

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	10	Maximum Rainfall (mm/hr)	250.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	1.000
Ratio-R	0.338	Preferred Cover Depth (m)	0.600
CV	0.750	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)
S7	0.016	4.00	164.142	450	83.282	-26.511	1.392
S4	0.021	4.00	164.700	450	63.333	-52.226	0.750
S8	0.047	4.00	163.872	600	65.303	-35.609	1.800
S1	0.000	4.00	169.500	450	62.263	-68.079	0.750
S2	0.011	4.00	168.900	450	78.204	-58.987	0.750
S5	0.018	4.00	164.700	450	71.527	-47.419	1.500
S9	0.029	4.00	163.572	600	50.903	-43.223	1.700
S11	0.025	4.00	163.500	1200	31.383	-49.258	2.990
S12	0.000	4.00	161.650	1500	28.881	-43.839	1.500
S3		4.00	165.000	450	55.333	-56.968	0.750
T1			161.600		26.708	-44.884	1.200
S6	0.004	4.00	166.000	450	94.347	-39.417	1.500
S10	0.013	4.00	163.572	600	44.749	-45.319	1.800
Interceptor			162.700		30.141	-46.562	2.220

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)
2.000	9.300	31.0	150	Circular	165.000	164.250	0.600	164.700	163.950	0.600
1.000	18.352	30.6	150	Circular	169.500	168.750	0.600	168.900	168.150	0.600
2.001	9.500	12.7	150	Circular	164.700	163.950	0.600	164.700	163.200	1.350
1.001	13.357	2.7	150	Circular	168.900	168.150	0.600	164.700	163.200	1.350
1.004	6.501	65.0	225	Circular	163.572	161.872	1.475	163.572	161.772	1.575
1.006	2.968	100.0	300	Circular	163.500	160.510	2.690	162.700	160.480	1.920
1.003	16.289	81.4	225	Circular	163.872	162.072	1.575	163.572	161.872	1.475
1.002	13.350	12.7	150	Circular	164.700	163.200	1.350	163.872	162.147	1.575
1.007	2.500	50.0	300	Circular	161.650	160.450	0.900	161.600	160.400	0.900
3.001	20.150	33.4	150	Circular	164.142	162.750	1.242	163.872	162.147	1.575
1.005	13.934	51.2	225	Circular	163.572	161.772	1.575	163.500	161.500	1.775
3.000	17.000	9.7	150	Circular	166.000	164.500	1.350	164.142	162.750	1.242
1.007_1	3.000	100.0	300	Circular	162.700	160.480	1.920	161.650	160.450	0.900

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	S3	450	Manhole	Plastic Inspection Chamber	S4	450	Manhole	Plastic Inspection Chamber
1.000	S1	450	Manhole	Plastic Inspection Chamber	S2	450	Manhole	Plastic Inspection Chamber
2.001	S4	450	Manhole	Plastic Inspection Chamber	S5	450	Manhole	Plastic Inspection Chamber
1.001	S2	450	Manhole	Plastic Inspection Chamber	S5	450	Manhole	Plastic Inspection Chamber
1.004	S9	600	Manhole	Plastic Inspection Chamber	S10	600	Manhole	Plastic Inspection Chamber
1.006	S11	1200	Manhole	Private	Interceptor		Junction	
1.003	S8	600	Manhole	Plastic Inspection Chamber	S9	600	Manhole	Plastic Inspection Chamber
1.002	S5	450	Manhole	Plastic Inspection Chamber	S8	600	Manhole	Plastic Inspection Chamber
1.007	S12	1500	Manhole	Private	T1		Junction	
3.001	S7	450	Manhole	Plastic Inspection Chamber	S8	600	Manhole	Plastic Inspection Chamber
1.005	S10	600	Manhole	Plastic Inspection Chamber	S11	1200	Manhole	Private
3.000	S6	450	Manhole	Plastic Inspection Chamber	S7	450	Manhole	Plastic Inspection Chamber
1.007_1	Interceptor		Junction		S12	1500	Manhole	Private

Simulation Settings

Rainfall Methodology	FSR	Winter CV	0.840	Check Discharge Rate(s)	✓
FSR Region	England and Wales	Analysis Speed	Normal	Check Discharge Volume	✓
M5-60 (mm)	18.000	Skip Steady State	x	100 year 360 minute (m³)	
Ratio-R	0.338	Drain Down Time (mins)	240		
Summer CV	0.750	Additional Storage (m³/ha)	20.0		

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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	30	35	0	0
2	0	0	0	100	45	0	0
10	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	Soil Index	1	Growth Factor 30 year	1.95	Q 1 year (l/s)
Greenfield Method	IH124	SPR	0.10	Growth Factor 100 year	2.48	Q 30 year (l/s)
Positively Drained Area (ha)		Region	1	Betterment (%)	0	Q 100 year (l/s)
SAAR (mm)		Growth Factor 1 year	0.85	QBar		

Pre-development Discharge Volume

Site Makeup	Greenfield	Soil Index	1	Return Period (years)	100	Betterment (%)	0
Greenfield Method	FSR/FEH	SPR	0.10	Climate Change (%)	0	PR	
Positively Drained Area (ha)		CWI		Storm Duration (mins)	360	Runoff Volume (m³)	

Node T1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	158.750
Side Inf Coefficient (m/hr)	0.23760	Porosity	1.00	Time to half empty (mins)	



Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	66.0	0.0	2.000	66.0	98.0	2.001	0.0	98.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S7	10	162.779	0.029	2.5	0.0114	0.0000	OK
15 minute winter	S4	10	163.974	0.024	2.7	0.0170	0.0000	OK
15 minute winter	S8	10	162.152	0.080	14.8	0.0646	0.0000	OK
15 minute summer	S1	1	168.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2	10	168.162	0.012	1.4	0.0053	0.0000	OK
15 minute winter	S5	10	163.237	0.037	6.4	0.0149	0.0000	OK
15 minute winter	S9	10	161.964	0.092	18.5	0.0575	0.0000	OK
15 minute winter	S11	10	160.614	0.104	23.2	0.1350	0.0000	OK
15 minute winter	S12	10	160.536	0.086	23.1	0.1522	0.0000	OK
15 minute summer	S3	1	164.250	0.000	0.0	0.0000	0.0000	OK
720 minute winter	T1	555	159.176	-1.224	2.4	28.1109	0.0000	OK
15 minute winter	S6	10	164.510	0.010	0.5	0.0021	0.0000	OK
15 minute winter	S10	10	161.858	0.086	20.0	0.0366	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	S7	3.001	S8	2.5	1.041	0.080	0.0480	
15 minute winter	S4	2.001	S5	2.7	1.060	0.054	0.0246	
15 minute winter	S8	1.003	S9	14.8	1.056	0.256	0.2280	
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0059	
15 minute winter	S2	1.001	S5	1.4	0.753	0.013	0.0270	
15 minute winter	S5	1.002	S8	6.4	1.918	0.127	0.0446	
15 minute winter	S9	1.004	S10	18.4	1.266	0.286	0.0948	
15 minute winter	S11	1.006	Interceptor	23.2	1.097	0.209	0.0627	
15 minute winter	S12	1.007	T1	23.1	1.491	0.146	0.0387	
15 minute summer	S3	2.000	S4	0.0	0.000	0.000	0.0083	
720 minute winter	T1	Depth/Flow		0.0				0.0
720 minute winter	T1	Infiltration		0.6				
15 minute winter	S6	3.000	S7	0.5	0.369	0.009	0.0247	
15 minute winter	S10	1.005	S11	20.0	1.508	0.275	0.1849	

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Interceptor	10	160.580	0.100	23.2	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 winter	Interceptor	1.007_1	S12	23.1	1.243	0.208	0.0559	

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S7	10	162.784	0.034	3.3	0.0131	0.0000	OK
15 minute summer	S4	10	163.977	0.027	3.4	0.0191	0.0000	OK
15 minute winter	S8	10	162.165	0.093	19.1	0.0750	0.0000	OK
15 minute summer	S1	1	168.750	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	10	168.163	0.013	1.8	0.0060	0.0000	OK
15 minute winter	S5	10	163.242	0.042	8.1	0.0168	0.0000	OK
15 minute winter	S9	10	161.980	0.108	23.8	0.0671	0.0000	OK
15 minute winter	S11	10	160.630	0.120	29.9	0.1561	0.0000	OK
15 minute winter	S12	10	160.549	0.099	29.9	0.1752	0.0000	OK
15 minute summer	S3	1	164.250	0.000	0.0	0.0000	0.0000	OK
720 minute winter	T1	540	159.265	-1.135	2.9	33.9578	0.0000	OK
15 minute winter	S6	10	164.512	0.012	0.7	0.0025	0.0000	OK
15 minute winter	S10	10	161.871	0.099	25.9	0.0424	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	S7	3.001	S8	3.3	1.129	0.106	0.0586	
15 minute summer	S4	2.001	S5	3.4	1.126	0.068	0.0292	
15 minute winter	S8	1.003	S9	19.1	1.115	0.331	0.2788	
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0070	
15 minute summer	S2	1.001	S5	1.8	0.811	0.016	0.0321	
15 minute winter	S5	1.002	S8	8.1	2.047	0.161	0.0528	
15 minute winter	S9	1.004	S10	23.8	1.334	0.368	0.1158	
15 minute winter	S11	1.006	Interceptor	29.9	1.166	0.269	0.0761	
15 minute winter	S12	1.007	T1	29.8	1.594	0.189	0.0468	
15 minute summer	S3	2.000	S4	0.0	0.000	0.000	0.0097	
720 minute winter	T1	Depth/Flow		0.0				0.0
720 minute winter	T1	Infiltration		0.8				
15 minute winter	S6	3.000	S7	0.7	0.422	0.012	0.0304	
15 minute winter	S10	1.005	S11	25.8	1.607	0.355	0.2240	

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Interceptor	10	160.595	0.115	29.9	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 winter	Interceptor	1.007_1	S12	29.9	1.322	0.269	0.0678	

Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S7	10	162.790	0.040	4.9	0.0157	0.0000	OK
15 minute summer	S4	10	163.982	0.032	5.1	0.0232	0.0000	OK
15 minute summer	S8	10	162.192	0.120	28.6	0.0968	0.0000	OK
15 minute summer	S1	1	168.750	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	10	168.166	0.016	2.7	0.0073	0.0000	OK
15 minute winter	S5	10	163.253	0.053	12.2	0.0210	0.0000	OK
15 minute summer	S9	10	162.013	0.140	35.7	0.0877	0.0000	OK
15 minute winter	S11	10	160.663	0.153	45.0	0.1988	0.0000	OK
15 minute winter	S12	10	160.575	0.125	44.9	0.2206	0.0000	OK
15 minute summer	S3	1	164.250	0.000	0.0	0.0000	0.0000	OK
720 minute winter	T1	540	159.472	-0.928	4.0	47.6590	0.0000	OK
15 minute summer	S6	10	164.514	0.014	1.0	0.0029	0.0000	OK
15 minute summer	S10	10	161.900	0.128	38.9	0.0548	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	S7	3.001	S8	4.9	1.218	0.159	0.0835	
15 minute summer	S4	2.001	S5	5.1	1.254	0.101	0.0393	
15 minute summer	S8	1.003	S9	28.6	1.200	0.496	0.3880	
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0093	
15 minute summer	S2	1.001	S5	2.7	0.894	0.025	0.0435	
15 minute winter	S5	1.002	S8	12.2	2.284	0.243	0.0713	
15 minute summer	S9	1.004	S10	35.7	1.444	0.553	0.1607	
15 minute winter	S11	1.006	Interceptor	45.0	1.285	0.405	0.1039	
15 minute winter	S12	1.007	T1	44.9	1.771	0.285	0.0634	
15 minute summer	S3	2.000	S4	0.0	0.000	0.000	0.0129	
720 minute winter	T1	Depth/Flow		0.0				0.0
720 minute winter	T1	Infiltration		1.1				
15 minute summer	S6	3.000	S7	1.0	0.462	0.017	0.0394	
15 minute summer	S10	1.005	S11	38.9	1.766	0.534	0.3069	

Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Interceptor	10	160.625	0.145	45.0	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 winter	Interceptor	1.007_1	S12	44.9	1.460	0.404	0.0924	

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S7	10	162.804	0.053	8.4	0.0208	0.0000	OK
15 minute summer	S4	10	163.993	0.043	8.8	0.0306	0.0000	OK
15 minute winter	S8	10	162.262	0.190	48.9	0.1528	0.0000	OK
15 minute summer	S1	1	168.750	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	10	168.171	0.021	4.6	0.0094	0.0000	OK
15 minute summer	S5	10	163.268	0.067	20.9	0.0269	0.0000	OK
15 minute winter	S9	10	162.119	0.247	60.1	0.1542	0.0000	SURCHARGED
15 minute winter	S11	10	160.723	0.213	75.5	0.2768	0.0000	OK
15 minute winter	S12	10	160.620	0.170	75.3	0.2997	0.0000	OK
15 minute summer	S3	1	164.250	0.000	0.0	0.0000	0.0000	OK
960 minute winter	T1	675	159.956	-0.444	5.5	79.6198	0.0000	OK
15 minute summer	S6	10	164.518	0.018	1.7	0.0038	0.0000	OK
15 minute winter	S10	10	161.965	0.193	65.2	0.0824	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	S7	3.001	S8	8.4	1.205	0.272	0.2024	
15 minute summer	S4	2.001	S5	8.8	1.507	0.175	0.0560	
15 minute winter	S8	1.003	S9	48.0	1.282	0.833	0.6151	
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0134	
15 minute summer	S2	1.001	S5	4.6	1.071	0.042	0.0611	
15 minute summer	S5	1.002	S8	20.9	2.274	0.416	0.1473	
15 minute winter	S9	1.004	S10	59.8	1.551	0.927	0.2471	
15 minute winter	S11	1.006	Interceptor	75.4	1.461	0.679	0.1532	
15 minute winter	S12	1.007	T1	75.1	2.013	0.477	0.0933	
15 minute summer	S3	2.000	S4	0.0	0.000	0.000	0.0191	
960 minute winter	T1	Depth/Flow		0.0				0.0
960 minute winter	T1	Infiltration		1.9				
15 minute summer	S6	3.000	S7	1.7	0.532	0.030	0.0578	
15 minute winter	S10	1.005	S11	65.1	1.931	0.894	0.4688	

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Interceptor	10	160.679	0.199	75.4	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 winter	Interceptor	1.007_1	S12	75.3	1.659	0.678	0.1361	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S7	11	162.833	0.083	11.6	0.0322	0.0000	OK
15 minute summer	S4	10	164.000	0.050	12.1	0.0361	0.0000	OK
15 minute winter	S8	11	162.753	0.681	65.9	0.5478	0.0000	SURCHARGED
15 minute summer	S1	1	168.750	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	10	168.174	0.024	6.4	0.0110	0.0000	OK
15 minute winter	S5	10	163.297	0.097	28.9	0.0389	0.0000	OK
15 minute winter	S9	11	162.447	0.575	78.6	0.3585	0.0000	SURCHARGED
15 minute winter	S11	10	160.769	0.259	98.0	0.3365	0.0000	OK
15 minute winter	S12	11	160.650	0.200	97.3	0.3539	0.0000	OK
15 minute summer	S3	1	164.250	0.000	0.0	0.0000	0.0000	OK
720 minute winter	T1	540	160.408	0.007	9.5	109.3934	0.0000	OK
15 minute summer	S6	10	164.521	0.021	2.3	0.0044	0.0000	OK
15 minute winter	S10	11	162.199	0.427	84.6	0.1825	0.0000	SURCHARGED
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	S7	3.001	S8	11.2	1.196	0.364	0.2779	
15 minute summer	S4	2.001	S5	12.1	1.619	0.241	0.0810	
15 minute winter	S8	1.003	S9	62.2	1.565	1.080	0.6478	
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.0170	
15 minute summer	S2	1.001	S5	6.4	1.148	0.059	0.0918	
15 minute winter	S5	1.002	S8	28.3	2.223	0.562	0.1983	
15 minute winter	S9	1.004	S10	77.5	1.948	1.200	0.2586	
15 minute winter	S11	1.006	Interceptor	97.6	1.568	0.879	0.1845	
15 minute winter	S12	1.007	T1	97.6	2.146	0.620	0.1136	
15 minute summer	S3	2.000	S4	0.0	0.000	0.000	0.0240	
720 minute winter	T1	Depth/Flow		0.0				0.0
720 minute winter	T1	Infiltration		2.7				
15 minute summer	S6	3.000	S7	2.3	0.569	0.040	0.0856	
15 minute winter	S10	1.005	S11	84.5	2.125	1.160	0.5486	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Interceptor	10	160.717	0.237	97.6	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 winter	Interceptor	1.007_1	S12	97.3	1.772	0.876	0.1643	