

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	x
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1.01		5.00	93.888	475	466919.020	173799.487	0.501
1.02			93.914	475	466927.342	173808.586	0.850
2.01		5.00	93.873	475	466908.298	173803.251	0.492
3.01	0.059	5.00	93.885	1200	466919.457	173815.632	1.003
4.01			93.885	1200	466908.173	173816.371	1.187
S/WAY			93.598	1200	466913.617	173820.908	0.950
PB1	0.007	5.00	93.575	475	466905.345	173818.119	0.680
PB2	0.006	5.00	93.675	475	466910.342	173813.471	0.430
PB3	0.006	5.00	93.575	475	466903.604	173816.495	0.680
Dummy			95.000	1200	466886.866	173790.321	1.500

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)
1.001	1.01	1.02	12.330	0.600	93.387	93.114	0.273	45.2	150	5.14	50.0
1.002	1.02	3.01	10.480	0.600	93.064	92.932	0.132	79.4	150	5.29	50.0
1.004	3.01	S/WAY	6.800	0.600	92.882	92.648	0.234	29.1	150	5.35	50.0
1.005	2.01	3.01	15.730	0.600	93.381	93.185	0.196	80.3	150	5.23	50.0
2.001	PB1	4.01	3.320	0.600	92.895	92.698	0.197	16.9	150	5.02	50.0
2.003	PB2	4.01	3.600	0.600	93.245	92.698	0.547	6.6	150	5.02	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)
1.001	1.501	26.5	0.0	0.351	0.650	0.000	0.0	0	0.000
1.002	1.129	20.0	0.0	0.700	0.803	0.000	0.0	0	0.000
1.004	1.874	33.1	8.0	0.853	0.800	0.059	0.0	50	1.547
1.005	1.123	19.8	0.0	0.342	0.550	0.000	0.0	0	0.000
2.001	2.465	43.6	0.9	0.530	1.037	0.007	0.0	16	1.008
2.003	3.953	69.9	0.8	0.280	1.037	0.006	0.0	11	1.323

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)
3.001	S/WAY	Dummy	40.635	0.600	92.782	93.500	-0.718	-56.6	150	6.03	50.0
4.001	PB3	4.01	4.600	0.600	92.895	92.698	0.197	23.4	150	5.04	50.0
4.002	4.01	S/WAY	1.000	0.600	92.849	92.648	0.201	5.0	150	5.04	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)
3.001	1.000	17.7	10.6	0.666	1.350	0.078	0.0	150	0.000
4.001	2.092	37.0	0.8	0.530	1.037	0.006	0.0	16	0.855
4.002	4.548	80.4	2.6	0.886	0.800	0.019	0.0	18	2.087

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)
1.001	12.330	45.2	150	Circular	93.888	93.387	0.351	93.914	93.114	0.650
1.002	10.480	79.4	150	Circular	93.914	93.064	0.700	93.885	92.932	0.803
1.004	6.800	29.1	150	Circular	93.885	92.882	0.853	93.598	92.648	0.800
1.005	15.730	80.3	150	Circular	93.873	93.381	0.342	93.885	93.185	0.550
2.001	3.320	16.9	150	Circular	93.575	92.895	0.530	93.885	92.698	1.037
2.003	3.600	6.6	150	Circular	93.675	93.245	0.280	93.885	92.698	1.037
3.001	40.635	-56.6	150	Circular	93.598	92.782	0.666	95.000	93.500	1.350
4.001	4.600	23.4	150	Circular	93.575	92.895	0.530	93.885	92.698	1.037
4.002	1.000	5.0	150	Circular	93.885	92.849	0.886	93.598	92.648	0.800

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	1.01	475	Manhole	Adoptable	1.02	475	Manhole	Adoptable
1.002	1.02	475	Manhole	Adoptable	3.01	1200	Manhole	Adoptable
1.004	3.01	1200	Manhole	Adoptable	S/WAY	1200	Manhole	Adoptable
1.005	2.01	475	Manhole	Adoptable	3.01	1200	Manhole	Adoptable
2.001	PB1	475	Manhole	Adoptable	4.01	1200	Manhole	Adoptable
2.003	PB2	475	Manhole	Adoptable	4.01	1200	Manhole	Adoptable
3.001	S/WAY	1200	Manhole	Adoptable	Dummy	1200	Manhole	Adoptable
4.001	PB3	475	Manhole	Adoptable	4.01	1200	Manhole	Adoptable
4.002	4.01	1200	Manhole	Adoptable	S/WAY	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1.01	466919.020	173799.487	93.888	0.501	475				
						0	1.001	93.387	150
1.02	466927.342	173808.586	93.914	0.850	475		1	1.001	93.114
						0	1.002	93.064	150
2.01	466908.298	173803.251	93.873	0.492	475				
						0	1.005	93.381	150
3.01	466919.457	173815.632	93.885	1.003	1200		1	1.005	93.185
						2	1.002	92.932	150
						0	1.004	92.882	150
4.01	466908.173	173816.371	93.885	1.187	1200		1	4.001	92.698
						2	2.003	92.698	150
						3	2.001	92.698	150
						0	4.002	92.849	150
S/WAY	466913.617	173820.908	93.598	0.950	1200		1	4.002	92.648
						2	1.004	92.648	150
						0	3.001	92.782	150
PB1	466905.345	173818.119	93.575	0.680	475				
						0	2.001	92.895	150
PB2	466910.342	173813.471	93.675	0.430	475				
						0	2.003	93.245	150
PB3	466903.604	173816.495	93.575	0.680	475				
						0	4.001	92.895	150
Dummy	466886.866	173790.321	95.000	1.500	1200		1	3.001	93.500

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	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	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 %)
1	0	0	0
30	0	0	0
100	40	0	0

Node S/WAY Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.06120	Invert Level (m)	92.648	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.06120	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	7.500		

Node PB1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	92.895	Depth (m)	0.300
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	12.500		

Node PB2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	93.245	Depth (m)	0.200
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	60	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	2.500	Number Required	1
Porosity	0.30	Pit Length (m)	18.000		

Node PB3 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	92.895	Depth (m)	0.300
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	1.00	Pit Length (m)	9.500		

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1.01	1	93.387	0.000	0.0	0.0000	0.0000	OK
15 minute summer	1.02	1	93.064	0.000	0.0	0.0000	0.0000	OK
15 minute summer	2.01	1	93.381	0.000	0.0	0.0000	0.0000	OK
15 minute summer	3.01	9	92.932	0.050	6.7	0.1163	0.0000	OK
480 minute winter	4.01	352	92.871	0.173	0.3	0.1958	0.0000	OK
480 minute winter	S/WAY	352	92.871	0.223	1.2	6.6116	0.0000	OK
15 minute winter	PB1	13	92.906	0.011	0.8	0.2194	0.0000	OK
15 minute winter	PB2	12	93.255	0.010	0.7	0.1376	0.0000	OK
60 minute winter	PB3	43	92.902	0.007	0.4	0.3511	0.0000	OK
15 minute summer	Dummy	1	93.500	0.000	0.0	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	1.01	1.001	1.02	0.0	0.000	0.000	0.0000	
15 minute summer	1.02	1.002	3.01	0.0	0.000	0.000	0.0000	
15 minute summer	2.01	1.005	3.01	0.0	0.000	0.000	0.0000	
15 minute summer	3.01	1.004	S/WAY	6.8	1.705	0.204	0.0419	
480 minute winter	4.01	4.002	S/WAY	0.3	0.064	0.004	0.0096	
480 minute winter	S/WAY	3.001	Dummy	0.0	0.000	0.000	0.2216	0.0
480 minute winter	S/WAY	Infiltration		0.3				
15 minute winter	PB1	2.001	4.01	0.5	0.333	0.012	0.0302	
15 minute winter	PB2	2.003	4.01	0.6	0.623	0.008	0.0324	
60 minute winter	PB3	4.001	4.01	0.2	0.023	0.004	0.0412	

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1.01	1	93.387	0.000	0.0	0.0000	0.0000	OK
15 minute summer	1.02	1	93.064	0.000	0.0	0.0000	0.0000	OK
15 minute summer	2.01	1	93.381	0.000	0.0	0.0000	0.0000	OK
240 minute winter	3.01	236	93.024	0.142	3.3	0.3284	0.0000	OK
240 minute winter	4.01	236	93.024	0.326	2.0	0.3691	0.0000	SURCHARGED
240 minute winter	S/WAY	236	93.024	0.376	3.6	11.1511	0.0000	SURCHARGED
240 minute winter	PB1	236	93.024	0.129	0.8	2.4746	0.0000	OK
15 minute winter	PB2	11	93.261	0.016	1.7	0.2167	0.0000	OK
240 minute winter	PB3	236	93.024	0.129	2.0	6.1899	0.0000	OK
15 minute summer	Dummy	1	93.500	0.000	0.0	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	1.01	1.001	1.02	0.0	0.000	0.000	0.0000	
15 minute summer	1.02	1.002	3.01	0.0	0.000	0.000	0.0137	
15 minute summer	2.01	1.005	3.01	0.0	0.000	0.000	0.0000	
240 minute winter	3.01	1.004	S/WAY	3.2	0.947	0.096	0.1186	
240 minute winter	4.01	4.002	S/WAY	-1.7	0.137	-0.021	0.0176	
240 minute winter	S/WAY	3.001	Dummy	0.0	0.000	0.000	0.3577	0.0
240 minute winter	S/WAY	Infiltration		0.3				
240 minute winter	PB1	2.001	4.01	-0.4	0.173	-0.009	0.0560	
15 minute winter	PB2	2.003	4.01	1.6	0.567	0.022	0.0334	
240 minute winter	PB3	4.001	4.01	-1.7	-0.140	-0.045	0.0776	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1.01	1	93.387	0.000	0.0	0.0000	0.0000	OK
600 minute winter	1.02	585	93.330	0.266	0.1	0.0471	0.0000	SURCHARGED
15 minute summer	2.01	1	93.381	0.000	0.0	0.0000	0.0000	OK
600 minute winter	3.01	585	93.330	0.448	2.9	1.0337	0.0000	SURCHARGED
600 minute winter	4.01	585	93.330	0.632	1.7	0.7148	0.0000	SURCHARGED
600 minute winter	S/WAY	585	93.330	0.682	2.8	20.2097	0.0000	FLOOD RISK
600 minute winter	PB1	585	93.330	0.435	0.6	5.8010	0.0000	FLOOD RISK
600 minute winter	PB2	585	93.330	0.085	0.3	1.1869	0.0000	OK
600 minute winter	PB3	585	93.330	0.435	1.6	14.4278	0.0000	FLOOD RISK
15 minute summer	Dummy	1	93.500	0.000	0.0	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	1.01	1.001	1.02	0.0	0.000	0.000	0.0016	
600 minute winter	1.02	1.002	3.01	-0.1	-0.008	-0.007	0.1845	
15 minute summer	2.01	1.005	3.01	0.0	0.000	0.000	0.0000	
600 minute winter	3.01	1.004	S/WAY	2.8	0.800	0.084	0.1197	
600 minute winter	4.01	4.002	S/WAY	-1.4	0.108	-0.018	0.0176	
600 minute winter	S/WAY	3.001	Dummy	0.0	0.000	0.000	0.3577	0.0
600 minute winter	S/WAY	Infiltration		0.4				
600 minute winter	PB1	2.001	4.01	-0.3	0.061	-0.008	0.0584	
600 minute winter	PB2	2.003	4.01	0.3	0.030	0.004	0.0502	
600 minute winter	PB3	4.001	4.01	-1.3	-0.077	-0.036	0.0810	