

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1		5.00	27.850	600	381822.374	394309.021	0.600
S2	0.005	5.00	27.850	600	381819.300	394303.007	0.855
S3			27.900	600	381819.549	394298.614	0.938
S4	0.018	5.00	28.110	600	381831.907	394297.339	1.241
S5			28.110	1200	381837.499	394301.662	1.294
C1			28.110	600	381839.422	394300.995	1.310

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	6.754	0.600	27.250	26.995	0.255	26.5	150	5.06	50.0
1.001	S2	S3	4.400	0.600	26.995	26.962	0.033	133.3	150	5.14	50.0
1.002	S3	S4	12.424	0.600	26.962	26.869	0.093	133.6	150	5.38	50.0
1.003	S4	S5	7.068	0.600	26.869	26.816	0.053	133.4	150	5.52	50.0
1.004	S5	C1	2.035	0.600	26.816	26.800	0.016	127.2	150	5.55	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.964	34.7	0.0	0.450	0.705	0.000	0.0	0	0.000
1.001	0.868	15.3	0.7	0.705	0.788	0.005	0.0	21	0.433
1.002	0.868	15.3	0.7	0.788	1.091	0.005	0.0	21	0.432
1.003	0.868	15.3	3.1	1.091	1.144	0.023	0.0	46	0.683
1.004	0.889	15.7	3.1	1.144	1.160	0.023	0.0	45	0.695

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	6.754	26.5	150	Circular	27.850	27.250	0.450	27.850	26.995	0.705
1.001	4.400	133.3	150	Circular	27.850	26.995	0.705	27.900	26.962	0.788
1.002	12.424	133.6	150	Circular	27.900	26.962	0.788	28.110	26.869	1.091
1.003	7.068	133.4	150	Circular	28.110	26.869	1.091	28.110	26.816	1.144

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	600	Manhole	Adoptable	S2	600	Manhole	Adoptable
1.001	S2	600	Manhole	Adoptable	S3	600	Manhole	Adoptable
1.002	S3	600	Manhole	Adoptable	S4	600	Manhole	Adoptable
1.003	S4	600	Manhole	Adoptable	S5	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.004	2.035	127.2	150	Circular	28.110	26.816	1.144	28.110	26.800	1.160

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.004	S5	1200	Manhole	Adoptable	C1	600	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	17.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	40	0	0

Node S5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	26.816	Product Number	CTL-SHE-0045-1000-1200-1000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	27.760	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.400
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node S5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	26.810
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	67

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	7.0	0.0	0.500	7.0	0.0	0.501	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	1	27.250	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2	10	27.019	0.024	0.8	0.0095	0.0000	OK
15 minute winter	S3	11	26.985	0.023	0.8	0.0064	0.0000	OK
30 minute winter	S4	26	26.960	0.091	2.7	0.0520	0.0000	OK
30 minute winter	S5	26	26.960	0.144	2.7	1.1146	0.0000	OK
15 minute summer	C1	1	26.800	0.000	0.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0056	
15 minute winter	S2	1.001	S3	0.8	0.449	0.050	0.0075	
15 minute winter	S3	1.002	S4	0.8	0.240	0.049	0.0602	
30 minute winter	S4	1.003	S5	2.7	0.478	0.173	0.1006	
30 minute winter	S5	Hydro-Brake®	C1	0.7				2.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	1	27.250	0.000	0.0	0.0000	0.0000	OK
60 minute winter	S2	50	27.122	0.127	0.7	0.0507	0.0000	OK
60 minute winter	S3	50	27.122	0.160	0.7	0.0452	0.0000	SURCHARGED
60 minute winter	S4	50	27.122	0.253	3.3	0.1448	0.0000	SURCHARGED
60 minute winter	S5	51	27.121	0.305	2.8	2.3740	0.0000	SURCHARGED
15 minute summer	C1	1	26.800	0.000	0.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0164	
60 minute winter	S2	1.001	S3	0.7	0.433	0.048	0.0736	
60 minute winter	S3	1.002	S4	0.7	0.197	0.046	0.2187	
60 minute winter	S4	1.003	S5	2.8	0.417	0.185	0.1244	
60 minute winter	S5	Hydro-Brake®	C1	0.7				5.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	S1	59	27.645	0.395	1.0	0.1117	0.0000	FLOOD RISK
60 minute winter	S2	59	27.645	0.650	2.3	0.2598	0.0000	FLOOD RISK
60 minute winter	S3	59	27.645	0.683	2.2	0.1932	0.0000	FLOOD RISK
60 minute winter	S4	59	27.644	0.775	5.3	0.4443	0.0000	SURCHARGED
60 minute winter	S5	59	27.644	0.828	4.7	4.2224	0.0000	SURCHARGED
15 minute summer	C1	1	26.800	0.000	0.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	S1	1.000	S2	-1.0	-0.067	-0.029	0.1189	
60 minute winter	S2	1.001	S3	-1.2	0.464	-0.077	0.0775	
60 minute winter	S3	1.002	S4	-2.2	0.194	-0.145	0.2187	
60 minute winter	S4	1.003	S5	4.7	0.482	0.309	0.1244	
60 minute winter	S5	Hydro-Brake®	C1	0.9				9.2