

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	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

1 STANDARD Link Type

Template	Freeform Carrier	Auto Increment (mm)	75
Shape	Circular	Follow Ground	x
Barrels	1		

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.011	5.00	94.566	450	379127.045	410309.671	1.266
S2	0.011	5.00	94.566	450	379112.764	410295.996	1.566
S3	0.011	5.00	94.566	450	379104.551	410305.354	1.716
S4	0.011	5.00	94.566	450	379117.027	410317.301	1.866
S5			94.566	450	379110.885	410311.419	2.216
TANK			94.566	450	379109.370	410313.174	2.266
S6			94.566	600	379112.773	410316.659	2.366
EX			94.566	450	379112.009	410318.364	2.466

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	19.773	0.600	93.300	93.000	0.300	65.9	100	5.35	50.0
1.001	S2	S3	12.451	0.600	93.000	92.850	0.150	83.0	100	5.59	50.0
1.002	S3	S5	8.769	0.600	92.850	92.350	0.500	17.5	100	5.67	50.0
2.000	S4	S5	8.504	0.600	92.700	92.350	0.350	24.3	100	5.09	50.0
1.003	S5	TANK	2.318	0.600	92.350	92.300	0.050	46.4	100	5.71	50.0
1.004	TANK	S6	4.871	0.600	92.300	92.200	0.100	48.7	100	5.78	50.0
1.005	S6	EX	1.868	0.600	92.200	92.100	0.100	18.7	100	5.80	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	0.950	7.5	1.5	1.166	1.466	0.011	0.0	30	0.737
1.001	0.845	6.6	3.0	1.466	1.616	0.022	0.0	47	0.825
1.002	1.853	14.6	4.5	1.616	2.116	0.033	0.0	38	1.628
2.000	1.572	12.3	1.5	1.766	2.116	0.011	0.0	24	1.070
1.003	1.135	8.9	6.0	2.116	2.166	0.044	0.0	60	1.215
1.004	1.107	8.7	6.0	2.166	2.266	0.044	0.0	61	1.190
1.005	1.795	14.1	6.0	2.266	2.366	0.044	0.0	46	1.726

Pipeline Schedule

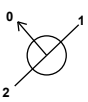
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	19.773	65.9	100	1 STANDARD	94.566	93.300	1.166	94.566	93.000	1.466
1.001	12.451	83.0	100	1 STANDARD	94.566	93.000	1.466	94.566	92.850	1.616
1.002	8.769	17.5	100	1 STANDARD	94.566	92.850	1.616	94.566	92.350	2.116
2.000	8.504	24.3	100	1 STANDARD	94.566	92.700	1.766	94.566	92.350	2.116
1.003	2.318	46.4	100	1 STANDARD	94.566	92.350	2.116	94.566	92.300	2.166
1.004	4.871	48.7	100	1 STANDARD	94.566	92.300	2.166	94.566	92.200	2.266
1.005	1.868	18.7	100	1 STANDARD	94.566	92.200	2.266	94.566	92.100	2.366

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	Adoptable	S2	450	Manhole	Adoptable
1.001	S2	450	Manhole	Adoptable	S3	450	Manhole	Adoptable
1.002	S3	450	Manhole	Adoptable	S5	450	Manhole	Adoptable
2.000	S4	450	Manhole	Adoptable	S5	450	Manhole	Adoptable
1.003	S5	450	Manhole	Adoptable	TANK	450	Manhole	Adoptable
1.004	TANK	450	Manhole	Adoptable	S6	600	Manhole	Adoptable
1.005	S6	600	Manhole	Adoptable	EX	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	379127.045	410309.671	94.566	1.266	450		0	1.000	93.300	100
S2	379112.764	410295.996	94.566	1.566	450		1	1.000	93.000	100
							0	1.001	93.000	100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S3	379104.551	410305.354	94.566	1.716	450	 1	1.001	92.850	100
						0	1.002	92.850	100
S4	379117.027	410317.301	94.566	1.866	450	 0	2.000	92.700	100
S5	379110.885	410311.419	94.566	2.216	450	 1 2	2.000 1.002	92.350 92.350	100 100
						0	1.003	92.350	100
TANK	379109.370	410313.174	94.566	2.266	450	 1	1.003	92.300	100
						0	1.004	92.300	100
S6	379112.773	410316.659	94.566	2.366	600	 1	1.004	92.200	100
						0	1.005	92.200	100
EX	379112.009	410318.364	94.566	2.466	450	 1	1.005	92.100	100

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)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node S6 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.600	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	4.0		
Invert Level (m)	92.200	Diameter (m)	0.039		

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	92.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	25

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	10.0	0.0	0.500	10.0	0.0	0.501	0.0	0.0

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

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m ³)	
Full Bore Velocity	✓		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	109.521	30.991	1 year 720 minute winter	5.513	2.199
1 year 15 minute winter	76.857	30.991	1 year 960 minute summer	6.768	1.782
1 year 30 minute summer	71.439	20.215	1 year 960 minute winter	4.483	1.782
1 year 30 minute winter	50.133	20.215	1 year 1440 minute summer	4.949	1.326
1 year 60 minute summer	48.435	12.800	1 year 1440 minute winter	3.326	1.326
1 year 60 minute winter	32.179	12.800	30 year 15 minute summer	268.706	76.035
1 year 120 minute summer	30.053	7.942	30 year 15 minute winter	188.566	76.035
1 year 120 minute winter	19.966	7.942	30 year 30 minute summer	174.929	49.499
1 year 180 minute summer	23.233	5.979	30 year 30 minute winter	122.757	49.499
1 year 180 minute winter	15.102	5.979	30 year 60 minute summer	116.589	30.811
1 year 240 minute summer	18.475	4.882	30 year 60 minute winter	77.459	30.811
1 year 240 minute winter	12.274	4.882	30 year 120 minute summer	70.438	18.615
1 year 360 minute summer	14.169	3.646	30 year 120 minute winter	46.797	18.615
1 year 360 minute winter	9.210	3.646	30 year 180 minute summer	53.298	13.715
1 year 480 minute summer	11.185	2.956	30 year 180 minute winter	34.645	13.715
1 year 480 minute winter	7.431	2.956	30 year 240 minute summer	41.604	10.995
1 year 600 minute summer	9.182	2.511	30 year 240 minute winter	27.641	10.995
1 year 600 minute winter	6.274	2.511	30 year 360 minute summer	31.221	8.034
1 year 720 minute summer	8.203	2.199	30 year 360 minute winter	20.295	8.034

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 480 minute summer	24.324	6.428	100 year 720 minute winter	15.089	6.017
30 year 480 minute winter	16.160	6.428	100 year 960 minute summer	18.166	4.784
30 year 600 minute summer	19.756	5.404	100 year 960 minute winter	12.033	4.784
30 year 600 minute winter	13.498	5.404	100 year 1440 minute summer	12.896	3.456
30 year 720 minute summer	17.490	4.687	100 year 1440 minute winter	8.667	3.456
30 year 720 minute winter	11.754	4.687	100 year +40% CC 15 minute summer	488.233	138.153
30 year 960 minute summer	14.215	3.743	100 year +40% CC 15 minute winter	342.620	138.153
30 year 960 minute winter	9.416	3.743	100 year +40% CC 30 minute summer	320.551	90.705
30 year 1440 minute summer	10.161	2.723	100 year +40% CC 30 minute winter	224.948	90.705
30 year 1440 minute winter	6.829	2.723	100 year +40% CC 60 minute summer	214.603	56.713
100 year 15 minute summer	348.738	98.681	100 year +40% CC 60 minute winter	142.577	56.713
100 year 15 minute winter	244.728	98.681	100 year +40% CC 120 minute summer	129.587	34.246
100 year 30 minute summer	228.965	64.789	100 year +40% CC 120 minute winter	86.094	34.246
100 year 30 minute winter	160.677	64.789	100 year +40% CC 180 minute summer	97.729	25.149
100 year 60 minute summer	153.288	40.510	100 year +40% CC 180 minute winter	63.526	25.149
100 year 60 minute winter	101.841	40.510	100 year +40% CC 240 minute summer	75.977	20.078
100 year 120 minute summer	92.562	24.461	100 year +40% CC 240 minute winter	50.477	20.078
100 year 120 minute winter	61.496	24.461	100 year +40% CC 360 minute summer	56.677	14.585
100 year 180 minute summer	69.806	17.964	100 year +40% CC 360 minute winter	36.841	14.585
100 year 180 minute winter	45.376	17.964	100 year +40% CC 480 minute summer	43.979	11.622
100 year 240 minute summer	54.269	14.342	100 year +40% CC 480 minute winter	29.219	11.622
100 year 240 minute winter	36.055	14.342	100 year +40% CC 600 minute summer	35.604	9.738
100 year 360 minute summer	40.484	10.418	100 year +40% CC 600 minute winter	24.327	9.738
100 year 360 minute winter	26.315	10.418	100 year +40% CC 720 minute summer	31.433	8.424
100 year 480 minute summer	31.414	8.302	100 year +40% CC 720 minute winter	21.125	8.424
100 year 480 minute winter	20.871	8.302	100 year +40% CC 960 minute summer	25.432	6.697
100 year 600 minute summer	25.431	6.956	100 year +40% CC 960 minute winter	16.847	6.697
100 year 600 minute winter	17.376	6.956	100 year +40% CC 1440 minute summer	18.055	4.839
100 year 720 minute summer	22.452	6.017	100 year +40% CC 1440 minute winter	12.134	4.839

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	S1	10	93.331	0.031	1.6	0.0104	0.0000	OK
15 minute winter	S2	10	93.051	0.051	3.2	0.0154	0.0000	OK
15 minute winter	S3	10	92.889	0.039	4.7	0.0112	0.0000	OK
15 minute winter	S4	10	92.724	0.024	1.6	0.0067	0.0000	OK
30 minute winter	S5	25	92.477	0.127	4.8	0.0202	0.0000	SURCHARGED
30 minute winter	TANK	26	92.474	0.174	4.6	1.6810	0.0000	SURCHARGED
30 minute winter	S6	26	92.469	0.269	1.7	0.0763	0.0000	SURCHARGED
15 minute summer	EX	1	92.100	0.000	1.5	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 winter	S1	1.000	S2	1.6	0.518	0.211	0.0605	
15 minute winter	S2	1.001	S3	3.1	0.909	0.468	0.0427	
15 minute winter	S3	1.002	S5	4.7	1.017	0.321	0.0453	
15 minute winter	S4	2.000	S5	1.6	0.483	0.128	0.0385	
30 minute winter	S5	1.003	TANK	4.6	0.980	0.517	0.0181	
30 minute winter	TANK	1.004	S6	1.7	0.530	0.196	0.0381	
30 minute winter	S6	Orifice	EX	1.6				3.7

Results for 30 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	S1	10	93.350	0.050	3.8	0.0167	0.0000	OK
15 minute winter	S2	12	93.187	0.187	7.6	0.0560	0.0000	SURCHARGED
15 minute winter	S3	12	93.023	0.173	10.6	0.0495	0.0000	SURCHARGED
30 minute winter	S4	27	92.867	0.167	2.9	0.0461	0.0000	SURCHARGED
30 minute winter	S5	27	92.865	0.515	11.3	0.0820	0.0000	SURCHARGED
30 minute winter	TANK	27	92.858	0.558	10.6	4.8435	0.0000	SURCHARGED
30 minute winter	S6	27	92.846	0.646	2.9	0.1829	0.0000	SURCHARGED
15 minute summer	EX	1	92.100	0.000	2.2	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	S1	1.000	S2	3.8	0.605	0.505	0.1163	
15 minute winter	S2	1.001	S3	6.8	1.012	1.020	0.0974	
15 minute winter	S3	1.002	S5	9.8	1.314	0.672	0.0686	
30 minute winter	S4	2.000	S5	2.9	0.483	0.234	0.0665	
30 minute winter	S5	1.003	TANK	10.6	1.350	1.185	0.0181	
30 minute winter	TANK	1.004	S6	2.9	0.628	0.330	0.0381	
30 minute winter	S6	Orifice	EX	2.5				9.1

Results for 100 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	S1	12	93.488	0.188	4.9	0.0627	0.0000	SURCHARGED
15 minute winter	S2	12	93.410	0.410	9.1	0.1230	0.0000	SURCHARGED
60 minute winter	S3	46	93.303	0.453	7.9	0.1299	0.0000	SURCHARGED
60 minute winter	S4	46	93.286	0.586	2.6	0.1622	0.0000	SURCHARGED
60 minute winter	S5	46	93.284	0.934	9.4	0.1485	0.0000	SURCHARGED
60 minute winter	TANK	46	93.272	0.972	8.7	4.9093	0.0000	SURCHARGED
60 minute winter	S6	47	93.253	1.053	4.4	0.2979	0.0000	SURCHARGED
15 minute summer	EX	1	92.100	0.000	2.6	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	S1	1.000	S2	4.5	0.646	0.601	0.1547	
15 minute winter	S2	1.001	S3	7.2	0.997	1.092	0.0974	
60 minute winter	S3	1.002	S5	7.5	0.991	0.514	0.0686	
60 minute winter	S4	2.000	S5	2.4	0.434	0.193	0.0665	
60 minute winter	S5	1.003	TANK	8.7	1.107	0.972	0.0181	
60 minute winter	TANK	1.004	S6	4.4	0.587	0.509	0.0381	
60 minute winter	S6	Orifice	EX	3.2				15.0

Results for 100 year +40% 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	S1	13	93.970	0.670	6.9	0.2232	0.0000	SURCHARGED
60 minute winter	S2	46	93.947	0.947	7.0	0.2841	0.0000	SURCHARGED
60 minute winter	S3	46	93.926	1.076	9.2	0.3087	0.0000	SURCHARGED
60 minute winter	S4	47	93.897	1.197	3.6	0.3317	0.0000	SURCHARGED
60 minute winter	S5	47	93.895	1.545	10.4	0.2456	0.0000	SURCHARGED
60 minute winter	TANK	48	93.876	1.576	9.6	5.0054	0.0000	SURCHARGED
60 minute winter	S6	48	93.846	1.646	5.2	0.4658	0.0000	SURCHARGED
15 minute summer	EX	1	92.100	0.000	3.4	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	S1	1.000	S2	5.0	0.696	0.667	0.1547	
60 minute winter	S2	1.001	S3	6.0	0.955	0.898	0.0974	
60 minute winter	S3	1.002	S5	8.0	1.051	0.549	0.0686	
60 minute winter	S4	2.000	S5	2.6	0.483	0.208	0.0665	
60 minute winter	S5	1.003	TANK	9.6	1.230	1.080	0.0181	
60 minute winter	TANK	1.004	S6	5.2	0.670	0.603	0.0381	
60 minute winter	S6	Orifice	EX	4.0				21.0