



Drainage Strategy

For

Proposed Development

Oldham Road / Woodbine Street

Rochdale OL16 5JB

Client Name: Arcon Housing Association
Our ref: LRD31163
Date: September 2022
Revision: 003



SUTCLIFFE

Drainage Strategy

DOCUMENT VERIFICATION

Report Reference: LRD31163

Issue: 02

Date: September 2022

Prepared by:

Name:	Dave Samuels
Title:	Executive Associate
Qualifications:	CEng MIStructE MAPS

Checked / Approved by:

Name:	Martin Pocock
Title:	Director
Qualifications:	BEng(Hons) CEng FICE MCIHT CMgr FCMI C.WEM MCIWEM

Revision History:

Rev	Date	Description	Prepared	Checked	Approved
02	Sep 2022	Issued for Planning	DS	MP	DS
03	Oct 2022	Drainage Layout amended to suit UU Easement Requirement	DS	MP	DS

This document has been prepared by Sutcliffe within the terms of the Contract with the Client to whom this document is addressed. Sutcliffe disclaims any responsibility to the Client and others in respect of matters outside the scope of the said contract. No person other than the Client shall rely on it in any respect and Sutcliffe shall owe no duty of care to any such third party.

Contents

1.0	Introduction
2.0	Existing flood risk
3.0	Drainage Hierarchy
3.1	Infiltration to ground
3.2	Discharge to water course
3.3	Discharge to surface water network
3.4	Discharge to combined sewer
4.0	Existing surface water drainage
5.0	Proposed surface water drainage
6.0	Climate Change and Urban Creep
7.0	Discussion with Utility Company
8.0	Proposed surface water discharge rate
9.0	SuDS Interception
10.0	Water quality management
11.0	Proposed surface water drainage layout
12.0	Flood exceedance / drainage failure
13.0	Surface water drainage management and maintenance plan
Appendix A	Existing site layout
	Proposed site layout
Appendix B	Hydraulic calculations
Appendix C	Proposed Drainage Layout
	Drainage Areas Plan
Appendix D	Flood Exceedance
Appendix E	Correspondence

1.0 Site Description and Proposals

The site is currently grassed with some trees located along the northern boundary and is located within a developed area of Rochdale.

The site is bound by Woodbine Street, to the south, Oldham Road, to the west, an existing building to the east and Rochdale Canal to the north. Between the north site boundary and canal is a strip of land whose ownership is unknown.

The proposed scheme consists of 18 flats with infrastructure.

The total site area is approximately 0.11 Ha and its location can be found by the following references;

Postcode OL16 5JB

Coordinates 390364, 412335

Grid reference SD 90364 12335

The site is currently undeveloped with a level difference of up to 0.5m from north east to south west.

The purpose of the strategy and flood risk assessment is to consider how the surface water runoff from the development site will be effectually drained and managed throughout the lifetime of the development.

A copy of the existing and proposed sites are included in Appendix A.

2.0 Existing Flood Risk

An inspection of the Environment Agency flood maps was made on the internet and the following can be stated.

- That the site is located within a Zone 1 low risk flood area and the site is, therefore, considered not to be at risk of flooding from rivers or sea.
- That the site is not indicated as having surface water flooding. The site can, therefore, be assessed as having a very low risk of surface water flooding.
- That the site is not at risk from flooding from reservoirs or other man-made water features

Therefore, from the above observations we confirm that the site is at low risk of flooding from existing sources.

3.0 Drainage Hierarchy

3.1 Infiltration to ground

Infiltration to ground is, in the main, provided by the provision of soakaways and permeable paving.

To provide infiltration via soakaways the ground conditions must be suitable to allow infiltration to occur and the ground water table must be at least 1.0m below the base of any soakaways provided.

To allow infiltration via permeable paving the ground conditions must be suitable to allow infiltration to occur.

Soakaways cannot be located within 5m of boundaries, highways or existing / proposed buildings.

The site has few areas that could accommodate soakaways, should infiltration be available.

3.1.1 Underlying geology

From the Phase 1 ground investigation the site is stated as being underlain by Glaciofluvial deposits (clay) overlying mudstone, siltstone and sandstone.

3.1.2 Intrusive ground investigation

No intrusive ground investigation has been carried out at the time of the preparation of this document.

3.1.3 British Geological Survey

A review of the BGS web site for logs in and around the proposed site, at the following web site address, [Borehole records - British Geological Survey \(bgs.ac.uk\)](http://bgs.ac.uk), was made.

No borehole records within meaningful distance of the site were indicated.

3.1.4 Infiltration Test

No infiltration test has been carried out as no site works have yet been instructed.

From the Phase 1 ground investigation it would suggest that infiltration will not be possible but will need to be confirmed by undertaking trial holes and an infiltration test should it be appropriate.

For the purpose of this drainage strategy it will be assumed that infiltration is not possible, subject to confirmation.

3.2 Discharge to a Water Course

An inspection of historic / current maps and the Environment Agency maps reveal that the Rochdale Canal is located 10m to the north of the site.

However, there are 2 aspects to consider before making a decision as to whether or not the canal is a viable option.

1. The level of the canal is only approximately 250mm above the canal water level. It would not be possible to drain from the development into the canal using a gravity drainage design. It would be uneconomic to provide a pumped discharge at a low discharge rate into the canal.
2. There is third party land between the site and the Canal and it is not known if access to the canal can be reasonably gained. It is usual that a developer has to pay a commuted sum to the canal owner / operator and for a development of 18 flats the cost of a connection to the Canal, with the associated costs of a commuted sum, are likely to make the scheme unviable.

Therefore, discharge of surface water into a water course is not currently thought to be available / economic for this site.

3.3 Discharge to surface water network

A review of the existing drainage network within the surroundings of the development site was made and of United Utility sewer records.

The review indicated that there are no surface water sewers located within or adjacent to the site.

Therefore, disposal of surface water drainage into a surface water sewer or highway drainage is not available for this site.

3.4 Discharge to combined sewer

A review of the existing drainage network and of United Utility sewer records within the surroundings of the development site was made.

The review indicated that there are combined sewers in the following locations.

- a deep 600mm ø combined sewer is located to the north of the site at a depth of approximately 5.8m
- a 300mm ø combined sewer in Woodbine Street at a depth of approximately 3.0m

Therefore, discharge of surface water into a combined sewer is available for this site.

4.0 Existing site surface water drainage

There is no known surface water drainage currently serving the site.

5.0 **Proposed surface water drainage**

From the above drainage hierarchy discussions evidence has been collected and recorded and the following discussion can be said.

Infiltration: Infiltration via soakaways is unlikely to be available but will require an infiltration test to be carried out to confirm this subject to findings of intrusive ground investigations. Should soakaways be found to be possible a check on available space to locate the soakaways on site will be required.

Infiltration via permeable paving is unlikely to be available but will require an infiltration test to be carried out to confirm this subject to findings of intrusive ground investigations.

Water course: No water course is economically available to receive surface water from this site.

Surface water sewer: No surface water sewers are available.

Combined sewer: A combined sewer is available in Woodbine Street.

The above discussion of the surface water drainage hierarchy has indicated that the proposed surface water drainage discharge point will be to the combined sewer located in Woodbine Street.

The NPPF, paragraph 196, states that major developments should incorporate SuDS unless there is clear evidence that it would be inappropriate.

The below table lists the potential SuDS options and identifies whether the SuDS element is site appropriate and also provides a brief commentary as to its suitability for this development in relation to the site layout provided.

SuDS Option	Appropriate To Development	Comments
Soakaways	P	No infiltration rates have yet been confirmed.
Infiltration basin	N	Not appropriate for this project.
Sand filter	N	Not appropriate for this project.
Filter strip	N	Not appropriate for this project.
Filter drains	N	Not appropriate for this project.
Detention basin	N	Not appropriate for this project.
Swales	N	Not appropriate for this project.

Rainwater harvesting / Rainwater Butts	N	RWH is not provided for blocks of flats as there is insufficient area of roof to collect sufficient rain water or each flat. It is, therefore, uneconomic to provide rainwater harvesting.
Green roofs	N	Green roofs are able to be used on flat roofs. However, the flat roof will be required for the provision of PV panels that will be required of part of the Building Regulation approval.
Geo-cellular storage systems	P	These are a potential storage method and should be wrapped in geo membrane to retain the attenuated surface water so it can be discharged in a controlled manner to the agreed surface water discharge location.
Permeable pavements	Y	Permeable paving can be provided. Currently a lined system would be required as infiltration has not been confirmed.
Ponds	N	Not appropriate for this project.
Oversized pipes	N	Oversized pipes will not be offered for this scheme as they will be uneconomic.
Tanks	P	A possible alternative to geo-cellular storage system, but generally more expensive, but may be required due to the location of required off line attenuation adjacent to the proposed highway.
Flow control devices	Y	Required to control off site discharge rates .

Where; Y: Suitable for use on a project of this size and nature
N: Not suitable for use on a project of this size and nature
P: Potentially suitable for use on a project of this size and nature

The following SuDS features have been identified as being potentially appropriate for this development.

Rainwater harvesting for this site is not practical as the scheme is flats.

Geo-cellular storage systems can be utilised as offline attenuation for storm events exceeding 5 l/s.

Permeable paving can be used. Permeable paving will provide water interception and water quality benefits and are discussed in later sections of this drainage strategy.

Tanks may be required in lieu of geo-cellular attenuation and will depend on personal preference of the Principal Contractor..

A flow control device will be required to reduce the surface water discharge from the site at the agreed discharge rate.

Therefore, from the above it is proposed to use a traditional piped drainage network with off line attenuation provided for this development. Permeable paving will be provided to

the car park area as a SuDS solution that can be incorporated into the drainage scheme, where appropriate.

6.0 Climate Change and Urban Creep

6.1 Climate Change

From the DEFRA website the current peak rainfall allowances are provided.

Climate change allowances for peak rainfall in England allowances for the 2050's and the 2070's.

The life span for residential housing is taken as 100 years, which puts the allowance for consideration of climate change into the 2070's.

Climate change allowances are provided for both 30 year and 100 year annual exceedance rainfall events

The following information is provided by the EA on the DEFRA web site.

Catchment: Irwell Management Catchment

Central allowance 30 year: 25%

Higher allowance 30 year: 40%

Central allowance 100 year: 30%

Higher allowance 100 year: 45%

For this development we will use climate change values provided for the 100 year annual exceedance rainfall events, due to the lifetime of the development.

6.2 Urban Creep

Urban creep is the conversion of permeable surfaces to impermeable over time, e.g. impermeable surfacing of front gardens to provide additional parking spaces, extensions to existing buildings, creation of large patio areas. The consideration of urban creep (is best) assessed on a site by site basis but is limited to residential development only.

It is important that the appropriate allowance for urban creep is included in the design of the drainage system over the lifetime of the proposed development. The allowances are set out in the Non-statutory technical guidance for sustainable drainage.

Urban Creep is not applied to flats. Therefore, no urban creep needs to be considered for this development.

7.0 Discussions with Utility Company

A pre-development enquiry was submitted to United Utilities. UU have stated we should discharge surface water into the sewer in Woodbine Street. Refer to Appendix E

8.0 **Proposed surface water discharge rate**

The site has been previously developed and is also partly drained by an existing car park that is currently drained.

It will not be possible to drain the development using the existing drainage and so the site is, therefore, classed as greenfield runoff.

The SuDS Manual, C753, and DEFRA Technical Standards direct the developer to discharge surface water at greenfield runoff rates where practicable.

Greenfield runoff rates for the site have been calculated as being.

Q_{bar} : 0.1 l/s

Q_{1yr} : 0.1 l/s

Q_{2yr} : 0.1 l/s

Q_{30yr} : 0.1 l/s

Q_{100yr} : 0.2 l/s

The above greenfield runoff rate, Q_{bar} , is not reasonable to maintain throughout the life time of the development.

In accordance with advice provided by the Defra / Environment Agency's report "Rainfall runoff management for developments" (Report SC030219) it is stated that a practicable minimum limit on the discharge rate from a flow attenuation device is often a compromise between attenuating to a satisfactorily low flow rate while keeping the risk of blockage to an acceptable level. This limit is set at 5 l/s, using an appropriate vortex or other flow control device.

Therefore, it is reasonable to manage and discharge surface water from the site at a runoff rate of 5.0 l/s, as guided by the above referenced document.

A copy of the greenfield calculation is included in Appendix B.

9.0 **SuDS interception**

The SuDS Manual, C753, seeks to intercept the first 5mm of rainfall.

Interception is deemed to be delivered using one or a combination of the following.

- Rainwater harvesting
- Infiltration
- Permeable paving
- Evapotranspiration using temporary shallow ponding or storage within the soil or upper aggregate layers

Additional interception methods are identified in C753, table 24.6.

The below table lists the potential interception options and identifies whether the element is site appropriate and also provides a brief commentary as to its site suitability for this development in relation to the site layout provided.

Interception System	Interception methods that can be assumed to be compliant for zero runoff from the first 5mm rainfall for 80% of events during the summer and 50% in the winter	Comments for provision / non provision of interception system
Green Roof	All surfaces that have green roofs	Not appropriate for this project.
Rainwater harvesting system / Water Butts	All surfaces drained to RWH systems designed to BS 8515:2009+A1 whether for surface water management or just water supply, provided the RWH design is based on regular daily demand for non-potable water	The use of RWH tanks are not practical for this site as the site is being developed with flats.
Soakaway or other infiltration system	Areas of the site drained to systems that are designed to infiltrate runoff for events greater than a 1 month return period. Note: design of the infiltration system should be in accordance with C753 chapters 14 & 25	No infiltration rate has been confirmed and this element of SUDS will need to be reassessed once an infiltration test has been carried out, should ground conditions be found to be potentially suitable for infiltration.
Permeable pavements	All permeable pavements (lined or unlined) can be deemed to comply. Where the pavement also drains an adjacent impermeable area, compliance can be assumed when the permeable pavement is not lined. Refer to C753 for more details and description. Where the pavement also drains adjacent impermeable areas and is lined it is deemed not to comply	Permeable paving can be provided.
Filter strips / swales	Refer to C753 for compliance notes	Not appropriate for this project.
Infiltration trenches	Roads drained by infiltration trenches can be considered to provide interception	Not appropriate for this project.
Detention basins	Refer to C753 for compliance notes	Not appropriate for this project.

Bioretention area and rain water gardens	Refer to C753 for compliance notes	Not appropriate for this project.
Ponds	Areas drained by ponds that is maintained by the provision of an outlet structure are not deemed to intercept	Not appropriate for this project.
Evapotranspiration using temporary shallow ponding or storage within the soil or upper aggregate layers	Refer to C753, Box 24.3 for design requirements	Appropriate for patio / path areas where levels allow runoff.

From the above table we have identified which interception systems may, or may not, be appropriate for this development.

The only form of potential interception is permeable paving to the car park. Permeable paving will be required to be lined until such time it can be confirmed that infiltration is or is not suitable for this site.

Infiltration via soakaways can not be confirmed until an infiltration rate is obtained.

Note: That the drainage strategy will be amended upon confirmation of an infiltration rate for the site.

10.0 Water quality management

Water quality needs to be considered in accordance with Section 26 of the SuDS manual.

We need to allocate suitable hazard indices (Table 26.2, C753) as follows.

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Property drives	Low	0.5	0.4	0.4
Total Indices	N/A	0.7	0.6	0.45

We determine the pollution mitigation indices in accordance with Table 26.3, C753 as follows.

	Mitigation indices		
SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6

Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

From the above table there is only 1 appropriate option to provide water quality management, which is permeable paving. Permeable paving can be provided to the car park area.

From the tables above the total mitigation index is required to be greater than or equal to the pollution hazard index, as below table. (The table will require amending once the final solution has been specified). At this stage of design we cannot commit to a final solution as it will likely be finalised by the appointed principal contractor during the construction phase.

	Total suspended solids (TSS)	Metals	Hydro-carbons
Total hazard indices	0.7	0.6	0.45
Total mitigation indices	0.7	0.6	0.7

11.0 **Proposed surface water drainage layout**

From the above discussions and decision making processes the following surface water drainage network is proposed.

The maximum surface water discharge rate from the site will be set at 5.0 l/s in accordance with Report SC030219.

This discharge rate can be reasonably managed and maintained throughout the lifetime of the development.

From the above discussion and evidence we confirm that the proposed drainage layout will discharge into the existing combined water sewer located in Woodbine Street. The existing combined water sewer is a 300mm Ø.

The onsite drainage will consist of a piped drainage network in conjunction with an off line geo-cellular attenuation tank to manage surface water discharge from the site to a maximum rate of 5.0 l/s up to and including a 1 in 100 year storm event including an allowance of 45% for climate change.

A copy of the proposed drainage layout is included in Appendix C.

A copy of the drainage areas plan indicating drained impermeable areas is included in Appendix C.

Hydraulic calculations have been carried out for the 1 year, 2 year, 30 year and 100 year + 45% climate change.

A copy of the calculations are included in Appendix B.

12.0 Flood exceedance / Drainage failure / Sensitivity test

Calculations carried out on the drainage network indicate that there is no flooding for the storm events up to and including the 30 year storm event.

There is flooding of 0.44m³ for the 100 year storm event with an allowance of 45% for climate change and the discharge rate does not exceed 5.0l/s. The flooding has no consequence to the volume will re-enter the permeable paving.

It should be noted that the permeable paving has not been included within the hydraulic calculations.

In accordance with paragraph 167 (d) of the NPPF, we need to confirm that in the event of a drainage failure, or flood exceedance, event, that the development will remain safe and will not increase flood risk elsewhere and be safely managed.

The drainage network was interrogated for a 200 year storm event using the higher allowance of 45%.

The critical storm event was identified and a flood flow analysis was carried out for a 120 minute summer 200 year storm event with an allowance of 45% climate change for a storm duration.

The discharge rate exceeded 5.0 l/s with a maximum discharge rate of 6.1 l/s. Flooding occurred to several pipes with the maximum flooding occurring at the flow control chamber. A flooded volume of 8.9m³ was recorded.

The flooding does not affect any property. As the flood depth is indicated as being less than 75mm the depth of flood flow is below the DPC level for the dwellings.

The access road will remain safe to use during an exceedance event.

The volume of flooding is low and indicates that the proposed surface water drainage network and site layout for this development is relatively resilient against potential future exceedance flood and / or drainage failure events.

Hydraulic calculations for the exceedance event are included in Appendix D

The graphical output from the flood exceedance calculation has been added to the flood exceedance drawing included in Appendix D.

13.0 Management & Maintenance Plan

A Management & Maintenance Plan is required to ensure that the SuDS elements are maintained and managed to ensure they remain effective throughout the lifetime of the development.

Chapter 32 of The SuDS Manual, C753, provides information of maintenance requirements for SuDS systems.

This section of the drainage strategy will be developed in line with the end user so that they can have an input as to how it will be managed.

At this stage of the design process we would request a planning condition in relation to Management & Maintenance.

The following elements that will require maintenance are.

- Permeable paving
- Cellular attenuation
- Flow control device.

A management company will be required to maintain and manage the drainage elements.

The client, Arcon Housing Association, will progress the Management and Maintenance Plan at the appropriate time.

Appendix A

Existing Site Layout

Proposed Site Layout

412380N
390320E

390340E

390360E

390380E

390400E

412380N
390420E



412360N

412360N

412340N

412340N

412320N

412320N

412300N

412300N

Station	Easting	Northing	Level
1	390391.908	412306.687	144.079
2	390359.782	412295.257	143.558

390320E
412280N

390340E

390360E

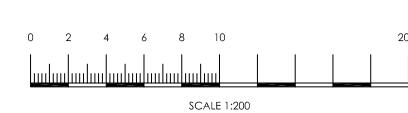
390380E

390400E

390420E
412280N

OLDHAM ROAD

WOODBINE STREET



Abbreviations/Symbols (Measured Building Surveys):

C:	Window Cill Height
H:	Window Head Height
BH:	Beam Height
DH:	Door Height
COL:	Column
SVP:	Soil Vent Pipe
FL:	Floor Level
TH:	Threshold Level
F2C:	Floor to Ceiling Height
(V.C.)	Vaulted Ceiling

Line types

~~~~~	Hedge Lines
- - - - -	Drainage Runs
- - - - -	Overhead Electricity Cables
- - - - -	Overhead Telephone Cables

Symbols

(Circle with cross)	Tree/Bush	(Cross-hatch)	Glass House
(Star in circle)	Control Station	(Upward arrow)	Obtm
(Circle with dot)	Borehole		
(Square with cross)	Trial Hole		

Abbreviations (Topographic Survey):

AH:	Arch Height
AV:	Air Valve
BB:	Bellho Beacon
BOX:	Electricity Box, Cables Box, Etc.
BOL:	Bollard
BS:	Bus Stop
BS/IC:	Bus Stop / Lamp Post
CAIV:	CAIV Inspection Chamber
CCTV:	Closed Circuit Television
CL:	Cellar Light
C.PT:	Catch Pit
ER:	Earth Road
EC:	Electricity Inspection Chamber
EP:	Electricity Pole
EH:	Fire Hydrant
FP:	Flag Pole
GV:	Gas Valve
G:	Gully
IC:	Inspection Chamber
KO:	Kerb Outlet
LP:	Lamp Post
LB:	Letter Box
LC:	Lighting Column
MAR:	Marker
MH:	Manhole
MP:	Mooring Post
MS:	Mile Stone
NYNEX:	Nynex Inspection Chamber
O/H:	Over Hang
P:	Post
PO/IC:	Post Office Inspection Chamber
R/S:	Road Sign
RE:	Rodding Eye
RTW:	Retaining Wall
S/P:	Sign Post
SNP:	Street Name Plate
ST:	Stop Tap
SV:	Stop Valve
T:	Telecom Inspection Chamber
TCB:	Telephone Call Box
TH:	Threshold Level
TL:	Traffic Light
TP:	Telegraph Pole
TROUGH:	Trough
WO:	Water Outlet
WM:	Water Meter

Fence Descriptions:

B/W:	Barbed Wire
C/B:	Close Boarded
C/BARRIER:	Crash Barrier
C/L:	Chain Link
C/P:	Chestnut Paling
C/I:	Corrugated Iron
I/R:	Iron Rolling
MBC:	Miscellaneous
P/R:	Post & Rail
P/W:	Post & Wire
P/C:	Post & Chain
S/PAL:	Steel Palisade
W/M:	Wire Mesh

Survey Notes:

Coordinates and Levels related to Ordnance Survey Datum - GPS OSGB36

Revision	Date	Description



Chris Partington Land Surveyors

44a Green Lane  
Sale  
Cheshire  
M33 5PP  
T: 0161 976 1194  
www.cpls.co.uk e:survey@cpls.co.uk



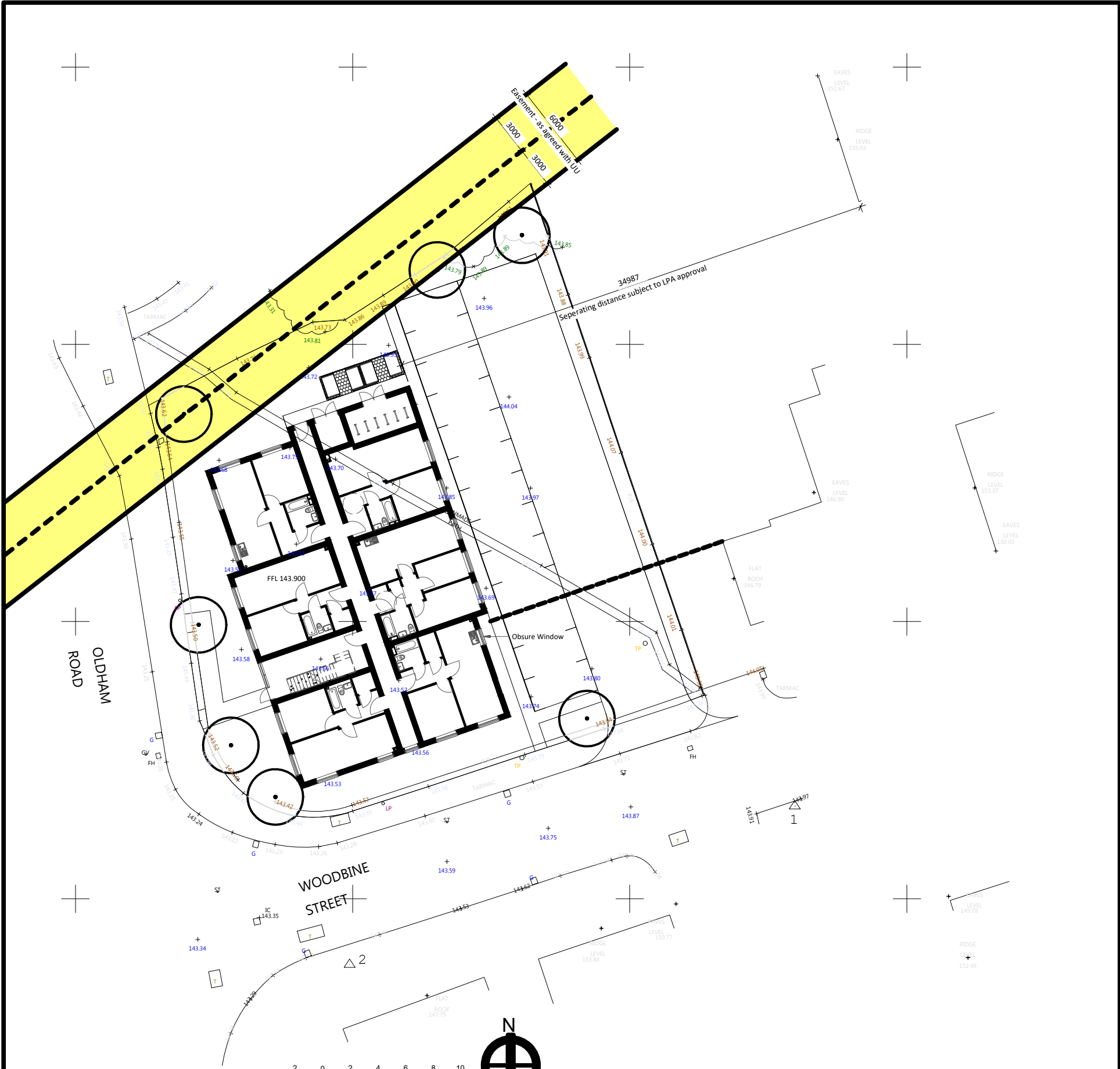
Client

Bernard Taylor Partnership

Project

Woodbine Street, Rochdale  
Site Survey

Scale	Surveyed By	Date
1:200	C G P	30.03.21
Drawing No.	Checked By	Date
300321/CP-01	CPLS	31.03.21
	Drawn By	Date
	J C	31.03.21



00 Proposed Site Plan  
1 : 200

DO NOT SCALE FROM THIS DRAWING  
ALL DIMENSIONS MUST BE CHECKED ON SITE BY CONTRACTOR  
RISK TO CONSTRUCTION

**Key**

- 2400 x 4800mm parking space
- Pavement
- Block Paved Parking Space
- Landscaped Area / Residence Garden
- Tarmac
- Easement

**Schedule of Accommdation**

**Affordable Rent**  
1B2P Flat @ 45m² - 13no  
2B3P Flat @ 53m² - 3no  
2B3P Flat @ 55m² - 2no

**Total: 18no**

72% Car Parking Provision for all flats (13no car parking)

**Caveats**

- Overlooking distances subject to LPA Approval
- Density and parking mix subject to LPA Approval

Layout subject to confirmation of red line boundary, all statutory approvals including highways, planning and building regulations, relevant surveys and reports such as topographical, ecology, trees, ground investigation and flood risk.

1	28.09.22	ED	Drawing revised to amend easement as agreed with United Utilities
Rev	Date	Int	Description

\\btp02\VR_Live\3576 - Woodbine Street\BTP\Planning\VS-BTP-00-HS-A-3576-0-Title\BTP-Design\02-450275.jpg

Arcon Housing Association

Woodbine Street, Rochdale

Proposed Site Plan

Planning

ED MA 27.07.22 1 : 200

3576 S2 105 1

WS-BTP-00-SP-DR-A-3576_105.1

Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS  
0161 443 1221info@bernardtaylor.co.uk www.btparchitects.co.uk

## Appendix B

Qbar Hydraulic Calculations

Proposed Drainage Network Hydraulic Calculations

Sutcliffe		Page 1
18-20 Harrington Street Liverpool L2 9QA	Oldham Road / Woodbine Street Oldham	
Date 26/04/2021 10:43 File	Designed by DS Checked by	
Innovyze Source Control 2020.1.3		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.150
Area (ha)	0.110	Urban	0.000
SAAR (mm)	1132	Region Number	Region 10

**Results 1/s**

QBAR Rural	0.1
QBAR Urban	0.1
Q2 years	0.1
Q1 year	0.1
Q30 years	0.1
Q100 years	0.2

©1982-2020 Innovyze

Sutcliffe		Page 0																																																																																																																																																																																																															
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE																																																																																																																																																																																																																
Date 16/09/2022 11:53 File 31163-Model 001.mdx	Designed by DS Checked by																																																																																																																																																																																																																
Innovyze	Network 2020.1.3																																																																																																																																																																																																																
<u>STORM SEWER DESIGN by the Modified Rational Method</u>   <u>Design Criteria for Surface Network 1</u>   Pipe Sizes STANDARD Manhole Sizes STANDARD   FSR Rainfall Model - England and Wales  <table><tr><td>Return Period (years)</td><td>2</td><td>PIMP (%)</td><td>100</td></tr><tr><td>M5-60 (mm)</td><td>19.000</td><td>Add Flow / Climate Change (%)</td><td>0</td></tr><tr><td>Ratio R</td><td>0.271</td><td>Minimum Backdrop Height (m)</td><td>0.200</td></tr><tr><td>Maximum Rainfall (mm/hr)</td><td>50</td><td>Maximum Backdrop Height (m)</td><td>1.500</td></tr><tr><td>Maximum Time of Concentration (mins)</td><td>30</td><td>Min Design Depth for Optimisation (m)</td><td>1.200</td></tr><tr><td>Foul Sewage (l/s/ha)</td><td>0.000</td><td>Min Vel for Auto Design only (m/s)</td><td>1.00</td></tr><tr><td>Volumetric Runoff Coeff.</td><td>0.750</td><td>Min Slope for Optimisation (1:X)</td><td>400</td></tr></table>  Designed with Level Soffits			Return Period (years)	2	PIMP (%)	100	M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0	Ratio R	0.271	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)	1.200	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																																																																																																																																																																																			
Return Period (years)	2	PIMP (%)	100																																																																																																																																																																																																														
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0																																																																																																																																																																																																														
Ratio R	0.271	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)	1.200																																																																																																																																																																																																														
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																																																																																																																																																																																																														
<u>Network Design Table for Surface Network 1</u>  <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>1.000</td><td>4.866</td><td>0.049</td><td>100.0</td><td>0.006</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.001</td><td>17.087</td><td>0.171</td><td>100.0</td><td>0.008</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.002</td><td>2.016</td><td>0.020</td><td>100.0</td><td>0.005</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.003</td><td>19.918</td><td>0.810</td><td>24.6</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>2.000</td><td>33.499</td><td>0.600</td><td>55.8</td><td>0.059</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>3.000</td><td>2.821</td><td>0.031</td><td>90.8</td><td>0.000</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>225</td><td>Pipe/Conduit</td><td></td></tr><tr><td>3.001</td><td>1.892</td><td>0.019</td><td>100.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>225</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.004</td><td>6.993</td><td>0.117</td><td>60.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr></table>  <u>Network Results Table</u>  <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>Σ I.Area (ha)</th><th>Σ Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>1.000</td><td>50.00</td><td>5.08</td><td>142.950</td><td>0.006</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>17.8</td><td>0.8</td></tr><tr><td>1.001</td><td>50.00</td><td>5.36</td><td>142.901</td><td>0.014</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>17.8</td><td>1.9</td></tr><tr><td>1.002</td><td>50.00</td><td>5.40</td><td>142.730</td><td>0.020</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>17.8</td><td>2.6</td></tr><tr><td>1.003</td><td>50.00</td><td>5.56</td><td>142.710</td><td>0.020</td><td>0.0</td><td>0.0</td><td>0.0</td><td>2.04</td><td>36.0</td><td>2.6</td></tr><tr><td>2.000</td><td>50.00</td><td>5.41</td><td>142.500</td><td>0.059</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.35</td><td>23.8</td><td>8.0</td></tr><tr><td>3.000</td><td>50.00</td><td>5.03</td><td>141.950</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.37</td><td>54.6</td><td>0.0</td></tr><tr><td>3.001</td><td>50.00</td><td>5.06</td><td>141.919</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.31</td><td>52.0</td><td>0.0</td></tr><tr><td>1.004</td><td>50.00</td><td>5.65</td><td>141.900</td><td>0.079</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.30</td><td>23.0</td><td>10.6</td></tr></table>			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	4.866	0.049	100.0	0.006	5.00	0.0	0.600	o	150	Pipe/Conduit		1.001	17.087	0.171	100.0	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit		1.002	2.016	0.020	100.0	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit		1.003	19.918	0.810	24.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		2.000	33.499	0.600	55.8	0.059	5.00	0.0	0.600	o	150	Pipe/Conduit		3.000	2.821	0.031	90.8	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit		3.001	1.892	0.019	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		1.004	6.993	0.117	60.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		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)	1.000	50.00	5.08	142.950	0.006	0.0	0.0	0.0	1.00	17.8	0.8	1.001	50.00	5.36	142.901	0.014	0.0	0.0	0.0	1.00	17.8	1.9	1.002	50.00	5.40	142.730	0.020	0.0	0.0	0.0	1.00	17.8	2.6	1.003	50.00	5.56	142.710	0.020	0.0	0.0	0.0	2.04	36.0	2.6	2.000	50.00	5.41	142.500	0.059	0.0	0.0	0.0	1.35	23.8	8.0	3.000	50.00	5.03	141.950	0.000	0.0	0.0	0.0	1.37	54.6	0.0	3.001	50.00	5.06	141.919	0.000	0.0	0.0	0.0	1.31	52.0	0.0	1.004	50.00	5.65	141.900	0.079	0.0	0.0	0.0	1.30	23.0	10.6
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	4.866	0.049	100.0	0.006	5.00	0.0	0.600	o	150	Pipe/Conduit																																																																																																																																																																																																							
1.001	17.087	0.171	100.0	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit																																																																																																																																																																																																							
1.002	2.016	0.020	100.0	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit																																																																																																																																																																																																							
1.003	19.918	0.810	24.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit																																																																																																																																																																																																							
2.000	33.499	0.600	55.8	0.059	5.00	0.0	0.600	o	150	Pipe/Conduit																																																																																																																																																																																																							
3.000	2.821	0.031	90.8	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit																																																																																																																																																																																																							
3.001	1.892	0.019	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit																																																																																																																																																																																																							
1.004	6.993	0.117	60.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit																																																																																																																																																																																																							
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)																																																																																																																																																																																																							
1.000	50.00	5.08	142.950	0.006	0.0	0.0	0.0	1.00	17.8	0.8																																																																																																																																																																																																							
1.001	50.00	5.36	142.901	0.014	0.0	0.0	0.0	1.00	17.8	1.9																																																																																																																																																																																																							
1.002	50.00	5.40	142.730	0.020	0.0	0.0	0.0	1.00	17.8	2.6																																																																																																																																																																																																							
1.003	50.00	5.56	142.710	0.020	0.0	0.0	0.0	2.04	36.0	2.6																																																																																																																																																																																																							
2.000	50.00	5.41	142.500	0.059	0.0	0.0	0.0	1.35	23.8	8.0																																																																																																																																																																																																							
3.000	50.00	5.03	141.950	0.000	0.0	0.0	0.0	1.37	54.6	0.0																																																																																																																																																																																																							
3.001	50.00	5.06	141.919	0.000	0.0	0.0	0.0	1.31	52.0	0.0																																																																																																																																																																																																							
1.004	50.00	5.65	141.900	0.079	0.0	0.0	0.0	1.30	23.0	10.6																																																																																																																																																																																																							
©1982-2020 Innovyze																																																																																																																																																																																																																	

Sutcliffe		Page 1
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:53 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

#### Area Summary for Surface Network 1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.006	0.006	0.006
1.001	User	-	100	0.008	0.008	0.008
1.002	User	-	100	0.005	0.005	0.005
1.003	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.020	0.020	0.020
	User	-	100	0.039	0.039	0.059
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.079	0.079	0.079

#### Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.004	PS7	143.734	141.783	0.000	180	0

#### Simulation Criteria for Surface Network 1

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
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)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.271		

Sutcliffe		Page 2
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:53 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: PS5, DS/PN: 1.004, Volume (m³): 4.3

Unit Reference	MD-SHE-0104-5000-1100-5000
Design Head (m)	1.100
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	104
Invert Level (m)	141.900
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	5.0
Flush-Flo™	0.323	5.0
Kick-Flo®	0.690	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	3.5	1.200	5.2	3.000	8.0	7.000	12.0
0.200	4.8	1.400	5.6	3.500	8.6	7.500	12.4
0.300	5.0	1.600	6.0	4.000	9.2	8.000	12.7
0.400	5.0	1.800	6.3	4.500	9.7	8.500	13.1
0.500	4.8	2.000	6.6	5.000	10.2	9.000	13.5
0.600	4.6	2.200	6.9	5.500	10.7	9.500	13.8
0.800	4.3	2.400	7.2	6.000	11.1		
1.000	4.8	2.600	7.5	6.500	11.5		

Sutcliffe		Page 3												
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE													
Date 16/09/2022 11:53 File 31163-Model 001.mdx	Designed by DS Checked by													
Innovyze	Network 2020.1.3													
<u>Storage Structures for Surface Network 1</u>   <u>Tank or Pond Manhole: PS9, DS/PN: 3.000</u>   Invert Level (m) 141.951  <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>28.0</td><td>0.900</td><td>28.0</td><td>0.901</td><td>0.0</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	28.0	0.900	28.0	0.901	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)									
0.000	28.0	0.900	28.0	0.901	0.0									
©1982-2020 Innovyze														

Sutcliffe		Page 4
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:53 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

### Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

#### Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0      MADD Factor * 10m³/ha Storage 0.000  
 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

#### Synthetic Rainfall Details

Rainfall Model FSR      Ratio R 0.271  
 Region England and Wales Cv (Summer) 1.000  
 M5-60 (mm) 19.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

Profile(s) Summer and Winter  
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
 Return Period(s) (years) 1  
 Climate Change (%) 0

									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	PS1	15 Summer	1	+0%					142.975
1.001	PS2	15 Summer	1	+0%					142.935
1.002	PS3	15 Summer	1	+0%					142.780
1.003	PS4	15 Summer	1	+0%					142.738
2.000	PS10	15 Summer	1	+0%					142.564
3.000	PS9	30 Summer	1	+0%					142.016
3.001	PS8	15 Summer	1	+0%					142.104
1.004	PS5	15 Summer	1	+0%	1/15 Summer				142.138

Surcharged Flooded					Half Drain	Pipe			
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	PS1	-0.125	0.000	0.06			0.9	OK	
1.001	PS2	-0.116	0.000	0.11			1.9	OK	
1.002	PS3	-0.100	0.000	0.23			2.5	OK	
1.003	PS4	-0.123	0.000	0.08			2.6	OK	
2.000	PS10	-0.086	0.000	0.37			8.6	OK	
3.000	PS9	-0.159	0.000	0.06			1.7	OK	

Sutcliffe		Page 5
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:53 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

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)	Flow		
3.001	PS8	-0.040	0.000	0.08			2.2		OK	
1.004	PS5	0.088	0.000	0.25			4.9		SURCHARGED	

Sutcliffe		Page 0
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:54 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

### Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

#### Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0      MADD Factor * 10m³/ha Storage 0.000  
 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

#### Synthetic Rainfall Details

Rainfall Model FSR      Ratio R 0.271  
 Region England and Wales Cv (Summer) 1.000  
 M5-60 (mm) 19.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

Profile(s) Summer and Winter  
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
 Return Period(s) (years) 2  
 Climate Change (%) 0

									Water
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)
1.000	PS1	15 Summer	2	+0%					142.979
1.001	PS2	15 Summer	2	+0%					142.940
1.002	PS3	15 Summer	2	+0%					142.788
1.003	PS4	15 Summer	2	+0%					142.742
2.000	PS10	15 Summer	2	+0%					142.575
3.000	PS9	30 Summer	2	+0%					142.058
3.001	PS8	15 Summer	2	+0%	2/15 Summer				142.162
1.004	PS5	15 Summer	2	+0%	2/15 Summer				142.178

Surcharged Flooded					Half Drain	Pipe			
PN	US/MH Name	Depth (m)	Volume (m ³ )	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
1.000	PS1	-0.121	0.000	0.08		1.2	OK		
1.001	PS2	-0.111	0.000	0.15		2.5	OK		
1.002	PS3	-0.093	0.000	0.30		3.3	OK		
1.003	PS4	-0.119	0.000	0.10		3.3	OK		
2.000	PS10	-0.075	0.000	0.48		11.1	OK		
3.000	PS9	-0.117	0.000	0.10		3.0	OK		





Sutcliffe		Page 1
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:55 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

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)	Flow (l/s)		
3.001	PS8	0.135	0.000	0.16			4.8		SURCHARGED	
1.004	PS5	0.230	0.000	0.25			5.0		SURCHARGED	



Sutcliffe		Page 1
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:56 File 31163-Model 001.mdx	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

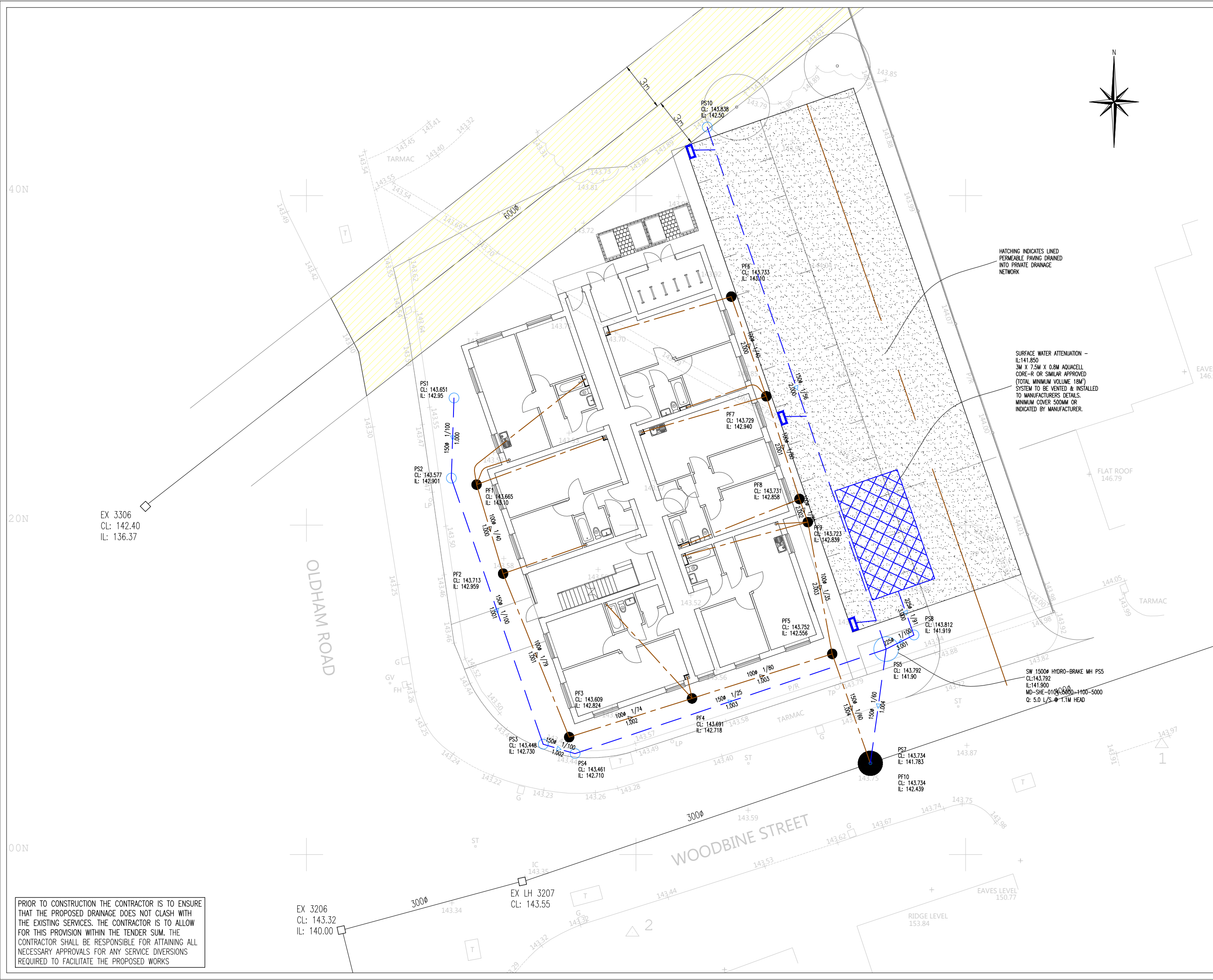
Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow		Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Cap.	(l/s)	Time (mins)	Flow (l/s)	
3.001	PS8	143.014	0.870	0.000	0.18			5.2	SURCHARGED
1.004	PS5	143.014	0.964	0.000	0.26			5.0	SURCHARGED

US/MH		Level
PN	Name	Exceeded
1.000	PS1	
1.001	PS2	
1.002	PS3	
1.003	PS4	
2.000	PS10	3
3.000	PS9	
3.001	PS8	
1.004	PS5	

## Appendix C

### Proposed Drainage Layout Drained Areas Plan



PRIOR TO CONSTRUCTION THE CONTRACTOR IS TO ENSURE THAT THE PROPOSED DRAINAGE DOES NOT CLASH WITH THE EXISTING SERVICES. THE CONTRACTOR IS TO ALLOW FOR THIS PROVISION WITHIN THE TENDER SUM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ATTAINING ALL NECESSARY APPROVALS FOR ANY SERVICE DIVERSIONS REQUIRED TO FACILITATE THE PROPOSED WORKS

General Notes

DO NOT SCALE OFF THIS DRAWING

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.O.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

PROPOSED DRAINAGE

ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1m AND MANHOLES 0.5m FROM KERB FACES AND SERVICE MARGINS.

PRIOR TO CONSTRUCTION THE CONTRACTOR IS TO ENSURE THAT THE PROPOSED DRAINAGE DOES NOT CLASH WITH THE EXISTING SERVICES. THE CONTRACTOR IS TO ALLOW FOR THIS PROVISION WITHIN THE TENDER SUM.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ATTAINING ALL NECESSARY APPROVALS FOR ANY SERVICE DIVERSIONS REQUIRED TO FACILITATE THE PROPOSED WORKS

SURFACE WATER DRAINAGE

ALL PRIVATE SURFACE WATER DRAINAGE TO BE 100MM Ø AT 1:80 GRADIENT UNLESS NOTED OTHERWISE.

AN ALLOWANCE TO BE MADE FOR DRIVEWAY GULLIES AND ASSOCIATED DRAIN RUNS WHERE APPLICABLE

ALL FLOWS FROM PRIVATE CELLULAR SW STORAGE TO BE DISCHARGED THROUGH A SILT TRAP MANHOLE PRIOR TO BEING DISCHARGED INTO ANY PUBLIC SEWERS.

ALL SURFACE WATER GULLEYS TO BE TRAPPED.

ARCHITECT TO CONFIRM ALL RWP LOCATIONS PRIOR TO CONSTRUCTION.

FOUL WATER / COMBINED DRAINAGE

ALL PRIVATE FOUL WATER DRAINAGE TO BE 100MM Ø AT 1:80 GRADIENT UNLESS NOTED OTHERWISE

INTERNAL VENTING OF DRAINAGE SYSTEM TO ARCHITECT'S DETAILS

DRAINAGE KEY

EXTG COMBINED DRAINAGE

PROPOSED FOUL WATER DRAINAGE

PROPOSED SURFACE WATER DRAINAGE

PROPOSED COMBINED DRAINAGE

SEWER EASEMENT (AS DIMENSIONED ON PLAN)

ACO CHANNEL

BACK INLET GULLY

RWP RAIN WATER PIPE

SOIL PIPE - REFER TO ARCHITECTS PLAN FOR VENTING DETAILS

G GULLY

RODDING EYE

MINI ACCESS CHAMPER

FW PPIC FOUL WATER POLYPROPYLENE INSPECTION CHAMBER

SW PPIC SURFACE WATER POLYPROPYLENE INSPECTION CHAMBER

SW 1500Ø HYDRO-BRAKE MH PS5  
CL:143.792  
IL:141.900  
MD-SHE-0104-5000-1100-5000  
Q: 5.0 L/S @ 1.1M HEAD

P02	EASEMENT AMENDED	04.10.22	MJG	DS
P01	PRELIMINARY ISSUE	16.09.22	MJG	DS
Rev	Description	Date	By	Chkd
Drawing Status				

PRELIMINARY

Sutcliffe

Structural & Civil Engineering  
Geotechnical & Environmental Investigations  
Building Surveying  
Fire Planning Services

General Head Office  
0161 275 2700  
www.sutcliffe.co.uk

Southwest Office  
01752 871 110  
www.sutcliffe.co.uk

South Wales Office  
01495 470 070  
www.sutcliffe.co.uk

London Office  
020 896 0001  
www.sutcliffe.co.uk

BSI

ENR

ISO 9001

ISO 14001

ISO 45001

ISO 50001

ISO 50001

ISO 50001

Client

ARCON

Project

OLDHAM ROAD  
ROCHDALE

Drawing Title

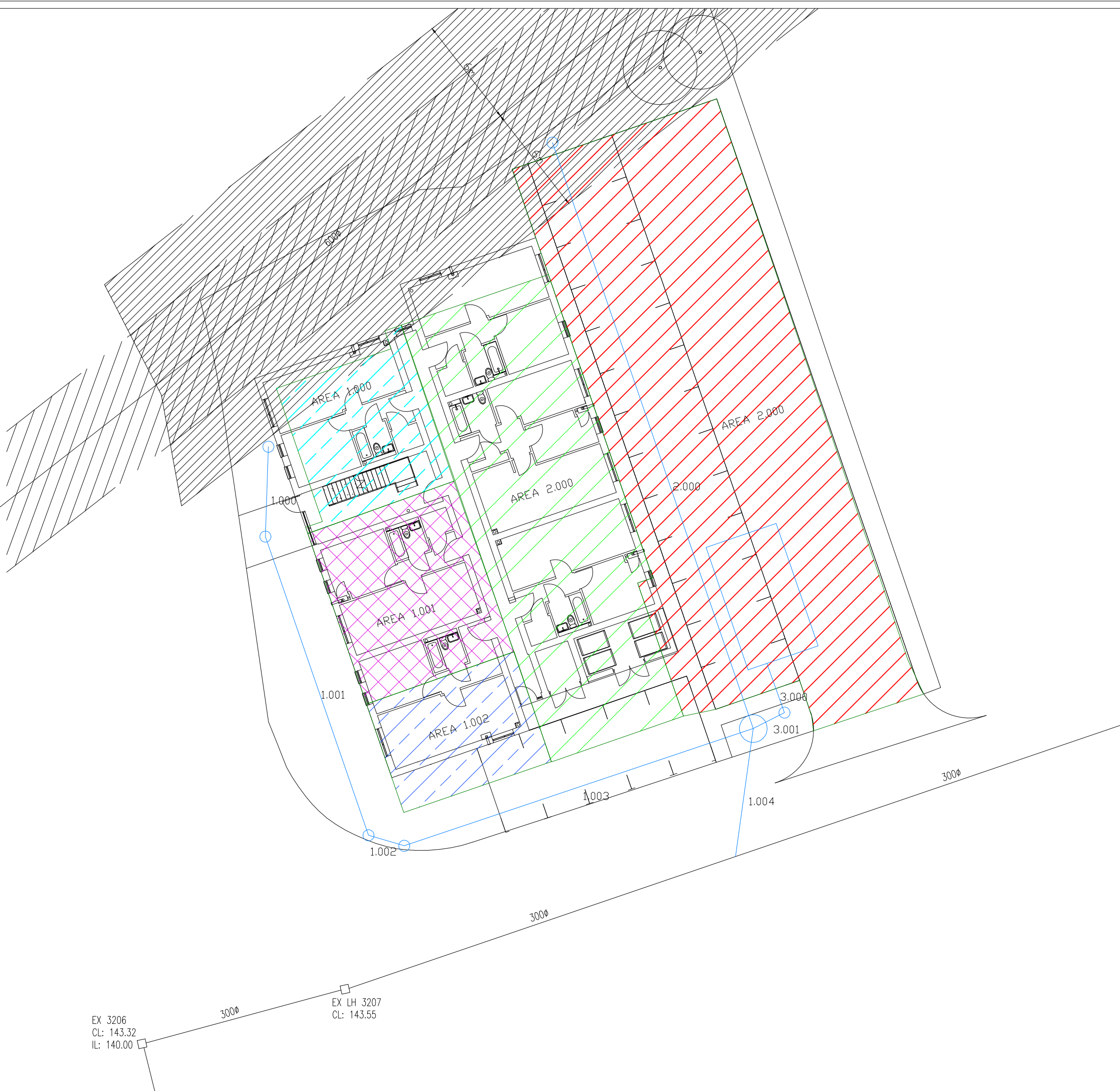
PROPOSED DRAINAGE PLAN

Date	Drawn By	Checked By
SEP 22	MJG	DS
Scale at A1	Project Number	
1:100	31163	
Sheet Number	Revision	
31163-SUT-ZZ-00-DR-C-6200	P02	

EX 3306  
CL: 142.40  
IL: 136.37

EX 3206  
CL: 143.32  
IL: 140.00

EX LH 3207  
CL: 143.55



General Notes

DO NOT SCALE OFF THIS DRAWING

THIS DRAWING HAS BEEN PREPARED AS PART OF THE DRAINAGE STRATEGY REQUIRED AS PART OF THE PLANNING SUBMISSION.

P01	PRELIMINARY ISSUE	16.09.22	MJG	DS
Rev	Description	Date	By	Chkd
Drawing Status				

PRELIMINARY

**Sutcliffe**

Structural & Civil Engineering  
Environmental & Environmental Investigations  
Building Services  
The Planning Services

General Head Office:  
0161 271 1100  
www.sutcliffe.co.uk

Stockport Office:  
0161 271 1100

Stockport Office:  
0161 271 1100

Leeds Office:  
0113 271 1100

Client

ARCON

Project

OLDHAM ROAD  
ROCHDALE

Drawing Title

DRAINED AREAS PLAN

Date	SEP 22	Drawn By	MJG	Checked By	DS
Scale at A1	1:100	Project Number	31163	Revision	P01
Sheet Number	31163-SUT-ZZ-00-DR-C-6203				

## Appendix D

Flood Exceedance Hydraulic Calculation  
Flood Exceedance Drawing

Sutcliffe	Page 0
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE
Date 16/09/2022 11:59 File 31163-Model 001_Exceeda...	Designed by DS Checked by
Innovyze	Network 2020.1.3



### STORM SEWER DESIGN by the Modified Rational Method

#### Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.271	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)	1.200
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 Surface Network 1

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	4.866	0.049	100.0	0.006	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
1.001	17.087	0.171	100.0	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	🔒
1.002	2.016	0.020	100.0	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit	🔒
1.003	19.918	0.810	24.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🔒
2.000	33.499	0.600	55.8	0.059	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
3.000	2.821	0.031	90.8	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	🔒
3.001	1.892	0.019	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
1.004	6.993	0.117	60.0	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)
1.000	50.00	5.08	142.950	0.006	0.0	0.0	0.0	1.00	17.8	0.8
1.001	50.00	5.36	142.901	0.014	0.0	0.0	0.0	1.00	17.8	1.9
1.002	50.00	5.40	142.730	0.020	0.0	0.0	0.0	1.00	17.8	2.6
1.003	50.00	5.56	142.710	0.020	0.0	0.0	0.0	2.04	36.0	2.6
2.000	50.00	5.41	142.500	0.059	0.0	0.0	0.0	1.35	23.8	8.0
3.000	50.00	5.03	141.950	0.000	0.0	0.0	0.0	1.37	54.6	0.0
3.001	50.00	5.06	141.919	0.000	0.0	0.0	0.0	1.31	52.0	0.0
1.004	50.00	5.65	141.900	0.079	0.0	0.0	0.0	1.30	23.0	10.6

Sutcliffe		Page 1
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:59 File 31163-Model 001_Exceeda...	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

#### Area Summary for Surface Network 1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.006	0.006	0.006
1.001	User	-	100	0.008	0.008	0.008
1.002	User	-	100	0.005	0.005	0.005
1.003	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.020	0.020	0.020
	User	-	100	0.039	0.039	0.059
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.079	0.079	0.079

#### Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	----------	--------

1.004	PS7	143.734	141.783	0.000	180	0
-------	-----	---------	---------	-------	-----	---

#### Simulation Criteria for Surface Network 1

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	45.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
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)	240
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	4
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)	200	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Storm Duration (mins)	120
Ratio R	0.271		

Sutcliffe		Page 2
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:59 File 31163-Model 001_Exceeda...	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: PS5, DS/PN: 1.004, Volume (m³): 4.3

Unit Reference	MD-SHE-0104-5000-1100-5000
Design Head (m)	1.100
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	104
Invert Level (m)	141.900
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	5.0
Flush-Flo™	0.323	5.0
Kick-Flo®	0.690	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	3.5	1.200	5.2	3.000	8.0	7.000	12.0
0.200	4.8	1.400	5.6	3.500	8.6	7.500	12.4
0.300	5.0	1.600	6.0	4.000	9.2	8.000	12.7
0.400	5.0	1.800	6.3	4.500	9.7	8.500	13.1
0.500	4.8	2.000	6.6	5.000	10.2	9.000	13.5
0.600	4.6	2.200	6.9	5.500	10.7	9.500	13.8
0.800	4.3	2.400	7.2	6.000	11.1		
1.000	4.8	2.600	7.5	6.500	11.5		

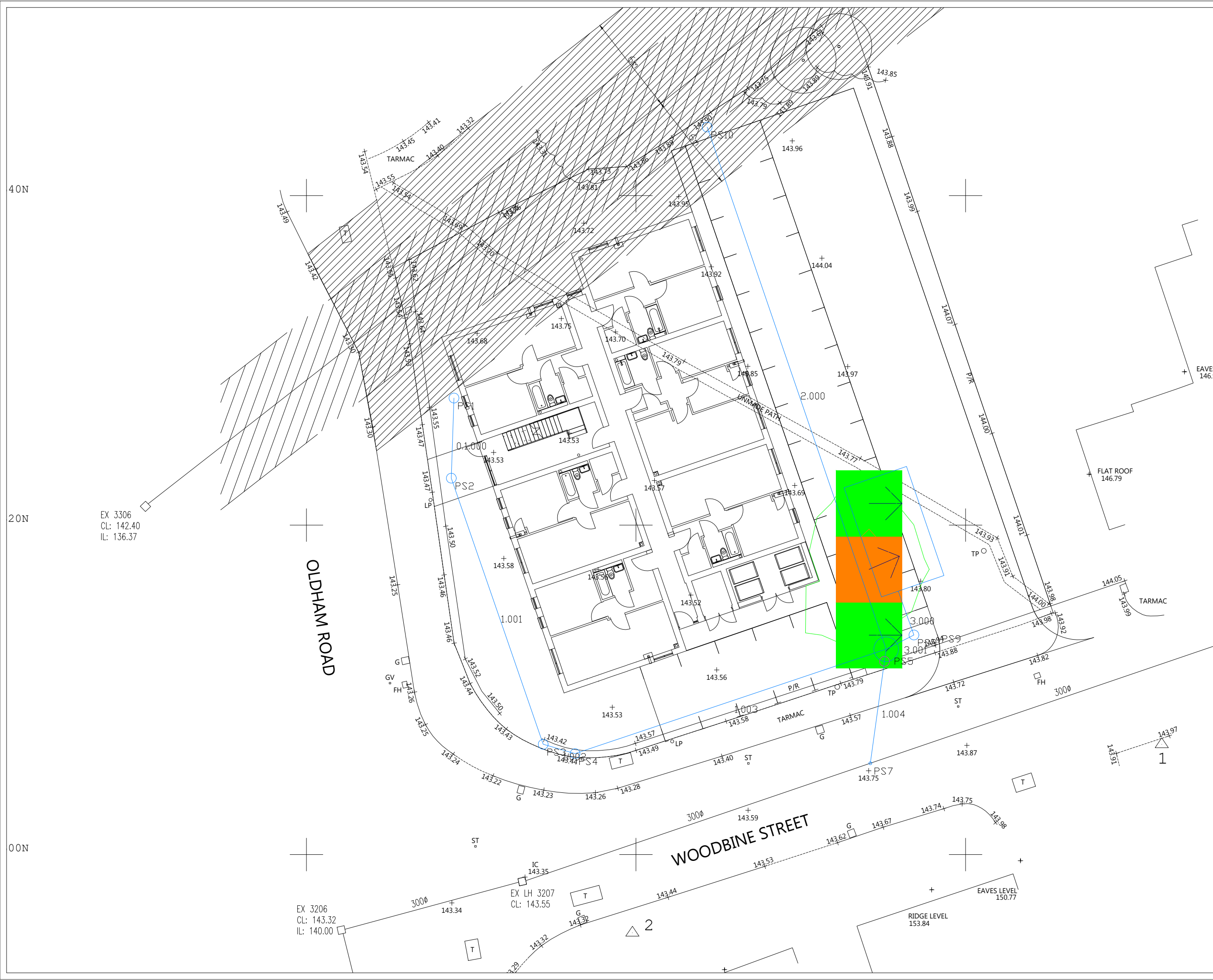
Sutcliffe		Page 3												
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE													
Date 16/09/2022 11:59 File 31163-Model 001_Exceeda...	Designed by DS Checked by													
Innovyze Network 2020.1.3														
<u>Storage Structures for Surface Network 1</u>   <u>Tank or Pond Manhole: PS9, DS/PN: 3.000</u>   Invert Level (m) 141.951  <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>28.0</td><td>0.900</td><td>28.0</td><td>0.901</td><td>0.0</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	28.0	0.900	28.0	0.901	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)									
0.000	28.0	0.900	28.0	0.901	0.0									
©1982-2020 Innovyze														

Sutcliffe		Page 4
18-20 Harrington Street Liverpool L2 9QA	WOODBINE STREET ROCHDALE	
Date 16/09/2022 11:59 File 31163-Model 001_Exceeda...	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

Summary of Results for 120 minute 200 year Summer (Surface Network 1)

Margin for Flood Risk Warning (mm) 300.0      DVD Status OFF  
 Analysis Timestep      Fine Inertia Status OFF  
 DTS Status      ON

		Water	Surcharged	Flooded		Half Drain	Pipe		
PN	US/MH Name	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status
1.000	PS1	143.454	0.354	0.000	0.18			2.5	FLOOD RISK
1.001	PS2	143.453	0.402	0.000	0.36			5.9	FLOOD RISK
1.002	PS3	143.448	0.567	4.388	0.73			7.9	FLOOD
1.003	PS4	143.461	0.600	5.133	1.11			37.7	FLOOD
2.000	PS10	143.838	1.188	0.437	1.03			23.7	FLOOD
3.000	PS9	143.677	1.502	0.400	0.40			11.9	FLOOD
3.001	PS8	143.812	1.669	0.797	0.39			11.5	FLOOD
1.004	PS5	143.966	1.916	8.917	0.31			6.1	FLOOD



General Notes

DO NOT SCALE OFF THIS DRAWING

THIS DRAWING HAS BEEN PREPARED AS PART OF THE DRAINAGE STRATEGY REQUIRED AS PART OF THE PLANNING SUBMISSION.

KEY:

DEPTH OF WATER < 25MM

DEPTH OF WATER 25 - 125MM

DEPTH OF WATER > 125MM

DIRECTION OF FLOOD FLOW

P01	PRELIMINARY ISSUE	16.09.22	MJG	DS
Rev	Description	Date	By	Chkd
Drawing Status				
PRELIMINARY				
Sutcliffe  Structural &amp; Civil Engineering  Geotechnical &amp; Environmental Investigations  Building Surveying  Fire Planning Services				
Client				
ARCON				
Project				
OLDHAM ROAD ROCHDALE				
Drawing Title				
PROPOSED FLOOD ROUTING PLAN				
Date	Drawn By	Checked By		
SEP 22	MJG	DS		
Scale at A1		Project Number		
1:100		31163		
Sheet Number				Revision
31163-SUT-ZZ-00-DR-C-6202				P01

## Appendix E

### Correspondence

**From:** [wastewaterdeveloperservices@uuplc.co.uk](mailto:wastewaterdeveloperservices@uuplc.co.uk)  
**To:** [Dave Samuels](#)  
**Subject:** Pre Development Enquiry for: Woodbine Street, OL16 5JB UU Reference Number : 02808693  
**Date:** 27 September 2022 10:13:48

---

**Good morning Dave,**

**Pre Development Enquiry for: Woodbine Street, OL16 5JB UU Reference Number : 02808693**

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

**Foul Water**

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 300mm diameter public combined sewer within Woodbine Street located to the South of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

**Surface Water**

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

*Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.*

This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The [North West SuDS Pro-Forma](#) provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

### **Infiltration**

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

### **Waterbody**

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment

Agency to discuss a point of discharge to the canal located 10m North of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

### **Highway Drainage**

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

### **Public Sewer**

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 300mm diameter public combined sewer within Woodbine Street located South of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

### **Levels**

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

### **Land drainage / Overland flows / track drainage**

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

### **Existing Wastewater Assets Crossing the Site**

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

*Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.*

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

#### **Existing Water Assets Crossing the Site**

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: [DeveloperServicesWater@uuplc.co.uk](mailto:DeveloperServicesWater@uuplc.co.uk). Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

#### **Connection Application**

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

**Ashleigh Bellerby**

Assistant Developer Engineer  
Developer Services & Metering  
Customer Services

**T:** 07826891650  
unitedutilities.com

**If you have received a great service today why not tell us?**

**Visit:** [unitedutilities.com/wow](https://unitedutilities.com/wow)

----- Original Message -----

**From:** wastewaterdeveloperservices@uuplc.co.uk

[wastewaterdeveloperservices@uuplc.co.uk]

**Sent:** 15/09/2022 08:51

**To:** dave.samuels@sutcliffe.co.uk

**Subject:** Our reference - 02808693

Picture1





Assistant Developer Engineer  
Developer Services & Metering  
Customer Services  
**T:** 07826891650  
unitedutilities.com

**If you have received a great service today why not tell us?**

**Visit:** [unitedutilities.com/wow](https://unitedutilities.com/wow)

----- Original Message -----

**From:** wastewaterdeveloperservices@uuplc.co.uk

[wastewaterdeveloperservices@uuplc.co.uk]

**Sent:** 15/09/2022 08:51

**To:** dave.samuels@sutcliffe.co.uk

**Subject:** Our reference - 02808693

Picture1



Dear Dave

**PRE DEVELOPMENT APPLICATION AT: Corner of Oldham / Woodbine Street,  
OL16 5JB – UU Ref 02808693**

Please accept this email as receipt of your application received on 14/09/22 for the above development. This has now been logged on our system and the job reference is 02808693 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to an engineer for technical assessment. You will receive their response within 8 working days.

Kind regards,  
Casey

**Casey Dand**

Customer Advisor Advanced  
Developer Services & Metering  
Customer Services

**T:** 03450726067  
unitedutilities.com

**If you have received a great service today why not tell us?**  
**Visit: [unitedutilities.com/wow](https://www.unitedutilities.com/wow)**

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at [WastewaterDeveloperServices@uuplc.co.uk](mailto:WastewaterDeveloperServices@uuplc.co.uk)



Customer Advisor Advanced  
Developer Services & Metering  
Customer Services  
**T:** 03450726067  
unitedutilities.com

**If you have received a great service today why not tell us?**  
**Visit: [unitedutilities.com/wow](https://www.unitedutilities.com/wow)**

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at [WastewaterDeveloperServices@uuplc.co.uk](mailto:WastewaterDeveloperServices@uuplc.co.uk)

Footer



The information contained in this e-mail is intended only for the individual to whom it is addressed. It may contain legally privileged or confidential information or otherwise be exempt from disclosure. If you have received this Message

in error or there are any problems, please notify the sender immediately and delete the message from your computer. You must not use, disclose, copy or alter this message for any unauthorised purpose. Neither United Utilities Group PLC nor any of its subsidiaries will be liable for any direct, special, indirect or consequential damages as a result of any virus being passed on, or arising from the alteration of the contents of this message by a third party.

United Utilities Group PLC, Haweswater House, Lingley Mere  
Business Park, Lingley Green Avenue, Great Sankey,  
Warrington, WA5 3LP  
Registered in England and Wales. Registered No 6559020

[www.unitedutilities.com](http://www.unitedutilities.com)  
[www.unitedutilities.com/subsidiaries](http://www.unitedutilities.com/subsidiaries)