

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	19.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.450
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
RE2.00	0.014	4.00	238.850	320	415861.568	407174.586	0.450
S2.01	0.006	4.00	238.850	450	415856.186	407165.546	0.763
RE2.10	0.014	4.00	238.850	320	415886.294	407162.969	0.450
S2.02	0.007	4.00	238.850	450	415881.578	407153.240	1.116
RE1.00	0.014	4.00	238.850	320	415861.875	407116.799	0.450
S1.01	0.006	4.00	238.925	450	415852.417	407120.442	0.828
RE1.10	0.014	4.00	238.850	320	415872.195	407142.983	0.450
S1.02	0.006	4.00	238.925	450	415862.532	407146.704	1.180
S1.20	0.089	4.00	239.100	600	415857.653	407144.293	0.675
S1.21			239.100	1000	415858.068	407145.729	0.812
S1.03			238.825	1200	415864.573	407150.508	1.209
S1.04			238.825	1500	415879.430	407144.584	1.316
S1.05			238.160	600	415885.389	407141.374	0.820
EX			235.488	600	415891.408	407137.614	1.222

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)
1.000	RE1.00	S1.01	10.135	0.600	238.400	238.147	0.253	40.0	100	4.14
1.001	S1.01	S1.02	28.143	0.600	238.097	237.745	0.352	80.0	150	4.56
2.000	RE1.10	S1.02	10.355	0.600	238.400	237.795	0.605	17.1	100	4.09
1.002	S1.02	S1.03	4.317	0.600	237.745	237.691	0.054	80.0	150	4.62
3.000	S1.20	S1.21	1.495	0.600	238.425	238.388	0.037	40.0	225	4.01
3.001	S1.21	S1.03	8.072	0.600	238.288	237.616	0.672	12.0	225	4.05
1.003	S1.03	S1.04	15.995	0.600	237.616	237.509	0.107	150.0	225	4.87
4.000	RE2.00	S2.01	10.521	0.600	238.400	238.137	0.263	40.0	100	4.14
4.001	S2.01	S2.02	28.217	0.600	238.087	237.734	0.353	80.0	150	4.56

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	RE1.00	S1.01	1.223	9.6	2.4	0.350	0.678	0.014	35	1.027
1.001	S1.01	S1.02	1.125	19.9	3.4	0.678	1.030	0.020	42	0.842
2.000	RE1.10	S1.02	1.876	14.7	2.5	0.350	1.030	0.014	28	1.394
1.002	S1.02	S1.03	1.125	19.9	6.7	1.030	0.984	0.040	60	1.017
3.000	S1.20	S1.21	2.074	82.5	15.7	0.450	0.487	0.089	66	1.607
3.001	S1.21	S1.03	3.796	150.9	15.7	0.587	0.984	0.089	49	2.479
1.003	S1.03	S1.04	1.065	42.3	21.2	0.984	1.091	0.129	113	1.067
4.000	RE2.00	S2.01	1.223	9.6	2.4	0.350	0.613	0.014	35	1.027
4.001	S2.01	S2.02	1.125	19.9	3.4	0.613	0.966	0.020	42	0.842

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)
5.000	RE2.10	S2.02	10.812	0.600	238.400	237.784	0.616	17.6	100	4.10
4.002	S2.02	S1.04	8.919	0.600	237.734	237.592	0.142	62.8	150	4.68
1.004	S1.04	S1.05	6.769	0.600	237.509	237.340	0.169	40.0	150	4.94
1.005	S1.05	EX	7.097	0.600	237.340	234.266	3.074	2.3	150	4.96

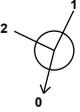
Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Pro Depth (mm)	Pro Velocity (m/s)
5.000	RE2.10	S2.02	1.852	14.5	2.5	0.350	0.966	0.014	28	1.376
4.002	S2.02	S1.04	1.271	22.5	6.8	0.966	1.083	0.041	57	1.116
1.004	S1.04	S1.05	1.596	28.2	27.8	1.166	0.670	0.170	122	1.813
1.005	S1.05	EX	6.683	118.1	27.7	0.670	1.072	0.170	50	5.488

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	10.135	40.0	100	Circular	238.850	238.400	0.350	238.925	238.147	0.678
1.001	28.143	80.0	150	Circular	238.925	238.097	0.678	238.925	237.745	1.030
2.000	10.355	17.1	100	Circular	238.850	238.400	0.350	238.925	237.795	1.030
1.002	4.317	80.0	150	Circular	238.925	237.745	1.030	238.825	237.691	0.984
3.000	1.495	40.0	225	Circular	239.100	238.425	0.450	239.100	238.388	0.487
3.001	8.072	12.0	225	Circular	239.100	238.288	0.587	238.825	237.616	0.984
1.003	15.995	150.0	225	Circular	238.825	237.616	0.984	238.825	237.509	1.091
4.000	10.521	40.0	100	Circular	238.850	238.400	0.350	238.850	238.137	0.613
4.001	28.217	80.0	150	Circular	238.850	238.087	0.613	238.850	237.734	0.966
5.000	10.812	17.6	100	Circular	238.850	238.400	0.350	238.850	237.784	0.966
4.002	8.919	62.8	150	Circular	238.850	237.734	0.966	238.825	237.592	1.083
1.004	6.769	40.0	150	Circular	238.825	237.509	1.166	238.160	237.340	0.670
1.005	7.097	2.3	150	Circular	238.160	237.340	0.670	235.488	234.266	1.072

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	RE1.00	320	Manhole	Adoptable	S1.01	450	Manhole	Adoptable
1.001	S1.01	450	Manhole	Adoptable	S1.02	450	Manhole	Adoptable
2.000	RE1.10	320	Manhole	Adoptable	S1.02	450	Manhole	Adoptable
1.002	S1.02	450	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
3.000	S1.20	600	Manhole	Adoptable	S1.21	1000	Manhole	Adoptable
3.001	S1.21	1000	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
1.003	S1.03	1200	Manhole	Adoptable	S1.04	1500	Manhole	Adoptable
4.000	RE2.00	320	Manhole	Adoptable	S2.01	450	Manhole	Adoptable
4.001	S2.01	450	Manhole	Adoptable	S2.02	450	Manhole	Adoptable
5.000	RE2.10	320	Manhole	Adoptable	S2.02	450	Manhole	Adoptable
4.002	S2.02	450	Manhole	Adoptable	S1.04	1500	Manhole	Adoptable
1.004	S1.04	1500	Manhole	Adoptable	S1.05	600	Manhole	Adoptable
1.005	S1.05	600	Manhole	Adoptable	EX	600	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
RE2.00	415861.568	407174.586	238.850	0.450	320				
S2.01	415856.186	407165.546	238.850	0.763	450		0	4.000	238.400
							1	4.000	238.137
							0	4.001	238.087
RE2.10	415886.294	407162.969	238.850	0.450	320				
S2.02	415881.578	407153.240	238.850	1.116	450		0	5.000	238.400
							1	5.000	237.784
							2	4.001	237.734
							0	4.002	237.734
RE1.00	415861.875	407116.799	238.850	0.450	320				
S1.01	415852.417	407120.442	238.925	0.828	450		0	1.000	238.400
							1	1.000	238.147
							0	1.001	238.097
RE1.10	415872.195	407142.983	238.850	0.450	320				
S1.02	415862.532	407146.704	238.925	1.180	450		0	2.000	238.400
							1	2.000	237.795
							2	1.001	237.745
							0	1.002	237.745
S1.20	415857.653	407144.293	239.100	0.675	600				
							0	3.000	238.425
S1.21	415858.068	407145.729	239.100	0.812	1000		1	3.000	238.388
							0	3.001	238.288
S1.03	415864.573	407150.508	238.825	1.209	1200		1	3.001	237.616
							2	1.002	237.691
							0	1.003	237.616
S1.04	415879.430	407144.584	238.825	1.316	1500		1	4.002	237.592
							2	1.003	237.509
							0	1.004	237.509
S1.05	415885.389	407141.374	238.160	0.820	600		1	1.004	237.340
							0	1.005	237.340

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
EX	415891.408	407137.614	235.488	1.222	600	1 	1.005	234.266	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	✓
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	19.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.300	Starting Level (m)	
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 | 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	30	0	0

Node S1.04 Online StormBrake™ Control

Flap Valve	x	Design Flow (l/s)	3.0
Replaces Downstream Link	✓	Product Code	FPM-SB1-01200-00300-1100
Invert Level (m)	237.509	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.200	Min Node Diameter (mm)	1200

Node S1.04 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	237.509
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	126.0	0.0	0.750	126.0	0.0	0.751	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	RE2.00	10	238.441	0.041	3.1	0.0032	0.0000	OK
15 minute summer	S2.01	10	238.135	0.048	4.4	0.0076	0.0000	OK
15 minute summer	RE2.10	10	238.432	0.032	3.1	0.0026	0.0000	OK
15 minute summer	S2.02	10	237.805	0.071	9.1	0.0113	0.0000	OK
15 minute summer	RE1.00	10	238.441	0.041	3.1	0.0033	0.0000	OK
15 minute summer	S1.01	10	238.145	0.048	4.4	0.0076	0.0000	OK
15 minute summer	RE1.10	10	238.432	0.032	3.1	0.0026	0.0000	OK
15 minute summer	S1.02	10	237.824	0.079	8.8	0.0126	0.0000	OK
15 minute summer	S1.20	10	238.523	0.098	19.7	0.0277	0.0000	OK
15 minute summer	S1.21	10	238.343	0.055	19.7	0.0430	0.0000	OK
15 minute summer	S1.03	9	237.764	0.148	28.5	0.1673	0.0000	OK
240 minute summer	S1.04	160	237.703	0.194	11.2	23.5534	0.0000	SURCHARGED
240 minute summer	S1.05	160	237.357	0.017	2.8	0.0047	0.0000	OK
240 minute summer	EX	160	234.282	0.016	2.8	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 summer	RE2.00	4.000	S2.01	3.1	1.066	0.323	0.0306	
15 minute summer	S2.01	4.001	S2.02	4.4	0.675	0.220	0.1839	
15 minute summer	RE2.10	5.000	S2.02	3.1	1.443	0.213	0.0232	
15 minute summer	S2.02	4.002	S1.04	9.0	1.149	0.401	0.0698	
15 minute summer	RE1.00	1.000	S1.01	3.1	1.064	0.323	0.0295	
15 minute summer	S1.01	1.001	S1.02	4.4	0.620	0.221	0.2001	
15 minute summer	RE1.10	2.000	S1.02	3.1	1.455	0.210	0.0221	
15 minute summer	S1.02	1.002	S1.03	8.8	1.000	0.442	0.0382	
15 minute summer	S1.20	3.000	S1.21	19.7	1.408	0.239	0.0210	
15 minute summer	S1.21	3.001	S1.03	19.7	1.311	0.131	0.1414	
15 minute summer	S1.03	1.003	S1.04	28.8	1.732	0.681	0.2803	
240 minute summer	S1.04	StormBrake™	S1.05	2.8				
240 minute summer	S1.05	1.005	EX	2.8	2.790	0.024	0.0072	41.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	RE2.00	10	238.460	0.060	5.9	0.0048	0.0000	OK
15 minute summer	S2.01	10	238.155	0.068	8.4	0.0108	0.0000	OK
15 minute summer	RE2.10	9	238.445	0.045	5.9	0.0036	0.0000	OK
360 minute summer	S2.02	248	237.909	0.175	3.9	0.0279	0.0000	SURCHARGED
15 minute summer	RE1.00	10	238.460	0.060	5.9	0.0048	0.0000	OK
15 minute summer	S1.01	10	238.165	0.068	8.4	0.0108	0.0000	OK
15 minute summer	RE1.10	10	238.444	0.044	5.9	0.0035	0.0000	OK
15 minute summer	S1.02	10	237.942	0.197	16.8	0.0313	0.0000	SURCHARGED
15 minute summer	S1.20	10	238.570	0.145	37.3	0.0410	0.0000	OK
15 minute summer	S1.21	10	238.364	0.076	37.3	0.0596	0.0000	OK
360 minute summer	S1.03	248	237.910	0.294	12.1	0.3320	0.0000	SURCHARGED
360 minute summer	S1.04	256	237.909	0.400	15.5	48.6014	0.0000	SURCHARGED
960 minute summer	S1.05	675	237.357	0.017	3.0	0.0048	0.0000	OK
960 minute summer	EX	675	234.282	0.016	3.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	RE2.00	4.000	S2.01	5.9	1.243	0.614	0.0499	
15 minute summer	S2.01	4.001	S2.02	8.4	0.778	0.422	0.3027	
15 minute summer	RE2.10	5.000	S2.02	5.9	1.583	0.406	0.0442	
360 minute summer	S2.02	4.002	S1.04	3.8	0.744	0.171	0.1570	
15 minute summer	RE1.00	1.000	S1.01	5.9	1.241	0.614	0.0482	
15 minute summer	S1.01	1.001	S1.02	8.4	0.653	0.422	0.3565	
15 minute summer	RE1.10	2.000	S1.02	5.9	1.495	0.400	0.0578	
15 minute summer	S1.02	1.002	S1.03	16.6	1.100	0.835	0.0760	
15 minute summer	S1.20	3.000	S1.21	37.3	1.643	0.452	0.0339	
15 minute summer	S1.21	3.001	S1.03	37.3	1.306	0.247	0.2080	
360 minute summer	S1.03	1.003	S1.04	11.7	0.747	0.275	0.6361	
360 minute summer	S1.04	StormBrake™	S1.05	3.0				
960 minute summer	S1.05	1.005	EX	3.0	2.835	0.025	0.0075	116.4

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute winter	RE2.00	328	238.670	0.270	1.4	0.0216	0.0000	FLOOD RISK
360 minute winter	S2.01	328	238.670	0.583	2.0	0.0926	0.0000	FLOOD RISK
360 minute winter	RE2.10	328	238.670	0.269	1.4	0.0216	0.0000	FLOOD RISK
360 minute winter	S2.02	328	238.670	0.936	4.1	0.1488	0.0000	FLOOD RISK
15 minute summer	RE1.00	11	238.688	0.288	9.8	0.0230	0.0000	FLOOD RISK
360 minute winter	S1.01	328	238.670	0.573	2.0	0.0911	0.0000	FLOOD RISK
360 minute winter	RE1.10	328	238.670	0.270	1.4	0.0216	0.0000	FLOOD RISK
360 minute winter	S1.02	328	238.670	0.925	4.0	0.1471	0.0000	FLOOD RISK
360 minute winter	S1.20	320	238.671	0.246	9.1	0.0696	0.0000	SURCHARGED
360 minute winter	S1.21	328	238.673	0.385	9.1	0.3020	0.0000	SURCHARGED
360 minute winter	S1.03	328	238.670	1.054	12.8	1.1920	0.0000	FLOOD RISK
360 minute winter	S1.04	328	238.670	1.161	16.5	91.8861	0.0000	FLOOD RISK
15 minute summer	S1.05	55	237.357	0.017	3.0	0.0048	0.0000	OK
15 minute summer	EX	55	234.282	0.016	3.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute winter	RE2.00	4.000	S2.01	1.4	0.860	0.146	0.0823	
360 minute winter	S2.01	4.001	S2.02	2.0	0.545	0.101	0.4968	
360 minute winter	RE2.10	5.000	S2.02	1.4	1.106	0.096	0.0846	
360 minute winter	S2.02	4.002	S1.04	3.9	0.698	0.171	0.1570	
15 minute summer	RE1.00	1.000	S1.01	9.2	1.282	0.963	0.0793	
360 minute winter	S1.01	1.001	S1.02	2.0	0.483	0.101	0.4955	
360 minute winter	RE1.10	2.000	S1.02	1.4	1.115	0.095	0.0810	
360 minute winter	S1.02	1.002	S1.03	3.8	0.756	0.189	0.0760	
360 minute winter	S1.20	3.000	S1.21	9.1	1.170	0.110	0.0595	
360 minute winter	S1.21	3.001	S1.03	9.1	0.866	0.060	0.3210	
360 minute winter	S1.03	1.003	S1.04	12.7	0.847	0.299	0.6361	
360 minute winter	S1.04	StormBrake™	S1.05	3.0				
15 minute summer	S1.05	1.005	EX	3.0	2.835	0.025	0.0075	38.5