

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	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	0.300	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)
SW1.00	0.082	5.00	10.000	1350	435949.741	566956.614	1.519
SW1.01			10.000	1350	435952.775	566966.129	1.586
SW1.02			10.000	1350	435994.073	566959.575	1.865
SW1.03			9.850	1350	435997.030	566944.644	1.816
SW1.04	0.089	5.00	9.900	1350	435980.780	566926.217	2.030
SW1.05			9.900	1350	435969.328	566923.268	2.184
SW1.06	0.087	5.00	8.460	1350	435950.701	566902.910	2.124
SW1.07			7.313	1350	435938.054	566897.742	2.551
SW1.08			4.158	1350	435912.581	566870.522	1.881
SW1.09			4.150	1350	435898.990	566854.429	2.227
SW2.00	0.012	5.00	7.840	1350	435930.329	566908.443	2.840
SW3.00	0.010	5.00	5.087	1350	435913.380	566878.963	1.825

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	SW1.00	SW1.01	9.987	0.600	8.481	8.414	0.067	150.0	225	5.16	50.0
1.001	SW1.01	SW1.02	41.815	0.600	8.414	8.135	0.279	150.0	225	5.81	50.0
1.002	SW1.02	SW1.03	15.221	0.600	8.135	8.034	0.101	150.0	225	6.05	50.0
1.003	SW1.03	SW1.04	24.569	0.600	8.034	7.870	0.164	150.0	225	6.43	50.0
1.004	SW1.04	SW1.05	11.826	0.600	7.870	7.791	0.079	150.0	225	6.62	50.0
1.005	SW1.05	SW1.06	27.594	0.600	7.716	6.336	1.380	20.0	300	6.75	50.0
1.006	SW1.06	SW1.07	13.662	0.600	6.336	4.970	1.366	10.0	300	6.79	50.0
1.007	SW1.07	SW1.08	37.280	0.600	4.762	2.277	2.485	15.0	300	6.95	50.0
1.008	SW1.08	SW1.09	21.064	0.600	2.277	1.923	0.354	59.5	300	7.12	50.0
2.000	SW2.00	SW1.07	13.198	0.600	5.000	4.912	0.088	150.0	150	5.27	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	1.065	42.3	11.1	1.294	1.361	0.082	0.0	79	0.901
1.001	1.065	42.3	11.1	1.361	1.640	0.082	0.0	79	0.901
1.002	1.065	42.3	11.1	1.640	1.591	0.082	0.0	79	0.901
1.003	1.065	42.3	11.1	1.591	1.805	0.082	0.0	79	0.901
1.004	1.065	42.3	23.2	1.805	1.884	0.171	0.0	119	1.090
1.005	3.531	249.6	23.2	1.884	1.824	0.171	0.0	61	2.236
1.006	4.999	353.4	35.0	1.824	2.043	0.258	0.0	63	3.220
1.007	4.079	288.3	36.6	2.251	1.581	0.270	0.0	72	2.829
1.008	2.042	144.3	37.9	1.581	1.927	0.280	0.0	105	1.730
2.000	0.818	14.5	1.6	2.690	2.251	0.012	0.0	34	0.539

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)
3.000	SW3.00	SW1.08	8.479	0.600	3.262	2.427	0.835	10.2	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)
3.000	3.180	56.2	1.4	1.675	1.581	0.010	0.0	16	1.334

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	9.987	150.0	225	1 STANDARD	10.000	8.481	1.294	10.000	8.414	1.361
1.001	41.815	150.0	225	1 STANDARD	10.000	8.414	1.361	10.000	8.135	1.640
1.002	15.221	150.0	225	1 STANDARD	10.000	8.135	1.640	9.850	8.034	1.591
1.003	24.569	150.0	225	1 STANDARD	9.850	8.034	1.591	9.900	7.870	1.805
1.004	11.826	150.0	225	1 STANDARD	9.900	7.870	1.805	9.900	7.791	1.884
1.005	27.594	20.0	300	1 STANDARD	9.900	7.716	1.884	8.460	6.336	1.824
1.006	13.662	10.0	300	1 STANDARD	8.460	6.336	1.824	7.313	4.970	2.043
1.007	37.280	15.0	300	1 STANDARD	7.313	4.762	2.251	4.158	2.277	1.581
1.008	21.064	59.5	300	1 STANDARD	4.158	2.277	1.581	4.150	1.923	1.927
2.000	13.198	150.0	150	1 STANDARD	7.840	5.000	2.690	7.313	4.912	2.251
3.000	8.479	10.2	150	1 STANDARD	5.087	3.262	1.675	4.158	2.427	1.581

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW1.00	1350	Manhole	1 STANDARD	SW1.01	1350	Manhole	1 STANDARD
1.001	SW1.01	1350	Manhole	1 STANDARD	SW1.02	1350	Manhole	1 STANDARD
1.002	SW1.02	1350	Manhole	1 STANDARD	SW1.03	1350	Manhole	1 STANDARD
1.003	SW1.03	1350	Manhole	1 STANDARD	SW1.04	1350	Manhole	1 STANDARD
1.004	SW1.04	1350	Manhole	1 STANDARD	SW1.05	1350	Manhole	1 STANDARD
1.005	SW1.05	1350	Manhole	1 STANDARD	SW1.06	1350	Manhole	1 STANDARD
1.006	SW1.06	1350	Manhole	1 STANDARD	SW1.07	1350	Manhole	1 STANDARD
1.007	SW1.07	1350	Manhole	1 STANDARD	SW1.08	1350	Manhole	1 STANDARD
1.008	SW1.08	1350	Manhole	1 STANDARD	SW1.09	1350	Manhole	1 STANDARD
2.000	SW2.00	1350	Manhole	1 STANDARD	SW1.07	1350	Manhole	1 STANDARD
3.000	SW3.00	1350	Manhole	1 STANDARD	SW1.08	1350	Manhole	1 STANDARD

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.300	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 SW1.09 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m ²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to All storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	1.830	10080	1.830

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	84.280	23.848
1 year 15 minute winter	59.144	23.848
1 year 30 minute summer	57.102	16.158
1 year 30 minute winter	40.072	16.158
1 year 60 minute summer	40.398	10.676
1 year 60 minute winter	26.839	10.676
1 year 120 minute summer	26.432	6.985
1 year 120 minute winter	17.561	6.985
1 year 180 minute summer	21.115	5.434
1 year 180 minute winter	13.725	5.434
1 year 240 minute summer	17.197	4.545
1 year 240 minute winter	11.425	4.545
1 year 360 minute summer	13.694	3.524
1 year 360 minute winter	8.901	3.524
1 year 480 minute summer	11.066	2.925
1 year 480 minute winter	7.352	2.925
1 year 600 minute summer	9.254	2.531
1 year 600 minute winter	6.323	2.531
1 year 720 minute summer	8.394	2.250
1 year 720 minute winter	5.641	2.250
1 year 960 minute summer	7.097	1.869
1 year 960 minute winter	4.701	1.869
1 year 1440 minute summer	5.374	1.440
1 year 1440 minute winter	3.611	1.440
1 year 2160 minute summer	4.012	1.109
1 year 2160 minute winter	2.764	1.109
1 year 2880 minute summer	3.437	0.921
1 year 2880 minute winter	2.310	0.921
1 year 4320 minute summer	2.717	0.710
1 year 4320 minute winter	1.789	0.710
1 year 5760 minute summer	2.311	0.591
1 year 5760 minute winter	1.496	0.591
1 year 7200 minute summer	2.002	0.511
1 year 7200 minute winter	1.292	0.511
1 year 8640 minute summer	1.776	0.453
1 year 8640 minute winter	1.146	0.453

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 10080 minute summer	1.605	0.409
1 year 10080 minute winter	1.036	0.409
30 year 15 minute summer	205.071	58.028
30 year 15 minute winter	143.910	58.028
30 year 30 minute summer	140.191	39.669
30 year 30 minute winter	98.380	39.669
30 year 60 minute summer	98.615	26.061
30 year 60 minute winter	65.517	26.061
30 year 120 minute summer	63.038	16.659
30 year 120 minute winter	41.881	16.659
30 year 180 minute summer	49.285	12.683
30 year 180 minute winter	32.037	12.683
30 year 240 minute summer	39.344	10.398
30 year 240 minute winter	26.139	10.398
30 year 360 minute summer	30.343	7.808
30 year 360 minute winter	19.724	7.808
30 year 480 minute summer	24.111	6.372
30 year 480 minute winter	16.019	6.372
30 year 600 minute summer	19.882	5.438
30 year 600 minute winter	13.585	5.438
30 year 720 minute summer	17.819	4.776
30 year 720 minute winter	11.975	4.776
30 year 960 minute summer	14.763	3.887
30 year 960 minute winter	9.779	3.887
30 year 1440 minute summer	10.836	2.904
30 year 1440 minute winter	7.282	2.904
30 year 2160 minute summer	7.836	2.166
30 year 2160 minute winter	5.399	2.166
30 year 2880 minute summer	6.555	1.757
30 year 2880 minute winter	4.405	1.757
30 year 4320 minute summer	4.995	1.306
30 year 4320 minute winter	3.290	1.306
30 year 5760 minute summer	4.130	1.057
30 year 5760 minute winter	2.673	1.057
30 year 7200 minute summer	3.521	0.898
30 year 7200 minute winter	2.272	0.898
30 year 8640 minute summer	3.082	0.786
30 year 8640 minute winter	1.989	0.786
30 year 10080 minute summer	2.754	0.702
30 year 10080 minute winter	1.777	0.702
100 year +40% CC 15 minute summer	368.854	104.373
100 year +40% CC 15 minute winter	258.845	104.373
100 year +40% CC 30 minute summer	255.101	72.185
100 year +40% CC 30 minute winter	179.018	72.185
100 year +40% CC 60 minute summer	180.954	47.821
100 year +40% CC 60 minute winter	120.222	47.821
100 year +40% CC 120 minute summer	116.088	30.679
100 year +40% CC 120 minute winter	77.126	30.679
100 year +40% CC 180 minute summer	90.626	23.321
100 year +40% CC 180 minute winter	58.909	23.321
100 year +40% CC 240 minute summer	72.104	19.055
100 year +40% CC 240 minute winter	47.904	19.055

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 360 minute summer	55.175	14.198
100 year +40% CC 360 minute winter	35.865	14.198
100 year +40% CC 480 minute summer	43.619	11.527
100 year +40% CC 480 minute winter	28.979	11.527
100 year +40% CC 600 minute summer	35.816	9.797
100 year +40% CC 600 minute winter	24.472	9.797
100 year +40% CC 720 minute summer	31.983	8.572
100 year +40% CC 720 minute winter	21.495	8.572
100 year +40% CC 960 minute summer	26.337	6.935
100 year +40% CC 960 minute winter	17.446	6.935
100 year +40% CC 1440 minute summer	19.151	5.133
100 year +40% CC 1440 minute winter	12.870	5.133
100 year +40% CC 2160 minute summer	13.707	3.788
100 year +40% CC 2160 minute winter	9.444	3.788
100 year +40% CC 2880 minute summer	11.375	3.049
100 year +40% CC 2880 minute winter	7.645	3.049
100 year +40% CC 4320 minute summer	8.565	2.239
100 year +40% CC 4320 minute winter	5.641	2.239
100 year +40% CC 5760 minute summer	7.017	1.796
100 year +40% CC 5760 minute winter	4.542	1.796
100 year +40% CC 7200 minute summer	5.944	1.516
100 year +40% CC 7200 minute winter	3.836	1.516
100 year +40% CC 8640 minute summer	5.175	1.320
100 year +40% CC 8640 minute winter	3.340	1.320
100 year +40% CC 10080 minute summer	4.604	1.174
100 year +40% CC 10080 minute winter	2.971	1.174

Results for 1 year Critical Storm Duration. Lowest mass balance: 74.21%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	SW1.00	10	8.554	0.073	8.9	0.1845	0.0000	OK
15 minute winter	SW1.01	11	8.484	0.070	8.8	0.0996	0.0000	OK
15 minute winter	SW1.02	11	8.207	0.072	8.7	0.1028	0.0000	OK
15 minute winter	SW1.03	12	8.102	0.068	8.6	0.0975	0.0000	OK
15 minute winter	SW1.04	11	7.977	0.107	17.4	0.2463	0.0000	OK
15 minute winter	SW1.05	11	7.769	0.053	17.2	0.0762	0.0000	OK
15 minute winter	SW1.06	11	6.393	0.057	25.9	0.1289	0.0000	OK
15 minute winter	SW1.07	11	4.824	0.062	27.1	0.0882	0.0000	OK
15 minute winter	SW1.08	13	3.802	1.525	27.4	2.1829	0.0000	SURCHARGED
15 minute summer	SW1.09	1	3.753	1.830	26.5	0.0000	0.0000	OK
15 minute winter	SW2.00	11	5.030	0.030	1.3	0.0457	0.0000	OK
30 minute winter	SW3.00	19	3.824	0.562	8.5	0.8665	0.0000	SURCHARGED

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	SW1.00	1.000	SW1.01	8.8	0.810	0.207	0.1080	
15 minute winter	SW1.01	1.001	SW1.02	8.7	0.824	0.206	0.4460	
15 minute winter	SW1.02	1.002	SW1.03	8.6	0.829	0.204	0.1587	
15 minute winter	SW1.03	1.003	SW1.04	8.6	0.613	0.203	0.3501	
15 minute winter	SW1.04	1.004	SW1.05	17.2	0.973	0.405	0.2087	
15 minute winter	SW1.05	1.005	SW1.06	17.1	1.943	0.068	0.2453	
15 minute winter	SW1.06	1.006	SW1.07	25.8	2.858	0.073	0.1236	
15 minute winter	SW1.07	1.007	SW1.08	27.0	1.190	0.094	1.5064	
15 minute winter	SW1.08	1.008	SW1.09	21.6	0.307	0.150	1.4833	5.6
15 minute winter	SW2.00	2.000	SW1.07	1.2	0.499	0.086	0.0328	
30 minute winter	SW3.00	3.000	SW1.08	-7.6	0.803	-0.136	0.1493	

Results for 30 year Critical Storm Duration. Lowest mass balance: 74.21%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	SW1.00	10	8.605	0.124	21.7	0.3104	0.0000	OK
15 minute winter	SW1.01	10	8.529	0.115	21.4	0.1639	0.0000	OK
15 minute winter	SW1.02	11	8.255	0.120	21.2	0.1717	0.0000	OK
15 minute winter	SW1.03	11	8.145	0.111	21.3	0.1587	0.0000	OK
15 minute winter	SW1.04	11	8.079	0.209	43.1	0.4827	0.0000	OK
15 minute winter	SW1.05	11	7.801	0.085	42.5	0.1209	0.0000	OK
15 minute winter	SW1.06	11	6.429	0.093	64.0	0.2097	0.0000	OK
15 minute winter	SW1.07	11	4.860	0.098	67.1	0.1398	0.0000	OK
15 minute summer	SW1.08	10	3.881	1.604	66.9	2.2949	0.0000	FLOOD RISK
15 minute summer	SW1.09	1	3.753	1.830	65.7	0.0000	0.0000	OK
15 minute winter	SW2.00	10	5.049	0.049	3.2	0.0738	0.0000	OK
15 minute summer	SW3.00	10	3.929	0.667	13.8	1.0281	0.0000	SURCHARGED

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	SW1.00	1.000	SW1.01	21.4	1.004	0.506	0.2129	
15 minute winter	SW1.01	1.001	SW1.02	21.2	1.023	0.501	0.8718	
15 minute winter	SW1.02	1.002	SW1.03	21.3	1.037	0.502	0.3119	
15 minute winter	SW1.03	1.003	SW1.04	21.0	0.719	0.496	0.7122	
15 minute winter	SW1.04	1.004	SW1.05	42.5	1.184	1.005	0.4211	
15 minute winter	SW1.05	1.005	SW1.06	42.4	2.460	0.170	0.4812	
15 minute winter	SW1.06	1.006	SW1.07	64.0	3.634	0.181	0.2406	
15 minute winter	SW1.07	1.007	SW1.08	67.0	1.392	0.232	1.6831	
15 minute summer	SW1.08	1.008	SW1.09	65.7	0.934	0.456	1.4833	22.8
15 minute winter	SW2.00	2.000	SW1.07	3.1	0.643	0.214	0.0637	
15 minute summer	SW3.00	3.000	SW1.08	-11.4	1.103	-0.203	0.1493	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 74.21%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	SW1.00	12	8.708	0.227	38.9	0.5697	0.0000	SURCHARGED
15 minute winter	SW1.01	12	8.655	0.241	38.5	0.3456	0.0000	SURCHARGED
15 minute winter	SW1.02	11	8.475	0.340	38.4	0.4865	0.0000	SURCHARGED
15 minute winter	SW1.03	11	8.405	0.371	33.7	0.5306	0.0000	SURCHARGED
15 minute winter	SW1.04	11	8.300	0.430	70.1	0.9931	0.0000	SURCHARGED
15 minute winter	SW1.05	11	7.826	0.110	70.0	0.1575	0.0000	OK
15 minute winter	SW1.06	11	6.463	0.127	108.7	0.2857	0.0000	OK
15 minute winter	SW1.07	11	4.928	0.166	114.2	0.2370	0.0000	OK
15 minute winter	SW1.08	11	4.065	1.788	117.6	2.5593	0.0000	FLOOD RISK
15 minute summer	SW1.09	1	3.753	1.830	111.1	0.0000	0.0000	OK
15 minute winter	SW2.00	10	5.068	0.068	5.7	0.1024	0.0000	OK
15 minute winter	SW3.00	11	4.070	0.808	14.1	1.2446	0.0000	SURCHARGED

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	SW1.00	1.000	SW1.01	38.5	1.133	0.908	0.3971	
15 minute winter	SW1.01	1.001	SW1.02	38.4	1.121	0.907	1.6630	
15 minute winter	SW1.02	1.002	SW1.03	33.7	1.065	0.796	0.6054	
15 minute winter	SW1.03	1.003	SW1.04	34.9	0.878	0.824	0.9771	
15 minute winter	SW1.04	1.004	SW1.05	70.0	1.760	1.653	0.4629	
15 minute winter	SW1.05	1.005	SW1.06	69.9	2.738	0.280	0.7140	
15 minute winter	SW1.06	1.006	SW1.07	108.7	4.132	0.308	0.3597	
15 minute winter	SW1.07	1.007	SW1.08	113.8	1.829	0.395	2.0561	
15 minute winter	SW1.08	1.008	SW1.09	116.1	1.649	0.805	1.4833	53.6
15 minute winter	SW2.00	2.000	SW1.07	5.6	0.749	0.385	0.0983	
15 minute winter	SW3.00	3.000	SW1.08	-10.4	1.090	-0.184	0.1493	