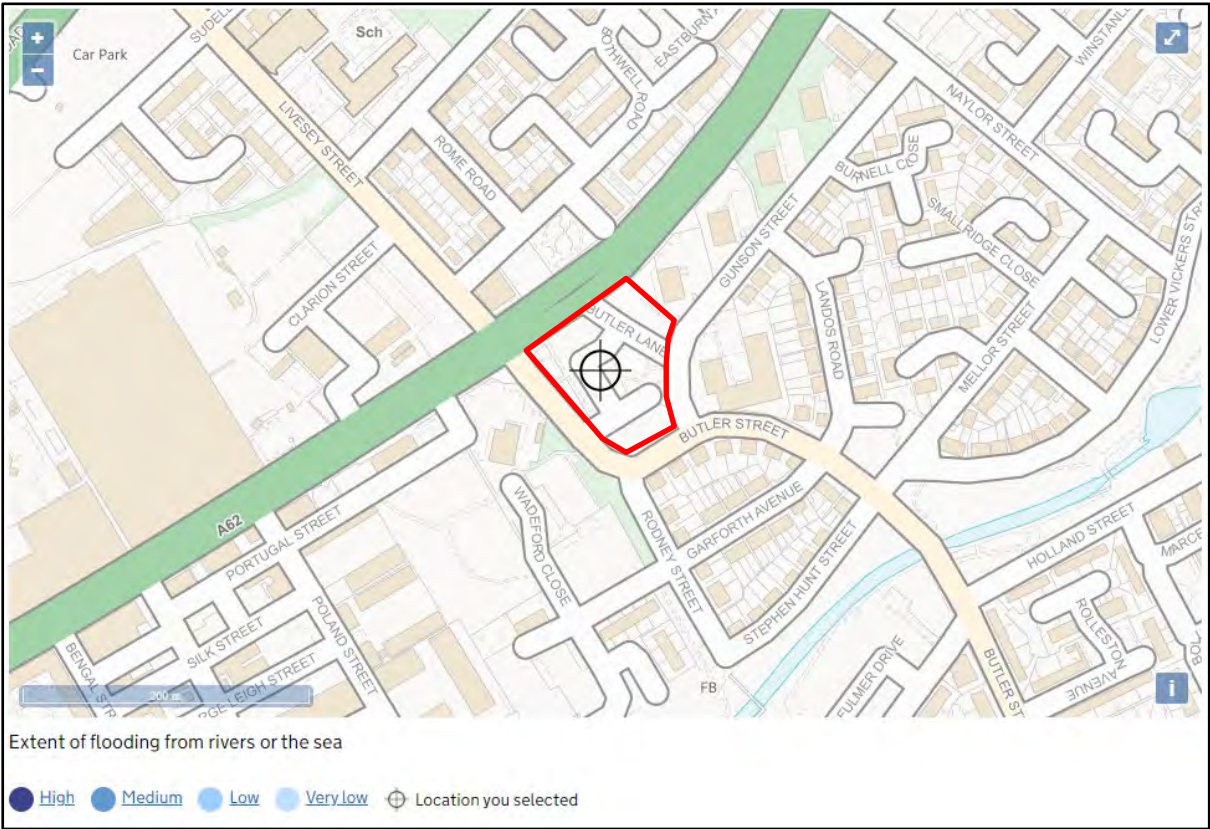
Created

7 Jan 2021 17:11

-  Selected area
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

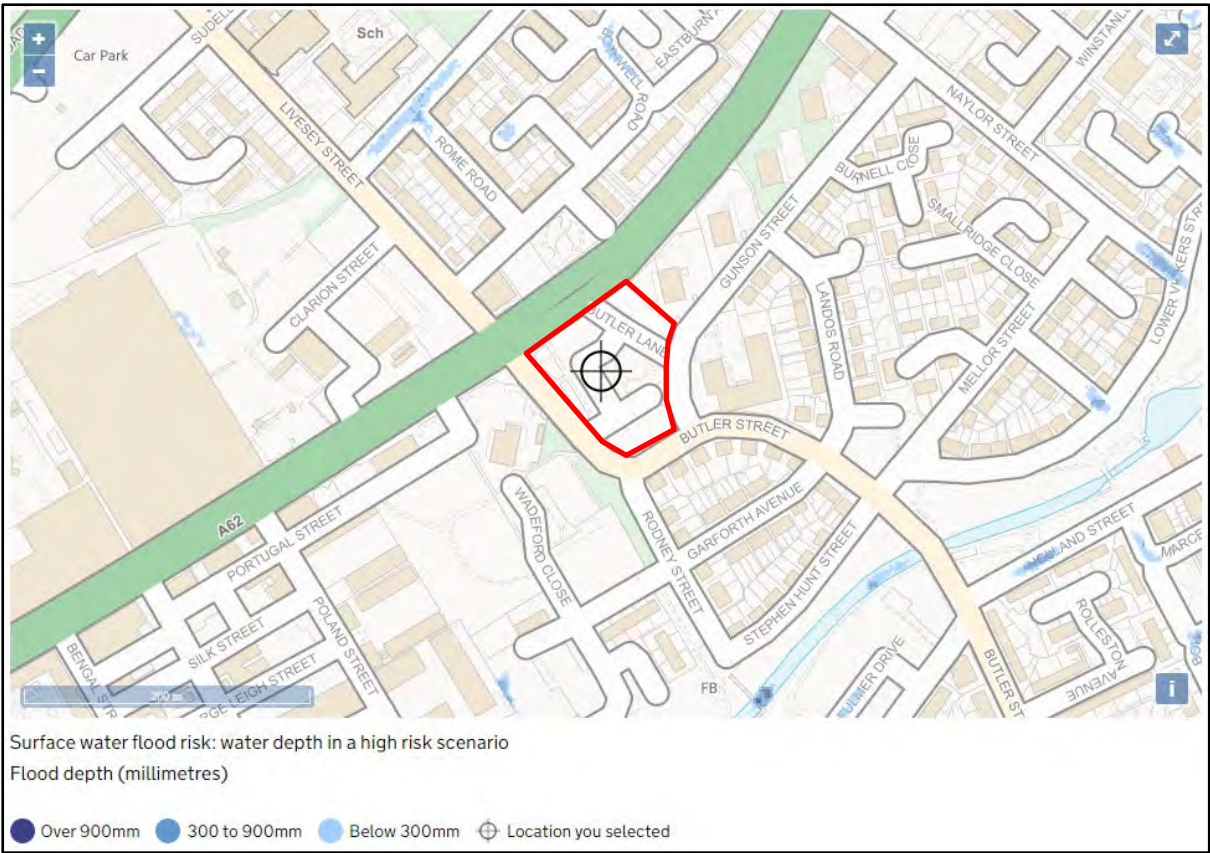
Flooding from River and Sea



Surface Water Flooding: Extent



Surface Water Flooding: High Risk Depth



Surface Water Flooding: Medium Risk Depth



Surface Water Flooding: Low Risk Depth



Flooding from Reservoirs

