Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	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)	20.000	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)	2.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
SW01	0.051	2.00	211.300	1200	1.200
SW02	0.029	2.00	211.800	1800	1.739
SW03	0.076	2.00	211.300	1200	1.184
SW04			213.600	1800	3.623
YW			213.280	1800	3.371

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	SW01	SW02	9.770	0.600	210.100	210.061	0.039	250.5	300	2.16	50.0
2.000	SW03	SW02	12.390	0.600	210.116	210.061	0.055	225.3	300	2.20	50.0
1.001	SW02	SW04	41.670	0.600	210.061	209.977	0.084	496.1	825	2.72	50.0
1.002	SW04	YW	13.620	0.600	209.977	209.909	0.068	200.0	825	2.83	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	0.989	69.9	6.9	0.900	1.439	0.051	0.0	64	0.637
2.000	1.043	73.7	10.3	0.884	1.439	0.076	0.0	75	0.740
1.001	1.326	708.8	21.1	0.914	2.798	0.156	0.0	96	0.609
1.002	2.095	1120.1	21.1	2.798	2.546	0.156	0.0	77	0.842

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	9.770	250.5	300	Circular	211.300	210.100	0.900	211.800	210.061	1.439
2.000	12.390	225.3	300	Circular	211.300	210.116	0.884	211.800	210.061	1.439
1.001	41.670	496.1	825	Circular	211.800	210.061	0.914	213.600	209.977	2.798
1.002	13.620	200.0	825	Circular	213.600	209.977	2.798	213.280	209.909	2.546

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW01	1200	Manhole	Adoptable	SW02	1800	Manhole	Adoptable
2.000	SW03	1200	Manhole	Adoptable	SW02	1800	Manhole	Adoptable
1.001	SW02	1800	Manhole	Adoptable	SW04	1800	Manhole	Adoptable
1.002	SW04	1800	Manhole	Adoptable	YW	1800	Manhole	Adoptable

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Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW01	211.300	1.200	1200				
				0	1.000	210.100	300
SW02	211.800	1.739	1800	1	2.000	210.061	300
				2	1.000	210.061	300
				0	1.001	210.061	825
SW03	211.300	1.184	1200				
				0	2.000	210.116	300
SW04	213.600	3.623	1800	1	1.001	209.977	825
				0	1.002	209.977	825
YW	213.280	3.371	1800	1	1.002	209.909	825

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Node SW04 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	209.977	Product Number	CTL-SHE-0190-2130-2000-2130
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	21.3	Min Node Diameter (mm)	1800

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Results for 1 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	SW01	9	210.183	0.083	9.6	0.1640	0.0000	OK
15 minute winter	SW02	11	210.177	0.116	25.9	0.3326	0.0000	OK
15 minute summer	SW03	9	210.212	0.096	14.3	0.2322	0.0000	OK
15 minute summer	SW04	10	210.181	0.204	27.4	0.5192	0.0000	OK
15 minute summer	YW	1	209.909	0.000	17.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW01	1.000	SW02	9.5	0.519	0.135	0.1889	
15 minute summer	SW02	1.001	SW04	27.4	0.492	0.039	2.9593	
15 minute summer	SW03	2.000	SW02	14.3	0.693	0.194	0.2622	
15 minute summer	SW04	Hydro-Brake®	YW	17.6				9.0

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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 winter	SW01	12	210.382	0.282	20.9	0.5589	0.0000	OK
15 minute winter	SW02	12	210.382	0.321	58.8	0.9243	0.0000	OK
15 minute winter	SW03	12	210.382	0.266	31.1	0.6427	0.0000	OK
15 minute winter	SW04	12	210.381	0.404	38.6	1.0274	0.0000	OK
15 minute summer	YW	1	209.909	0.000	20.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW01	1.000	SW02	21.1	0.614	0.302	0.6439	
15 minute summer	SW02	1.001	SW04	45.9	0.590	0.065	8.3311	
15 minute summer	SW03	2.000	SW02	32.9	0.850	0.446	0.7906	
15 minute winter	SW04	Hydro-Brake®	YW	20.8				24.8

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Results for 100 year +45% 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
30 minute winter	SW01	25	211.221	1.121	27.7	2.2214	0.0000	FLOOD RISK
30 minute winter	SW02	25	211.221	1.160	77.9	3.3385	0.0000	SURCHARGED
30 minute winter	SW03	25	211.222	1.106	41.2	2.6707	0.0000	FLOOD RISK
30 minute winter	SW04	25	211.221	1.244	48.6	3.1661	0.0000	SURCHARGED
15 minute summer	YW	1	209.909	0.000	21.3	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW01	1.000	SW02	38.9	0.573	0.557	0.6880	
15 minute summer	SW02	1.001	SW04	71.2	0.688	0.100	20.0330	
15 minute summer	SW03	2.000	SW02	59.1	0.841	0.801	0.8725	
60 minute summer	SW04	Hydro-Brake®	YW	21.3				68.6

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