

DRAINAGE STRATEGY

SCHEME NAME:

Kenyon Lane,
Middleton,
Manchester,
M24 2QX

CLIENT

Mr R Jones

REPORT REFERENCE:

9758-ADS-XX-XX-RP-C-001[P2]

DATE:

01.02.2025



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Field investigations and on-site surveys that have been carried out, will have been restricted to a level of detail required to achieve the stated objectives of the work to compile this report.

The report has been produced in accordance with the quality management system of ADS Consult.

Rev	Reason for Issue	Date issued	Author	Checker	Approver
P1	First Issue	29.05.2025	GR	DCS	DCS
P2	Planning amendments	16.06.2025	GDR	DCS	DCS
P3	Planning amendments	18.06.2025	DCS	DCS	DCS

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Strategy Summary

General Site Information	
The site is located on Kenyon Lane, Middleton. The site is to be repurposed into 8 residential houses.	
Existing Site Specifications	
Site Area	0.26 ha
Greenfield Area	0.26 ha
Brownfield Area	Nil
Surface Run Off Existing	4.2 l/s Qbar
Ground Condition	Till, Devensian - Clay, sandy, gravelly, cobbly. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period
Investigation Methods	Office Based & site trial holes with testing.
Infiltration Potential	Very Low
Drainage SuDS Strategy	
Infiltration	Not possible - CLAY
Surface water discharge location	The proposal is to discharge attenuated surface water to a combined sewer. Surface water from the existing private roads will be discharged to tree pits / water gardens
Flow rate Control	5.0 l/s
Storage Required For	100 years plus 45% climate change
Foul water discharge Location	Existing combined system on Kenyon Lane.
Elements of SuDS Utilised	Below ground permeable stone. Tree Pits Water butts
Surface Water Quality Controls	Removal of combined pollution from stone attenuation
Exceedance Flows	Contained on site.

Strategy Overall Conclusions

Percolation is not possible therefore existing combined sewer will be utilised for the discharge of both surface water and foul water.

Both foul and surface water systems are to employ traditional pipe gravity feed. All down pipes to have vertical rodding eye ports available.

Rainwater to be fed directly into the subbase of porous paving and gravel trenches attenuation. Discharge is to be controlled via vortex valve (hydrobrake) operating at 5.0 l/s downstream of the attenuation. Outfall rate set to 5.0 l/s to avoid blockage issues impacting the system.

Water recycling provided by water butts and tree pits.

1.0 Scheme Introduction

- 1.1 ADS Consult has been commissioned to produce a drainage strategy for the proposed new development, repurposing the site into 8 residential houses.
- 1.2 The report is intended to demonstrate that the run-off from the site can be reduced that of 5.0 l/s set above the Qbar rate to avoid blockages which will impact the proposed system.
- 1.3 Limitations associated with this report are:
 - Several sources of data have been used to compile this report, and all are deemed to be trustworthy. We are however unable to guarantee the validity of these sources fully.
 - This report has been compiled using the available information from other sources. Any further information obtained post issue of this report may result in modifications to parts or the entire report.



2.0 Site Location

- 2.1 The proposed development is situated on Kenyon Lane, Middleton, M24 2DR. SD880059. Grid reference 388084mE, 405914mN. See Appendix A
- 2.2 The local authority associated with the development is Rochdale Council.

3.0 Description of Site

3.1 The site as proposed sits to the rear of Lily Street.



3.2 A commissioned topographical survey has been undertaken and can be found at Appendix B.

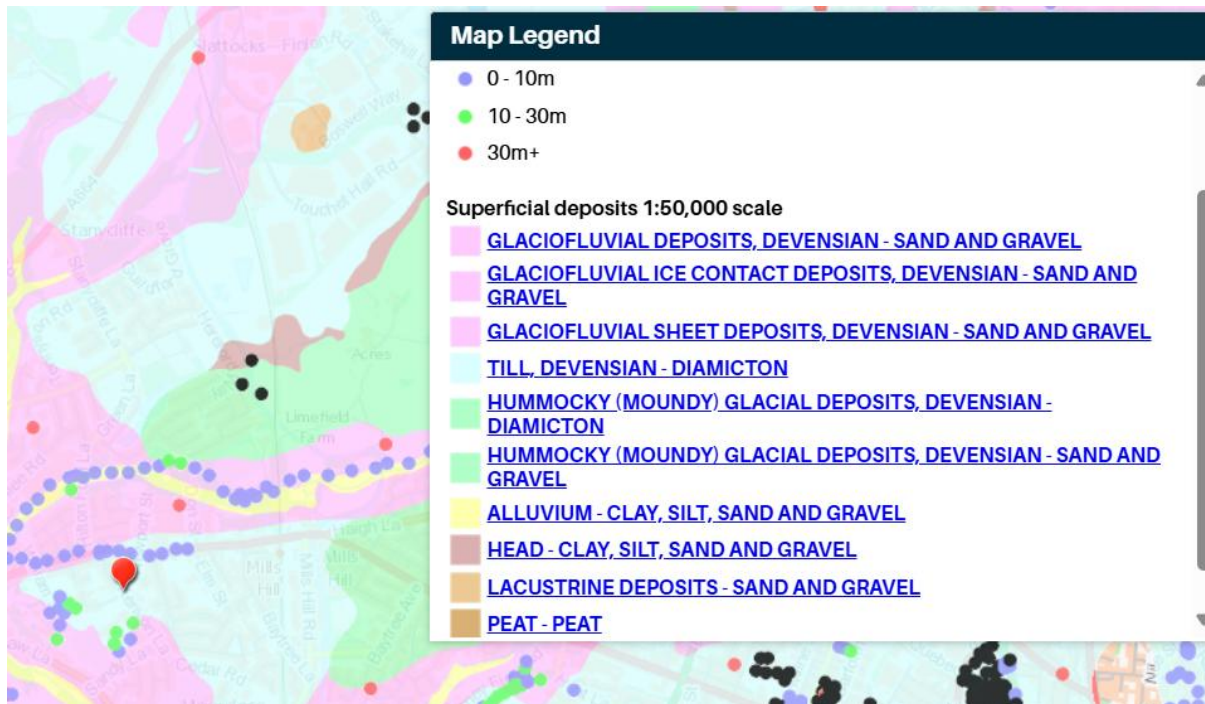
3.3 United utility sewer records indicated a combined sewer in Kenyon Lane. Appendix F.

3.4 Existing run off has been calculated using the modified Wallingford equation and is ascertained to be as follows: -

Period	Rate l/s.
2 yr	4.25
30 yr	6.03
100 yr + 45%CC	6.55

3.5 The site has an approximate area of 0.27 ha, primarily greenfield with partial development in small areas.

3.6 The geology of the site has been ascertained by reference to the 1:50,000 British Geological Survey website. The data provided on the website indicates that the existing ground is Till, Devensian - Clay, sandy, gravelly, cobbly.



- 3.7 Trial holes on site found clay. Appendix D.
- 3.8 Based on the office study and site information, infiltration is not suitable for the development. The requirement for a positive surface water discharge has been considered in this report.
- 3.9 The Environment Agency (EA) mapping service, as provided by Magic Map, indicates the aquifer designation for the bedrock and superficial drift geology and the groundwater vulnerability in the area. The mapping, as included at Appendix E, provide the following information for the site:

Geology Map	Site Information
1 st Aquifer Designation [Secondary A)	Principal Nil
2 nd Aquifer Designation (Secondary A)	Secondary Nil
Vulnerability of Groundwater	Nil
Groundwater Source Protection Zone	Not known

4.0 Surface Water Run-Off from Site

- 4.1 No data as to previous function can be found.
- 4.2 After analysis of the Greenfield run-off rate, it is appropriate to adopt this for the proposal of the new development for the 0.27 hectares of the site.
- 4.3 A rate of 5.0 l/s has been adopted for the development to comply with both the rates as well as the volumes. With a total storage of 55.1 m³ required.

5.0 Site Development Proposal

- 5.1 The proposed development will be 8 residential dwellings and private gardens. Appendix A.
- 5.2 The site will use a traditional pipe system and is discharge into an existing manhole once the location and viability has been established at a rate of 5.0 l/s. With attenuation from below ground permeable stone within the access road area.
- 5.3 Foul waste discharge is to run into existing combined sewer located at the west of the site via a new manhole. Appendix F.
- 5.4 In order to demonstrate the development is of low risk the report should show:
- That it will be feasible to restrict surface water run-off for all events up to the 1 in 100-year storm (including a 45% allowance for climate change) and set out how this will be achieved.
 - What sustainable drainage techniques (SuDS) will be used with any obstacles to their use clearly justified.
- 5.5 Climate change (CC) will be taken into account by increasing the rainfall intensity by 45% in line with the Environment Agency and NPPF Technical Guidance.
- 5.6 The application of the SuDS Manual requires that the runoff from sites is restricted to meet the pre-development runoff characteristics.

Site runoff rates and volumes: -

SITE RUN OFF RATES PRE AND POST		
PERIOD	PRE DEVELOPMENT	POST DEVELOPMENT
2 yr	4.25 l/s	0.8 l/s
30 yr	6.03 l/s	4.0 l/s
100 yr + 45% CC	6.55 l/s	5.3 l/s

SITE RUN OFF VOLUMES PRE AND POST		
OUTFALL	PRE DEVELOPMENT	POST DEVELOPMENT
MH-12	44.80m ³	17.96m ³

The most appropriate attenuation system will need to satisfy three main characteristics, firstly, provide the required volume of storage, secondly, minimise the loss of developable land and thirdly, where possible provide local amenity.

- 5.7 For information refer to the proposed drainage layout drawing see Appendix M. With the supporting calculations provided by infodrainage at Appendix G.

6.0 Sustainable Drainage Assessment

6.1 Following the Hierarchy of Sustainable Drainage Systems (SUDS) the following options must be considered:

- Discharge to the ground. (Soakways for roof run-off and permeable surfacing for roads, drives, car parks and private access roads).
- Discharge to a surface water body. (watercourse, land drains, ponds or similar).
- Discharge to a surface water sewer.
- Discharge to a local highway drain.
- Discharge to a combined sewer.

Discharge Option	Viability based on Office Investigation
Ground percolation.	Not possible due to clay.
Surface Water Body.	None within the area.
Surface Water Sewer.	None within the area.
Local Highway Drain.	None within the area.
Other Sewer.	Combined sewer.

6.2 Current guidance promotes sustainable water management through the use of SuDS. SuDS measures should be used to control the surface water runoff from the proposed development site therefore managing the flood risk to the site and surrounding areas from surface water runoff.

A hierarchy of techniques is identified:

- Prevention – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
- Source Control - control of runoff at or very near its source (such as the use of rainwater harvesting, permeable paving, soakaways, and/or green roofs).
- Site Control - management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site, swales, and/or infiltration trenches).
- Regional Control - management of runoff from several sites, typically in a detention pond, basins, tanks, and/or wetland.

It is generally accepted that the implementation of SuDS as opposed to conventional drainage systems, provides several benefits by:

- reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream.
- reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites.
- improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources
- reducing potable water demand through rainwater harvesting.
- improving amenity through the provision of public open spaces and wildlife habitat.
- replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

6.3 For differing options assessed during the design process and their adoptability for the scheme refer to tables displayed on Appendix H & J

SuDS Options Considered	Viability
Green Roofs.	Not appropriate to roof construction.
External Gardens / Tree pits.	To be provided particularly for draining the existing private access roads.
Rainwater Harvesting	Water butts to be provided to each house.
Permeable Paving.	To be provided.to site access road and driveways.
Wetlands / Retention Ponds / Detention Basins / Swales.	Not possible - Potential free area has contaminated land.
Infiltration Basins / Filter Strips / Soakaways.	Not possible due to presence of clay.

6.4 The application of the SuDS Manual requires that SuDS systems are utilised to improve the quality of the runoff prior to outfall to watercourses.

6.5 A requirement of any SuDS system is that it protects the receiving water body from the risk of pollution. This can be managed by an appropriate “train” or sequence of SuDS components that are connected in series.

6.6 The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals, and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be adequately treated with SuDS.

6.7 The minimum number of treatment stages will depend on the sensitivity of the receiving water body and the potential hazard associated with the proposed development SuDS Manual (CIRIA, 2015).

- 6.8 The accumulated run off of surface water from the proposed site has been assessed following with the regulations from Part H of the Building Regulations and DEFRA's draft national standards for SuDS.

Pollution Hazard Index				
Land usage	Risk	Solids	Metals	Hydrocarbons
Residential Roof	Very Low	0.2	0.2	0.05
Individual Driveway	Low	0.5	0.4	0.4
Low Traffic Roads	Low	0.5	0.4	0.5

Pollution Mitigation Index				
SuDS	Component	Solids	Metals	Hydrocarbons
Stage 1	Pervious Pavement	0.7	0.6	0.7
Stage 2	None	0.0	0.0	0.0
Stage 3	None	0.0	0.0	0.0
Combined		0.7	0.6	0.7

7.0 Strategy Summary

- 7.1 The development of the site is construction of 8 residential dwellings on a site of previous use not known.
- 7.2 The site is to be treated as greenfield the runoff rate will have a runoff rate of 5.0 l/s for maintenance purposes.
- 7.3 Surface water runoff is to discharge into its exiting combined sewer located to west of the site via a new manhole. Existing surface water for the private roads will be directed to tree pits / water gardens.
- 7.4 Full attenuation for the impermeable areas will be primarily provided up to the 1 in 100 yr + 45% climate change. This will primarily be obtained utilising the subbase fill on driveways and connecting access roads.
- 7.5 In addition to this, each dwelling is to have a water harvesting unit on one of the rear down pipes utilising slim units attached to the external walls.
- 7.6 As additional SuDS to be used will be tree bowls. Four locations have been identified to employ tree bowls along the main access road.
- 7.7 Water quality is improved by the usage of permeable paving and water percolation through quality placed stone.
- 7.8 Ground water protection is provided by a laid membrane below the stone and natural clay substrata below.
- 7.9 This proposal has been compiled in accordance with the directions set out in the SuDS manual.

8.0 Conclusion

- 8.1 The strategy outlined above shows a viable sustainable drainage solution is achievable within the constraints of the site. Detailed design of the system following a successful planning application can be delivered to meet the NPPF, Environment Agency, Local Authority and United Utilities requirements.

Report has been prepared by:

G Ratcliffe

Reviewed by:

A handwritten signature in black ink, appearing to read 'D C Sparkes'.

D C Sparkes, BEng (Hons) CEng MICE
On behalf of
ADS Consult Ltd



APPENDIX A
LOCATION PLAN

Do not scale from the drawing. Use flared dimensions only. The contractor is requested to check all dimensions on the prior to work beginning. Any discrepancy within the drawings should be reported prior to commencement of work. It is assumed that all works on this drawing will be carried out by a competent contractor, working where appropriate to an approved method statement.

DRAFT



: Stone paving

: Stone flags

: Natural seed/turf

: Vertical boarded timber fence with concrete posts and base

[illegible]

WhiteBox Architecture

RIBA Architects & Interior Designers

studio@whiteboxarchitecture.com
www.whiteboxarchitecture.com

Suite 9, 25 King Street
www.winnibooz.com

July 9, 23 K
Knutsford,
WA 16 40W

WA16 6DW	
4 144 15/5 754 500	

t: +44 1565 75
Middleton

drawing title

Proposed Site Finishes

scale	date	drawn
As indicated@A1	10/24/23	IW

job number	drawing number
07/67/01	

2693 004

© writing box architecture



1:20



APPENDIX B
TOPOGRAPHICAL SURVEY



Telephone: 01257 795111

Web Site: www.QuickdrawSurveys.co.uk

Notes:

and level datum using Leica GPS SmartNet data

The extent of tree canopies and tree bole sizes are estimated.

Only features that are accessible/visible at the time of survey can be detailed

There are no gaurantees offered on the drainage information supplied.

Before commencing works please check important dimensions on-site.

should there be any discrepancies, inconsistencies, omissions or queries, please contact Quickdraw Surveys Ltd as soon as possible for a resolution.

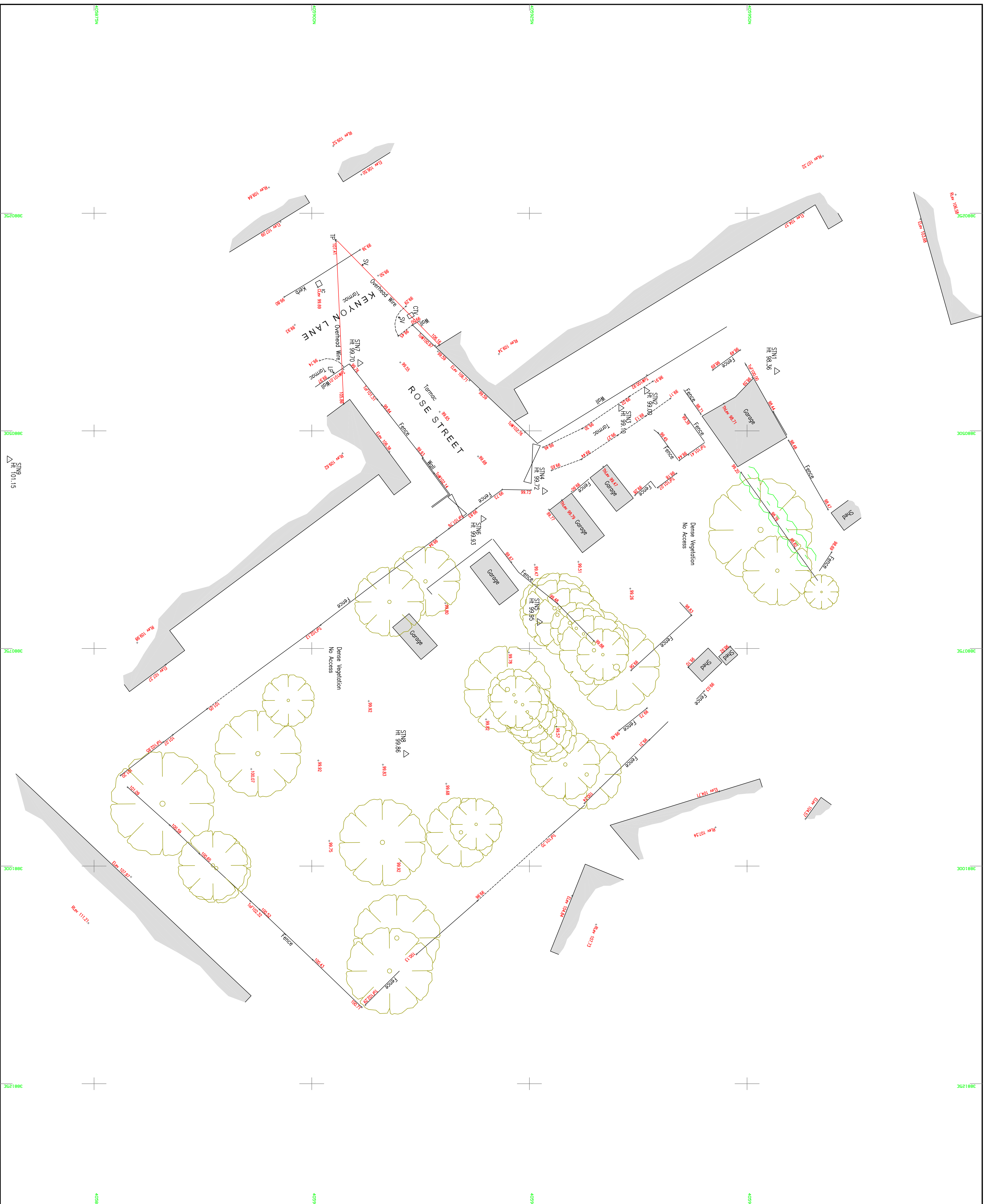
Abbreviations:

Topographical Surveys

[illegible]

Station Coordinates:

Station	Easting	Northing	Level
3804.3	1.00	4.525	98.362
3804.3	1.392	4.525	98.362
3804.3	1.784	4.525	98.362
3804.3	2.176	4.525	98.362
3804.3	2.568	4.525	98.362
3804.3	2.960	4.525	98.362
3804.3	3.352	4.525	98.362
3804.3	3.744	4.525	98.362
3804.3	4.136	4.525	98.362
3804.3	4.528	4.525	98.362
3804.3	4.920	4.525	98.362
3804.3	5.312	4.525	98.362
3804.3	5.704	4.525	98.362
3804.3	6.096	4.525	98.362
3804.3	6.488	4.525	98.362
3804.3	6.880	4.525	98.362
3804.3	7.272	4.525	98.362
3804.3	7.664	4.525	98.362
3804.3	8.056	4.525	98.362
3804.3	8.448	4.525	98.362
3804.3	8.840	4.525	98.362
3804.3	9.232	4.525	98.362
3804.3	9.624	4.525	98.362
3804.3	10.016	4.525	98.362
3804.3	10.408	4.525	98.362
3804.3	10.800	4.525	98.362
3804.3	11.192	4.525	98.362
3804.3	11.584	4.525	98.362
3804.3	11.976	4.525	98.362
3804.3	12.368	4.525	98.362
3804.3	12.760	4.525	98.362
3804.3	13.152	4.525	98.362
3804.3	13.544	4.525	98.362
3804.3	13.936	4.525	98.362
3804.3	14.328	4.525	98.362
3804.3	14.720	4.525	98.362
3804.3	15.112	4.525	98.362
3804.3	15.504	4.525	98.362
3804.3	15.896	4.525	98.362
3804.3	16.288	4.525	98.362
3804.3	16.680	4.525	98.362
3804.3	17.072	4.525	98.362
3804.3	17.464	4.525	98.362
3804.3	17.856	4.525	98.362
3804.3	18.248	4.525	98.362
3804.3	18.640	4.525	98.362
3804.3	19.032	4.525	98.362
3804.3	19.424	4.525	98.362
3804.3	19.816	4.525	98.362
3804.3	20.208	4.525	98.362
3804.3	20.600	4.525	98.362
3804.3	20.992	4.525	98.362
3804.3	21.384	4.525	98.362
3804.3	21.776	4.525	98.362
3804.3	22.168	4.525	98.362
3804.3	22.560	4.525	98.362
3804.3	22.952	4.525	98.362
3804.3	23.344	4.525	98.362
3804.3	23.736	4.525	98.362
3804.3	24.128	4.525	98.362
3804.3	24.520	4.525	98.362
3804.3	24.912	4.525	98.362
3804.3	25.304	4.525	98.362
3804.3	25.696	4.525	98.362
3804.3	26.088	4.525	98.362
3804.3	26.480	4.525	98.362
3804.3	26.872	4.525	98.362
3804.3	27.264	4.525	98.362
3804.3	27.656	4.525	98.362
3804.3	28.048	4.525	98.362
3804.3	28.440	4.525	98.362
3804.3	28.832	4.525	98.362
3804.3	29.224	4.525	98.362
3804.3	29.616	4.525	98.362
3804.3	30.008	4.525	98.362
3804.3			



A1 Plot @ 1:200

Client
Michael Hewitt

Date July 2022

Topographical Survey
Land off Kenyon Lane,
Middleton, Manchester, M24 2DR.

Scale
1:200

Drawing Number

QDS/350/1214/TOP C



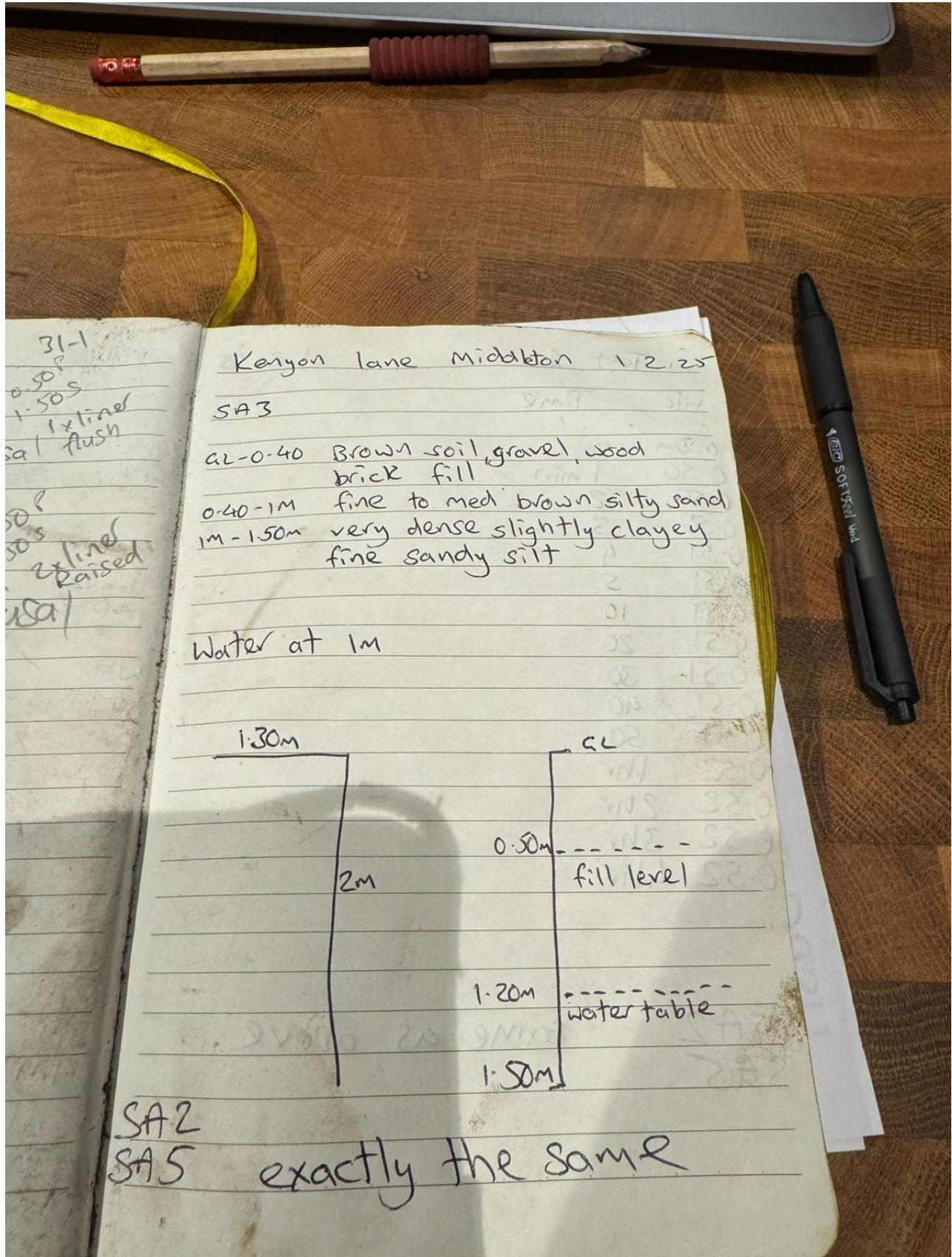
APPENDIX C

WALLINGFORD GREENFIELDS RUN OFF RATES (COURTESY OF WWW.UKSUDS.COM)



APPENDIX D
BOREHOLE INFORMATION







APPENDIX E

AQUIFER INFORMATION FROM MAGIC MAP



APPENDIX F
SEWER LAYOUT

ADS Structural Limited**25
Peel House Lane,
Widnes, Cheshire
WA8 6TN****FAO:****How to contact us:****United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP****Telephone: 0370 7510101****E-mail: propertysearches@uuplc.co.uk****Your Ref: 9758
Our Ref: UUPS-ORD-633276
Date: 23/02/2025****Dear Sirs****Location: Kenyon Lane 49 Kenyon Lane, Middleton, M24 2DR**

I acknowledge with thanks your request dated 18/02/2025 for information on the location of our services.

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

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

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

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

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

Yours Faithfully,



Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

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

TERMS AND CONDITIONS:

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



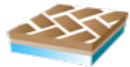
Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
8001	90.44	CO	92.45	225	150	VC	73.77847	1 in 70	
8002	90.44	CO	87.17	750	750	VC	68.65858	1 in 40	
9218			88.76	150	150	VC	10.89786	1 in 75	
8005	91.84	CO	88.76	675	675	VC	63.06345	1 in 31	
8903	92.8	CO	91.39	300	300	VC	105.2616	1 in 31	
2613				150	150	VC	2.66714		
9204	91.63	CO	0	225	225	VC	4.123106		1 in 104
2801	103.55	CI	92.20153	300	300	VC	52.20153		
3806			96.32	525	525	VC	40.80441		
9110	103.38	CO	0	150	150	VC	51.8891		
9905			98.32	150	150	VC	13.49813		
1701	104.81	CO	101.92	225	225	VC	35.5852	1 in 32	
1003	99.76	CO	95.34	375	375	CO	107.629	1 in 56	
3010			0	150	150	VC	81.67781		
9001		CO	0	300	300	VC	17.12343		
9902		VC	0	150	150	VC	75.18643		
1902			0	150	150	VC	3.162278		
1004	99.34	CO	97.48	225	225	VC	6.147013		
8906		FO	92.76	150	150	VC	84.17244	1 in 167	
9125			0	150	150	VC	3.34473		
3714			0	150	150	VC	2.127042		
0001	95.97	CO	93.88	600	600	VC	10.723	1 in 23	
9120			0	225	225	VC	67.55384		
1930			0	150	150	VC	17.5463		
2701	102.85	CO	100.21	300	300	VC	1.318551	1 in 92	
8019		CO	0	100	100	VC	29.41088		
3805	102.6	SW	100.6	300	300	VC	3.092959	1 in 162	
2902			0	150	150	VC	27.51353		
8004	90.57	CO	87.96	300	300	VC	15.9453		
9101	92.08	CO	90.37	375	375	VC	70.34202	1 in 90	
2704			0	225	225	VC	64.2841	1 in 100	
2616		VC	0	150	150	VC	32.28003		
2805	102.63	SW	100	300	300	VC	6.704951	1 in 3627	
3606		CO	0	150	150	VC	72.53275		
1909		VC	0	150	150	VC	7.3427		
2605	103.59	CO	101.51	300	300	VC	13.60147	1 in 103	
9103	91.56	CO	89.24	300	300	VC	38.05258	1 in 123	
0101			0	150	150	VC	24.59875		
2608		SW	0	225	225	VC	14.66349		
3612		CO	0	150	150	VC	16		
1109			0	150	150	VC	6.019729		
1905		VC	0	225	225	VC	6.725598		
2604	103.59	CO	101.61	225	225	VC	35.1141	1 in 115	
0200		UN	0	100	100	VC	5.062258		
3601	103.59	SW	99.97	225	225	VC	5.433333		
9807		CO	95.04	150	150	VC	42.05948	1 in 74	
2903			0	150	150	VC	17.84163		
8906		CO	95.35	150	150	VC	19.59353		
2514	92.04	CO	90.35	300	300	VC	19.62065	1 in 63	
0901		VC	0	150	150	VC	48.27007		
9107		CO	0	225	225	VC	15.13275		
0002			0	150	150	VC	7.234281		
2702		CO	0	225	225	VC	27.313		
9002	92.04	VC	90.25	300	300	VC	25.80988	1 in 92	
2705	103.5	CO	102.05	225	225	VC	118.8781	1 in 151	
8101	91.56	CO	88.62	375	375	VC	20.61503	1 in 164	
2601	103.19	CO	101.12	300	300	VC	59.03389	1 in 1	
0801	101.38	CO	98.56	300	300	VC	62.36185		
9701			0	150	150	VC	69.89278		
1929		CO	0	150	150	VC	80.61957		
1910			0	150	150	VC	10.43971		
7101	91.25	CO	88.77	225	225	VC	12.6553	1 in 104	
1903			0	150	150	VC	55.97321		
8102	91.07	CO	88.23	375	375	VC	38.40209	1 in 178	
3609			0	150	150	VC	78.24325		
2903	103.86	CO	102.19	150	150	VC	15.63145	1 in 83	
1704			0	150	150	VC	45.38244		
3902			0	150	150	VC	3.597419		
9904		CO	0	225	225	VC	58.24945		
9019		CO	0	225	225	VC	5.306005		
1101		VC	0	225	225	VC	6.835948		
1906		CO	0	150	150	VC	62.20129	1 in 24	
1002	102.41	CO	97.38	600	600	VC	5.324555		
2806		CO	97.38	600	600	VC	48.83919		
1931			0	150	150	VC	11.40175		
1113		CO	0	150	150	VC	7.280723		
1103			0	150	150	VC	3.813285		
2003		CO	0	525	525	VC	19.61701	1 in 142	
3803	102.28	SW	100.81	300	300	VC	15.65563		
3608		VC	0	150	150	VC	28.4005		
3611		CO	0	150	150	VC	14.59862		
9903	95.65	CO	94.17	150	150	VC	9.533937		
3702			0	225	225	VC	5		
3602		CO	0	225	225	VC	56.75385		
1106			0	150	150	VC	10.03016	1 in 172	
9104	91.82	CO	88.99	375	375	VC	9.960201		
1914			0	100	100	VC	56.61272	1 in 248	
2607	102.45	SW	99.25	300	300	VC	13.10468		
8102	91.07	CO	88.73	375	375	VC	20.80601		
1918		CO	0	150	150	VC	14.66607		
0004		CO	0	225	225	VC	5.936017		
9119		VC	0	225	225	VC	44.28318		
2617		VC	0	150	150	VC	18.56966		
3801	102.45	SW	100.94	300	300	VC	5.594909		
0201	92.69	CO	89.64	375	375	VC	21.54066	1 in 198	
9016		CO	0	100	100	VC	24.5153	1 in 102	
9003	94.7	CO	90.97	600	600	VC	18.65559		
1006			0	150	150	VC	40.31129	1 in 30	
2802	102.96	SW	100.36	300	300	VC	6.11568	1 in	
8103	104.77	CO	102.25	300	300	VC	25	1 in 71	
7002		CO	0	150	150	VC	30.23243	1 in 104	
3804		CO	0	150	150	VC	24.56206		
1510	101.09	SW	0	225	225	VC	33.86351		
1013		SW	0	225	225	VC	28.4605		
1917		CO	0	150	150	VC	17.11724		
9802		CO	92.61	900	900	VC	6.560552	1 in 79	
0103			0	150	150	VC	12.20198		
8001	90.79	CO	87.81	750	750	VC	17.36028	1 in 61	
2606		SW	0	225	225	VC	4.472136		
0102		CO	0	225	225	VC	37.59499	1 in 287	
2703	102.84	CO	100.74	300	300	VC	6.246211		
3716		CO	0	100	100	VC	55.7315	1 in 55	
9116			0	100	100	VC	27.80265		
8905		CO	92.74	150	150	VC	11.09721		
9801		SW	93.7	900	900	VC	6.331555	1 in 45	
3802		CO	0	150	150	VC	13.04891	1 in 287	
3722			0	100	100	VC	24.01688		
0107			0	150	150	VC	21.93171		
2002	103.37	CO	97.79	600	600	VC	16.7626		
1902			0	225	225	VC	11.21231	1 in 109	
1904		CO	0	225	225	VC	46.71036		
9113			0	150	150	VC	51.0352		
1204			0	150	150	VC	41		
9901		CO	0	225	225	VC	6.529485		
9006		CO	0	300	300	VC	7.553737		
9027		CO	0	100	100	VC	38.91015		
8021		CO	0	100	100	VC	114.8763		
8801		SW	93.24	150	150	VC	0.8252806	1 in 1	
8012		CO	0	100	100	VC	24.17303		
2201	96.33	UN	93.18	375	375	VC	0.3242579	1 in 1	
9803		SW	93.39	1050	1050	VC	0.9302401	1 in 231	
8909		FO	94.44	150	150	VC	95.04736	1 in 15	
2623			0	150	150	VC	1.0669877		
2804	103.1	CO	99.7	300	300	VC	7.960514	1 in 105	
1913			0	150	150	VC	1.000272		
1622		FO	0	100	100	VC	99.28342		
1901		VC	0	225	225	VC	27.63516		
0007			0	100	100	VC	5.362143		
1703	105.22	CO	103.74	225	225	VC	38.11624	1 in 80	
1504			0	150	150	VC	2.203237		
2004			0	225	225	VC	63.48653		
1715			0	150	150	VC	10.37837		
9804	SW	93.27	1050	1050	1050	VC	19.72105	1 in 297	
8802		FO	93.9	150	150	VC	38.11624	1 in 16	
2707			0	150	150	VC	20.2948		
0601	100.3	CO	96.08	300	300	VC	26.74633	1 in 27	
2810			0	150	150	VC	14.61688		
0602	100.3	CO	98.27	150	150	VC	21.18962		
2001	102.84	CO	98.3	300	300	VC	23.72199	1 in 32	
2803			0	225	225	VC	58.18935		
1910			0	100	100	VC	23.3586		
1201	94.78	CO	91.53	375	375	VC	99.29753	1 in 89	
1522			0	150	150	VC	10.23629		
2015			0	150	150	VC	10.49571		
9926			0	150	150	VC	10.5177		
1907			0	150	150	VC	8.433881		
2807	102.9	CO	99.89	300	300	VC	30.36445	1 in 160	
9806			0	150	150	VC	27.8617		



APPENDIX G

INFODRAINAGE CALCULATION

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Block a Acc Rd W

Type : Porous Paving

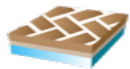
Dimensions

Exceedance Level (m)	98.434
Depth (m)	0.480
Base Level (m)	97.954
Paving Layer Depth (mm)	180
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	16.688
Long. Slope (1:X)	150.00
Width (m)	4.191
Total Volume (m³)	6.295

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



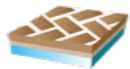
Block a 3 Drv

Type : Porous Paving

Dimensions	
Exceedance Level (m)	99.024
Depth (m)	0.430
Base Level (m)	98.594
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	8.111
Long. Slope (1:X)	80.00
Width (m)	2.956
Total Volume (m³)	2.158

Advanced	
Conductivity (m/hr)	0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Block a 4 Drv

Type : Porous Paving

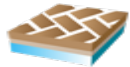
Dimensions

Exceedance Level (m)	99.118
Depth (m)	0.438
Base Level (m)	98.680
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	6.927
Long. Slope (1:X)	80.00
Width (m)	3.452
Total Volume (m³)	2.209

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Block b 4 Drv

Type : Porous Paving

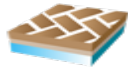
Dimensions

Exceedance Level (m)	100.764
Depth (m)	0.580
Base Level (m)	100.184
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	7.439
Long. Slope (1:X)	20.00
Width (m)	3.226
Total Volume (m³)	3.240

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Block b 3 Drv

Type : Porous Paving

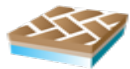
Dimensions

Exceedance Level (m)	100.623
Depth (m)	0.430
Base Level (m)	100.193
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	8.157
Long. Slope (1:X)	80.00
Width (m)	2.942
Total Volume (m³)	2.160

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



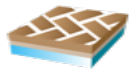
Block b 2 Drv

Type : Porous Paving

Dimensions	
Exceedance Level (m)	100.410
Depth (m)	0.430
Base Level (m)	99.980
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	8.088
Long. Slope (1:X)	80.00
Width (m)	2.967
Total Volume (m³)	2.160

Advanced	
Conductivity (m/hr)	0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



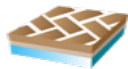
Block b 1 Drv

Type : Porous Paving

Dimensions	
Exceedance Level (m)	100.180
Depth (m)	0.430
Base Level (m)	99.750
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	7.552
Long. Slope (1:X)	80.00
Width (m)	3.178
Total Volume (m³)	2.160

Advanced	
Conductivity (m/hr)	0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



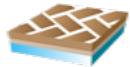
Block a 1 Drv

Type : Porous Paving

Dimensions	
Exceedance Level (m)	98.535
Depth (m)	0.430
Base Level (m)	98.105
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	8.240
Long. Slope (1:X)	40.00
Width (m)	2.915
Total Volume (m³)	2.162

Advanced	
Conductivity (m/hr)	0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



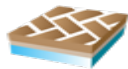
Block a 2 Drv

Type : Porous Paving

Dimensions	
Exceedance Level (m)	98.813
Depth (m)	0.430
Base Level (m)	98.383
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	9.097
Long. Slope (1:X)	80.00
Width (m)	2.650
Total Volume (m³)	2.170

Advanced	
Conductivity (m/hr)	0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



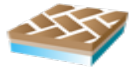
Block a Acc Rd E

Type : Porous Paving

Dimensions		
Exceedance Level (m)		98.815
Depth (m)		0.480
Base Level (m)		98.335
Paving Layer Depth (mm)		180
Membrane Percolation (m/hr)		1000.0
Porosity (%)		30
Length (m)		23.148
Long. Slope (1:X)		500.00
Width (m)		5.183
Total Volume (m³)		10.797

Advanced		
Conductivity (m/hr)		0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Block b Acc Rd W

Type : Porous Paving

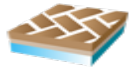
Dimensions

Exceedance Level (m)	100.118
Depth (m)	0.480
Base Level (m)	99.638
Paving Layer Depth (mm)	180
Membrane Percolation (m/hr)	1000.0
Porosity (%)	30
Length (m)	19.318
Long. Slope (1:X)	300.00
Width (m)	4.863
Total Volume (m³)	8.455

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



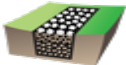
Block b Acc Rd E

Type : Porous Paving

Dimensions		
Exceedance Level (m)		100.421
Depth (m)		0.480
Base Level (m)		99.941
Paving Layer Depth (mm)		180
Membrane Percolation (m/hr)		1000.0
Porosity (%)		30
Length (m)		21.696
Long. Slope (1:X)		300.00
Width (m)		6.269
Total Volume (m³)		12.242

Advanced		
Conductivity (m/hr)		0.1

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



236.4

Type : Infiltration Trench

Dimensions

Exceedance Level (m)	98.498
Depth (m)	1.450
Base Level (m)	97.048
Freeboard (mm)	12
Porosity (%)	30
Length (m)	26.406
Long. Slope (1:X)	150.00
Width (m)	1.500
Total Volume (m³)	17.828

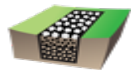
Under Drain

Height Above Base (m)	0.150
Diameter (mm)	225
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Block b Acc Rd W Trn

Type : Infiltration Trench

Dimensions

Exceedance Level (m)	100.189
Depth (m)	1.250
Base Level (m)	98.939
Freeboard (mm)	480
Porosity (%)	30
Length (m)	17.149
Long. Slope (1:X)	300.00
Width (m)	1.000
Total Volume (m³)	4.439

Under Drain

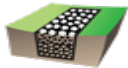
Height Above Base (m)	0.150
Diameter (mm)	225
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		

ads:
consult



Block b Acc Rd E Trn

Type : Infiltration Trench

Dimensions

Exceedance Level (m)	100.430
Depth (m)	1.250
Base Level (m)	99.180
Freeboard (mm)	480
Porosity (%)	30
Length (m)	17.894
Long. Slope (1:X)	300.00
Width (m)	1.000
Total Volume (m³)	4.632

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		

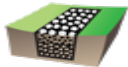


Under Drain

Height Above Base (m)	0.150
Diameter (mm)	225
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	0.1
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Block a Acc Rd E Trn

Type : Infiltration Trench

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Dimensions

Exceedance Level (m)	99.017
Depth (m)	1.350
Base Level (m)	97.667
Freeboard (mm)	480
Porosity (%)	30
Length (m)	6.685
Long. Slope (1:X)	300.00
Width (m)	1.000
Total Volume (m³)	1.931

Under Drain

Height Above Base (m)	0.150
Diameter (mm)	225
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	0.1
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Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Title: Rainfall Analysis Criteria	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



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

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Audit Report Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		

ads:
consult

Discharge Rate

Audit Details

Selected Rainfall
9758-Keynon Ln FSR

Results

Outfall	Rainfall	Audit Discharge Rate (L/s)	Actual Discharge Rate (L/s)	Pass/Fail
MH-12	2 (years) + 0 (%)	4.253	0.8	Pass
	30 (years) + 0 (%)	6.029	4.0	Pass
	100 (years) + 45 (%)	6.553	5.3	Pass

Discharge Volume

Details

Selected Rainfall	Storm
9758-Keynon Ln FSR	100 years: +45 %: 60 mins: Winter

Results

Outfall	Audit Discharge Volume (m³)	Actual Discharge Volume (m³)	Pass/Fail
MH-12	44.797	17.966	Pass

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Title: UK and Ireland Rural Runoff Calculator	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.27
SAAR (mm)	876.0
Soil	0.47
Region	Region 10
Urban	0.75
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 10	1.7	4.2	3.6	6.0	6.6

Greenfield Volume

FSR

Details

Region	England And Wales
M5-60 (mm)	18.0
Ratio R	0.357
Area (ha)	0.268
SAAR (mm)	880.0
CWI	121.218
Urban 1990	0
Areal Reduction Factor	1.00
SPR	47
Storm Duration (mins)	60
Return Period (years)	100

Results

PR%	46.05
Greenfield Runoff Volume (m³)	44.797

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



9758-Keynon Ln FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH-05	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter	98.971	98.256	98.549	0.293	0.0	0.047	0.000	0.0	0.390	Surcharged
MH-06	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter	99.224	98.188	98.549	0.361	0.1	0.057	0.000	0.0	0.981	Surcharged
MH-07	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter	99.425	98.100	98.549	0.449	0.0	0.071	0.000	0.0	0.000	OK
MH-11	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	99.029	96.750	97.211	0.461	1.2	0.521	0.000	0.8	2.338	OK
MH-10	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	99.272	98.000	98.015	0.015	1.1	0.010	0.000	1.1	2.636	OK
MH-9	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	100.048	99.066	99.077	0.012	1.1	0.007	0.000	1.1	2.475	OK
MH-08	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	100.466	99.308	99.318	0.010	0.5	0.006	0.000	0.5	0.781	OK
MH-03	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.383	99.848	99.865	0.018	0.5	0.003	0.000	0.4	0.229	OK
MH-04	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.144	99.724	99.751	0.028	1.1	0.004	0.000	1.0	0.541	OK
MH-01	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.905	100.051	100.074	0.023	1.1	0.004	0.000	1.0	0.535	OK
MH02	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.853	99.804	99.828	0.024	1.0	0.004	0.000	0.9	0.532	OK
BI a 1 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	98.715	97.950	97.965	0.015	0.3	0.000	0.000	0.3	0.136	OK
BI a 2 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	98.977	97.900	97.915	0.015	0.3	0.000	0.000	0.3	0.139	OK
BI a 3 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	99.221	98.450	98.466	0.016	0.3	0.000	0.000	0.3	0.151	OK
BI a 4 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	99.299	98.440	98.455	0.015	0.3	0.000	0.000	0.3	0.142	OK
BI b 1 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.278	99.550	99.564	0.014	0.3	0.000	0.000	0.2	0.121	OK
BI b 2 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.505	99.700	99.717	0.017	0.4	0.000	0.000	0.4	0.172	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE				Date: 29/03/2025									
				Designed by: GDR		Checked by: DCS						Approved By: ADS	
Report Details: Type: Junctions Summary Storm Phase: Phase				Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS									

BI b 3 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.840	99.800	99.816	0.016	0.3	0.000	0.000	0.3	0.154	OK
BI b 4 F RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.849	99.850	99.866	0.016	0.3	0.000	0.000	0.3	0.148	OK
BI a 2 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter	98.885	98.325	98.549	0.224	0.0	0.003	0.000	0.0	0.729	Surcharged
BI a 3 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	99.126	98.566	98.589	0.023	0.6	0.000	0.000	0.5	0.267	OK
BI a 4 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter	99.307	98.747	99.307	0.560	0.0	0.379	0.372	0.0	0.000	Flood
BI b 2 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.419	99.859	99.881	0.022	0.5	0.000	0.000	0.5	0.231	OK
BI b 3 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.689	100.129	100.151	0.022	0.6	0.000	0.000	0.5	0.255	OK
BI b 4 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.836	100.276	100.297	0.021	0.5	0.000	0.000	0.4	0.217	OK
MH-12	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	98.989	97.116	97.138	0.022	0.8	0.000	0.000	0.8	1.856	OK
BI a1 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	98.724	98.000	98.024	0.024	0.6	0.000	0.000	0.6	0.288	OK
BI b 1 R RWP	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter	100.297	99.737	99.764	0.027	0.7	0.000	0.000	0.6	0.315	OK
BI a Jnk 1	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter		98.159	98.549	0.390	0.0			0.0	0.524	Surcharged
BI a Jnk 2	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter		97.988	98.008	0.020	0.6			0.6	0.286	OK
BI b Jnk 1	9758-Keynon Ln FSR: 2 years: +0 %: 15 mins: Winter		100.084	100.111	0.027	1.0			0.9	0.469	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



9758-Keynon Ln FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH-05	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	98.971	98.256	98.810	0.555	0.0	0.088	0.000	0.0	1.341	Flood Risk
MH-06	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	99.224	98.188	98.811	0.622	0.1	0.099	0.000	0.0	2.647	Surcharged
MH-07	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	99.425	98.100	98.811	0.711	0.0	0.113	0.000	0.0	0.279	OK
MH-11	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	99.029	96.750	97.307	0.557	4.5	0.630	0.000	4.0	6.277	Surcharged
MH-10	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	99.272	98.000	98.030	0.030	4.3	0.019	0.000	4.3	5.058	OK
MH-9	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	100.048	99.066	99.087	0.022	4.2	0.014	0.000	4.1	4.801	OK
MH-08	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.466	99.308	99.326	0.018	1.8	0.011	0.000	1.7	0.544	OK
MH-03	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.383	99.848	99.872	0.025	0.9	0.004	0.000	0.9	0.436	OK
MH-04	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.144	99.724	99.763	0.039	2.1	0.006	0.000	2.0	1.031	OK
MH-01	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.905	100.051	100.083	0.032	2.1	0.005	0.000	2.0	1.014	OK
MH02	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.853	99.804	99.838	0.035	2.0	0.006	0.000	1.9	1.010	OK
BI a 1 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	98.715	97.950	97.971	0.021	0.6	0.000	0.000	0.5	0.259	OK
BI a 2 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	98.977	97.900	97.921	0.021	0.6	0.000	0.000	0.5	0.268	OK
BI a 3 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	99.221	98.450	98.472	0.022	0.6	0.000	0.000	0.6	0.286	OK
BI a 4 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	99.299	98.440	98.461	0.021	0.6	0.000	0.000	0.6	0.274	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



BI b 1 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.278	99.550	99.570	0.020	0.5	0.000	0.000	0.5	0.238	OK
BI b 2 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.505	99.700	99.724	0.024	0.7	0.000	0.000	0.7	0.337	OK
BI b 3 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.840	99.800	99.822	0.022	0.6	0.000	0.000	0.6	0.295	OK
BI b 4 F RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.849	99.850	99.871	0.021	0.6	0.000	0.000	0.6	0.274	OK
BI a 2 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	98.885	98.325	98.811	0.486	0.1	0.006	0.000	0.0	1.604	Flood Risk
BI a 3 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	99.126	98.566	98.811	0.245	0.1	0.003	0.000	0.1	1.931	Surcharged
BI a 4 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	99.307	98.747	99.308	0.561	0.0	1.249	1.242	0.0	0.000	Flood
BI b 2 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.419	99.859	99.889	0.030	0.9	0.000	0.000	0.9	0.438	OK
BI b 3 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.689	100.129	100.160	0.031	1.0	0.000	0.000	1.0	0.480	OK
BI b 4 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.836	100.276	100.306	0.030	0.9	0.000	0.000	0.8	0.408	OK
MH-12	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	98.989	97.116	97.164	0.048	4.0	0.000	0.000	4.0	5.321	OK
BI a1 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	98.724	98.000	98.034	0.034	1.2	0.000	0.000	1.1	0.549	OK
BI b 1 R RWP	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter	100.297	99.737	99.776	0.039	1.3	0.000	0.000	1.2	0.600	OK
BI a Jnk 1	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter		98.159	98.810	0.651	0.0			0.0	1.484	Surcharged
BI a Jnk 2	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter		97.988	98.016	0.028	1.1			1.1	0.546	OK
BI b Jnk 1	9758-Keynon Ln FSR: 30 years: +0 %: 15 mins: Winter		100.084	100.121	0.037	1.8			1.8	0.885	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



9758-Keynon Ln FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH-05	9758-Keynon Ln FSR: 100 years: +45 %: 480 mins: Winter	98.971	98.256	98.856	0.600	0.2	0.095	0.000	0.2	1.650	Flood Risk
MH-06	9758-Keynon Ln FSR: 100 years: +45 %: 480 mins: Winter	99.224	98.188	98.856	0.668	0.3	0.106	0.000	0.3	3.488	Surcharged
MH-07	9758-Keynon Ln FSR: 100 years: +45 %: 480 mins: Winter	99.425	98.100	98.856	0.756	0.3	0.120	0.000	0.3	1.636	OK
MH-11	9758-Keynon Ln FSR: 100 years: +45 %: 60 mins: Winter	99.029	96.750	97.907	1.157	9.7	1.308	0.000	5.3	21.080	Surcharged
MH-10	9758-Keynon Ln FSR: 100 years: +45 %: 30 mins: Winter	99.272	98.000	98.056	0.056	11.3	0.035	0.000	11.3	8.383	OK
MH-9	9758-Keynon Ln FSR: 100 years: +45 %: 30 mins: Winter	100.048	99.066	99.100	0.035	10.9	0.022	0.000	10.9	8.003	OK
MH-08	9758-Keynon Ln FSR: 100 years: +45 %: 30 mins: Winter	100.466	99.308	99.337	0.029	4.3	0.018	0.000	4.3	2.995	OK
MH-03	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.383	99.848	99.882	0.034	1.7	0.005	0.000	1.7	0.816	OK
MH-04	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.144	99.724	99.779	0.055	4.0	0.009	0.000	3.8	1.945	OK
MH-01	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.905	100.051	100.096	0.045	3.9	0.007	0.000	3.8	1.904	OK
MH02	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.853	99.804	99.853	0.049	3.8	0.008	0.000	3.6	1.899	OK
BI a 1 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	98.715	97.950	97.979	0.029	1.1	0.000	0.000	1.0	0.492	OK
BI a 2 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	98.977	97.900	97.929	0.029	1.1	0.000	0.000	1.0	0.498	OK
BI a 3 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	99.221	98.450	98.480	0.030	1.1	0.000	0.000	1.1	0.528	OK
BI a 4 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	99.299	98.440	98.470	0.030	1.1	0.000	0.000	1.1	0.513	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE					Date: 29/03/2025						
					Designed by: GDR		Checked by: DCS		Approved By: ADS		
Report Details: Type: Junctions Summary Storm Phase: Phase					Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS						

BI b 1 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.278	99.550	99.578	0.028	1.0	0.000	0.000	0.9	0.445	OK
BI b 2 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.505	99.700	99.733	0.033	1.4	0.000	0.000	1.3	0.627	OK
BI b 3 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.840	99.800	99.831	0.031	1.2	0.000	0.000	1.2	0.558	OK
BI b 4 F RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.849	99.850	99.880	0.030	1.1	0.000	0.000	1.1	0.513	OK
BI a 2 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 480 mins: Winter	98.885	98.325	98.856	0.531	0.2	0.006	0.000	0.2	2.235	Flood Risk
BI a 3 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 480 mins: Winter	99.126	98.566	98.856	0.290	0.3	0.003	0.000	0.2	2.583	Flood Risk
BI a 4 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	99.307	98.747	99.310	0.563	0.1	2.887	2.880	0.0	0.000	Flood
BI b 2 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.419	99.859	99.901	0.042	1.8	0.001	0.000	1.7	0.818	OK
BI b 3 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.689	100.129	100.174	0.045	2.0	0.001	0.000	1.9	0.902	OK
BI b 4 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.836	100.276	100.318	0.042	1.7	0.001	0.000	1.6	0.768	OK
MH-12	9758-Keynon Ln FSR: 100 years: +45 %: 60 mins: Winter	98.989	97.116	97.172	0.056	5.3	0.000	0.000	5.3	17.966	OK
BI a1 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	98.724	98.000	98.048	0.048	2.2	0.001	0.000	2.2	1.034	OK
BI b 1 R RWP	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter	100.297	99.737	99.795	0.058	2.5	0.001	0.000	2.4	1.133	OK
BI a Jnk 1	9758-Keynon Ln FSR: 100 years: +45 %: 480 mins: Winter		98.159	98.855	0.697	0.3			0.3	2.591	Surcharged
BI a Jnk 2	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter		97.988	98.028	0.040	2.2			2.1	1.032	OK
BI b Jnk 1	9758-Keynon Ln FSR: 100 years: +45 %: 15 mins: Winter		100.084	100.136	0.052	3.5			3.4	1.667	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



9758-Keynon Ln FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)
Block a Acc Rd W	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	98.253	97.954	98.017	0.188	0.000	0.063	0.1	1.319	0.000	0.000	0.0	0.536
Block a 3 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 480 mins: Winter	98.803	98.594	98.648	0.108	0.000	0.054	0.0	0.390	0.000	0.000	0.0	0.000
Block a 4 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 480 mins: Winter	98.881	98.681	98.737	0.114	0.001	0.057	0.0	0.408	0.000	0.000	0.0	0.000
Block b 4 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 960 mins: Winter	100.659	100.222	100.254	0.103	0.038	0.070	0.0	0.505	0.000	0.000	0.0	0.251
Block b 3 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	100.395	100.225	100.259	0.100	0.032	0.066	0.0	0.473	0.000	0.000	0.0	0.396
Block b 2 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	100.201	99.982	100.040	0.120	0.001	0.060	0.0	0.432	0.000	0.000	0.0	0.000
Block b 1 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	99.963	99.752	99.809	0.118	0.002	0.059	0.0	0.426	0.000	0.000	0.0	0.000
Block a 1 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	98.311	98.253	98.179	0.000	0.148	0.074	0.0	0.532	0.000	0.000	0.0	0.007
Block a 2 Drv	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	98.596	98.557	98.520	0.099	0.174	0.137	0.0	0.988	0.000	0.000	0.0	0.003
Block a Acc Rd E	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	98.557	98.335	98.379	0.176	0.000	0.044	0.1	1.589	0.000	0.000	0.0	0.628
Block b Acc Rd W	9758-Keynon Ln FSR: 2 years: +0 %: 360 mins: Winter	99.707	99.638	99.639	0.004	0.000	0.001	0.0	0.042	0.000	0.000	0.0	0.000

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Percentage Available (%)	Status
79.050	OK
81.930	OK
81.536	OK
84.413	OK
78.080	OK
80.001	OK
80.279	OK
75.384	OK
54.466	OK
85.282	OK
99.503	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE				Date: 29/03/2025							
				Designed by: GDR		Checked by: DCS					
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase				Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS							

Block b Acc Rd E	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	100.228	99.941	99.995	0.215	0.000	0.054	0.1	2.202	0.000	0.000	0.0	0.574
236.4	9758-Keynon Ln FSR: 2 years: +0 %: 1440 mins: Winter	97.383	97.200	97.203	0.159	0.153	0.155	0.1	1.847	0.000	0.000	0.0	0.561
Block b Acc Rd W Trn	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	99.179	99.116	99.120	0.182	0.176	0.180	1.0	0.928	0.000	0.000	0.9	1.794
Block b Acc Rd E Trn	9758-Keynon Ln FSR: 2 years: +0 %: 60 mins: Winter	99.421	99.347	99.355	0.181	0.167	0.174	0.9	0.934	0.000	0.000	0.6	0.586
Block a Acc Rd E Trn	9758-Keynon Ln FSR: 2 years: +0 %: 120 mins: Winter	97.875	97.850	97.852	0.186	0.183	0.184	1.3	0.370	0.000	0.000	1.2	2.946

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



82.016	OK
89.641	OK
79.083	OK
79.827	OK
80.857	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



9758-Keynon Ln FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)
Block a Acc Rd W	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	98.546	97.954	98.434	0.481	0.000	0.480	0.1	2.199	0.021	0.000	0.0	0.937
Block a 3 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 960 mins: Winter	98.923	98.648	98.735	0.228	0.055	0.141	0.1	1.016	0.000	0.000	0.0	0.010
Block a 4 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 960 mins: Winter	99.012	98.684	98.803	0.245	0.004	0.123	0.0	0.882	0.000	0.000	0.0	0.000
Block b 4 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 960 mins: Winter	100.783	100.287	100.348	0.226	0.102	0.164	0.3	1.181	0.000	0.000	0.4	4.935
Block b 3 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	100.508	100.307	100.355	0.213	0.114	0.162	0.3	1.168	0.000	0.000	0.3	8.841
Block b 2 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 960 mins: Winter	100.329	99.983	100.105	0.248	0.003	0.124	0.0	0.894	0.000	0.000	0.0	0.000
Block b 1 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 960 mins: Winter	100.090	99.753	99.873	0.246	0.003	0.123	0.0	0.888	0.000	0.000	0.0	0.000
Block a 1 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	98.312	98.365	98.235	0.001	0.260	0.130	0.0	0.938	0.000	0.000	0.0	0.005
Block a 2 Drv	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	98.709	98.668	98.632	0.212	0.285	0.249	0.1	1.798	0.000	0.000	0.0	0.008
Block a Acc Rd E	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	98.668	98.335	98.407	0.287	0.000	0.072	0.1	2.609	0.000	0.000	0.0	1.305
Block b Acc Rd W	9758-Keynon Ln FSR: 30 years: +0 %: 480 mins: Winter	99.712	99.638	99.641	0.010	0.000	0.003	0.0	0.090	0.000	0.000	0.0	0.000

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Percentage Available (%)	Status
65.071	Flood
52.898	OK
60.082	OK
63.541	OK
45.912	OK
58.612	OK
58.890	OK
56.622	OK
17.123	OK
75.836	OK
98.936	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE				Date: 29/03/2025									
				Designed by: GDR		Checked by: DCS						Approved By: ADS	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase				Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS									

Block b Acc Rd E	9758-Keynon Ln FSR: 30 years: +0 %: 1440 mins: Winter	100.307	99.941	100.015	0.294	0.000	0.074	0.1	3.027	0.000	0.000	0.0	3.121
236.4	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	97.404	97.307	97.248	0.180	0.259	0.201	3.5	2.386	0.000	0.000	1.0	1.101
Block b Acc Rd W Trn	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	99.206	99.147	99.148	0.210	0.208	0.209	3.5	1.075	0.000	0.000	3.4	3.672
Block b Acc Rd E Trn	9758-Keynon Ln FSR: 30 years: +0 %: 30 mins: Winter	99.439	99.366	99.375	0.199	0.186	0.195	2.3	1.044	0.000	0.000	2.3	1.281
Block a Acc Rd E Trn	9758-Keynon Ln FSR: 30 years: +0 %: 60 mins: Winter	97.910	97.890	97.889	0.220	0.223	0.221	4.9	0.444	0.000	0.000	4.6	5.700

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



75.271	OK
86.614	OK
75.778	OK
77.449	OK
77.019	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



9758-Keynon Ln FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)
Block a Acc Rd W	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	98.550	97.959	98.436	0.485	0.005	0.482	0.2	4.320	0.118	0.000	0.0	1.776
Block a 3 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	99.127	98.681	99.024	0.432	0.087	0.431	0.2	1.414	0.022	0.000	0.0	0.534
Block a 4 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 960 mins: Winter	99.208	98.712	99.120	0.441	0.032	0.439	0.1	1.247	0.030	0.000	0.1	0.520
Block b 4 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	100.996	100.313	100.468	0.440	0.129	0.284	0.2	2.047	0.000	0.000	0.2	0.898
Block b 3 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	100.727	100.317	100.624	0.432	0.124	0.431	0.5	1.553	0.026	0.000	0.6	15.503
Block b 2 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	100.514	100.038	100.411	0.432	0.057	0.431	0.0	1.303	0.026	0.000	0.0	1.065
Block b 1 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	100.276	99.810	100.181	0.432	0.060	0.431	0.1	1.311	0.025	0.000	0.1	1.918
Block a 1 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 360 mins: Winter	98.328	98.365	98.243	0.017	0.260	0.138	0.2	0.997	0.000	0.000	0.0	0.050
Block a 2 Drv	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	98.929	98.682	98.814	0.432	0.299	0.431	0.1	2.195	0.028	0.000	0.0	0.577
Block a Acc Rd E	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	98.868	98.336	98.817	0.487	0.001	0.482	0.2	7.084	0.221	0.000	0.0	1.407
Block b Acc Rd W	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	99.808	99.638	99.673	0.106	0.000	0.035	0.0	0.995	0.000	0.000	0.0	0.094

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



Percentage Available (%)	Status
31.382	Flood
34.475	Flood
43.559	Flood
36.812	OK
28.096	Flood
39.657	Flood
39.316	Flood
53.858	OK
-1.148	Flood
34.387	Flood
88.233	OK

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE				Date: 29/03/2025							
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase				Designed by: GDR		Checked by: DCS					
				Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS							

Block b Acc Rd E	9758-Keynon Ln FSR: 100 years: +45 %: 1440 mins: Winter	100.499	99.941	100.422	0.486	0.001	0.481	0.3	7.831	0.199	0.000	0.0	2.389
236.4	9758-Keynon Ln FSR: 100 years: +45 %: 60 mins: Winter	97.907	97.907	97.819	0.683	0.859	0.772	4.7	9.172	0.000	0.000	4.0	8.154
Block b Acc Rd W Trn	9758-Keynon Ln FSR: 100 years: +45 %: 30 mins: Winter	99.244	99.193	99.189	0.247	0.254	0.250	8.7	1.286	0.000	0.000	8.7	6.239
Block b Acc Rd E Trn	9758-Keynon Ln FSR: 100 years: +45 %: 30 mins: Winter	99.457	99.398	99.398	0.217	0.217	0.217	4.3	1.165	0.000	0.000	4.3	3.175
Block a Acc Rd E Trn	9758-Keynon Ln FSR: 100 years: +45 %: 30 mins: Winter	97.969	97.955	97.951	0.279	0.288	0.284	12.8	0.569	0.000	0.000	12.8	9.466

Project: KENYON LANE MIDDLETON WHITE COX ARCHITECTURE	Date: 29/03/2025		
	Designed by: GDR	Checked by: DCS	Approved By: ADS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: ADS CONSULT 107 MERE GRANGE BUSINESS PK LEASIDE, ST HELENS		



36.030	Flood
48.553	OK
71.027	OK
74.837	OK
70.540	OK



APPENDIX H
SUDS HIERARCHY

SuDS Regulatory Hierarchy						
SuDS Feature	Environmental Benefits	Quality Improvements	Suitability for low permeability soils [$k < 10^{-6}$]	ground water recharge	Suitability for confined or small sites	Specific restrictions For Proposed Site
Wetlands	Yes	Yes	Yes	No	No	Yes
Retention Ponds	Yes	Yes	Yes	No	No	Yes
Detention Basins	Yes	Yes	Yes	No	No	Yes
Infiltration Basins	Yes	Yes	Yes	No	No	Yes
Soakaways	No	Yes	No	Yes	Yes	Yes
Swales	Yes	Yes	Yes	No	No	Yes
Below ground Tanks	No	No	Yes	Yes	Yes	Yes
Filter Strips	Yes	Yes	Yes	Yes	No	Yes
Rainwater Harvesting	No	Yes	Yes	Yes	Yes	Yes
Permeable Paving	No	Yes	Yes	Yes	Yes	Yes
Green Roofs	Yes	Yes	Yes	No	Yes	Yes
External Gardens	Yes	Yes	Yes	No	Yes	Yes
Gardens Planters	Yes	Yes	Yes	No	Yes	Yes



APPENDIX J

SUDS APPRAISAL INVESTIGATION

SuDS Appraisal Investigation	
Feature	Investigation
Wetlands	Historical map information.
Retention Ponds	Historical map information, ground investigation information & assessment of proposed site layout.
Detention Basins	Historical map information, ground investigation information & assessment of proposed site layout.
Infiltration Basins	Historical map information, ground investigation information & assessment of proposed site layout.
Soakaways	Ground investigation information & percolation testing.
Swales	Ground investigation information & assessment of proposed site layout & levels.
Below Ground Tanks	Assessment of site layout.
Filter Strips	Ground investigation information & assessment of proposed site layout.
Rainwater Harvesting	Only practical for small developments.
Permeable Paving	Assessment of site layout and proposed surfaces.
Green Roofs	Assessment of proposed site buildings structural composition and roof shape.
External Gardens	Proposed site usage.
Gardens Planters	Proposed site usage.



APPENDIX K
MAINTENANCE SCHEDULE



SUSTAINABLE DRAINAGE SYSTEM (SUDS) MANAGEMENT STRATEGY

PROPERTY ADDRESS

Residential Development,
Kenyon Lane,
Middleton

CLIENT

GR Jones Property

REPORT REFERENCE

9758-ADS-XX-XX-RP-C-500

DATE

March 2025

AUTHOR

D Sparkes

REVIEWER

G Ratcliffe



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1.0 INTRODUCTION

This management strategy has been prepared by ADS Consult Limited on behalf of GR Jones Property, for the residential development at Kenyon Lane, Middleton.

This document outlines the long-term maintenance of the proposed surface water system and will refer to the following documents, some of which provide further detail on the maintenance operations required:

- CIRIA Report C753, 'The SUDS Manual', 2015
- CIRIA Report C625, 'Model Agreements for Sustainable Water Management Systems', 2004.
- CIRIA Report C768, 'Guidance on the Construction of SuDS', 2017.

The SUDS, considered for the purposes of this statement, include drainage features that will be employed to reduce and manage surface water runoff from the development to a design return period of one hundred years plus climate change of 45%. This is required so that the development will not increase the risk of flooding to the site and its environment.

All drainage on site is taken to the underlying strata via the following features:

- Flow Control
- Attenuation Tank
- Pipes
- Manholes

2.0 MAINTENANCE RESPONSIBILITIES

Responsibility for drainage within England and Wales rests with various bodies. For the Development, the drainage responsibilities will be as following:

- **Site**
A Management company will be set up by the developer for the development to maintain the drainage features, all SUDS features, stormwater attenuation tanks, outfalls and any associated flow controls within communal areas. However, it should be noted that if the Flood and Water Management Act 2010 is ever fully implemented this allows a surface water drainage system to be vested to the SUDS approving body (SAB) in this case Bury Metropolitan City Council. This will be reviewed at the time of any implementation of the act.

3.0 MAINTENANCE REGIME

The following section describes the required maintenance for each feature in turn. The SUDS maintenance requirements listed below should be reviewed after the first 5 years, with a view to agreeing a new regime for the ongoing maintenance.

Notwithstanding the routine inspections and maintenance requirements, after severe storm events all features shall be inspected to clear debris and repair damaged structures or features. Records of the maintenance carried out shall be prepared by the Operator.

3.1 Flow Controls

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Inspect inlets, outlets, and overflows for blockages, and clear if required.	Monthly
	Inspect inlets, outlets, and overflows for evidence of physical damage.	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (Year1), Annually or as required
	Check any penstocks and other mechanical devices	Annually
	Maintenance of pump plant	As per the supplier maintenance agreement schedule
Occasional Maintenance	Remove sediment from inlets, outlets, forebay and mainbasin when required	Every 5 years, or as required, (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair/rehabilitation of inlets, outlets, and overflows	As required

3.2 Storage Tanks, Filter Strip & Porous Roads

Maintenance schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly, take remedial action if required	Monthly (for 3 months) Annually
	Remove debris from the catchment surface (where it may cause risks to performance.	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface for blockage or damage. Clear sediment, algae or other matter from the surface; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required
	Flush and clean medium annually to remove buildup of sediment, algae and foreign matter which would impede functionality.	Annually, or as required
Remedial actions	Repair/rehabilitate inlet surface, outlet, overflows and vents	As required
Monitoring	Inspect/check all surfaces, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually
	Survey runs off from tank for sediment and other foreign bodies and flush medium as necessary.	Every 5 years or as required

3.3 Manholes

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Inspect inlets, outlets, and overflows for blockages, and clear if required.	Monthly
	Inspect inlets, outlets, and overflows for evidence of physical damage.	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (Year 1), Annually
	Check any penstocks and other mechanical devices	Annually
Occasional Maintenance	Remove sediment from inlets, outlets, forebay and mainbasin when required	Every 5 years, or as required, (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair/rehabilitation of inlets, outlets, and overflows	As required

3.4 Pipes

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect inlets, outlets, and overflows for evidence of poor operation.	Monthly
	Inspect inlets and facility surface for silt accumulation.	Monthly (Year 1) Annually
Occasional Maintenance	Rod through poorly performing pipes	As required
	If continued poor performance jet and CCTV survey poorly performing runs.	As required
Remedial actions	Repair / rehabilitation	As required

APPENDIX A

INSPECTION CHECKLIST

General information	
Site ID	
Site location and co-ordinates (GIS if appropriate)	
Approved drawing reference	
Elements forming the SuDS scheme	
Inspection frequency	
Approved specification reference	
Type of development	
Specific purpose of any part of the scheme (e.g., biodiversity, wildlife, and visual aspects)	

Inspection Date	Details	Y / N	Action required	Date completed	Details	Y / N	Action required	Date completed
General inspection items								
Is there any evidence of erosion, channeling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours, or nuisance insects?								
Have any health and safety risks been identified by either the public or maintenance operatives?								

Inspection Date	Details	Y / N	Action required	Date completed	Details	Y / N	Action required	Date completed
Silt/Sediment accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)								
Is surface clogging visible potentially problematic where water must soak into the underlying construction or ground (e.g., under drained swale or infiltration basin)?								
Does permeable or porous surfacing require sweeping to remove silt?								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								

Is there any evidence of any other clogging or blockage of outlets or drainage paths?								
Is the vegetation condition satisfactory (density, weed growth, coverage etc.)? (check against approved planting regime)								
Does any part of the system require weeding, pruning, or mowing? (check against maintenance frequency state in approved design).								
Is there any evidence of invasive species becoming established? If yes, state action is required								
Are any check dams or weirs in good condition?								
Is there any evidence of any accidental damage to the system (e.g., wheel ruts?)								
Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow control?								

Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity, and visual aspects?

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Inspection Date	Details	Y / N	Action required	Date compl eted	Details	Y / N	Action required	Date completed
Other observations								
Information appended (e.g., photos)								
Continue as current Increase maintenance. Decrease maintenance								
Proposed date for the next inspection								



APPENDIX M
DRAINAGE LAYOUT

