

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	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	0.350	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.059	5.00	23.250	1350	450093.827	114842.484	1.486
S2	0.036	5.00	23.468	1350	450110.999	114839.588	1.895
S3	0.051	5.00	23.253	1500	450114.017	114857.481	1.876
S4	0.083	5.00	22.950	1500	450108.063	114893.786	1.757
S5	0.048	5.00	22.840	1500	450099.515	114904.651	1.791
S6	0.025	5.00	22.892	1500	450090.483	114911.573	1.900
S7	0.073	5.00	22.658	1500	450083.289	114903.961	2.618
S8	0.039	5.00	22.642	1500	450055.266	114904.669	2.696
S9			22.296	1500	450038.109	114901.388	2.407
S10	0.060	5.00	22.700	1500	450052.463	114851.229	1.425
S11			22.526	1500	450038.800	114852.251	1.557
S12			22.452	1500	450033.029	114872.897	2.659
S3032			22.286	3000	450006.729	114871.644	2.581

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	S1	S2	17.414	0.600	21.764	21.648	0.116	150.1	150	5.35	50.0
1.001	S2	S3	18.146	0.600	21.573	21.452	0.121	150.0	225	5.64	50.0
1.002	S3	S4	36.790	0.600	21.377	21.193	0.184	199.9	300	6.19	50.0
1.003	S4	S5	13.824	0.600	21.193	21.124	0.069	200.4	300	6.40	50.0
1.004	S5	S6	11.379	0.600	21.049	20.992	0.057	199.6	375	6.55	50.0
1.005	S6	S7	10.474	0.600	20.992	20.115	0.877	11.9	375	6.58	50.0
1.006	S7	S8	28.032	0.600	20.040	19.946	0.094	298.2	450	6.98	50.0
1.007	S8	S9	17.468	0.600	19.946	19.889	0.057	306.5	450	7.23	50.0
1.008	S9	S12	28.940	0.600	19.889	19.793	0.096	301.5	450	7.65	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	0.818	14.4	10.7	1.336	1.670	0.059	0.0	96	0.893
1.001	1.065	42.4	17.2	1.670	1.576	0.095	0.0	100	1.011
1.002	1.108	78.3	26.4	1.576	1.457	0.146	0.0	120	1.003
1.003	1.107	78.2	41.4	1.457	1.416	0.229	0.0	155	1.121
1.004	1.278	141.2	50.1	1.416	1.525	0.277	0.0	154	1.174
1.005	5.267	581.7	54.6	1.525	2.168	0.302	0.0	77	3.347
1.006	1.172	186.4	67.8	2.168	2.246	0.375	0.0	188	1.083
1.007	1.156	183.8	74.8	2.246	1.957	0.414	0.0	200	1.099
1.008	1.165	185.3	74.8	1.957	2.209	0.414	0.0	198	1.104

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)
2.000	S10	S11	13.701	0.600	21.275	20.969	0.306	44.8	225	5.12	50.0
2.001	S11	S12	21.437	0.600	20.969	20.018	0.951	22.5	225	5.25	50.0
1.009	S12	S3032	26.330	0.600	19.793	19.705	0.088	299.2	450	8.02	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)
2.000	1.960	77.9	10.8	1.200	1.332	0.060	0.0	57	1.393
2.001	2.767	110.0	10.8	1.332	2.209	0.060	0.0	47	1.768
1.009	1.170	186.1	85.7	2.209	2.131	0.474	0.0	214	1.146

Pipeline Schedule

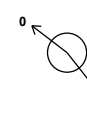
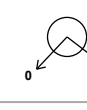
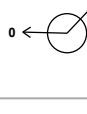
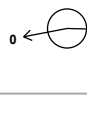
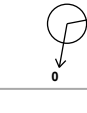
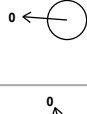
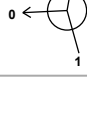
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	17.414	150.1	150	Circular	23.250	21.764	1.336	23.468	21.648	1.670
1.001	18.146	150.0	225	Circular	23.468	21.573	1.670	23.253	21.452	1.576
1.002	36.790	199.9	300	Circular	23.253	21.377	1.576	22.950	21.193	1.457
1.003	13.824	200.4	300	Circular	22.950	21.193	1.457	22.840	21.124	1.416
1.004	11.379	199.6	375	Circular	22.840	21.049	1.416	22.892	20.992	1.525
1.005	10.474	11.9	375	Circular	22.892	20.992	1.525	22.658	20.115	2.168
1.006	28.032	298.2	450	Circular	22.658	20.040	2.168	22.642	19.946	2.246
1.007	17.468	306.5	450	Circular	22.642	19.946	2.246	22.296	19.889	1.957
1.008	28.940	301.5	450	Circular	22.296	19.889	1.957	22.452	19.793	2.209
2.000	13.701	44.8	225	Circular	22.700	21.275	1.200	22.526	20.969	1.332
2.001	21.437	22.5	225	Circular	22.526	20.969	1.332	22.452	20.018	2.209
1.009	26.330	299.2	450	Circular	22.452	19.793	2.209	22.286	19.705	2.131

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1350	Manhole	Adoptable	S2	1350	Manhole	Adoptable
1.001	S2	1350	Manhole	Adoptable	S3	1500	Manhole	Adoptable
1.002	S3	1500	Manhole	Adoptable	S4	1500	Manhole	Adoptable
1.003	S4	1500	Manhole	Adoptable	S5	1500	Manhole	Adoptable
1.004	S5	1500	Manhole	Adoptable	S6	1500	Manhole	Adoptable
1.005	S6	1500	Manhole	Adoptable	S7	1500	Manhole	Adoptable
1.006	S7	1500	Manhole	Adoptable	S8	1500	Manhole	Adoptable
1.007	S8	1500	Manhole	Adoptable	S9	1500	Manhole	Adoptable
1.008	S9	1500	Manhole	Adoptable	S12	1500	Manhole	Adoptable
2.000	S10	1500	Manhole	Adoptable	S11	1500	Manhole	Adoptable
2.001	S11	1500	Manhole	Adoptable	S12	1500	Manhole	Adoptable
1.009	S12	1500	Manhole	Adoptable	S3032	3000	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	450093.827	114842.484	23.250	1.486	1350		0	1.000	21.764	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S2	450110.999	114839.588	23.468	1.895	1350		1	1.000	21.648	150
							0	1.001	21.573	225
S3	450114.017	114857.481	23.253	1.876	1500		1	1.001	21.452	225
							0	1.002	21.377	300
S4	450108.063	114893.786	22.950	1.757	1500		1	1.002	21.193	300
							0	1.003	21.193	300
S5	450099.515	114904.651	22.840	1.791	1500		1	1.003	21.124	300
							0	1.004	21.049	375
S6	450090.483	114911.573	22.892	1.900	1500		1	1.004	20.992	375
							0	1.005	20.992	375
S7	450083.289	114903.961	22.658	2.618	1500		1	1.005	20.115	375
							0	1.006	20.040	450
S8	450055.266	114904.669	22.642	2.696	1500		1	1.006	19.946	450
							0	1.007	19.946	450
S9	450038.109	114901.388	22.296	2.407	1500		1	1.007	19.889	450
							0	1.008	19.889	450
S10	450052.463	114851.229	22.700	1.425	1500					
							0	2.000	21.275	225
S11	450038.800	114852.251	22.526	1.557	1500		1	2.000	20.969	225
							0	2.001	20.969	225
S12	450033.029	114872.897	22.452	2.659	1500		1	2.001	20.018	225
							2	1.008	19.793	450
							0	1.009	19.793	450
S3032	450006.729	114871.644	22.286	2.581	3000		1	1.009	19.705	450

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	19.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.350	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 %)
1	0	0	0
30	0	0	0
100	45	0	0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	99.342	28.110	30 year 180 minute winter	34.187	13.534
1 year 15 minute winter	69.713	28.110	30 year 240 minute summer	41.442	10.952
1 year 30 minute summer	65.891	18.645	30 year 240 minute winter	27.533	10.952
1 year 30 minute winter	46.239	18.645	30 year 360 minute summer	31.498	8.106
1 year 60 minute summer	45.726	12.084	30 year 360 minute winter	20.475	8.106
1 year 60 minute winter	30.379	12.084	30 year 480 minute summer	24.762	6.544
1 year 120 minute summer	29.101	7.690	30 year 480 minute winter	16.451	6.544
1 year 120 minute winter	19.334	7.690	30 year 600 minute summer	20.251	5.539
1 year 180 minute summer	22.852	5.881	30 year 600 minute winter	13.837	5.539
1 year 180 minute winter	14.854	5.881	30 year 720 minute summer	18.029	4.832
1 year 240 minute summer	18.381	4.857	30 year 720 minute winter	12.116	4.832
1 year 240 minute winter	12.212	4.857	30 year 960 minute summer	14.782	3.892
1 year 360 minute summer	14.319	3.685	30 year 960 minute winter	9.792	3.892
1 year 360 minute winter	9.308	3.685	30 year 1440 minute summer	10.694	2.866
1 year 480 minute summer	11.429	3.020	30 year 1440 minute winter	7.187	2.866
1 year 480 minute winter	7.593	3.020	100 year +45% CC 15 minute summer	456.184	129.084
1 year 600 minute summer	9.465	2.589	100 year +45% CC 15 minute winter	320.129	129.084
1 year 600 minute winter	6.467	2.589	100 year +45% CC 30 minute summer	306.687	86.782
1 year 720 minute summer	8.517	2.283	100 year +45% CC 30 minute winter	215.219	86.782
1 year 720 minute winter	5.724	2.283	100 year +45% CC 60 minute summer	210.766	55.699
1 year 960 minute summer	7.108	1.872	100 year +45% CC 60 minute winter	140.028	55.699
1 year 960 minute winter	4.708	1.872	100 year +45% CC 120 minute summer	130.652	34.527
1 year 1440 minute summer	5.284	1.416	100 year +45% CC 120 minute winter	86.802	34.527
1 year 1440 minute winter	3.551	1.416	100 year +45% CC 180 minute summer	99.943	25.719
30 year 15 minute summer	243.268	68.836	100 year +45% CC 180 minute winter	64.966	25.719
30 year 15 minute winter	170.714	68.836	100 year +45% CC 240 minute summer	78.406	20.720
30 year 30 minute summer	161.958	45.828	100 year +45% CC 240 minute winter	52.091	20.720
30 year 30 minute winter	113.654	45.828	100 year +45% CC 360 minute summer	59.190	15.232
30 year 60 minute summer	110.635	29.238	100 year +45% CC 360 minute winter	38.475	15.232
30 year 60 minute winter	73.503	29.238	100 year +45% CC 480 minute summer	46.316	12.240
30 year 120 minute summer	68.536	18.112	100 year +45% CC 480 minute winter	30.772	12.240
30 year 120 minute winter	45.534	18.112	100 year +45% CC 600 minute summer	37.736	10.322
30 year 180 minute summer	52.594	13.534	100 year +45% CC 600 minute winter	25.783	10.322

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC 720 minute summer	33.487	8.975	100 year +45% CC 960 minute winter	18.090	7.191
100 year +45% CC 720 minute winter	22.505	8.975	100 year +45% CC 1440 minute summer	19.598	5.252
100 year +45% CC 960 minute summer	27.309	7.191	100 year +45% CC 1440 minute winter	13.171	5.252

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	21.856	0.092	9.6	0.2043	0.0000	OK
15 minute summer	S2	11	21.670	0.097	15.1	0.1752	0.0000	OK
15 minute summer	S3	11	21.487	0.110	23.0	0.2546	0.0000	OK
15 minute summer	S4	11	21.346	0.153	35.9	0.4154	0.0000	OK
15 minute summer	S5	11	21.194	0.145	43.2	0.3350	0.0000	OK
15 minute summer	S6	11	21.063	0.071	47.1	0.1450	0.0000	OK
15 minute summer	S7	11	20.225	0.185	58.4	0.4298	0.0000	OK
15 minute summer	S8	11	20.146	0.200	64.2	0.4108	0.0000	OK
15 minute summer	S9	12	20.083	0.194	63.1	0.3423	0.0000	OK
15 minute summer	S10	10	21.332	0.057	9.7	0.1485	0.0000	OK
15 minute summer	S11	10	21.015	0.046	9.6	0.0807	0.0000	OK
15 minute summer	S12	12	19.998	0.205	71.9	0.3615	0.0000	OK
15 minute summer	S3032	12	19.891	0.186	72.5	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 summer	S1	1.000	S2	9.3	0.853	0.645	0.1905	
15 minute summer	S2	1.001	S3	15.1	0.956	0.356	0.2862	
15 minute summer	S3	1.002	S4	23.1	0.776	0.294	1.0964	
15 minute summer	S4	1.003	S5	35.8	1.045	0.458	0.4740	
15 minute summer	S5	1.004	S6	43.2	1.640	0.306	0.3075	
15 minute summer	S6	1.005	S7	47.1	2.558	0.081	0.2170	
15 minute summer	S7	1.006	S8	58.2	0.901	0.312	1.8118	
15 minute summer	S8	1.007	S9	63.1	0.954	0.343	1.1560	
15 minute summer	S9	1.008	S12	63.4	0.938	0.342	1.9581	
15 minute summer	S10	2.000	S11	9.6	1.418	0.124	0.0933	
15 minute summer	S11	2.001	S12	9.5	1.683	0.086	0.1211	
15 minute summer	S12	1.009	S3032	72.5	1.100	0.390	1.7357	33.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	22.085	0.321	23.4	0.7136	0.0000	SURCHARGED
15 minute summer	S2	11	21.744	0.171	35.7	0.3100	0.0000	OK
15 minute summer	S3	11	21.572	0.195	55.0	0.4504	0.0000	OK
15 minute summer	S4	11	21.488	0.295	86.1	0.7988	0.0000	OK
15 minute summer	S5	11	21.283	0.234	103.8	0.5386	0.0000	OK
15 minute summer	S6	11	21.103	0.111	113.2	0.2250	0.0000	OK
15 minute summer	S7	11	20.388	0.348	140.9	0.8085	0.0000	OK
15 minute summer	S8	11	20.316	0.370	154.4	0.7600	0.0000	OK
15 minute summer	S9	12	20.243	0.354	152.2	0.6256	0.0000	OK
15 minute summer	S10	10	21.368	0.093	23.8	0.2429	0.0000	OK
15 minute summer	S11	10	21.039	0.070	23.6	0.1244	0.0000	OK
15 minute summer	S12	12	20.148	0.355	172.5	0.6265	0.0000	OK
15 minute summer	S3032	12	19.998	0.293	173.4	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 summer	S1	1.000	S2	22.1	1.255	1.527	0.2977	
15 minute summer	S2	1.001	S3	35.7	1.153	0.843	0.5609	
15 minute summer	S3	1.002	S4	54.6	0.897	0.697	2.1809	
15 minute summer	S4	1.003	S5	85.6	1.314	1.094	0.8822	
15 minute summer	S5	1.004	S6	103.8	2.100	0.735	0.5658	
15 minute summer	S6	1.005	S7	113.2	2.497	0.195	0.5920	
15 minute summer	S7	1.006	S8	139.6	1.045	0.749	3.7952	
15 minute summer	S8	1.007	S9	152.2	1.120	0.828	2.3821	
15 minute summer	S9	1.008	S12	151.1	1.129	0.815	3.8746	
15 minute summer	S10	2.000	S11	23.6	1.812	0.302	0.1787	
15 minute summer	S11	2.001	S12	23.5	2.093	0.214	0.3590	
15 minute summer	S12	1.009	S3032	173.4	1.420	0.932	3.2046	81.4

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	12	23.248	1.484	44.0	3.3030	0.0000	FLOOD RISK
15 minute summer	S2	12	22.401	0.828	59.4	1.4987	0.0000	SURCHARGED
15 minute summer	S3	11	22.108	0.731	92.3	1.6903	0.0000	SURCHARGED
15 minute summer	S4	11	21.820	0.627	147.7	1.7009	0.0000	SURCHARGED
15 minute summer	S5	11	21.464	0.415	179.4	0.9547	0.0000	SURCHARGED
15 minute summer	S6	11	21.277	0.285	195.3	0.5785	0.0000	OK
15 minute summer	S7	11	21.127	1.087	244.1	2.5267	0.0000	SURCHARGED
15 minute summer	S8	11	20.905	0.959	269.4	1.9725	0.0000	SURCHARGED
15 minute summer	S9	11	20.709	0.820	267.9	1.4486	0.0000	SURCHARGED
15 minute summer	S10	10	21.413	0.138	44.7	0.3588	0.0000	OK
15 minute summer	S11	10	21.068	0.099	44.4	0.1743	0.0000	OK
15 minute summer	S12	11	20.433	0.640	310.1	1.1309	0.0000	SURCHARGED
15 minute summer	S3032	11	20.091	0.386	309.7	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 summer	S1	1.000	S2	35.5	2.018	2.459	0.3066	
15 minute summer	S2	1.001	S3	58.7	1.475	1.385	0.7217	
15 minute summer	S3	1.002	S4	91.8	1.304	1.172	2.5907	
15 minute summer	S4	1.003	S5	145.3	2.063	1.857	0.9735	
15 minute summer	S5	1.004	S6	177.5	2.155	1.257	1.1388	
15 minute summer	S6	1.005	S7	193.6	2.497	0.333	1.0482	
15 minute summer	S7	1.006	S8	241.7	1.526	1.297	4.4415	
15 minute summer	S8	1.007	S9	267.9	1.691	1.458	2.7677	
15 minute summer	S9	1.008	S12	268.3	1.693	1.447	4.5854	
15 minute summer	S10	2.000	S11	44.4	2.105	0.570	0.2887	
15 minute summer	S11	2.001	S12	44.2	2.211	0.401	0.6056	
15 minute summer	S12	1.009	S3032	309.7	1.965	1.665	3.9928	152.5