



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)	0.500
Ratio-R	0.300	Preferred Cover Depth (m)	0.900
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	0.010	5.00	17.500		107008.387	500851.019	1.050
2	0.010	5.00	17.350	450	107005.552	500841.653	1.950
3	0.019	5.00	17.350	1350	107034.720	500832.825	2.100
4			17.150	1350	107045.683	500841.611	1.965
4_OUT			16.970		107046.706	500842.940	1.835

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	9.786	0.600	16.450	16.350	0.100	97.9	150	5.16	50.0
1.001	2	3	30.475	0.600	15.400	15.250	0.150	203.2	375	5.56	50.0
1.002	3	4	14.049	0.600	15.250	15.185	0.065	216.1	375	5.75	50.0
1.003	4	4_OUT	1.677	0.600	15.185	15.135	0.050	33.5	150	5.77	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	1.016	17.9	1.4	0.900	0.850	0.010	0.0	28	0.598
1.001	1.267	140.0	2.7	1.575	1.725	0.020	0.0	36	0.501
1.002	1.228	135.6	5.3	1.725	1.590	0.039	0.0	50	0.603
1.003	1.744	30.8	5.3	1.815	1.685	0.039	0.0	42	1.306

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	9.786	97.9	150	Circular	17.500	16.450	0.900	17.350	16.350	0.850
1.001	30.475	203.2	375	Circular	17.350	15.400	1.575	17.350	15.250	1.725
1.002	14.049	216.1	375	Circular	17.350	15.250	1.725	17.150	15.185	1.590
1.003	1.677	33.5	150	Circular	17.150	15.185	1.815	16.970	15.135	1.685

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1		Junction		2	450	Manhole	Adoptable
1.001	2	450	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.002	3	1350	Manhole	Adoptable	4	1350	Manhole	Adoptable
1.003	4	1350	Manhole	Adoptable	4_OUT		Junction	



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	107008.387	500851.019	17.500	1.050					
							0	1.000	16.450
2	107005.552	500841.653	17.350	1.950	450		1	1.000	16.350
							0	1.001	15.400
3	107034.720	500832.825	17.350	2.100	1350		1	1.001	15.250
							0	1.002	15.250
4	107045.683	500841.611	17.150	1.965	1350		1	1.002	15.185
							0	1.003	15.185
4_OUT	107046.706	500842.940	16.970	1.835			1	1.003	15.135

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	19.700	Additional Storage (m³/ha)	20.0
Ratio-R	0.300	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x
Analysis Speed	Detailed		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node 4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	15.185	Product Number	CTL-SHE-0064-2500-1965-2500
Design Depth (m)	1.965	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.5	Min Node Diameter (mm)	1200



Results for 2 year Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	16.483	0.033	1.9	0.0063	0.0000	OK
30 minute winter	2	26	15.444	0.044	3.2	0.0116	0.0000	OK
30 minute winter	3	26	15.443	0.193	6.2	0.3106	0.0000	OK
30 minute winter	4	25	15.444	0.259	4.5	0.3702	0.0000	SURCHARGED
15 minute winter	4_OUT	1	15.135	0.000	1.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	1.9	0.654	0.104	0.0279	
30 minute winter	2	1.001	3	3.2	0.332	0.023	0.9791	
30 minute winter	3	1.002	4	4.5	0.353	0.033	0.9683	
30 minute winter	4	Hydro-Brake®	4_OUT	1.8				4.7



Results for 30 year Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	16.497	0.047	3.7	0.0089	0.0000	OK
60 minute winter	2	52	15.755	0.355	4.5	0.0930	0.0000	OK
60 minute winter	3	51	15.750	0.500	7.7	0.8068	0.0000	SURCHARGED
60 minute winter	4	51	15.750	0.565	3.8	0.8086	0.0000	SURCHARGED
15 minute winter	4_OUT	1	15.135	0.000	1.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	3.6	0.789	0.203	0.0452	
60 minute winter	2	1.001	3	4.0	0.288	0.028	3.3262	
60 minute winter	3	1.002	4	3.8	0.336	0.028	1.5496	
60 minute winter	4	Hydro-Brake®	4_OUT	1.8				11.8



Results for 100 year Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	16.504	0.054	4.8	0.0102	0.0000	OK
60 minute winter	2	49	16.478	1.078	5.4	0.2825	0.0000	SURCHARGED
60 minute winter	3	51	16.478	1.228	9.6	1.9797	0.0000	SURCHARGED
60 minute winter	4	51	16.481	1.296	5.0	1.8540	0.0000	SURCHARGED
15 minute winter	4_OUT	1	15.135	0.000	1.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	4.7	0.846	0.263	0.0547	
60 minute winter	2	1.001	3	4.4	0.293	0.031	3.3613	
60 minute winter	3	1.002	4	5.0	0.368	0.037	1.5496	
60 minute winter	4	Hydro-Brake®	4_OUT	2.1				15.6



Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute winter	1	78	17.162	0.712	2.4	0.1353	0.0000	SURCHARGED
60 minute winter	2	41	17.159	1.759	8.8	0.4608	0.0000	FLOOD RISK
120 minute winter	3	76	17.155	1.905	8.7	3.0712	0.0000	FLOOD RISK
120 minute winter	4	76	17.150	1.965	7.5	2.8119	2.2849	FLOOD
15 minute winter	4_OUT	1	15.135	0.000	2.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute winter	1	1.000	2	2.4	0.703	0.134	0.1723	
60 minute winter	2	1.001	3	5.4	0.324	0.039	3.3613	
120 minute winter	3	1.002	4	7.5	0.336	0.055	1.5496	
120 minute winter	4	Hydro-Brake®	4_OUT	2.5				25.7