

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	20	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)	20.000	Minimum Backdrop Height (m)	0.500
Ratio-R	0.300	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)
1	0.310	5.00	78.141	20	373861.824	438462.689	1.575
2	0.000	5.00	78.283	1350	373850.080	438421.935	2.146
3	0.020	5.00	78.332	2100	373847.784	438415.822	2.382
4	0.041	5.00	77.277	2700	373819.543	438415.325	4.178
5	0.035	5.00	75.378	2700	373781.216	438425.101	2.378
6			75.131	1200	373775.381	438428.949	2.326

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	42.412	0.600	76.566	76.137	0.429	98.9	150	5.70	50.0
1.001	2	3	6.531	0.600	76.137	75.950	0.187	35.0	150	5.76	50.0
1.002	3	4	28.245	0.600	75.950	75.143	0.807	35.0	150	6.04	50.0
1.003	4	5	39.554	0.600	73.099	73.000	0.099	400.0	900	6.46	50.0
1.004	5	6	6.989	0.600	73.000	72.805	0.195	35.8	150	6.53	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)
1.000	1.010	17.9	42.0	1.425	1.996	0.310	0.0
1.001	1.707	30.2	42.0	1.996	2.232	0.310	0.0
1.002	1.707	30.2	44.7	2.232	1.984	0.330	0.0
1.003	1.560	992.5	50.3	3.278	1.478	0.371	0.0
1.004	1.686	29.8	55.0	2.228	2.176	0.406	0.0

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	42.412	98.9	150	Circular	78.141	76.566	1.425	78.283	76.137	1.996
1.001	6.531	35.0	150	Circular	78.283	76.137	1.996	78.332	75.950	2.232
1.002	28.245	35.0	150	Circular	78.332	75.950	2.232	77.277	75.143	1.984
1.003	39.554	400.0	900	Circular	77.277	73.099	3.278	75.378	73.000	1.478

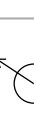
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	20	Junction		2	1350	Manhole	Adoptable
1.001	2	1350	Manhole	Adoptable	3	2100	Manhole	Adoptable
1.002	3	2100	Manhole	Adoptable	4	2700	Manhole	Adoptable
1.003	4	2700	Manhole	Adoptable	5	2700	Manhole	Adoptable

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	6.989	35.8	150	Circular	75.378	73.000	2.228	75.131	72.805	2.176

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.004	5	2700	Manhole	Adoptable	6	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	373861.824	438462.689	78.141	1.575	20		0	1.000	76.566	150
2	373850.080	438421.935	78.283	2.146	1350		1	1.000	76.137	150
3	373847.784	438415.822	78.332	2.382	2100		1	1.001	75.950	150
4	373819.543	438415.325	77.277	4.178	2700		0	1.002	75.950	150
5	373781.216	438425.101	75.378	2.378	2700		1	1.002	75.143	150
6	373775.381	438428.949	75.131	2.326	1200		0	1.003	73.099	900
							1	1.003	73.000	900
								1.004	73.000	150
								1.004	72.805	150

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Check Discharge Rate(s)	x
Summer CV	0.750	Check Discharge Volume	x
Analysis Speed	Normal		

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 %)
2	0	0	0
30	0	0	0
100	45	0	0

Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	73.000	Product Number	CTL-SHE-0055-2000-2400-2000
Design Depth (m)	2.400	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	2.0		
Invert Level (m)	76.137	Diameter (m)	0.020		

Node 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	76.566
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	379.5	0.0	0.800	379.5	0.0	0.801	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	1	780	76.702	0.136	5.2	52.1968	0.0000	OK
960 minute summer	2	780	76.702	0.565	0.8	0.8080	0.0000	SURCHARGED
15 minute summer	3	11	75.985	0.035	3.6	0.1271	0.0000	OK
120 minute summer	4	122	73.336	0.237	5.2	1.4017	0.0000	OK
120 minute summer	5	118	73.336	0.336	5.9	2.0235	0.0000	SURCHARGED
15 minute summer	6	1	72.805	0.000	1.2	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)
960 minute summer	1	1.000	2	0.8	0.148	0.044	0.7295	
960 minute summer	2	Orifice	3	0.6				
15 minute summer	3	1.002	4	3.5	1.136	0.116	0.0873	
120 minute summer	4	1.003	5	3.3	0.138	0.003	6.8700	
120 minute summer	5	Hydro-Brake®	6	1.2				23.5

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	1	960	76.841	0.275	9.2	105.2964	0.0000	SURCHARGED
960 minute summer	2	960	76.840	0.703	0.8	1.0058	0.0000	SURCHARGED
15 minute summer	3	11	75.999	0.049	6.8	0.1780	0.0000	OK
240 minute summer	4	244	73.645	0.546	5.9	3.2339	0.0000	OK
240 minute summer	5	244	73.645	0.645	5.1	3.8831	0.0000	SURCHARGED
15 minute summer	6	1	72.805	0.000	1.2	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)
960 minute summer	1	1.000	2	0.8	0.172	0.043	0.7467	
960 minute summer	2	Orifice	3	0.7				
15 minute summer	3	1.002	4	6.7	1.361	0.223	0.1393	
240 minute summer	4	1.003	5	2.3	0.145	0.002	17.5790	
240 minute summer	5	Hydro-Brake®	6	1.2				29.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	1	1440	77.141	0.575	12.1	220.3449	0.0000	SURCHARGED
1440 minute summer	2	1440	77.140	1.003	0.8	1.4348	0.0000	SURCHARGED
15 minute summer	3	10	76.020	0.070	12.9	0.2527	0.0000	OK
240 minute summer	4	240	75.033	1.934	10.6	11.4511	0.0000	SURCHARGED
240 minute summer	5	240	75.033	2.033	8.7	12.2366	0.0000	SURCHARGED
15 minute summer	6	1	72.805	0.000	1.2	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)
1440 minute summer	1	1.000	2	0.8	0.179	0.047	0.7467	
1440 minute summer	2	Orifice	3	0.8				
15 minute summer	3	1.002	4	12.6	1.609	0.419	0.2216	
240 minute summer	4	1.003	5	3.3	0.175	0.003	25.0683	
240 minute summer	5	Hydro-Brake®	6	1.9				42.2