

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	45	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
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	0.072	5.00	182.099	1200	414846.243	409173.242	0.899
SW2	0.054	5.00	182.724	1200	414822.821	409138.622	1.434
SW3	0.032	5.00	182.877	1200	414832.224	409152.664	1.837
SW4		5.00	179.248	600	414761.232	409180.420	1.248
SW5	0.068	5.00	179.154	1500	414763.736	409185.704	1.650
SW6		5.00	180.625	600	414778.754	409158.226	1.250
SW7	0.060	5.00	180.576	1500	414780.554	409160.922	3.094
SW8			180.522	1500	414789.319	409175.745	3.089
SW9	0.019	5.00	181.140	1500	414801.078	409171.740	3.736
SW10			180.867	1800	414805.926	409179.581	4.037
SW11			180.867	1200	414813.434	409191.210	4.977
SW12			181.025	1500	414808.225	409177.828	4.138
SW13		5.00	180.883	1500	414818.214	409193.268	3.951

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)
S1	SW1	SW3	24.899	0.600	181.200	181.040	0.160	155.6	225	5.40	50.0
S2	SW2	SW3	16.900	0.600	181.290	181.115	0.175	96.6	150	5.28	50.0
S3	SW3	SW9	36.524	0.600	181.040	178.404	2.636	13.9	225	5.57	50.0
DMPN4	SW4	SW5	5.847	0.600	178.000	177.804	0.196	29.8	150	5.05	50.0
S4	SW5	SW8	27.453	0.600	177.504	177.433	0.071	386.7	450	5.50	50.0
DMPN5	SW6	SW7	3.242	0.600	179.375	179.132	0.243	13.3	150	5.02	50.0
S5	SW7	SW8	17.220	0.600	177.482	177.433	0.049	351.4	450	5.29	50.0
S6	SW8	SW9	12.422	0.600	177.433	177.404	0.029	428.3	450	5.71	50.0
S8	SW9	SW10	9.219	0.600	177.404	176.880	0.524	17.6	450	5.74	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)
S1	1.045	41.6	14.1	0.674	1.612	0.072	0.0	90	0.946
S2	1.022	18.1	10.6	1.284	1.612	0.054	0.0	83	1.064
S3	3.533	140.5	31.0	1.612	2.511	0.158	0.0	72	2.854
DMPN4	1.850	32.7	0.0	1.098	1.200	0.000	0.0	0	0.000
S4	1.028	163.4	13.4	1.200	2.639	0.068	0.0	87	0.629
DMPN5	2.772	49.0	0.0	1.100	1.294	0.000	0.0	0	0.000
S5	1.078	171.5	11.8	2.644	2.639	0.060	0.0	80	0.628
S6	0.976	155.2	25.2	2.639	3.286	0.128	0.0	122	0.724
S8	4.864	773.6	59.9	3.286	3.537	0.305	0.0	84	2.942

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)
S7	SW10	SW11	13.842	0.600	176.830	175.890	0.940	14.7	450	5.79	50.0
S10	SW12	SW10	2.891	0.600	176.887	176.880	0.007	413.0	450	5.36	50.0
S11	SW13	SW12	18.390	0.600	176.932	176.887	0.045	408.7	450	5.31	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)
S7	5.318	845.8	59.9	3.587	4.527	0.305	0.0	80	3.138
S10	0.994	158.1	0.0	3.688	3.537	0.000	0.0	0	0.000
S11	0.999	158.9	0.0	3.501	3.688	0.000	0.0	0	0.000

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	2880
Ratio-R	0.300	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	30	0	0

Node SW10 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	176.830	Design Flow (l/s)	3.5
Replaces Downstream Link	✓	Design Depth (m)	1.930		

Head (m)	Flow (l/s)										
0.100	1.610	0.500	1.780	0.900	2.390	1.300	2.870	1.700	3.280	2.100	3.650
0.200	2.180	0.600	1.950	1.000	2.520	1.400	2.980	1.800	3.380	2.200	3.740
0.300	2.010	0.700	2.110	1.100	2.640	1.500	3.090	1.900	3.470		
0.400	1.840	0.800	2.250	1.200	2.760	1.600	3.190	2.000	3.560		

Node SW13 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	176.910
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	552

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	120.0	0.0	1.500	120.0	0.0	1.501	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.02%

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	10	181.275	0.075	9.2	0.0843	0.0000	OK
15 minute winter	SW2	10	181.356	0.066	6.9	0.0748	0.0000	OK
15 minute winter	SW3	10	181.098	0.058	19.9	0.0653	0.0000	OK
15 minute summer	SW4	1	178.000	0.000	0.0	0.0000	0.0000	OK
15 minute winter	SW5	10	177.572	0.068	8.7	0.1210	0.0000	OK
15 minute summer	SW6	1	179.375	0.000	0.0	0.0000	0.0000	OK
15 minute winter	SW7	10	177.545	0.063	7.7	0.1118	0.0000	OK
15 minute winter	SW8	11	177.526	0.093	16.0	0.1645	0.0000	OK
15 minute winter	SW9	11	177.471	0.067	37.9	0.1183	0.0000	OK
240 minute winter	SW10	196	177.168	0.338	9.7	0.8600	0.0000	OK
15 minute summer	SW11	1	175.890	0.000	2.2	0.0000	0.0000	OK
240 minute winter	SW12	196	177.168	0.281	7.3	0.4964	0.0000	OK
240 minute winter	SW13	196	177.168	0.236	7.0	27.2580	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	SW1	S1	SW3	9.1	0.934	0.218	0.2428	
15 minute winter	SW2	S2	SW3	6.8	0.929	0.374	0.1229	
15 minute winter	SW3	S3	SW9	19.6	2.480	0.140	0.2892	
15 minute summer	SW4	DMPN4	SW5	0.0	0.000	0.000	0.0000	
15 minute winter	SW5	S4	SW8	8.5	0.445	0.052	0.5306	
15 minute summer	SW6	DMPN5	SW7	0.0	0.000	0.000	0.0000	
15 minute winter	SW7	S5	SW8	7.5	0.416	0.044	0.3177	
15 minute winter	SW8	S6	SW9	15.9	0.839	0.103	0.2379	
15 minute winter	SW9	S8	SW10	38.0	1.111	0.049	0.4665	
240 minute winter	SW10	Head/Flow	SW11	2.2				55.8
240 minute winter	SW12	S10	SW10	-7.3	0.330	-0.046	0.3052	
240 minute winter	SW13	S11	SW12	-7.0	-0.261	-0.044	1.7305	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.02%

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	10	181.323	0.123	22.6	0.1391	0.0000	OK
15 minute winter	SW2	10	181.413	0.123	17.0	0.1389	0.0000	OK
15 minute winter	SW3	10	181.134	0.094	48.9	0.1061	0.0000	OK
15 minute summer	SW4	1	178.000	0.000	0.0	0.0000	0.0000	OK
360 minute winter	SW5	344	177.656	0.152	3.6	0.2692	0.0000	OK
15 minute summer	SW6	1	179.375	0.000	0.0	0.0000	0.0000	OK
360 minute winter	SW7	344	177.656	0.174	3.2	0.3080	0.0000	OK
360 minute winter	SW8	344	177.656	0.223	6.8	0.3946	0.0000	OK
360 minute winter	SW9	344	177.656	0.252	16.2	0.4459	0.0000	OK
360 minute winter	SW10	344	177.656	0.826	16.1	2.1028	0.0000	SURCHARGED
15 minute summer	SW11	1	175.890	0.000	2.2	0.0000	0.0000	OK
360 minute winter	SW12	344	177.656	0.769	13.9	1.3593	0.0000	SURCHARGED
360 minute winter	SW13	344	177.656	0.724	13.4	83.7976	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	S1	SW3	22.3	1.180	0.537	0.4712	
15 minute winter	SW2	S2	SW3	16.6	1.124	0.919	0.2504	
15 minute winter	SW3	S3	SW9	48.3	3.161	0.344	0.5586	
15 minute summer	SW4	DMPN4	SW5	0.0	0.000	0.000	0.0000	
360 minute winter	SW5	S4	SW8	3.6	0.336	0.022	1.7250	
15 minute summer	SW6	DMPN5	SW7	0.0	0.000	0.000	0.0000	
360 minute winter	SW7	S5	SW8	3.2	0.313	0.019	1.1637	
360 minute winter	SW8	S6	SW9	6.8	0.640	0.044	1.0556	
360 minute winter	SW9	S8	SW10	16.1	0.905	0.021	1.1520	
360 minute winter	SW10	Head/Flow	SW11	2.3				139.0
360 minute winter	SW12	S10	SW10	-13.9	0.329	-0.088	0.4581	
360 minute winter	SW13	S11	SW12	-13.4	0.249	-0.084	2.9138	

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.02%

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	10	181.374	0.174	38.0	0.1970	0.0000	OK
15 minute winter	SW2	11	181.729	0.439	28.5	0.4961	0.0000	SURCHARGED
15 minute winter	SW3	10	181.167	0.127	81.4	0.1441	0.0000	OK
480 minute winter	SW4	456	178.295	0.294	0.1	0.0833	0.0000	SURCHARGED
480 minute winter	SW5	456	178.295	0.790	4.9	1.3967	0.0000	SURCHARGED
15 minute summer	SW6	1	179.375	0.000	0.0	0.0000	0.0000	OK
480 minute winter	SW7	456	178.295	0.812	4.3	1.4356	0.0000	SURCHARGED
480 minute winter	SW8	456	178.295	0.861	8.6	1.5222	0.0000	SURCHARGED
480 minute winter	SW9	456	178.295	0.890	19.6	1.5734	0.0000	SURCHARGED
480 minute winter	SW10	456	178.294	1.464	19.2	3.7270	0.0000	SURCHARGED
15 minute summer	SW11	1	175.890	0.000	2.2	0.0000	0.0000	OK
480 minute winter	SW12	456	178.294	1.407	16.7	2.4869	0.0000	SURCHARGED
480 minute winter	SW13	456	178.294	1.362	16.4	157.6699	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	S1	SW3	37.5	1.326	0.902	0.6993	
15 minute winter	SW2	S2	SW3	27.4	1.557	1.517	0.2941	
15 minute winter	SW3	S3	SW9	80.4	3.580	0.572	0.8209	
480 minute winter	SW4	DMPN4	SW5	-0.1	-0.010	-0.004	0.1029	
480 minute winter	SW5	S4	SW8	4.6	0.355	0.028	4.3497	
15 minute summer	SW6	DMPN5	SW7	0.0	0.000	0.000	0.0000	
480 minute winter	SW7	S5	SW8	4.0	0.330	0.023	2.7284	
480 minute winter	SW8	S6	SW9	8.0	0.675	0.052	1.9682	
480 minute winter	SW9	S8	SW10	19.2	0.920	0.025	1.4607	
480 minute winter	SW10	Head/Flow	SW11	3.1				251.0
480 minute winter	SW12	S10	SW10	-16.7	0.329	-0.106	0.4581	
480 minute winter	SW13	S11	SW12	-16.4	0.248	-0.103	2.9138	