

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)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.450	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)	Width (mm)	Depth (m)
2.01	0.006	5.00	15.146	450		0.696
2.02	0.003	5.00	15.064	450		0.834
2.07	0.011	5.00	15.113	450		0.713
2.03	0.004	5.00	15.064	600	450	1.584
2.08	0.007	5.00	15.132	450		0.732
2.04	0.005	5.00	15.065	450	600	1.755
RE2	0.004	5.00	15.103	300		0.903
RE1	0.003	5.00	15.180	300		0.980
2.06	0.002	5.00	15.040	1200		1.960
CS2	0.000		14.850	300		1.820
DMH			14.850	300		1.830

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)
1.000	2.01	2.02	3.916	0.600	14.450	14.300	0.150	26.1	150	5.03
1.001	2.02	2.03	7.719	0.600	14.230	14.130	0.100	77.2	150	5.15
2.000	2.07	2.03	2.567	0.600	14.400	14.300	0.100	25.7	150	5.02
1.002	2.03	2.04	15.142	0.600	13.480	13.310	0.170	89.1	150	5.38
3.000	2.08	2.04	1.579	0.600	14.400	14.300	0.100	15.8	150	5.01
1.003	2.04	2.06	14.398	0.600	13.310	13.155	0.155	92.9	150	5.61
4.000	RE2	2.06	11.250	0.600	14.200	14.000	0.200	56.3	150	5.14
5.000	RE1	2.06	11.590	0.600	14.200	13.995	0.205	56.5	150	5.14
1.004	2.06	CS2	4.379	0.600	13.080	13.030	0.050	87.6	225	5.66
1.005	CS2	DMH	2.000	0.600	13.030	13.020	0.010	200.0	100	5.73

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1.000	2.01	2.02	1.978	35.0	0.8	0.546	0.614	0.006
1.001	2.02	2.03	1.145	20.2	1.2	0.684	0.784	0.009
2.000	2.07	2.03	1.995	35.3	1.5	0.563	0.614	0.011
1.002	2.03	2.04	1.065	18.8	3.3	1.434	1.605	0.024
3.000	2.08	2.04	2.547	45.0	0.9	0.582	0.615	0.007
1.003	2.04	2.06	1.043	18.4	4.9	1.605	1.735	0.036
4.000	RE2	2.06	1.344	23.7	0.5	0.753	0.890	0.004
5.000	RE1	2.06	1.340	23.7	0.4	0.830	0.895	0.003
1.004	2.06	CS2	1.398	55.6	6.1	1.735	1.595	0.045
1.005	CS2	DMH	0.540	4.2	6.1	1.720	1.730	0.045

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)
2.01	15.146	0.696	450		Manhole		0	1.000	14.450
2.02	15.064	0.834	450		Manhole		1	1.000	14.300
2.07	15.113	0.713	450		Manhole		0	1.001	14.230
							0	2.000	14.400

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)
2.03	15.064	1.584	600	450	Manhole		1 2.000 2 1.001 0 1.002	14.300 14.130 13.480	150 150 150
2.08	15.132	0.732	450		Manhole		0 3.000	14.400	150
2.04	15.065	1.755	450	600	Manhole		1 3.000 2 1.002 0 1.003	14.300 13.310 13.310	150 150 150
RE2	15.103	0.903	300		Manhole		0 4.000	14.200	150
RE1	15.180	0.980	300		Manhole		0 5.000	14.200	150
2.06	15.040	1.960	1200		Manhole		1 5.000 2 4.000 3 1.003 0 1.004	13.995 14.000 13.155 13.080	150 150 150 225
CS2	14.850	1.820	300		Manhole		1 1.004 0 1.005	13.030 13.030	225 100
DMH	14.850	1.830	300		Manhole		1 1.005	13.020	100

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Drain Down Time (mins)	240
FSR Region	England and Wales	Winter CV	0.840	Additional Storage (m³/ha)	20.0
M5-60 (mm)	20.000	Analysis Speed	Normal	Check Discharge Rate(s)	x
Ratio-R	0.450	Skip Steady State	✓	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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	30	0	0	0
10	0	0	0	100	40	0	0

Node DMH Offline Weir Control

Flap Valve	x	Invert Level (m)	13.020	Design Flow (l/s)		Discharge Coefficient	0.590
Loop to Node	CS2	Design Depth (m)	1.600	Width (m)	0.300		

Node CS2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	12.000
Side Inf Coefficient (m/hr)	1.29600	Porosity	0.95	Time to half empty (mins)	62

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	4.5	4.5	1.600	4.5	22.1	1.601	0.0	22.1

Results for 1 year Critical Storm Duration. Lowest mass balance: 82.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m³)	Status
15 minute winter	2.01	10	14.467	0.017	0.9	0.0000	OK
15 minute winter	2.02	10	14.256	0.026	1.3	0.0000	OK
15 minute winter	2.07	10	14.423	0.023	1.6	0.0000	OK
15 minute winter	2.03	11	13.523	0.043	3.4	0.0000	OK
15 minute winter	2.08	10	14.417	0.017	1.0	0.0000	OK
15 minute winter	2.04	11	13.366	0.056	5.1	0.0000	OK
15 minute winter	RE2	11	14.217	0.017	0.6	0.0000	OK
15 minute winter	RE1	11	14.214	0.014	0.4	0.0000	OK
15 minute winter	2.06	11	13.136	0.056	6.4	0.0000	OK
60 minute winter	CS2	46	12.668	-0.362	3.2	0.0000	OK
15 minute summer	DMH	1	13.020	0.000	0.0	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	2.01	1.000	2.02	0.9	0.820	0.025	0.0042	
15 minute winter	2.02	1.001	2.03	1.2	0.627	0.062	0.0154	
15 minute winter	2.07	2.000	2.03	1.6	0.960	0.045	0.0042	
15 minute winter	2.03	1.002	2.04	3.4	0.676	0.181	0.0770	
15 minute winter	2.08	3.000	2.04	1.0	0.987	0.022	0.0016	
15 minute winter	2.04	1.003	2.06	5.1	0.876	0.278	0.0841	
15 minute winter	RE2	4.000	2.06	0.6	0.568	0.025	0.0119	
15 minute winter	RE1	5.000	2.06	0.4	0.503	0.017	0.0092	
15 minute winter	2.06	1.004	CS2	6.4	0.880	0.115	0.0319	
15 minute summer	CS2	1.005	DMH	0.0	0.000	0.000	0.0000	
60 minute winter	CS2	Infiltration		1.3				
15 minute summer	DMH	Weir	CS2	0.0				0.0

Results for 10 year Critical Storm Duration. Lowest mass balance: 82.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m³)	Status
15 minute winter	2.01	10	14.474	0.024	1.7	0.0000	OK
15 minute winter	2.02	10	14.267	0.037	2.6	0.0000	OK
15 minute winter	2.07	10	14.433	0.033	3.1	0.0000	OK
15 minute winter	2.03	10	13.543	0.063	6.7	0.0000	OK
15 minute winter	2.08	10	14.424	0.024	2.0	0.0000	OK
15 minute winter	2.04	11	13.393	0.083	10.0	0.0000	OK
15 minute winter	RE2	11	14.222	0.022	1.1	0.0000	OK
15 minute winter	RE1	10	14.220	0.020	0.9	0.0000	OK
60 minute winter	2.06	46	13.172	0.092	6.1	0.0000	OK
60 minute winter	CS2	45	13.172	0.142	6.1	0.0000	SURCHARGED
60 minute winter	DMH	46	13.173	0.153	5.4	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	2.01	1.000	2.02	1.7	0.987	0.048	0.0067	
15 minute winter	2.02	1.001	2.03	2.5	0.762	0.125	0.0256	
15 minute winter	2.07	2.000	2.03	3.1	1.143	0.087	0.0069	
15 minute winter	2.03	1.002	2.04	6.6	0.788	0.352	0.1274	
15 minute winter	2.08	3.000	2.04	2.0	1.184	0.044	0.0027	
15 minute winter	2.04	1.003	2.06	10.0	1.034	0.540	0.1385	
15 minute winter	RE2	4.000	2.06	1.1	0.680	0.046	0.0182	
15 minute winter	RE1	5.000	2.06	0.9	0.630	0.036	0.0158	
15 minute winter	2.06	1.004	CS2	12.4	1.045	0.224	0.0522	
60 minute winter	CS2	1.005	DMH	1.0	0.142	0.225	0.0156	
60 minute winter	CS2	Infiltration		2.3				
60 minute winter	DMH	Weir	CS2	0.5				-0.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 82.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m³)	Status
15 minute winter	2.01	10	14.477	0.027	2.2	0.0000	OK
15 minute winter	2.02	10	14.272	0.042	3.3	0.0000	OK
15 minute winter	2.07	10	14.438	0.038	4.0	0.0000	OK
15 minute winter	2.03	10	13.553	0.073	8.6	0.0000	OK
15 minute winter	2.08	10	14.427	0.027	2.5	0.0000	OK
15 minute winter	2.04	11	13.407	0.097	12.7	0.0000	OK
15 minute winter	RE2	11	14.225	0.025	1.4	0.0000	OK
15 minute winter	RE1	10	14.222	0.022	1.1	0.0000	OK
60 minute winter	2.06	46	13.371	0.291	7.9	0.0000	SURCHARGED
60 minute winter	CS2	46	13.370	0.340	32.4	0.0000	SURCHARGED
60 minute winter	DMH	46	13.389	0.369	2.4	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	2.01	1.000	2.02	2.2	1.057	0.062	0.0080	
15 minute winter	2.02	1.001	2.03	3.2	0.812	0.158	0.0304	
15 minute winter	2.07	2.000	2.03	4.0	1.219	0.112	0.0084	
15 minute winter	2.03	1.002	2.04	8.4	0.825	0.448	0.1547	
15 minute winter	2.08	3.000	2.04	2.5	1.252	0.055	0.0031	
15 minute winter	2.04	1.003	2.06	12.7	1.090	0.688	0.1676	
15 minute winter	RE2	4.000	2.06	1.4	0.729	0.059	0.0216	
15 minute winter	RE1	5.000	2.06	1.1	0.670	0.045	0.0183	
15 minute winter	2.06	1.004	CS2	15.9	1.110	0.286	0.1598	
60 minute summer	CS2	1.005	DMH	-1.9	0.247	-0.443	0.0156	
60 minute winter	CS2	Infiltration		2.7				
60 minute winter	DMH	Weir	CS2	28.7				16.6

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 82.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m³)	Status
15 minute winter	2.01	10	14.487	0.037	3.9	0.0000	OK
60 minute winter	2.02	44	14.362	0.132	2.9	0.0000	OK
15 minute winter	2.07	10	14.454	0.054	7.2	0.0000	OK
60 minute winter	2.03	45	14.350	0.870	7.8	0.0000	SURCHARGED
15 minute winter	2.08	10	14.438	0.038	4.6	0.0000	OK
60 minute winter	2.04	45	14.353	1.043	11.4	0.0000	SURCHARGED
60 minute winter	RE2	49	14.325	0.125	3.6	0.0000	OK
60 minute winter	RE1	45	14.325	0.125	3.3	0.0000	OK
60 minute winter	2.06	46	14.357	1.277	48.5	0.0000	SURCHARGED
30 minute winter	CS2	29	14.498	1.468	124.8	0.0000	SURCHARGED
60 minute winter	DMH	46	14.592	1.572	441.8	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	2.01	1.000	2.02	3.9	1.235	0.111	0.0123	
15 minute winter	2.02	1.001	2.03	5.8	0.949	0.286	0.0471	
15 minute winter	2.07	2.000	2.03	7.2	1.405	0.203	0.0131	
15 minute winter	2.03	1.002	2.04	14.2	0.888	0.753	0.2666	
15 minute winter	2.08	3.000	2.04	4.6	1.449	0.102	0.0050	
15 minute winter	2.04	1.003	2.06	21.1	1.200	1.145	0.2535	
60 minute winter	RE2	4.000	2.06	6.0	0.713	0.253	0.1871	
60 minute winter	RE1	5.000	2.06	5.8	0.660	0.245	0.1929	
120 minute summer	2.06	1.004	CS2	54.2	1.362	0.975	0.1742	
120 minute winter	CS2	1.005	DMH	-80.1	-10.239	-18.885	0.0156	
15 minute summer	CS2	Infiltration		3.2				
60 minute winter	DMH	Weir	CS2	112.4				-50.5