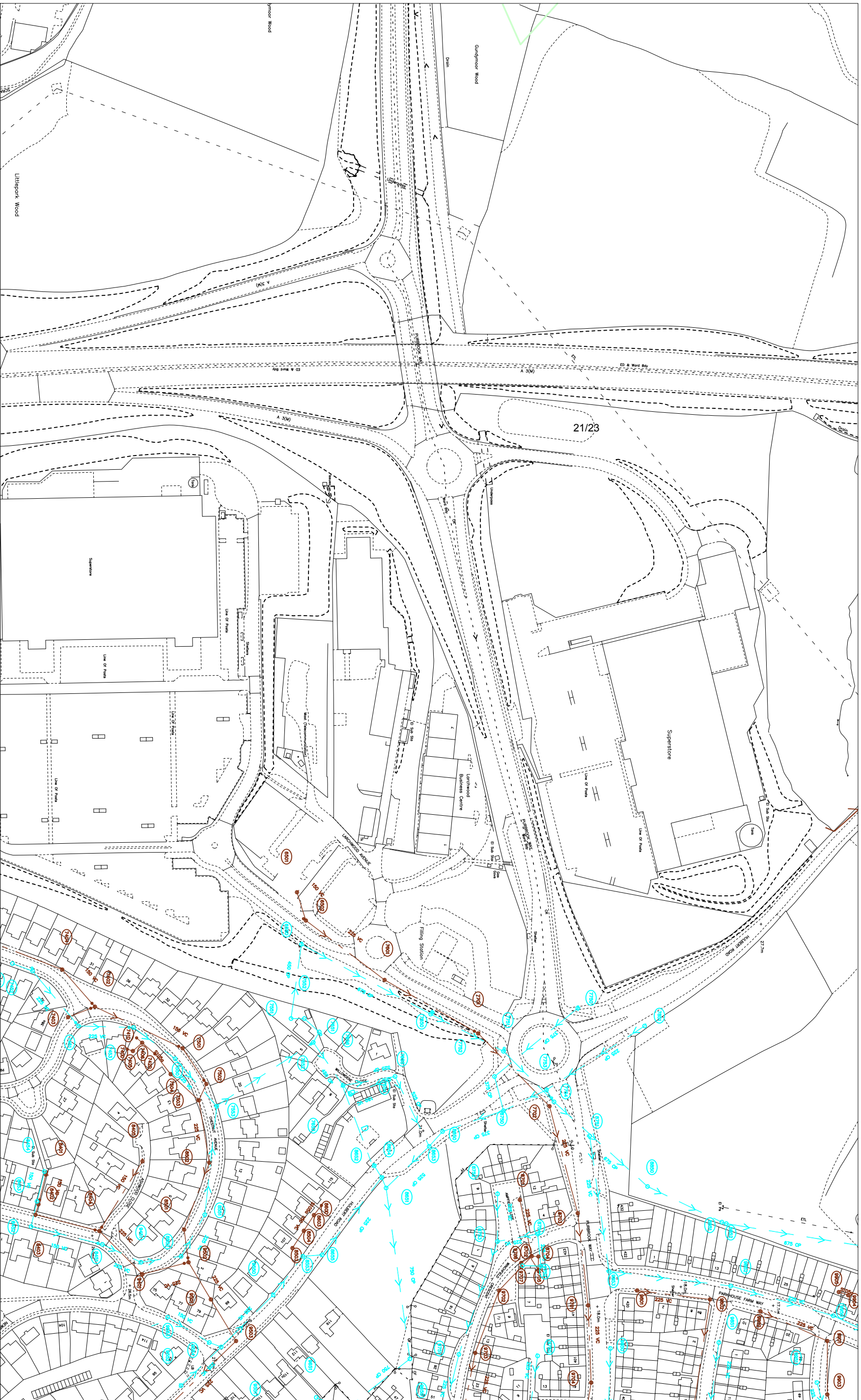
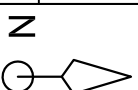




The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

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SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
6501X	26.8	23.47	150	VC	CIRC	8702X	19.25	17.12	225	VC	CIRC												
6502X	27.08	22.82	225	VC	CIRC	8703X	20.01	18.87	225	VC	CIRC												
6550X	27.15	22.96	675	CP	CIRC	8704X	19.2	17.72	225	VC	CIRC												
7402X	31.87	29.66	150	VC	CIRC	8750X	23.18	20.86	375	CP	CIRC												
7403X	32.53	30.64	150	VC	CIRC	8751X	22.05	19.79	225	VC	CIRC												
7404X	34.51	31.81	150	VC	CIRC	8752X	19.79	18.2	225	VC	CIRC												
7405X			UNK	UNK	CIRC	8753X	19.51	17.44	225	VC	CIRC												
7406X			UNK	UNK	CIRC	8754X	19.56	17.93	225	VC	CIRC												
740DX			UNK	UNK	CIRC	8850X	20.87	18.59	675	VC	CIRC												
741DX			UNK	UNK	CIRC	8851X	20.14	18.59	675	VC	CIRC												
742DX			UNK	UNK	CIRC	8852X	20.14	18	OTHER	CP	RECT												
7450X			UNK	UNK	CIRC	8852X	20.06	17.1	675	VC	CIRC												
7451X	32.08	29.37	225	VC	CIRC	9401X	26.97	25.1	225	VC	CIRC												
7452X	35.26	32.46	225	VC	CIRC	9451X	27.34	24.95	225	VC	CIRC												
7453X	29.58	26.98	225	VC	CIRC	9502X	25.6	21.66	225	VC	CIRC												
7501X	27.09	24.98	150	VC	CIRC	9503X	21.77	19.99	225	VC	CIRC												
7502X	24.85	23.34	225	VC	CIRC	9550X	21.31	20.61	225	CP	CIRC												
7503X	24.66	23.03	225	VC	CIRC	9551X	22.04	21.09	225	VC	CIRC												
7504X			UNK	UNK	CIRC	9552X	22.3	21.39	225	VC	CIRC												
7550X	26.88	24.4	225	VC	CIRC	9553X	24.57	23.04	150	VC	CIRC												
7551X	22.96		450	CP	CIRC	9554X	22.62	21.24	225	VC	CIRC												
7552X	23.01		450	CP	CIRC	9650X	17.84		750	UNK	CIRC												
7553X	24.41		300	UNK	CIRC	9651X			UNK	UNK	CIRC												
7601X	25	22.61	225	VC	CIRC	9701X	18.32	16.34	225	VC	CIRC												
7650X	25.39	20.9	675	CP	CIRC	9702X	18.94	16.6	225	VC	CIRC												
7651X	22.9		450	CP	CIRC	9703X	18.49	16.17	225	VC	CIRC												
7651X	22.9		450	CP	CIRC	9704X	17.76	15.85	225	VC	CIRC												
7652X	22.73	20.14	450	CP	CIRC	9705X	18.98	18.03	225	VC	CIRC												
7653X	22.02	20.35	225	VC	CIRC	9705X	18.98	18.03	225	VC	CIRC												
7654X	21.95	20.91	150	VC	CIRC	9705X	18.98	18.03	225	VC	CIRC												
7655X	21.72	19.14	525	CP	CIRC	9706X	18.88	16.94	225	VC	CIRC												
7656X	22.19	19.47	525	CP	CIRC	9707X	18.88	16.88	225	VC	CIRC												
7701X	24.7	21.49	225	VC	CIRC	9750X	18.7	17.67	225	VC	CIRC												
7702X	23.02	20.7	225	VC	CIRC	9751X	18.54	16.68	225	VC	CIRC												
7750X	25.62	23.47	375	CP	CIRC	9752X	18.99	18.09	225	VC	CIRC												
7751X	24.72	20.23	675	CP	CIRC	9801X	16.15	15.25	225	VC	CIRC												
7752X	23.75	21.13	375	CP	CIRC	9802X	17.97	15.96	225	VC	CIRC												
7753X	23.74	22.25	225	CP	CIRC	9850X	16.7	15.81	225	VC	CIRC												
7753X	23.74	22.25	225	CP	CIRC	9851X	18.09	14.81	225	VC	CIRC												
7754X	23.29	19.12	675	CP	CIRC	9852X	18.54	16.75	225	VC	CIRC												
7851X	26.16	24.76	225	CP	CIRC	9853X	15.75	13.9	225	VC	CIRC												
8401X	31.65	29.42	150	VC	CIRC	9901X	17.2	14.81	225	VC	CIRC												
8402X	29.79	27.31	150	VC	CIRC	9902X	15.29	13.38	225	VC	CIRC												
8403X	28.67	27.32	150	VC	CIRC	9903X	15.29	13.38	225	VC	CIRC												
8404X	28.83	26.46	225	VC	CIRC	9904X	16.39	13.53	300	UNK	CIRC												
8405X	29.95	27.92	150	VC	CIRC	9950X	15.31		225	VC	CIRC												
8451X	28.52	25.91	225	VC	CIRC																		
8452X	28.54	27.44	150	VC	CIRC																		
8453X	29.53	27.86	150	VC	CIRC																		
8454X	31.71	29.74	150	VC	CIRC																		
8501X	25.96	22.41	225	VC	CIRC																		
8502X	24.52	22.74	225	VC	CIRC																		
8504X			150	VC	CIRC																		
8551X	25.09	23.24	225	VC	CIRC																		
8552X	26.47	24.23	225	VC	CIRC																		
8553X	21.02	20.29	225	VC	CIRC																		
8603X			150	VC	CIRC																		
8603X			150	VC	CIRC																		
860DX			150	VC	CIRC																		
8650X	21.49	19.84	375	CP	CIRC																		
8651X	19.48	18.21	750	CP	CIRC																		
8652X	21.43	18.66	600	CP	CIRC																		
8653X	21.26	18.6	525	CP	CIRC																		
8654X	20.51	18.4	600	CP	CIRC																		
8655X	20.8	19.99	225	CP	CIRC																		
8701X	20.02	17.42	225	VC	CIRC																		

LINE STYLES / COLOURS

Brown

AK Asphalt

BAC Black Adhesive Cement

BBC Black (Common)

BPC Black (Polypropylene)

CC Concrete Box Culvert

CI Cast Iron

CO Concrete (H-SU)

CSB Concrete Segments (boxed)

CSU Concrete Segments (unboxed)

DI Ductile Iron

CS Concrete in random Courses

GP Glass Reinforced Plastic

MAC Masonry in regular Courses

MAC Masonry in random Courses

PF Pitch Fibre

PP Polypropylene

PR Polypropylene

PS Polystyrene

ST Steel

XXX Other

ZZZ Unknown

Orange

Dark Blue

Purple

Light Blue

Yellow

Green

Building Over Agreement Area

Treated Effluent

Section 104 Area

Surface Water

Surface Water Ruling Main

Private

Discommissioned

MATERIALS

AK Asphalt

BAC Black Adhesive Cement

BBC Black (Common)

BPC Black (Polypropylene)

CC Concrete Box Culvert

CI Cast Iron

CO Concrete (H-SU)

CSB Concrete Segments (boxed)

CSU Concrete Segments (unboxed)

DI Ductile Iron

CS Concrete in random Courses

GP Glass Reinforced Plastic

MAC Masonry in regular Courses

MAC Masonry in random Courses

PF Pitch Fibre

PP Polypropylene

PR Polypropylene

PS Polystyrene

ST Steel

XXX Other

ZZZ Unknown

Manhole (SV)

Lamp hole (SV)

Lamp hole (F&C)

Pumping Station (SV)

Pumping Station (F&C)

Site entry manhole (SV)

Blind shaft (SV)

Blind shaft (F&C)

Ejector station (SV)

Ejector station (F&C)

Waterlight door (SV)

Waterlight door (F&C)

Flushing on, 1/4-in (SV)

Flushing on, 1/4-in (F&C)

Flushing on, 1/4-in (SV)

Flushing on, 1/4-in (F&C)

Demarcation Chamber

Waterlight (SV)

Waterlight (F&C)

Roading Eye (SV)

Roading Eye (F&C)

Gauging point (SV)

Gauging point (F&C)

Intercept chamber (SV)

Intercept chamber (F&C)

Storm Tank (SV)

Storm Tank (F&C)

Vortex chamber (SV)

Vortex chamber (F&C)

Label ellipse

Outfall

Dummy S&A manhole

Peristock chamber

Diamboards

Storm Overflow

Backstop manhole

Other (S)

Change to sewer (S)

Change to sewer (F)

Relic valve

Flap valve

Culverts

Valve

Closed Valve

Air Valve

Hatch box (SV)

Hatch box (F&C)

Direction arrow

Emptying valve

Catchpit

Sideway

Islet

Balancing Pond

Wastewater treatment works

Manure treatment works

Culvert headworks

Valve

Valve column

Total storage tank

Blow end

Head of Public Sewer

Micro Pumping Station

SHAPES (S)

A Arcuate

C Circular

E Ellipse

H Hexagon

T Trapezoidal

U U-Shape

NODE REFERENCING SYSTEM

1st digit: hundred meters easting identifier

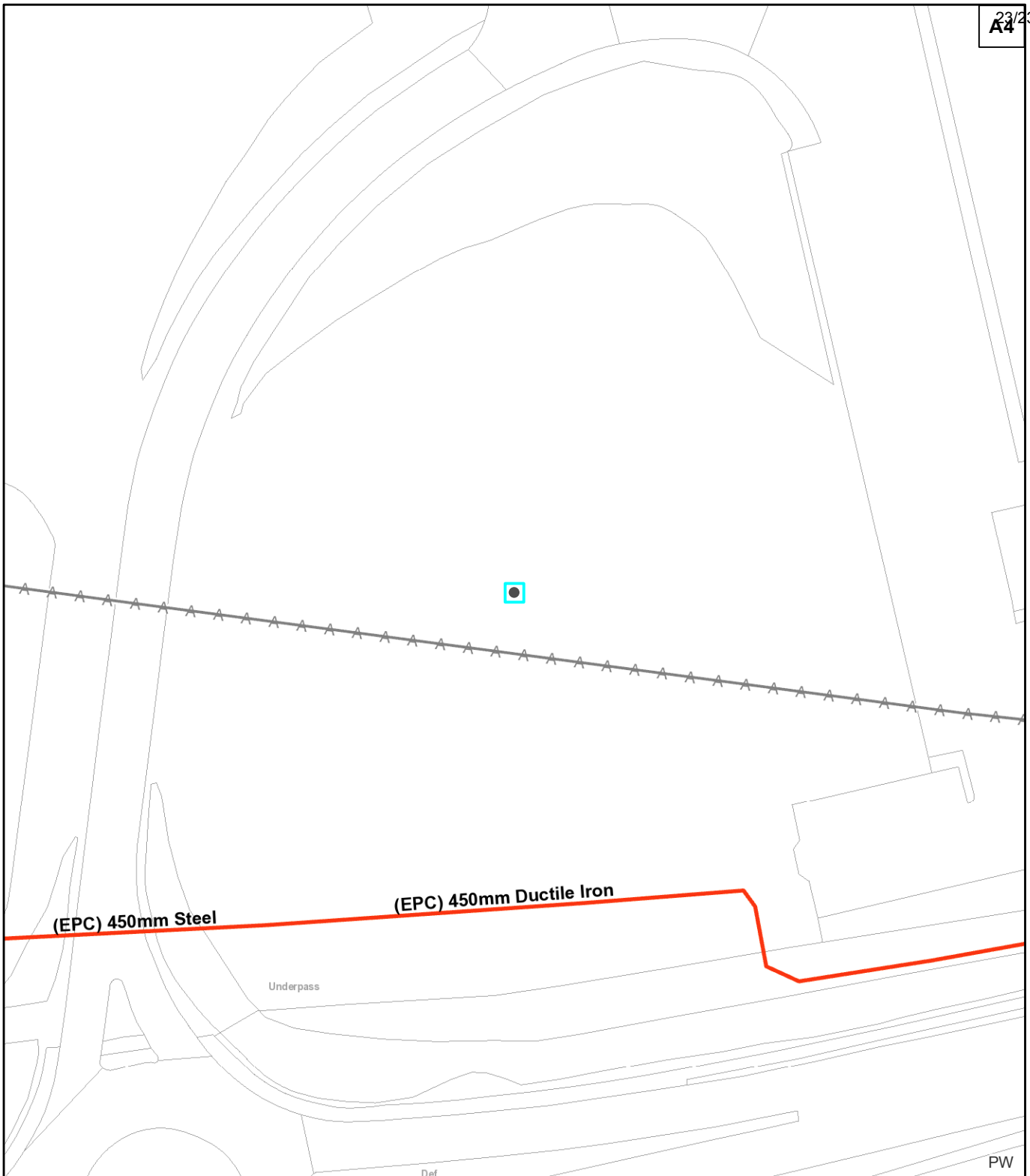
2nd digit: hundred meters northing identifier

3rd digit: sewer type identifier

4th digit: next sequential node

S-3 = Surface Water

Drawn by:	dassuta
Title:	Land at Purbrook Way
Date:	03/02/2020



Water Supply	Valves / Fittings	Hydrant
— Distribution Main - - - Fire Main — Trunk Main — Raw Water Main — Communication Pipe — Abandoned Main	- Capped End - StopCock - Butterfly Valve - Pressure Flow Valve	- Reflux Valve - Air Valve - Open Valve - Closed Valve - Company Washout Hydrant(Double) - Company Washout Hydrant(Double) Offset - Company Washout Hydrant(Single) - Company Washout Hydrant(Single) Offset
		- Fire Brigade Hydrant(Double) - Fire Brigade Hydrant(Double) Offset - Fire Brigade Hydrant(Single) - Fire Brigade Hydrant(Single) Offset - Fire Brigade Washout Hydrant

The information supplied is given in good faith as a guide to locating underground apparatus. Its accuracy cannot be guaranteed, nor does it include comprehensive information about the existence or location of service pipes or cables to individual premises. The responsibility for locating and avoiding damage to apparatus on site shall be that of the person proposing to excavate in the street who shall be liable to the apparatus owner and any third party who may be affected in any way for any loss or damage caused by their failure to do so.

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U1490087

OS Ref: SU6804SW

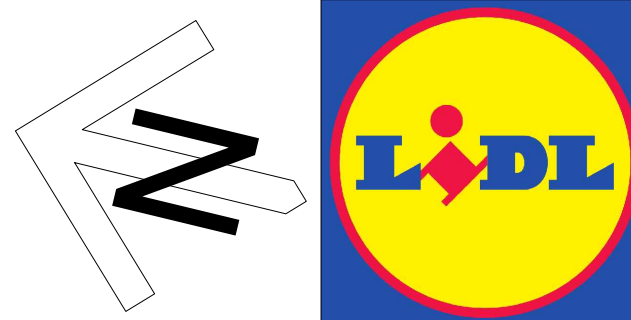
Scale: 1:1,250

Date: 17/01/2020



Registered Office
P.O. BOX NO. 8, West Street, Havant,
Hampshire. PO9 1LG.
Registered in England No. 2536455
Telephone: (023) 9249 9888
Fax: (023) 9245 3632
Website: www.portsmouthwater.co.uk

APPENDIX E: Proposed Layout



APPENDIX F: Proposed Calculations

Mayer Brown Limited		Page 1
Lion House Oriental Road Woking, GU22 8AR	Purbrook Way Havant Attenuation Tank Calculations	
Date 22/10/2020 File Proposed Attenuation ta...	Designed by SF Checked by SF	
Innovyze Source Control 2020.1		

Rainfall Details

Rainfall Model	FEH	F (1km)	2.245
Return Period (years)	100	Summer Storms	No
FEH Rainfall Version	1999	Winter Storms	Yes
Site Location	GB 470100 107800 SU 70100 07800	Cv (Summer)	0.750
C (1km)	-0.029	Cv (Winter)	0.840
D1 (1km)	0.462	Shortest Storm (mins)	15
D2 (1km)	0.300	Longest Storm (mins)	10080
D3 (1km)	0.383	Climate Change %	+40
E (1km)	0.310		

Time Area Diagram

Total Area (ha) 0.790

Time (mins)	Area (ha)
From: 0	To: 4 0.790

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Mayer Brown Limited		Page 2
Lion House Oriental Road Woking, GU22 8AR	Purbrook Way Havant Attenuation Tank Calculations	
Date 22/10/2020	Designed by SF	
File Proposed Attenuation ta...	Checked by SF	
Innovyze		Source Control 2020.1

Model Details

Storage is Online Cover Level (m) 41.550

Cellular Storage Structure

Invert Level (m) 39.080 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	525.0	525.0	1.500	525.0	675.0	1.501	0.0	675.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0075-3000-1500-3000
Design Head (m) 1.500
Design Flow (l/s) 3.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 75
Invert Level (m) 39.100
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	3.0	Kick-Flo®	0.671	2.1
Flush-Flo™	0.329	2.6	Mean Flow over Head Range	-	2.4

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)	Depth (m)	Flow (l/s)
0.100	2.1	0.800	2.2	2.000	3.4	4.000	4.7	7.000	6.1
0.200	2.5	1.000	2.5	2.200	3.6	4.500	5.0	7.500	6.3
0.300	2.6	1.200	2.7	2.400	3.7	5.000	5.2	8.000	6.5
0.400	2.6	1.400	2.9	2.600	3.9	5.500	5.5	8.500	6.7
0.500	2.5	1.600	3.1	3.000	4.1	6.000	5.7	9.000	6.9
0.600	2.3	1.800	3.3	3.500	4.4	6.500	5.9	9.500	7.1

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Mayer Brown Limited		Page 1
Lion House Oriental Road Woking, GU22 8AR	Purbrook Way Havant Attenuation Tank Calculations	
Date 22/10/2020 File Proposed Attenuation ta...	Designed by SF Checked by SF	
Innovyze	Source Control 2020.1	

Summary of Results for 30 year Return Period

Half Drain Time : 1195 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max E Outflow (1/s)	Max Volume (m³)	Status
15 min Winter	39.294	0.214	0.0	2.5	2.5	106.5	O K
30 min Winter	39.353	0.273	0.0	2.5	2.5	136.1	O K
60 min Winter	39.427	0.347	0.0	2.6	2.6	172.9	O K
120 min Winter	39.517	0.437	0.0	2.6	2.6	217.9	O K
180 min Winter	39.577	0.497	0.0	2.6	2.6	248.0	O K
240 min Winter	39.623	0.543	0.0	2.6	2.6	271.0	O K
360 min Winter	39.692	0.612	0.0	2.6	2.6	305.2	O K
480 min Winter	39.743	0.663	0.0	2.6	2.6	330.7	O K
600 min Winter	39.784	0.704	0.0	2.6	2.6	351.0	O K
720 min Winter	39.816	0.736	0.0	2.6	2.6	366.9	O K
960 min Winter	39.819	0.739	0.0	2.6	2.6	368.3	O K
1440 min Winter	39.800	0.720	0.0	2.6	2.6	359.3	O K
2160 min Winter	39.749	0.669	0.0	2.6	2.6	333.8	O K
2880 min Winter	39.697	0.617	0.0	2.6	2.6	307.9	O K
4320 min Winter	39.625	0.545	0.0	2.6	2.6	271.9	O K
5760 min Winter	39.550	0.470	0.0	2.6	2.6	234.4	O K
7200 min Winter	39.480	0.400	0.0	2.6	2.6	199.5	O K
8640 min Winter	39.418	0.338	0.0	2.6	2.6	168.7	O K
10080 min Winter	39.366	0.286	0.0	2.6	2.6	142.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	65.106	0.0	90.1	19
30 min Winter	41.891	0.0	119.3	33
60 min Winter	26.954	0.0	164.7	62
120 min Winter	17.343	0.0	215.1	122
180 min Winter	13.400	0.0	250.8	180
240 min Winter	11.159	0.0	279.2	238
360 min Winter	8.622	0.0	323.5	356
480 min Winter	7.180	0.0	356.6	472
600 min Winter	6.230	0.0	378.9	590
720 min Winter	5.548	0.0	386.8	704
960 min Winter	4.409	0.0	381.1	932
1440 min Winter	3.190	0.0	362.7	1368
2160 min Winter	2.308	0.0	536.8	1692
2880 min Winter	1.835	0.0	568.7	2132
4320 min Winter	1.373	0.0	634.1	2984
5760 min Winter	1.118	0.0	700.6	3808
7200 min Winter	0.953	0.0	747.0	4608
8640 min Winter	0.836	0.0	786.7	5352
10080 min Winter	0.749	0.0	821.0	6048

Mayer Brown Limited

Lion House

Oriental Road

Woking, GU22 8AR

Date 22/10/2020

File Proposed Attenuation ta...

Purbrook Way

Havant

Attenuation Tank Calculations

Designed by SF

Checked by SF

Page 1



Innovyze

Source Control 2020.1

Summary of Results for 100 year Return Period (+40%)							
Half Drain Time : 2436 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	39.540	0.460	0.0	2.6	2.6	229.6	O K
30 min Winter	39.656	0.576	0.0	2.6	2.6	287.2	O K
60 min Winter	39.799	0.719	0.0	2.6	2.6	358.5	O K
120 min Winter	39.973	0.893	0.0	2.6	2.6	445.2	O K
180 min Winter	40.089	1.009	0.0	2.6	2.6	503.1	O K
240 min Winter	40.178	1.098	0.0	2.6	2.6	547.4	O K
360 min Winter	40.310	1.230	0.0	2.7	2.7	613.5	O K
480 min Winter	40.408	1.328	0.0	2.8	2.8	662.1	O K
600 min Winter	40.484	1.404	0.0	2.9	2.9	700.3	O K
720 min Winter	40.546	1.466	0.0	2.9	2.9	731.2	O K
960 min Winter	40.563	1.483	0.0	3.0	3.0	739.5	O K
1440 min Winter	40.557	1.477	0.0	3.0	3.0	736.7	O K
2160 min Winter	40.505	1.425	0.0	2.9	2.9	710.8	O K
2880 min Winter	40.440	1.360	0.0	2.8	2.8	678.4	O K
4320 min Winter	40.385	1.305	0.0	2.8	2.8	650.9	O K
5760 min Winter	40.315	1.235	0.0	2.7	2.7	616.1	O K
7200 min Winter	40.242	1.162	0.0	2.6	2.6	579.4	O K
8640 min Winter	40.168	1.088	0.0	2.6	2.6	542.6	O K
10080 min Winter	40.095	1.015	0.0	2.6	2.6	506.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
15 min Winter	139.530	0.0	196.7	19			
30 min Winter	87.610	0.0	214.9	34			
60 min Winter	55.010	0.0	343.9	64			
120 min Winter	34.541	0.0	404.3	122			
180 min Winter	26.309	0.0	406.1	182			
240 min Winter	21.688	0.0	404.2	240			
360 min Winter	16.519	0.0	404.3	358			
480 min Winter	13.618	0.0	409.8	476			
600 min Winter	11.723	0.0	420.5	592			
720 min Winter	10.372	0.0	430.2	708			
960 min Winter	8.161	0.0	432.5	940			
1440 min Winter	5.821	0.0	428.3	1386			
2160 min Winter	4.152	0.0	823.6	2032			
2880 min Winter	3.267	0.0	800.3	2308			
4320 min Winter	2.410	0.0	770.1	3240			
5760 min Winter	1.942	0.0	1223.8	4160			
7200 min Winter	1.642	0.0	1292.8	5112			
8640 min Winter	1.432	0.0	1348.0	5968			
10080 min Winter	1.276	0.0	1350.6	6864			

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Mayer Brown Ltd		Page 1
Lion House Oriental Road Woking GU22 8AR	Purbrook Way Havant Greenfield Run-off Calculation	
Date 27/08/2020 File	Designed by CG Checked by	
XP Solutions Source Control 2018.1		

ICP SUDS Mean Annual Flood

Input

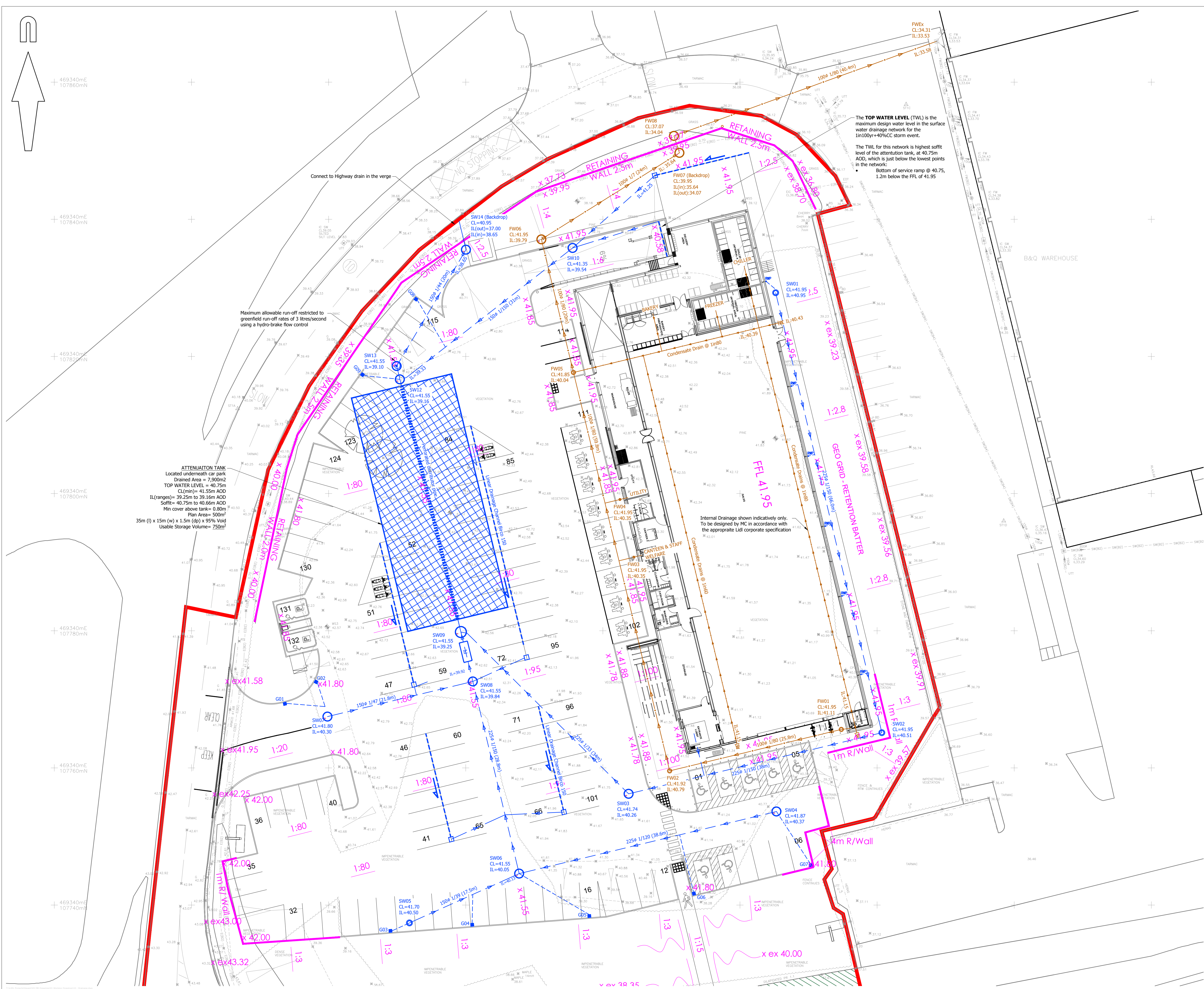
Return Period (years)	100	Soil	0.400
Area (ha)	0.790	Urban	0.000
SAAR (mm)	771	Region Number	Region 7

Results 1/s

QBAR Rural	3.0
QBAR Urban	3.0
Q100 years	9.6
Q1 year	2.6
Q30 years	6.8
Q100 years	9.6

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APPENDIX G: Proposed Drainage Layout



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A1 ORIGINAL

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- KEY:**
- PROPOSED SURFACE WATER SEWER AND MANHOLE
 - PROPOSED FOUL WATER SEWER AND INSPECTION CHAMBER
 - PROPOSED FOUL WATER OFFSITE SEWER AND MANHOLE
 - PROPOSED SURFACE WATER SEWER AND INSPECTION CHAMBER
 - PROPOSED SURFACE WATER LINEAR DRAINAGE CHANNEL
 - PROPOSED PERFORATED PIPE
 - PROPOSED PETROL INTERCEPTOR
 - PROPOSED INFILTRATION TANK
 - PROPOSED SURFACE WATER RISING MAIN
 - PROPOSED RAIN WATER PIPE
 - PROPOSED RODDING EYE
 - PROPOSED LEVELS FROM ONE DESIGN
 - PROPOSED RETAINING WALL DESIGNED BY ONE DESIGN
 - PROPOSED RED LINE BOUNDARY

- NOTES:**
- This drawing is not to be scaled.
 - The proposed levels design has been carried out by One Design
 - Levels are in metres Above Ordnance Datum (m AOD)

FOR APPROVAL
NOT FOR CONSTRUCTION

P2	Drainage updated to suit One Design proposed level strategy (TIC)	SF	23/10/20
P1	Initial Issue: (SF)	SF	28/08/20

rev.	amendment	checked	date
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LIDL UK GmbH					
project					
HAVANT					
scale	1:250	drawn by	SF	checked by	SF
date	AUGUST 2020	cad file	10 - DRAINAGE		
title					
PROPOSED SURFACE AND FOUL WATER GENERAL ARRANGEMENT DRAWING					
Mayer Brown Limited jobcode				suitability	revision
				-	P2
drawing number					
SF/LIDLHAVANT.23/10					

APPENDIX H: Geolight Proprietary Tank Details

SDS

Water
Infrastructure
Systems

INNOVATORS IN
WATER TECHNOLOGY

SDS GEOLight®

Stormwater Management System



SDS GEOLight® is an ultra lightweight honeycombed modular structure, made from recycled PVC, that provides an underground storage facility for the application of stormwater attenuation or infiltration.

SDS
Water
Infrastructure
Systems

Stormwater Management

The Environment Agency is keen to promote the wider use of sustainable drainage systems, which reduce the impact of surface water runoff. There are two main ways of storing surface water for stormwater management:

- Stormwater attenuation tanks
- Soakaway infiltration systems

Stormwater Attenuation Systems

This consists of underground water storage facilities that hold excess water during periods of peak rainfall.

The stored water is gradually released in a controlled manner into the surface water drainage system or directly into watercourses, reducing the risk of upstream and downstream flooding.

Soakaway Infiltration Systems

Soakaways are designed to store surface water runoff until it can be gradually absorbed by the surrounding ground.

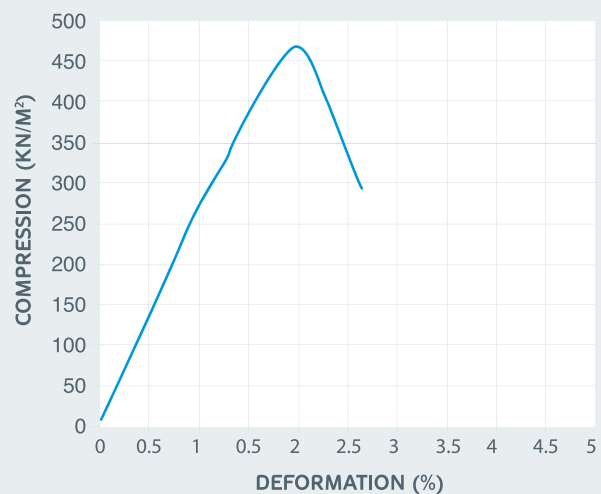
SDS GEOLight® – an efficient and economic solution for stormwater management.

SDS GEOLight® Attenuation

SDS GEOLight® has been specifically designed to form underground water storage reservoirs in stormwater management schemes. Its honeycombed structure gives it certain unique characteristics that make it ideal for this purpose:

- The high void rate (95%) of GEOLight® means that the maximum volume of water is stored in the minimum volume of storage unit.
- High compressive strength. GEOLight® is available in two strengths as standard: 200 and 400kN/m². Note: Higher compressive strengths available from 600 to 1000 kN/m². The graph on the right shows the results of a compression test, where samples of GEOLight® 400 were compressed at the rate of 1mm per minute. The deformation at 400kN/m² is about 1.6%.

RESULTS OF COMPRESSION TEST ON SDS GEOLIGHT® 400



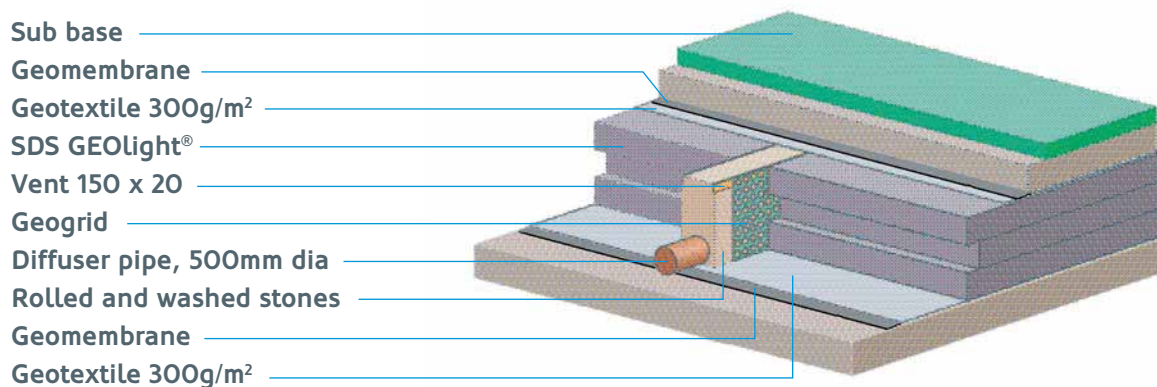
The GEOLight® Stormwater Attenuation System consists of two manholes (inspection chambers) connected by a length of perforated distribution pipe which feeds the stormwater storage reservoirs on either side formed from GEOLight®.

The distribution pipe is normally from 225mm up to 500mm diameter, generally covered in a trench that is filled with draining material such as 15/25 clean graded stone, free from fines.

The reservoirs and distribution pipe are wrapped in a waterproof membrane, such as butyl, to prevent seepage of water into the surrounding ground. The top of each GEOLight® reservoir has a vent which is connected back to the upstream manhole.

A geotextile or 10mm mesh geogrid is laid between the distribution pipe and GEOLight® to prevent the GEOLight® units being clogged by the draining materials.

SDS GEOLight® Attenuation



How does it work?

- 1. In normal conditions, water enters a back drop manhole. This is the upstream manhole and any silt or sediment will collect in the bottom of the chamber. The water then flows along the distribution pipe into the downstream manhole. The upstream pipework is sized to cope with normal flow conditions. The distribution pipe and attenuation tank are sized to cope with storm conditions. The outflow pipe is sized to cope with the permissible discharge.
- 2. In storm conditions the flow restrictor (vortex flow control or orifice plate) in the downstream manhole limits the amount of water flowing out of the manhole. This causes the water level in the distribution pipe to rise and water to spill into the GEOLight® reservoirs on either side. As the water level rises in the reservoirs, air is forced out of the high level vents into the upstream manhole.

- 3. Once the storm has passed, the water level in the GEOLight® reservoirs gradually falls as water passes through the flow restrictor in the downstream manhole. The vents now allow air to return into the GEOLight® reservoirs. Gradually the reservoirs empty. The flow restrictor prevents excess surges of flood water to pass downstream and uses the storage reservoirs to store the water for the period of the storm.

Calculating the storage capacity

The storage capacity of the GEOLight® reservoirs is determined by the maximum outflow permitted, (set by the water company or Environment Agency), the impermeable area of the site and the rainfall return period – normally 1 in 30 years, but again can be dictated by the water company. A full design service, including calculations, can be supplied via a third party consultant.

Please contact SDS for details.

Other uses

The water storage ability of SDS GEOLight® lends itself to a number of other uses:

- Water recycling combines with irrigation systems – this is increasingly popular: GEOLight® is used to retain stormwater which is then pumped as required to a network of standpipes for irrigation.
- Drainage channels – the natural permeability of GEOLight® lends itself for use as an underground drainage channel that collects and drains away groundwater.
- Pollution control – improved water runoff quality. When used in combination with oil / petrol separators, GEOLight® can replenish groundwater without the risk of contamination from oil, chemicals or suspended solids.
- To form lightweight embankments (slope stabilisation) – GEOLight® can be used to quickly form the base of embankments that only weigh a fraction of earth embankments.

Stormwater Attenuation System

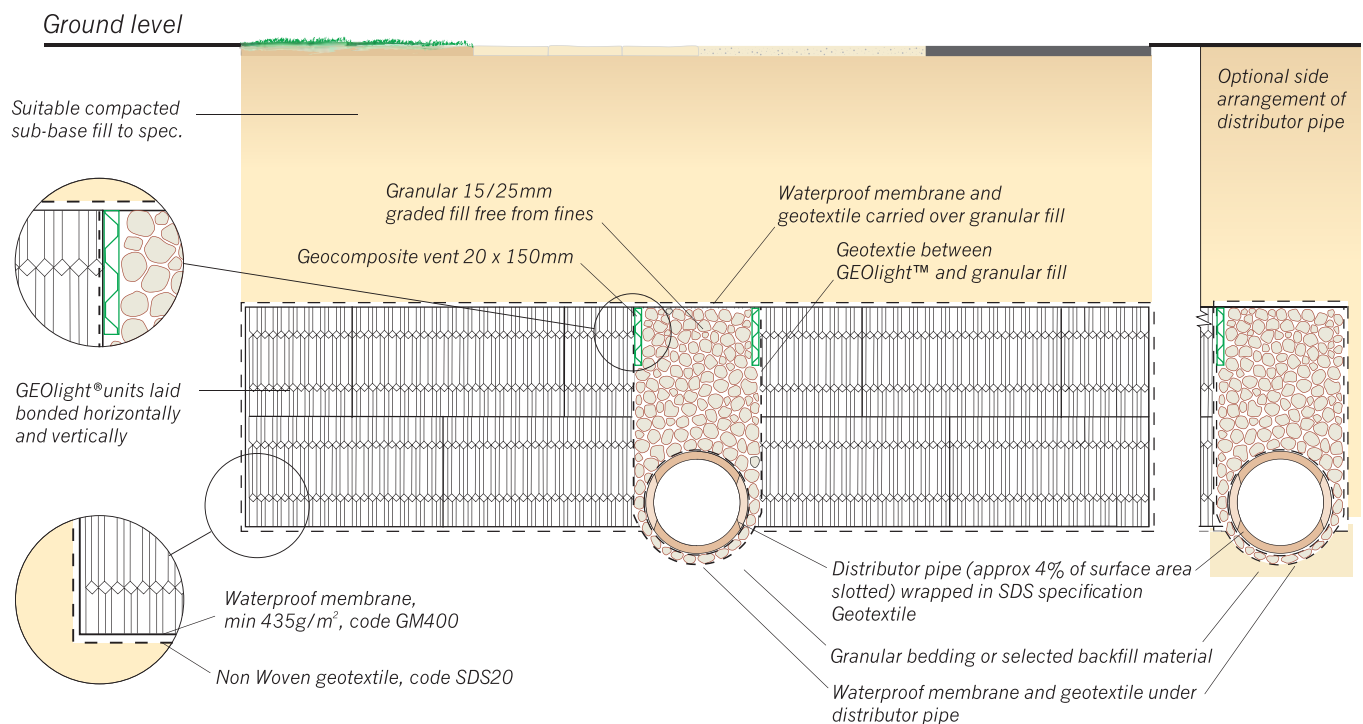
Design Details

The details on these two pages illustrate the construction of a typical SDS GEOLight® Stormwater Attenuation System. The length and height of the GEOLight® reservoirs is determined by the quantity of water to be stored.

The layout of each scheme is specifically designed to suit the characteristics and limitation of the site. Typically the distributor pipe would be arranged in the centre of the reservoir, but can alternatively be placed at the side where topographical constraints dictate.

The high performance waterproof membrane should be sealed continuously to encapsulate the GEOLight® reservoirs, distributor pipe and granular fill. It is protected by a heavyweight needle punched, non woven geotextile. To help with maintenance a high flow geotextile is placed between the granular fill and GEOLight® attenuation units to prevent silt and particles being washed into the reservoir. GEOLight® can be used under a range of surfaces e.g. grass, porous paving, standard paving block, tarmac and concrete.

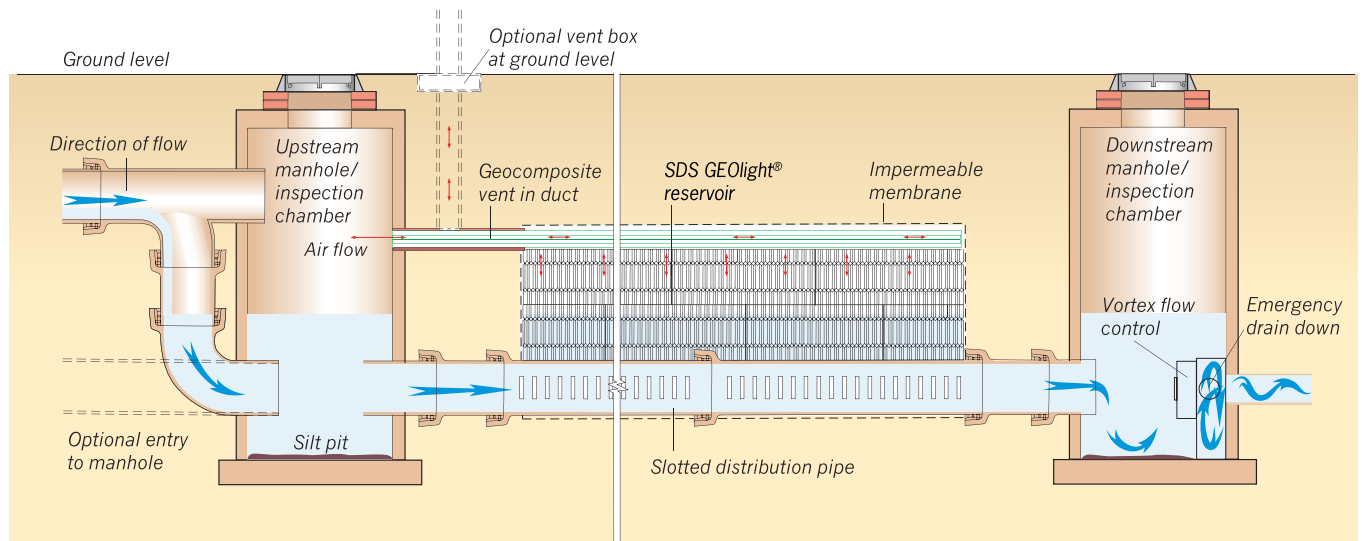
Cross Section



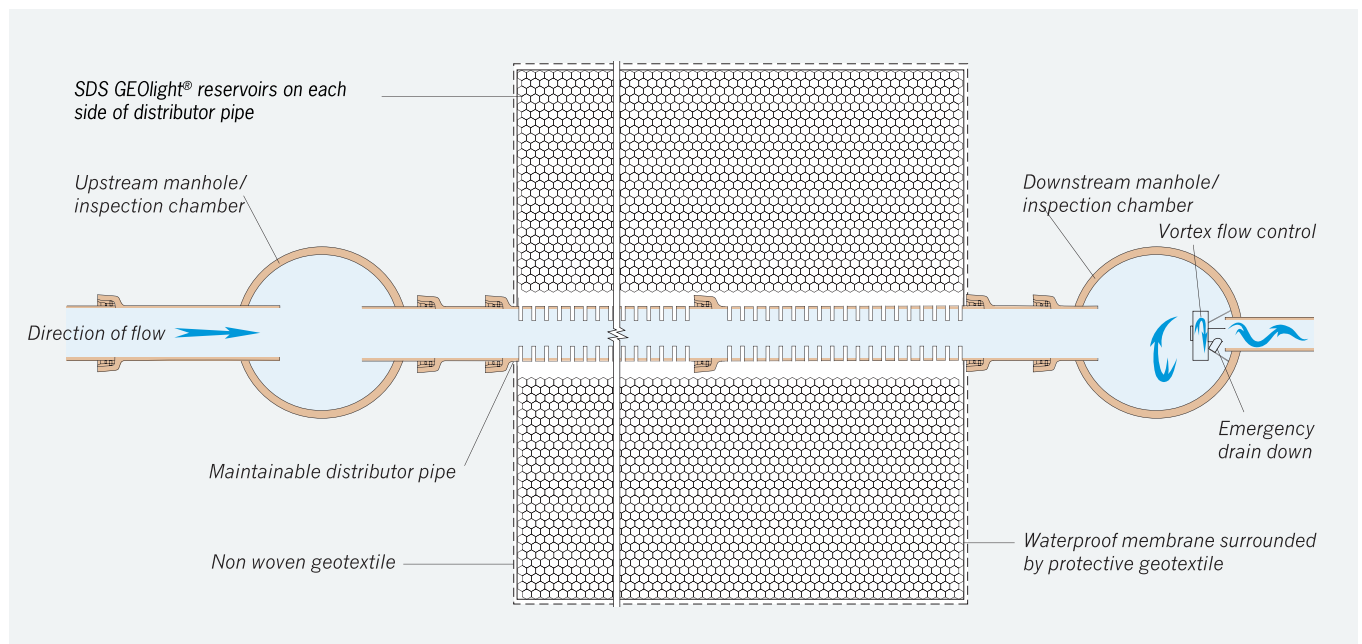
Stormwater Attenuation System

Design Details

Long Section



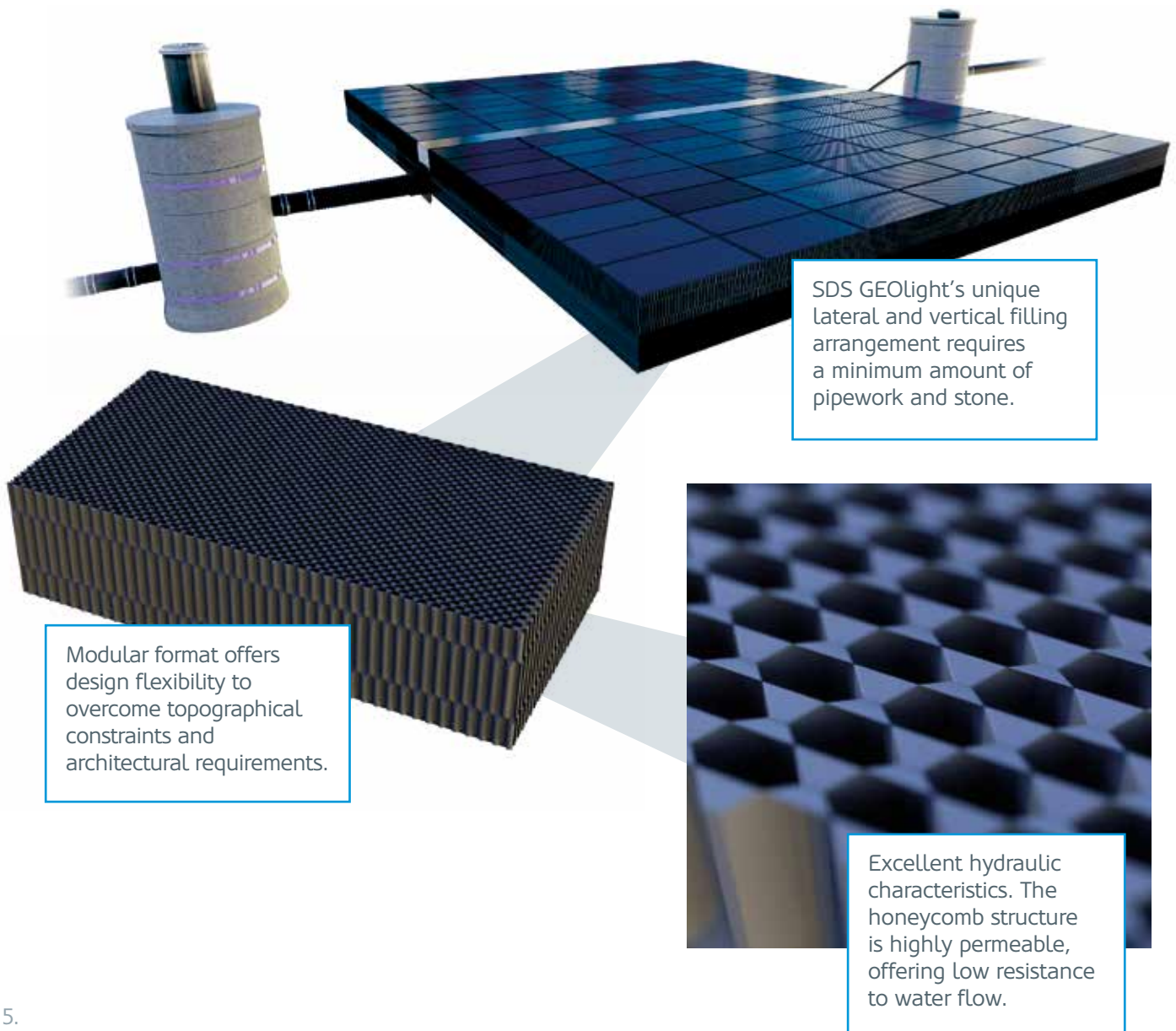
Plan



Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m³ reservoir, completed in one week.
- Light and easy to handle.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist petrol / oil separators.
- Design service available, including calculations.

GEOLight® block



COSHH and Handling Information

1. COMPOSITION/INFORMATION ON INGREDIENTS:

Hazardous ingredients:

None as finished goods or products.

Types of materials:

Polyvinyl chloride (PVC)
MEK

2. HAZARDS IDENTIFICATION

Nature of hazard:

There are no health risks from the products during normal use. The products may contain various pigment colours and stabilisers that may be toxic. The chemicals are, however, bound within the product material and not easily extracted.

3. FIRST-AID MEASURES

Eye contact:

Plastic materials may cause physical irritation in the eyes. Wash out with large amounts of water. If irritation persists, seek medical advice.

Skin contact:

Not applicable.

Inhalation:

Not applicable.

Ingestion:

Not expected to have any toxic effects.

4. FIRE-FIGHTING MEASURES

Extinguishing media:

On small fires use any hand-held extinguisher type.
On large fires use water.

Fire and explosion hazards:

Melting plastics may flow and spread in a large fire.
Products of fire will be thick black toxic smoke.

Material characteristics:

PVC products will burn in the presence of a flame but are classed as self-extinguishing.

Protective equipment:

Wear self-contained breathing apparatus and protective clothing.

5. HANDLING AND STORAGE

Handling:

There are no hazards associated with the finished products. However, when cutting SDS GEOLight®, we recommend that the correct tools are used e.g. Handsaw or Alligator saw. When cutting, dust may be created; avoid inhaling these dusts. Take care of heat build-up within materials during cutting etc. The pallets of SDS GEOLight® units should be placed on level ground and should not be stacked on site. The maximum weight of the pallet of SDS GEOLight® units as delivered to site is 650kg (700kg on one copy), including packaging. Machines used to lift the pallet should be able to lift this weight safely. Loose individual units should not be stored more than three units high. SDS GEOLight® units are lightweight ranging from 23kg to 55kg and can be easily handled – one or two person lift.

Storage:

SDS GEOLight® units will resist the effects of UV light for up to six months; however, prolonged storage in direct sunlight should be avoided. SDS GEOLight® units should not be stored near to any fuel storage areas or any other solvents. SDS GEOLight® units are very robust and resistant to damage during normal handling; however, they should be secured in areas where impacts from vehicles or construction plant will be avoided.

Material characteristics:

PVC products will burn in the presence of a flame but are classed as self-extinguishing.

Protective equipment:

Wear self-contained breathing apparatus and protective clothing.

6. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory protection:

Not required under normal conditions of use. Where cutting etc. creates dust, wear a disposable half-mask to the standard FFP2S.

Hand protection:

Wear impervious strong gloves to prevent cuts to the hands while handling, cutting etc.

Eye protection:

Wear safety glasses when cutting etc.

Skin protection:

Wear overalls.

7. SITE HAZARDS

Other hazards for consideration:

Working in excavations and trenches – SDS GEOLight® may be designed with a shallow invert for infiltration (soakaway) or attenuation (storage) system. This negates the need for deep excavations or trenches, excavation near services e.g. gas, electricity or contaminated soil areas. N.B. All risk assessments should be undertaken by the main contractor for forklift, access to and working in excavations and trench support.

8. STABILITY AND REACTIVITY

Decomposition products:

Major thermal decomposition products are oxides of carbon. Relevant differences are (in addition): PVC may produce amounts of Hydrogen Chloride.

Stability:

These materials are stable at temperatures up to normal operating limits (moulding parameters).

9. ECOLOGICAL INFORMATION

Biodegradability:

Plastic products are not readily biodegradable but are not detrimental to terrestrial wildlife.

Aquatic toxicity:

Non-toxic to marine life.

10. DISPOSAL CONSIDERATIONS

Method:

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

11. OTHER INFORMATION

As the handling, storage, use and disposal of the product are beyond our control SDS disclaims all liability for loss, damage, injury or expense in any way connected with such activities and further makes no warranties, expressed or implied, as to the suitability of the product for any particular use.

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

SDS

Water
Infrastructure
Systems

INNOVATORS IN WATER TECHNOLOGY



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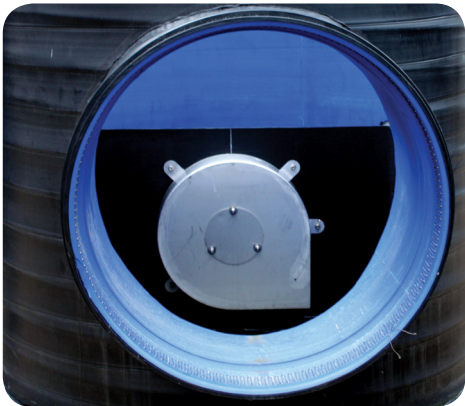
APPENDIX I: Vortex Flow Control Chamber Details

RIDGISTORMCheck Vortex Flow Control Chambers

Data Sheet

Where flows within a drainage system are required to be limited (i.e. prior to discharge from site), with improved hydraulic performance and reduced maintenance, we are able to offer our RIDGISTORMCheck Vortex Flow Control Chamber.

Pre-fabricated under factory controlled conditions, the RIDGISTORMCheck Chamber is available in a range of diameters from 1050-3000mm and incorporates a vortex flow control unit, fitted onto a preformed headwall. Each vortex flow control unit is manufactured to suit the unique hydraulic characteristics of the site's drainage system design. RIDGISTORMCheck Vortex Flow Control Chambers are typically supplied as a single unit, allowing simple installation and eliminating a number of construction risks associated with in-situ construction. When installed in conjunction with our range of pipe systems, they offer a fully integrated drainage system.



Applications

Site specific RIDGISTORMCheck Vortex Flow Control Chambers are engineered to suit a range of stormwater systems, providing a hydraulically efficient means of flow regulation that does not use moving parts or require power to operate.

Key Features and Benefits

- Self-activating vortex flow controller which controls forward flow of water
- No moving parts - virtually maintenance free
- Manufactured with an integral sump for silt catchment/removal
- Can be manufactured to adoptable standards
- Multiple inlet and outlet options, allowing quick and seamless connection to pipelines
- Depths can be tailored to suit project requirements
- Optional integral benching
- Optional step rungs to BS EN 13101 and ladders to BS EN 14396
- Optional riser section and riser location ring
- Integral lifting points available on request to improve Health and Safety during handling and installation
- Stub connections and rocker pipes are available
- Manufactured in a factory controlled environment for improved quality of finish
- Eliminates wastage associated with in-situ construction

Other fabrications in our RIDGISTORMCheck range:

- Orifice Plate Flow Control Chambers

Performance

RIDGISTORMCheck Vortex Flow Control Chambers are fabricated from Ridgistorm-XL pipework, which is manufactured to meet the material requirements of BS EN 13476.

RIDGISTORMCHECK VORTEX FLOW CONTROL CHAMBER	
PHYSICAL PROPERTIES	
Diameter	1050-3000mm
Depth	To suit requirements
Material	HDPE
Colour	Black with Blue Interior
Flow control units	Grade 304 Stainless Steel
Chemical resistance	HDPE is naturally resistant to most chemicals associated with stormwater drainage systems
Inlets/outlets	100-3000mm
Hydraulic performance	Unit manufactured to suit site specific conditions

Our Ridgistorm-XL Fabrications range

All of our Ridgistorm-XL fabrications are tailor-made, fully-welded, watertight structured wall chambers to suit project-specific requirements. Health and Safety benefits become apparent during handling and installation, due to our fabrications' strong but light in weight nature. In addition, off-site construction ensures uncompromised, high quality products being delivered to site ready-to-install, reducing installation time and costs.



RIDGISTORMCheck Vortex Flow Control Chambers

Data Sheet

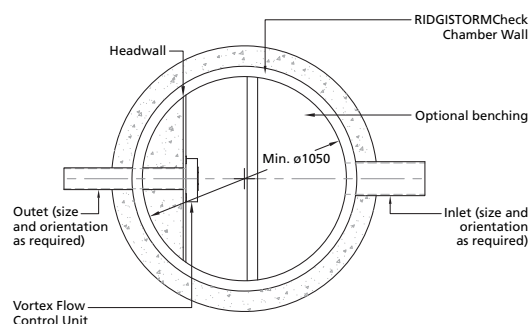
PRODUCT INFORMATION

P2

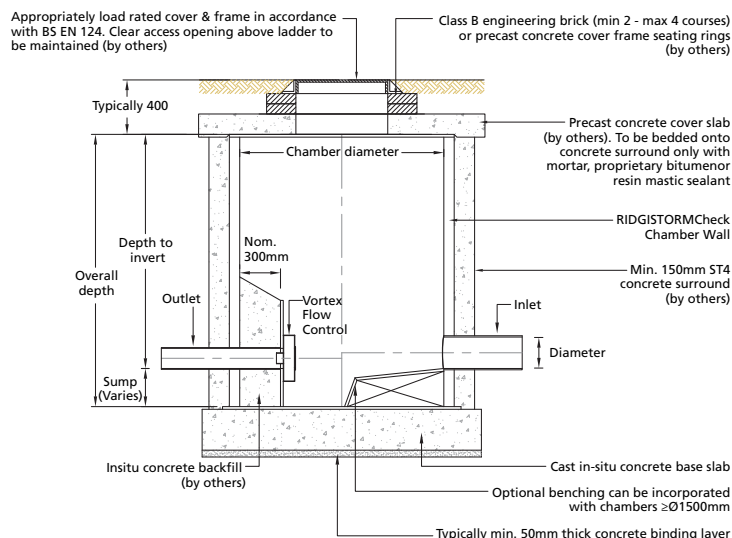
ISSUE 2 - MAR 2019

Non-Bypass Chamber

For sites where discharge rates must be guaranteed to not exceed a prescribed limit(s).

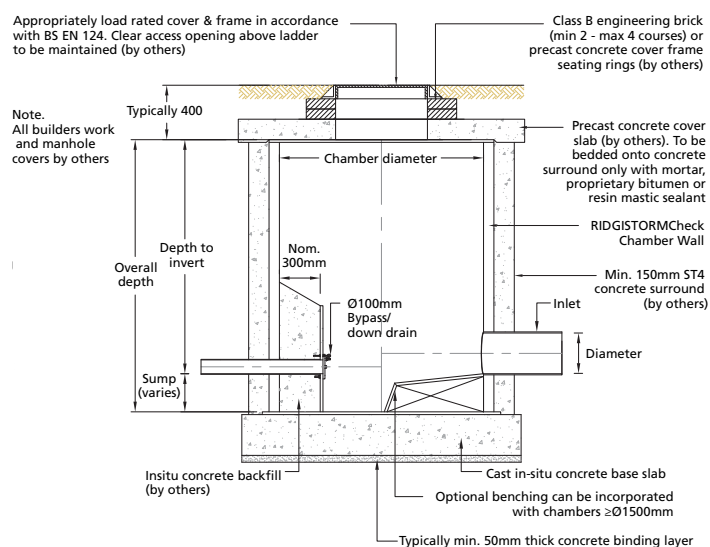
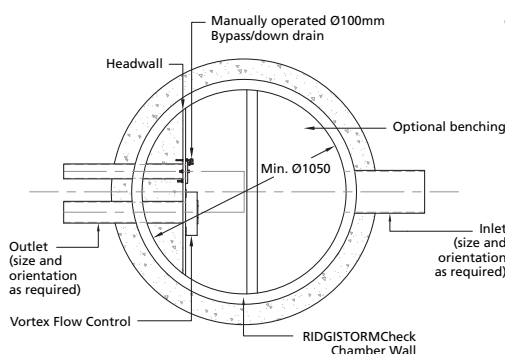


Note:
All builders work and
manhole covers by others



Manual Bypass Design

The manual bypass design offers a bypass the ability to flow control device to facilitate maintenance. Manually operated from the surface, the activation of the bypass system opens a door in the head wall allowing water in the chamber to drain down via the bypass pipe.



For further information please contact our Technical Team on +44 (0) 1509 615100 or download our CAD Standard Details from our website www.polypipe.com/civils-technical-hub

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APPENDIX J: Bypass Separator Details

SEPARATORS

A RANGE OF FUEL/OIL SEPARATORS
FOR PEACE OF MIND



60 YEARS OF
Expertise &
Innovation
1955-2015

Bypass NSB RANGE

APPLICATION

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

PERFORMANCE

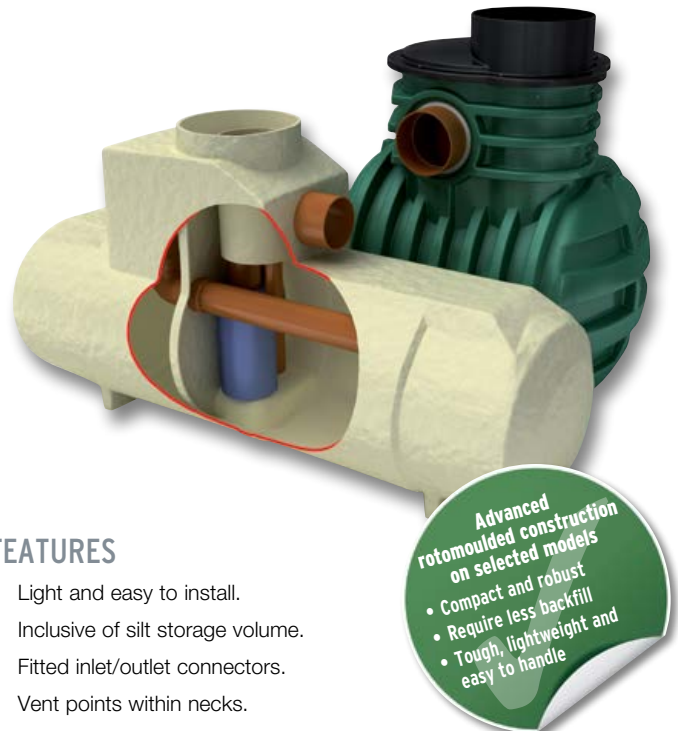
Klargester were one of the first UK manufacturers to have separators tested to EN 858-1. Klargester have now added the NSB bypass range to their portfolio of certified and tested models. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan Klargester Bypass separators and certified their performance in relation to their flow and process performance assessing the effluent qualities to the requirements of EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Oil storage volume.
- Silt storage capacity.
- Coalescer.

The unit is designed to treat 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 $NSB = 0.0018A(m^2)$. Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.



FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped.
- The drain invert inlet depth.
- Pipework type, size and orientation.

SIZES AND SPECIFICATIONS

UNIT NOMINAL SIZE	FLOW (l/s)	PEAK FLOW RATE (l/s)	DRAINAGE AREA (m ²)	STORAGE CAPACITY (litres)		UNIT LENGTH (mm)	UNIT DIA. (mm)	ACCESS SHAFT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT	STANDARD FALL ACROSS (mm)	MIN. INLET INVERT (mm)	STANDARD PIPEWORK DIA.
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

Rotomoulded chamber construction
 GRP chamber construction
 * Some units have more than one access shaft – diameter of largest shown.

PROFESSIONAL INSTALLERS

Kingspan Klargester Accredited Installers

Experience shows that correct installation is a prerequisite for the long-lasting and successful operation of any wastewater treatment product. This is why using an installer with the experience and expertise to install your product is highly recommended.



Services include :

- Site survey to establish ground conditions and soil types
- Advice on system design and product selection
- Assistance on gaining environmental consents and building approvals
- Tank and drainage system installation
- Connection to discharge point and electrical networks
- Waste emptying and disposal

Discover more about the Accredited Installers and locate your local expert online.

www.kingspanenviro.com/klargester



CARE & MAINTENANCE

Kingspan Environmental Services

Who better to look after your treatment plant than the people who designed and built it?



Kingspan Environmental have a dedicated service division providing maintenance for wastewater products.

Factory trained engineers are available for site visits as part of a planned maintenance contract or on a one-off call out basis.

To find out more about protecting your investment and ensuring peace of mind, call us on:

0844 846 0500

or visit us online:

www.kingspanenvservice.com



COMMERCIAL WASTEWATER SOLUTIONS

- **BIODISC® & ENVIROSAFE**
HIGH PERFORMANCE SEWAGE TREATMENT SYSTEMS
- PACKAGE PUMP STATIONS
- **PUMPSTOR24** PUMPING SYSTEMS
- OIL/WATER SEPARATORS
- BELOW GROUND STORAGE TANKS
- GREASE & SILT TRAPS

RAINWATER SOLUTIONS

- BELOW GROUND RAINWATER HARVESTING SYSTEMS
- ABOVE GROUND RAINWATER HARVESTING SYSTEMS

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Visit our website www.kingspanenviro.com/klargester



In keeping with Company policy of continuing research and development and in order to offer our clients the most advanced products, Kingspan Environmental reserves the right to alter specifications and drawings without prior notice.

APPENDIX K: SuDS Maintenance and Management Plan



**LIDL GREAT BRITAIN LTD
PURBROOK WAY
HAVANT**

**SUDS MANAGEMENT AND
MAINTENANCE PLAN**

NOVEMBER 2020



**LIDL GREAT BRITAIN LTD
PURBROOK WAY
HAVANT**

**SUDS MANAGEMENT AND
MAINTENANCE PLAN**

NOVEMBER 2020

Project Code:	A/LIDLHAVANT.23
Prepared by:	CG
Approved by:	SF
Issue Date:	November 2020
Status:	1st Issue

**LIDL Great Britain Ltd
Purbrook Way
Havant
SuDS Management and Maintenance Plan**

List of Contents

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Appendices

APPENDIX A: Proposed Drainage Strategy	
--	--

1 Introduction

- 1.1 Mayer Brown Ltd have been commissioned by Lidl Great Britain Ltd to provide a SuDS Management and Maintenance Plan in support of a planning application for a proposed new food store development located at Purbrook Way, Havant.
- 1.2 The proposed surface water drainage network (refer to Appendix A) utilises Sustainable Drainage techniques (SuDS) including a petrol interceptor and a proprietary attenuation tank. The management and maintenance of these features is of paramount importance to ensure their effectiveness over the lifetime of the development.
- 1.3 The proposed surface water attenuation features will not be adopted by any public body and will remain in private ownership. There will be a designated site maintenance team employed who should enable tight control over the operation and maintenance of the drainage/SuDS systems as proposed in this report.
- 1.4 This Owner's Manual is for advising the required maintenance activities for the sustainable drainage network. This report has been prepared with reference to CIRIA document C753 – The SuDS Manual and provides current best practice guidance on Sustainable Drainage Systems (SuDS) to facilitate their effective implementation within developments.

2 Management and Maintenance of SuDS Features

Introduction

- 2.1 Unlike conventional drainage systems, SuDS features should be visible and their function should be easily understood by those responsible for maintenance. When problems occur, they are generally obvious and can be remedied simply, using standard landscaping practice. If systems are properly monitored and maintained, any deterioration in performance can often be managed out.
- 2.2 There are three categories of maintenance activities:
- **Regular Maintenance** (*including inspections and monitoring*) – Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.
 - **Occasional Maintenance** – Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (e.g. sediment removal).
 - **Remedial Maintenance** – Comprises intermittent tasks that may be required to rectify faults associated with the system.

Health and Safety

- 2.3 All those responsible for maintenance should take appropriate health and safety precautions of all activities (including lone working, if relevant) and risk assessments should always be undertaken.

Attenuation Tank

- 2.4 Attenuation tanks are excavations that are filled with a void-forming material (typically geocellular units) that allows the temporary storage of water before it discharges at a controlled rate into the downstream sewer network or watercourse.
- 2.5 Regular inspection and maintenance are required to ensure the effective long-term operation of the below ground storage tanks, see Table 2.1 below for details:

Maintenance Schedule	Required Action	Recommended Frequency
Regular Maintenance	Inspect for sediment and debris in pre-treatment components.	Annually
	Cleaning of gutters and any filters on downpipes.	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages.	Annually, or as required.
Occasional Maintenance	Remove sediments and debris from pre-treatment components.	As required, based on inspections.
Remedial Actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failures occur.	As required.
	Replacement of clogged geotextile (will require reconstruction of soakaway).	As required.
Monitoring	Inspect silt traps and note rate of sediment accumulation.	Monthly in the first year and then annually.
	Check soakaway to ensure emptying is occurring.	Annually.

Table 2.1: Soakaway Tank Maintenance Requirements

Petrol Interceptor

- 2.6 The petrol interceptor is designed in this system to remove oils, silts and sediments from the surface water before it is discharged into the sewer.
- 2.7 A petrol interceptor is a type of proprietary treatment system which are surface and subsurface manufactured products designed to provide treatment of water through the removal of contaminants.
- 2.8 Regular inspection and maintenance are important for the effective operation of proprietary treatment systems as designed; these are described in Table 2.2:

Maintenance Schedule	Required Action	Recommended Frequency
Routine Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation.	Six monthly.
	Change the filter media.	As recommended by manufacturer.
	Remove sediment, oil, grease and floatables.	As necessary – indicated by system inspections or immediately following significant spill.
Remedial Actions	Replace malfunctioning parts or structures.	As required.
Monitoring	Inspect for evidence of poor operation.	Six monthly.
	Inspect filter media and establish appropriate replacement frequencies.	Six monthly.
	Inspect sediment accumulation rates and establish appropriate removal frequencies.	Monthly during first half of operation, then every six months.

Table 2.2: Proprietary Treatment System Maintenance Requirements

- 2.9 However, there are specific requirements for oil/water separators. The following should be undertaken every six months as a minimum:
- Check volume of sludge,
 - Check thickness of light liquid,
 - Check function of automatic closure device,
 - Empty the separator, if required,
 - Check the coalescing material and clean or change if necessary (class 1 only), and
 - Check the function of the warning device (if fitted).
- 2.10 General inspection of the integrity of the oil/water separator should take place every five years and should cover:
- Watertightness of system,
 - Structural condition,

- Internal coatings,
- In-built parts,
- Electrical devices and installations, and
- Adjustment of automatic closure device.

2.11 It is usually required to fill separators with clean water before they are put into operation and after every time it is emptied for maintenance. Failure to do this will cause the separator to malfunction until surface water builds up the required permanent water level in the facility. It is possible to fit an alarm to separators that will indicate when the collected oil volume is at a maximum, and this may be a regulatory requirement. The alarms should be placed in a location that is clearly visible to those responsible for maintenance of the system.

3 Maintenance Activities

Regular Maintenance Activities

Inspections and Reporting

- 3.1 Inspections can generally be carried out at monthly site visits and should be subsumed into regular maintenance requirements. During the first year of operation, inspections should ideally be carried out after every significant storm event to ensure proper functioning, but in practice this may be difficult or impractical to arrange.
- 3.2 Typical routine inspection questions that will indicate when occasional or remedial maintenance activities are required, and/or when water quality requires investigation include:
- Are inlets or outlets blocked?
 - Is there evidence of sediment build up?
 - Is there evidence of structural damage that requires repair?

Litter/Debris Removal

- 3.3 This is an integral part of SuDS maintenance and reduces the risks of inlet and outlet blockages, retains amenity value and minimises pollution risks.

Irregular Maintenance Activities

Sediment Removal

- 3.4 To ensure long-term effectiveness, the sediment that accumulates in SuDS should be removed periodically.
- 3.5 Sediment accumulation will typically be rapid for the entire construction period (including time required for the building, turfing and landscaping of all upstream development plots). Once a catchment is completely developed and all vegetation is well-established, sediment mobility and accumulation is likely to drop significantly.

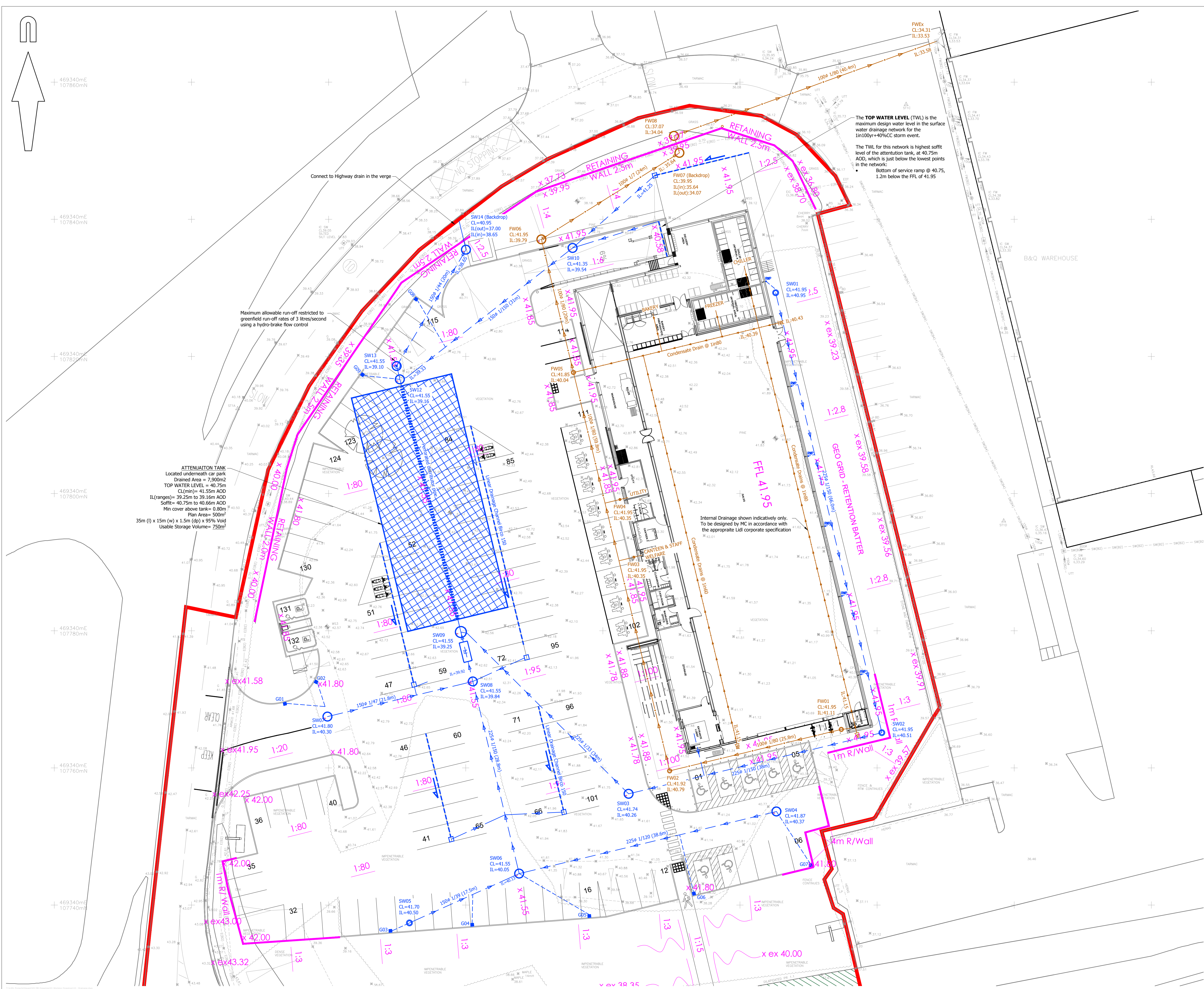
Remedial Maintenance

Structure rehabilitation/repair

- 3.6 There will come a time with most SuDS techniques when a major overhaul of the system is required to remove clogged filters, geotextiles, gravel etc. This will typically be between 10 and 25 years, depending on the technique and factors such as the type of catchment and sediment load.

- 3.7 Major overhaul is most likely to be required on techniques that rely on filtration through soils or aggregates, such as sand filters and infiltration devices. Other SuDS techniques are unlikely to need major overhaul if routine maintenance is undertaken as required.

APPENDIX A: Proposed Drainage Strategy



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A1 ORIGINAL

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KEY:

PROPOSED SURFACE WATER SEWER AND MANHOLE

PROPOSED FOUL WATER SEWER AND INSPECTION CHAMBER

PROPOSED FOUL WATER OFFSITE SEWER AND MANHOLE

PROPOSED SURFACE WATER SEWER AND INSPECTION CHAMBER

PROPOSED SURFACE WATER LINEAR DRAINAGE CHANNEL

PROPOSED PERFORATED PIPE

PROPOSED PETROL INTERCEPTOR

PROPOSED INFILTRATION TANK

PROPOSED SURFACE WATER RISING MAIN

PROPOSED RAIN WATER PIPE

PROPOSED RODDING EYE

ex 46.22

PROPOSED LEVELS FROM ONE DESIGN

PROPOSED RETAINING WALL DESIGNED BY ONE DESIGN

PROPOSED RED LINE BOUNDARY

NOTES:

1. This drawing is not to be scaled.

2. The proposed levels design has been carried out by One Design

3. Levels are in metres Above Ordnance Datum (m AOD)

FOR APPROVAL

NOT FOR CONSTRUCTION

P2

Drainage updated to suit One Design proposed level strategy (TIC)

SF

23/10/20

P1

Initial Issue: (SF)

SF

28/08/20

rev.

amendment

checked

date

m3

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client

LIDL UK GmbH

project

HAVANT

scale

1:250

drawn by

SF

checked by

SF

date

AUGUST 2020

cad file

10 - DRAINAGE

title

PROPOSED SURFACE AND FOUL WATER GENERAL ARRANGEMENT DRAWING

Mayer Brown Limited jobcode

suitability

revision

-

P2

drawing number

SF/LIDLHAVANT.23/10



APPENDIX L: Remada Ground Investigation Extract & Site Logs

PHASE 2 GROUND INVESTIGATION

Lidl Great Britain Ltd
Purbrook Way, Havant