

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)	0.75
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.360	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.196	4.00	39.750	1	1.150
2	0.055	4.00	39.200	475	1.950
3	0.016	4.00	39.643	1350	2.423
4			39.580	1350	2.396
5			39.729	2400	2.650
6	0.043	4.00	39.403	2400	2.421
6_OUT			39.691	1200	2.791

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	1	2	9.763	0.600	38.600	38.300	0.300	32.5	300	4.06	50.0
1.001	2	3	7.154	0.600	37.250	37.220	0.030	238.5	450	4.15	50.0
1.002	3	4	8.944	0.600	37.220	37.184	0.036	248.4	375	4.28	50.0
1.003	4	5	29.272	0.600	37.184	37.079	0.105	278.8	375	4.73	50.0
1.004	5	6	26.678	0.600	37.079	36.982	0.097	275.0	1600	4.90	50.0
1.005	6	6_OUT	18.260	0.600	36.982	36.900	0.082	222.7	225	5.25	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	2.765	195.5	26.6	0.850	0.600	0.196	0.0	74	1.951
1.001	1.312	208.6	34.0	1.500	1.973	0.251	0.0	122	0.975
1.002	1.145	126.4	36.2	2.048	2.021	0.267	0.0	137	0.991
1.003	1.080	119.3	36.2	2.021	2.275	0.267	0.0	141	0.950
1.004	2.685	5398.9	36.2	1.050	0.821	0.267	0.0	90	0.804
1.005	0.872	34.7	42.0	2.196	2.566	0.310	0.0	225	0.888

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	9.763	32.5	300	Circular	39.750	38.600	0.850	39.200	38.300	0.600
1.001	7.154	238.5	450	Circular	39.200	37.250	1.500	39.643	37.220	1.973
1.002	8.944	248.4	375	Circular	39.643	37.220	2.048	39.580	37.184	2.021
1.003	29.272	278.8	375	Circular	39.580	37.184	2.021	39.729	37.079	2.275
1.004	26.678	275.0	1600	Circular	39.729	37.079	1.050	39.403	36.982	0.821
1.005	18.260	222.7	225	Circular	39.403	36.982	2.196	39.691	36.900	2.566

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1	Manhole	Adoptable	2	475	Manhole	Adoptable
1.001	2	475	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.002	3	1350	Manhole	Adoptable	4	1350	Manhole	Adoptable
1.003	4	1350	Manhole	Adoptable	5	2400	Manhole	Adoptable
1.004	5	2400	Manhole	Adoptable	6	2400	Manhole	Adoptable
1.005	6	2400	Manhole	Adoptable	6_OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	39.750	1.150	1				
				0	1.000	38.600	300
2	39.200	1.950	475		1	1.000	38.300
				0	1.001	37.250	450
3	39.643	2.423	1350		1	1.001	37.220
				0	1.002	37.220	375
4	39.580	2.396	1350		1	1.002	37.184
				0	1.003	37.184	375
5	39.729	2.650	2400		1	1.003	37.079
				0	1.004	37.079	1600
6	39.403	2.421	2400		1	1.004	36.982
				0	1.005	36.982	225
6_OUT	39.691	2.791	1200		1	1.005	36.900
							225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	18.000	Drain Down Time (mins)	240
Ratio-R	0.360	Additional Storage (m ³ /ha)	20.0
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
8	0	0	0
30	0	0	0
100	0	0	40

Node 6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	36.982	Product Number	CTL-SHE-0132-1000-1950-1000
Design Depth (m)	1.950	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	10.0	Min Node Diameter (mm)	1500

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.94	Time to half empty (mins)	108

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	61.8	0.0	1.350	61.8	0.0	1.351	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	38.693	0.093	33.7	0.3153	0.0000	OK
30 minute summer	2	19	37.383	0.133	37.7	7.8506	0.0000	OK
30 minute summer	3	19	37.359	0.139	30.2	0.2171	0.0000	OK
60 minute summer	4	41	37.349	0.165	25.0	0.2357	0.0000	OK
60 minute summer	5	41	37.349	0.270	25.1	1.2193	0.0000	OK
60 minute summer	6	41	37.352	0.370	21.9	1.8031	0.0000	SURCHARGED
15 minute summer	6_OUT	1	36.900	0.000	9.5	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	1	1.000	2	33.7	1.957	0.172	0.1682	
30 minute summer	2	1.001	3	28.3	0.707	0.136	0.2892	
30 minute summer	3	1.002	4	30.1	0.851	0.238	0.3346	
60 minute summer	4	1.003	5	25.1	0.854	0.210	1.9224	
60 minute summer	5	1.004	6	18.3	0.185	0.003	7.6262	
60 minute summer	6	Hydro-Brake®	6_OUT	9.7				35.1

Results for 8 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	38.733	0.133	62.3	0.4527	0.0000	OK
60 minute summer	2	45	37.521	0.271	50.4	15.9371	0.0000	OK
60 minute summer	3	47	37.521	0.301	42.0	0.4710	0.0000	OK
60 minute summer	4	47	37.522	0.338	40.5	0.4832	0.0000	OK
60 minute summer	5	46	37.521	0.442	35.2	1.9977	0.0000	OK
60 minute summer	6	47	37.520	0.538	28.0	2.6262	0.0000	SURCHARGED
15 minute summer	6_OUT	1	36.900	0.000	9.9	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	1	1.000	2	62.3	2.265	0.319	0.2687	
60 minute summer	2	1.001	3	38.9	0.734	0.186	0.7596	
60 minute summer	3	1.002	4	40.5	0.902	0.320	0.8921	
60 minute summer	4	1.003	5	35.2	0.796	0.295	3.1447	
60 minute summer	5	1.004	6	19.6	0.185	0.004	13.8825	
60 minute summer	6	Hydro-Brake®	6_OUT	10.0				63.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	38.759	0.159	82.5	0.5413	0.0000	OK
60 minute winter	2	57	37.683	0.433	47.8	25.4780	0.0000	OK
60 minute winter	3	55	37.684	0.464	35.4	0.7248	0.0000	SURCHARGED
60 minute summer	4	52	37.683	0.499	44.1	0.7141	0.0000	SURCHARGED
60 minute winter	5	57	37.682	0.603	29.8	2.7285	0.0000	OK
60 minute winter	6	57	37.682	0.700	23.9	3.4156	0.0000	SURCHARGED
15 minute summer	6_OUT	1	36.900	0.000	10.0	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	1	1.000	2	82.5	2.409	0.422	0.3344	
60 minute winter	2	1.001	3	32.6	0.713	0.156	1.1267	
60 minute winter	3	1.002	4	33.8	0.867	0.268	0.9865	
60 minute summer	4	1.003	5	37.8	0.791	0.317	3.2286	
60 minute winter	5	1.004	6	16.0	0.206	0.003	20.4528	
60 minute winter	6	Hydro-Brake®	6_OUT	10.0				85.4

Results for 100 year +40% Q Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	38.848	0.248	149.1	0.8454	0.0000	OK
120 minute winter	2	116	38.409	1.159	55.2	68.1883	0.0000	SURCHARGED
120 minute winter	3	118	38.410	1.190	28.5	1.8605	0.0000	SURCHARGED
120 minute winter	4	116	38.409	1.225	27.7	1.7525	0.0000	SURCHARGED
120 minute winter	5	116	38.408	1.329	26.9	6.0138	0.0000	OK
120 minute winter	6	116	38.408	1.426	23.7	6.9587	0.0000	SURCHARGED
15 minute summer	6_OUT	1	36.900	0.000	10.0	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	1	1.000	2	149.2	2.682	0.763	0.5392	
120 minute winter	2	1.001	3	25.0	0.633	0.120	1.1335	
120 minute winter	3	1.002	4	27.7	0.739	0.219	0.9865	
120 minute winter	4	1.003	5	26.9	0.782	0.226	3.2286	
120 minute winter	5	1.004	6	14.4	0.205	0.003	48.8982	
120 minute winter	6	Hydro-Brake®	6_OUT	10.0				188.5