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)	19.000	Minimum Backdrop Height (m)	0.000
Ratio-R	0.350	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)	Depth (m)
IC S1	0.022	5.00	65.304	315	0.704
IC S2	0.021	5.00	64.970	315	0.520
IC S3	0.000		65.038	315	0.704
IC S4	0.007	5.00	65.212	315	0.955
MH S5	0.014	5.00	64.875	1200	1.948
IC S6	0.036	5.00	64.128	450	0.900
MH S7	0.019	5.00	64.875	1200	2.096
MH S8	0.000		65.031	1200	2.288
IC S9	0.043	5.00	64.921	600	0.900

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	IC S1	IC S2	15.000	0.600	64.600	64.450	0.150	100.0	150	5.25	47.7
1.001	IC S2	IC S3	11.600	0.600	64.450	64.334	0.116	100.0	150	5.44	46.9
1.002	IC S3	IC S4	7.700	0.600	64.334	64.257	0.077	100.0	150	5.57	46.5
1.003	IC S4	MH S5	8.600	0.600	64.257	64.042	0.215	40.0	150	5.66	46.1
1.004	MH S5	MH S7	14.800	0.600	62.927	62.779	0.148	100.0	150	5.90	45.3
1.005	MH S7	MH S8	2.900	0.600	62.779	62.743	0.036	80.0	150	5.95	45.1
2.000	IC S6	MH S5	17.900	0.600	63.228	62.927	0.301	59.5	150	5.23	47.7
3.000	IC S9	MH S7	5.800	0.600	64.021	63.923	0.098	59.2	150	5.07	48.4

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	1.005	17.8	2.8	0.554	0.370	0.022	0.0	41	0.740
1.001	1.005	17.8	5.5	0.370	0.554	0.043	0.0	57	0.886
1.002	1.005	17.8	5.4	0.554	0.805	0.043	0.0	57	0.881
1.003	1.596	28.2	6.3	0.805	0.683	0.050	0.0	48	1.284
1.004	1.005	17.8	12.3	1.798	1.946	0.100	0.0	92	1.082
1.005	1.125	19.9	19.8	1.946	2.138	0.162	0.0	123	1.278
2.000	1.306	23.1	4.7	0.750	1.798	0.036	0.0	45	1.022
3.000	1.310	23.1	5.6	0.750	0.802	0.043	0.0	50	1.080

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
IC S1	65.304	0.704	315	0	1.000	64.600	150
IC S2	64.970	0.520	315	1	1.000	64.450	150
				0	1.001	64.450	150
IC S3	65.038	0.704	315	1	1.001	64.334	150
				0	1.002	64.334	150
IC S4	65.212	0.955	315	1	1.002	64.257	150
				0	1.003	64.257	150
MH S5	64.875	1.948	1200	1	2.000	62.927	150
				2	1.003	64.042	150
				0	1.004	62.927	150
IC S6	64.128	0.900	450	0	2.000	63.228	150
MH S7	64.875	2.096	1200	1	3.000	63.923	150
				2	1.004	62.779	150
				0	1.005	62.779	150
MH S8	65.031	2.288	1200	1	1.005	62.743	150
IC S9	64.921	0.900	600	0	3.000	64.021	150

Simulation Settings

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

Node MH S7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	62.779	Product Number	CTL-SHE-0103-5000-1200-5000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node MH S5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	62.927
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	98

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	44.5	0.0	1.200	44.5	0.0	1.210	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC S1	10	64.640	0.040	2.8	0.0280	0.0000	OK
15 minute winter	IC S2	10	64.509	0.059	5.4	0.0522	0.0000	OK
15 minute winter	IC S3	11	64.394	0.060	5.3	0.0047	0.0000	OK
15 minute winter	IC S4	11	64.308	0.050	6.1	0.0114	0.0000	OK
30 minute winter	MH S5	26	63.057	0.130	11.2	5.9544	0.0000	OK
15 minute summer	IC S6	9	63.275	0.047	4.4	0.0450	0.0000	OK
30 minute winter	MH S7	25	63.052	0.273	6.2	0.3586	0.0000	SURCHARGED
15 minute summer	MH S8	1	62.743	0.000	4.9	0.0000	0.0000	OK
15 minute winter	IC S9	10	64.075	0.054	5.5	0.0663	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	IC S1	1.000	IC S2	2.8	0.545	0.155	0.0762	
15 minute winter	IC S2	1.001	IC S3	5.3	0.825	0.300	0.0749	
15 minute winter	IC S3	1.002	IC S4	5.3	0.909	0.301	0.0453	
15 minute winter	IC S4	1.003	MH S5	6.2	1.237	0.220	0.0431	
30 minute winter	MH S5	1.004	MH S7	4.7	0.345	0.263	0.2503	
15 minute summer	IC S6	2.000	MH S5	4.5	1.216	0.194	0.1256	
30 minute winter	MH S7	Hydro-Brake®	MH S8	4.9				12.6
15 minute winter	IC S9	3.000	MH S7	5.4	1.018	0.235	0.0310	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC S1	10	64.664	0.064	6.9	0.0453	0.0000	OK
15 minute winter	IC S2	10	64.555	0.105	13.4	0.0932	0.0000	OK
15 minute winter	IC S3	11	64.439	0.105	13.2	0.0082	0.0000	OK
15 minute winter	IC S4	11	64.344	0.087	15.2	0.0195	0.0000	OK
60 minute winter	MH S5	58	63.442	0.515	21.5	23.5966	0.0000	SURCHARGED
60 minute winter	IC S6	58	63.443	0.215	6.0	0.2063	0.0000	SURCHARGED
60 minute winter	MH S7	56	63.438	0.659	10.4	0.8646	0.0000	SURCHARGED
15 minute summer	MH S8	1	62.743	0.000	5.0	0.0000	0.0000	OK
15 minute winter	IC S9	10	64.114	0.093	13.5	0.1149	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	IC S1	1.000	IC S2	6.8	0.665	0.385	0.1531	
15 minute winter	IC S2	1.001	IC S3	13.2	1.004	0.742	0.1522	
15 minute winter	IC S3	1.002	IC S4	13.1	1.109	0.741	0.0911	
15 minute winter	IC S4	1.003	MH S5	15.4	1.539	0.545	0.0858	
60 minute winter	MH S5	1.004	MH S7	4.9	0.345	0.274	0.2606	
60 minute winter	IC S6	2.000	MH S5	6.0	0.994	0.260	0.3151	
60 minute winter	MH S7	Hydro-Brake®	MH S8	5.0				39.6
15 minute winter	IC S9	3.000	MH S7	13.4	1.258	0.578	0.0616	

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC S1	11	64.797	0.197	11.6	0.1388	0.0000	SURCHARGED
15 minute winter	IC S2	11	64.731	0.281	21.0	0.2485	0.0000	FLOOD RISK
15 minute winter	IC S3	11	64.525	0.191	20.7	0.0149	0.0000	SURCHARGED
15 minute winter	IC S4	11	64.380	0.123	24.0	0.0276	0.0000	OK
120 minute winter	MH S5	110	64.025	1.098	24.0	50.2437	0.0000	SURCHARGED
120 minute winter	IC S6	108	64.025	0.797	6.5	0.7647	0.0000	FLOOD RISK
120 minute winter	MH S7	110	64.019	1.240	11.1	1.6270	0.0000	SURCHARGED
15 minute summer	MH S8	1	62.743	0.000	5.0	0.0000	0.0000	OK
15 minute winter	IC S9	11	64.174	0.153	22.6	0.1893	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	IC S1	1.000	IC S2	10.6	0.700	0.596	0.2641	
15 minute winter	IC S2	1.001	IC S3	20.7	1.177	1.167	0.2042	
15 minute winter	IC S3	1.002	IC S4	20.5	1.182	1.156	0.1271	
15 minute winter	IC S4	1.003	MH S5	23.8	1.660	0.845	0.1233	
120 minute winter	MH S5	1.004	MH S7	-6.4	-0.363	-0.360	0.2606	
120 minute winter	IC S6	2.000	MH S5	6.0	0.972	0.259	0.3151	
120 minute winter	MH S7	Hydro-Brake®	MH S8	5.1				83.9
15 minute winter	IC S9	3.000	MH S7	22.0	1.351	0.949	0.0934	