

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)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.750
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)
S1	0.020	5.00	143.400	1200	1243.349	5206.728	0.900
S2	0.014	5.00	143.200	1200	1246.625	5195.417	0.903
S3	0.047	5.00	143.400	1200	1212.758	5185.299	1.531
S4	0.015	5.00	143.400	1200	1203.254	5217.628	1.729
S5	0.017	5.00	143.200	1200	1206.631	5232.516	1.619
S6	0.045	5.00	143.250	1200	1222.169	5248.056	1.798
SA-Outfall			143.250	1200	1240.740	5263.058	1.938

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)
1.00	S1	S2	11.776	0.600	142.500	142.297	0.203	58.0	150	5.15	46.8
1.001	S2	S3	35.346	0.600	142.297	141.944	0.353	100.0	150	5.73	44.8
1.002	S3	S4	33.697	0.600	141.869	141.671	0.198	170.0	225	6.30	43.0
1.003	S4	S5	15.266	0.600	141.671	141.581	0.090	170.0	225	6.55	42.3
1.004	S5	S6	21.975	0.600	141.581	141.452	0.129	170.0	225	6.92	41.3
1.005	S6	SA-Outfall	23.873	0.600	141.452	141.312	0.140	170.0	225	7.32	40.2

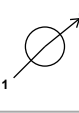
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.00	1.323	23.4	2.5	0.750	0.753	0.020	0.0	33	0.865
1.001	1.005	17.8	4.1	0.753	1.306	0.034	0.0	49	0.818
1.002	1.000	39.7	9.4	1.306	1.504	0.081	0.0	74	0.821
1.003	1.000	39.7	11.0	1.504	1.394	0.096	0.0	80	0.856
1.004	1.000	39.7	12.6	1.394	1.573	0.113	0.0	87	0.892
1.005	1.000	39.7	17.2	1.573	1.713	0.158	0.0	103	0.964

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)
1.00	11.776	58.0	150	Circular	143.400	142.500	0.750	143.200	142.297	0.753
1.001	35.346	100.0	150	Circular	143.200	142.297	0.753	143.400	141.944	1.306
1.002	33.697	170.0	225	Circular	143.400	141.869	1.306	143.400	141.671	1.504
1.003	15.266	170.0	225	Circular	143.400	141.671	1.504	143.200	141.581	1.394
1.004	21.975	170.0	225	Circular	143.200	141.581	1.394	143.250	141.452	1.573
1.005	23.873	170.0	225	Circular	143.250	141.452	1.573	143.250	141.312	1.713

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.00	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.001	S2	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
1.002	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.003	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
1.004	S5	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
1.005	S6	1200	Manhole	Adoptable	SA-Outfall	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	1243.349	5206.728	143.400	0.900	1200		0	1.00	142.500	150
S2	1246.625	5195.417	143.200	0.903	1200		1	1.00	142.297	150
S3	1212.758	5185.299	143.400	1.531	1200		0	1.001	142.297	150
S4	1203.254	5217.628	143.400	1.729	1200		1	1.002	141.869	225
S5	1206.631	5232.516	143.200	1.619	1200		0	1.003	141.671	225
S6	1222.169	5248.056	143.250	1.798	1200		1	1.004	141.581	225
SA-Outfall	1240.740	5263.058	143.250	1.938	1200		0	1.005	141.452	225
							1	1.005	141.312	225

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	20.000	Check Discharge Rate(s)	✓
Ratio-R	0.300	1 year (l/s)	1.9
Summer CV	0.750	30 year (l/s)	3.7
Winter CV	0.840	100 year (l/s)	4.5
Analysis Speed	Normal	Check Discharge Volume	x
Skip Steady State	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 %)
1	0	0	0
30	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.264	Betterment (%)	0
SAAR (mm)	1109	QBar	2.2
Soil Index	4	Q 1 year (l/s)	
SPR	0.47	Q 30 year (l/s)	
Region	10	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Node SA-Outfall Online Weir Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	2.0		
Invert Level (m)	142.490	Width (m)	0.001		

Node SA-Outfall Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00385	Invert Level (m)	141.312	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.00385	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	10.000	Number Required	1
Porosity	0.95	Pit Length (m)	15.000		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	99.562	28.172	1 year 180 minute summer	25.499	6.562
1 year 15 minute winter	69.868	28.172	1 year 180 minute winter	16.575	6.562
1 year 30 minute summer	67.776	19.178	1 year 240 minute summer	20.693	5.468
1 year 30 minute winter	47.562	19.178	1 year 240 minute winter	13.748	5.468
1 year 60 minute summer	48.435	12.800	1 year 360 minute summer	16.369	4.212
1 year 60 minute winter	32.179	12.800	1 year 360 minute winter	10.640	4.212
1 year 120 minute summer	31.831	8.412	1 year 480 minute summer	13.246	3.501
1 year 120 minute winter	21.148	8.412	1 year 480 minute winter	8.801	3.501

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 600 minute summer	11.089	3.033	30 year 960 minute summer	17.043	4.488
1 year 600 minute winter	7.577	3.033	30 year 960 minute winter	11.289	4.488
1 year 720 minute summer	10.069	2.699	30 year 1440 minute summer	12.485	3.346
1 year 720 minute winter	6.767	2.699	30 year 1440 minute winter	8.390	3.346
1 year 960 minute summer	8.526	2.245	100 year +40% CC 15 minute summer	441.486	124.925
1 year 960 minute winter	5.648	2.245	100 year +40% CC 15 minute winter	309.815	124.925
1 year 1440 minute summer	6.448	1.728	100 year +40% CC 30 minute summer	304.460	86.152
1 year 1440 minute winter	4.334	1.728	100 year +40% CC 30 minute winter	213.656	86.152
30 year 15 minute summer	243.818	68.992	100 year +40% CC 60 minute summer	214.603	56.713
30 year 15 minute winter	171.101	68.992	100 year +40% CC 60 minute winter	142.577	56.713
30 year 30 minute summer	166.387	47.082	100 year +40% CC 120 minute summer	135.791	35.885
30 year 30 minute winter	116.763	47.082	100 year +40% CC 120 minute winter	90.216	35.885
30 year 60 minute summer	116.589	30.811	100 year +40% CC 180 minute summer	104.615	26.921
30 year 60 minute winter	77.459	30.811	100 year +40% CC 180 minute winter	68.003	26.921
30 year 120 minute summer	73.902	19.530	100 year +40% CC 240 minute summer	82.776	21.875
30 year 120 minute winter	49.099	19.530	100 year +40% CC 240 minute winter	54.994	21.875
30 year 180 minute summer	57.313	14.749	100 year +40% CC 360 minute summer	63.377	16.309
30 year 180 minute winter	37.255	14.749	100 year +40% CC 360 minute winter	41.197	16.309
30 year 240 minute summer	45.598	12.050	100 year +40% CC 480 minute summer	50.006	13.215
30 year 240 minute winter	30.295	12.050	100 year +40% CC 480 minute winter	33.223	13.215
30 year 360 minute summer	35.178	9.053	100 year +40% CC 600 minute summer	40.997	11.214
30 year 360 minute winter	22.867	9.053	100 year +40% CC 600 minute winter	28.011	11.214
30 year 480 minute summer	27.920	7.379	100 year +40% CC 720 minute summer	36.560	9.799
30 year 480 minute winter	18.550	7.379	100 year +40% CC 720 minute winter	24.571	9.799
30 year 600 minute summer	23.001	6.291	100 year +40% CC 960 minute summer	30.041	7.911
30 year 600 minute winter	15.716	6.291	100 year +40% CC 960 minute winter	19.900	7.911
30 year 720 minute summer	20.598	5.520	100 year +40% CC 1440 minute summer	21.775	5.836
30 year 720 minute winter	13.843	5.520	100 year +40% CC 1440 minute winter	14.634	5.836

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	142.534	0.034	2.6	0.0528	0.0000	OK
15 minute winter	S2	11	142.347	0.050	4.3	0.0726	0.0000	OK
15 minute winter	S3	11	141.946	0.077	10.0	0.1347	0.0000	OK
15 minute winter	S4	11	141.759	0.088	11.8	0.1152	0.0000	OK
15 minute winter	S5	11	141.672	0.090	13.9	0.1214	0.0000	OK
1440 minute winter	S6	1410	141.621	0.168	1.7	0.2750	0.0000	OK
1440 minute winter	SA-Outfall	1410	141.621	0.308	1.7	44.3073	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 winter	S1	1.00	S2	2.6	0.646	0.109	0.0472	
15 minute winter	S2	1.001	S3	4.2	0.820	0.237	0.1815	
15 minute winter	S3	1.002	S4	10.0	0.758	0.252	0.4460	
15 minute winter	S4	1.003	S5	11.8	0.802	0.296	0.2242	
15 minute winter	S5	1.004	S6	13.7	0.722	0.345	0.4483	
1440 minute winter	S6	1.005	SA-Outfall	1.7	0.449	0.043	0.8554	
1440 minute winter	SA-Outfall	Weir		0.0				0.0
1440 minute winter	SA-Outfall	Infiltration		0.1				

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	142.553	0.053	6.3	0.0833	0.0000	OK
15 minute winter	S2	11	142.381	0.084	10.6	0.1211	0.0000	OK
15 minute winter	S3	11	141.995	0.126	24.8	0.2202	0.0000	OK
1440 minute winter	S4	1440	141.983	0.312	1.9	0.4074	0.0000	SURCHARGED
1440 minute winter	S5	1440	141.983	0.402	2.2	0.5396	0.0000	SURCHARGED
1440 minute winter	S6	1440	141.983	0.531	3.0	0.8672	0.0000	SURCHARGED
1440 minute winter	SA-Outfall	1440	141.983	0.671	2.9	96.4345	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 winter	S1	1.00	S2	6.2	0.808	0.266	0.0916	
15 minute winter	S2	1.001	S3	10.3	1.034	0.582	0.3534	
15 minute winter	S3	1.002	S4	24.5	0.851	0.616	1.0560	
1440 minute winter	S4	1.003	S5	1.9	0.490	0.048	0.6071	
1440 minute winter	S5	1.004	S6	2.2	0.427	0.055	0.8740	
1440 minute winter	S6	1.005	SA-Outfall	2.9	0.480	0.074	0.9495	
1440 minute winter	SA-Outfall	Weir		0.0				0.0
1440 minute winter	SA-Outfall	Infiltration		0.1				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	12	142.932	0.432	11.4	0.6797	0.0000	SURCHARGED
15 minute winter	S2	12	142.901	0.604	18.1	0.8709	0.0000	FLOOD RISK
15 minute winter	S3	12	142.674	0.805	36.3	1.4040	0.0000	SURCHARGED
15 minute winter	S4	12	142.495	0.824	41.6	1.0741	0.0000	SURCHARGED
1440 minute winter	S5	1440	142.488	0.907	3.7	1.2167	0.0000	SURCHARGED
1440 minute winter	S6	1440	142.488	1.036	5.2	1.6913	0.0000	SURCHARGED
1440 minute winter	SA-Outfall	1440	142.488	1.176	5.1	168.9551	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 winter	S1	1.00	S2	10.6	0.869	0.454	0.2073	
15 minute winter	S2	1.001	S3	16.8	0.971	0.949	0.6223	
15 minute winter	S3	1.002	S4	34.8	0.875	0.876	1.3402	
15 minute winter	S4	1.003	S5	42.2	1.062	1.063	0.6071	
1440 minute winter	S5	1.004	S6	3.7	0.427	0.093	0.8740	
1440 minute winter	S6	1.005	SA-Outfall	5.1	0.635	0.129	0.9495	
1440 minute winter	SA-Outfall	Weir		0.0				0.0
1440 minute winter	SA-Outfall	Infiltration		0.1				