

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	RE1	S1	5.183	0.600	149.200	149.148	0.052	99.7	150	4.09	65.2
1.001	S1	S2	14.031	0.600	149.148	149.008	0.140	100.2	150	4.32	63.9
1.002	S2	S3	10.839	0.600	149.008	148.900	0.108	100.4	150	4.50	63.0
1.003	S3	S5	6.782	0.600	148.900	148.832	0.068	99.7	150	4.61	62.4
2.000	S4	S5	3.140	0.600	148.985	148.832	0.153	20.5	150	4.02	65.5
1.004	S5	S6	22.709	0.600	148.532	148.441	0.091	249.5	450	4.91	61.0
3.000	RE8	S8	15.643	0.600	149.200	148.937	0.263	59.5	100	4.26	64.2
3.001	S8	S6	11.574	0.600	148.937	148.592	0.345	33.5	100	4.40	63.5
4.000	S10	RE11	6.956	0.600	149.145	148.700	0.445	15.6	150	4.05	65.4
5.000	S9	RE11	1.000	0.600	149.090	148.990	0.100	10.0	150	4.01	65.7
4.001	RE11	S11	12.944	0.600	148.700	148.571	0.129	100.3	150	4.26	64.2
5.002	S11	S6	2.870	0.600	148.571	148.542	0.029	99.0	150	4.31	64.0
6.000	S7	S6	3.641	0.600	149.275	149.238	0.037	98.4	150	4.06	65.3
1.005	S6	C1	10.612	0.600	148.441	148.332	0.109	97.4	150	5.08	60.2
1.006	C1	OUT	5.680	0.600	148.332	148.290	0.042	135.2	225	5.16	108.4

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	1.006	17.8	0.7	0.450	0.602	0.004	0.0	20	0.484
1.001	1.003	17.7	1.9	0.602	0.692	0.011	0.0	33	0.655
1.002	1.003	17.7	1.9	0.692	0.750	0.011	0.0	33	0.655
1.003	1.006	17.8	1.9	0.750	0.713	0.011	0.0	33	0.650
2.000	2.233	39.5	4.4	0.500	0.713	0.025	0.0	34	1.478
1.004	1.282	203.9	8.4	0.713	1.039	0.051	0.0	62	0.644
3.000	1.000	7.9	1.6	0.500	0.813	0.009	0.0	30	0.777
3.001	1.336	10.5	1.5	0.813	1.238	0.009	0.0	26	0.960
4.000	2.560	45.2	1.9	0.500	0.900	0.011	0.0	21	1.287
5.000	3.204	56.6	2.3	0.500	0.610	0.013	0.0	21	1.584
4.001	1.003	17.7	4.2	0.900	1.249	0.024	0.0	50	0.822
5.002	1.010	17.8	4.2	1.249	1.238	0.024	0.0	50	0.827
6.000	1.013	17.9	1.2	0.500	0.542	0.007	0.0	27	0.580
1.005	1.018	18.0	14.8	1.339	1.378	0.091	0.0	104	1.135
1.006	1.122	44.6	26.7	1.303	1.175	0.091	0.0	125	1.170

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
RE1	149.800	0.600	150				
				0	1.000	149.200	150
S1	149.900	0.752	450		1	1.000	149.148
				0	1.001	149.148	150
S2	149.850	0.842	450		1	1.001	149.008
				0	1.002	149.008	150

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S3	149.800	0.900	450	1	1.002	148.900	150
				0	1.003	148.900	150
S4	149.635	0.650	600	0	2.000	148.985	150
S5	149.695	1.163	1200	1	2.000	148.832	150
				2	1.003	148.832	150
				0	1.004	148.532	450
RE8	149.800	0.600	150	0	3.000	149.200	100
S8	149.850	0.913	450	1	3.000	148.937	100
				0	3.001	148.937	100
S10	149.795	0.650	600	0	4.000	149.145	150
S9	149.740	0.650	600	0	5.000	149.090	150
RE11	149.750	1.050	150	1	5.000	148.990	150
				2	4.000	148.700	150
				0	4.001	148.700	150
S11	149.970	1.399	450	1	4.001	148.571	150
				0	5.002	148.571	150
S7	149.925	0.650	600	0	6.000	149.275	150
S6	149.930	1.489	1500	1	6.000	149.238	150
				2	5.002	148.542	150
				3	3.001	148.592	100
				4	1.004	148.441	450
				0	1.005	148.441	150
C1	149.860	1.528	600	1	1.005	148.332	150
				0	1.006	148.332	225
OUT	149.690	1.400	750	1	1.006	148.290	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	✓
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.300	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160
30	120	240	480	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	45	0	0

Node S6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.005	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0107-5500-1200-5500
Invert Level (m)	148.441	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.200	Min Node Diameter (mm)	1200
Design Flow (l/s)	5.5		

Node S4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	148.985	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	82	Depth (m)	0.350
Safety Factor	1.0	Width (m)	4.800	Inf Depth (m)	
Porosity	0.30	Length (m)	14.800		

Node S7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	149.275	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	11	Depth (m)	0.350
Safety Factor	1.0	Width (m)	3.700	Inf Depth (m)	
Porosity	0.30	Length (m)	9.600		

Node S9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	149.090	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	60	Depth (m)	0.350
Safety Factor	1.0	Width (m)	4.800	Inf Depth (m)	
Porosity	0.30	Length (m)	6.200		

Node S10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	149.145	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	45	Depth (m)	0.350
Safety Factor	1.0	Width (m)	4.300	Inf Depth (m)	
Porosity	0.30	Length (m)	9.600		

Results for 2 year Critical Storm Duration. Lowest mass balance: 97.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	RE1	10	149.220	0.020	0.7	0.0004	0.0000	OK
15 minute winter	S1	10	149.182	0.034	1.9	0.0054	0.0000	OK
15 minute summer	S2	10	149.042	0.034	1.9	0.0054	0.0000	OK
15 minute summer	S3	11	148.934	0.034	1.9	0.0054	0.0000	OK
15 minute winter	S4	10	149.022	0.037	4.4	0.1134	0.0000	OK
30 minute winter	S5	23	148.775	0.243	6.8	0.2743	0.0000	OK
15 minute winter	RE8	10	149.232	0.032	1.6	0.0006	0.0000	OK
15 minute summer	S8	10	148.963	0.026	1.6	0.0042	0.0000	OK
15 minute winter	S10	10	149.166	0.021	1.9	0.0363	0.0000	OK
15 minute winter	S9	10	149.114	0.024	2.3	0.0508	0.0000	OK
30 minute winter	RE11	23	148.776	0.076	3.3	0.0014	0.0000	OK
30 minute winter	S11	24	148.775	0.204	3.2	0.0325	0.0000	SURCHARGED
15 minute winter	S7	10	149.302	0.027	1.2	0.0515	0.0000	OK
30 minute winter	S6	24	148.775	0.334	8.9	0.5901	0.0000	SURCHARGED
30 minute winter	C1	24	148.389	0.057	5.4	0.0160	0.0000	OK
30 minute winter	OUT	24	148.343	0.053	5.4	0.0000	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	RE1	1.000	S1	0.7	0.325	0.039	0.0114	
15 minute summer	S1	1.001	S2	1.9	0.641	0.107	0.0415	
15 minute summer	S2	1.002	S3	1.9	0.637	0.106	0.0318	
15 minute summer	S3	1.003	S5	1.9	0.639	0.105	0.0198	
15 minute winter	S4	2.000	S5	4.4	1.375	0.111	0.0100	
15 minute summer	S5	1.004	S6	6.3	0.386	0.031	2.0950	
15 minute winter	RE8	3.000	S8	1.6	0.843	0.204	0.0298	
15 minute summer	S8	3.001	S6	1.6	0.905	0.151	0.0543	
15 minute winter	S10	4.000	RE11	1.9	0.648	0.042	0.0302	
15 minute winter	S9	5.000	RE11	2.3	1.396	0.040	0.0016	
15 minute summer	RE11	4.001	S11	4.2	0.717	0.237	0.1441	
15 minute summer	S11	5.002	S6	3.8	0.628	0.213	0.0505	
15 minute winter	S7	6.000	S6	1.2	0.552	0.065	0.0077	
30 minute winter	S6	1.005	C1	5.4	0.865	0.302	0.0667	
30 minute winter	C1	1.006	OUT	5.4	0.731	0.122	0.0423	9.4

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 97.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	RE1	49	149.306	0.106	1.0	0.0019	0.0000	OK
60 minute winter	S1	49	149.306	0.158	2.7	0.0251	0.0000	SURCHARGED
60 minute winter	S2	49	149.305	0.297	3.5	0.0473	0.0000	SURCHARGED
60 minute winter	S3	50	149.305	0.405	3.3	0.0644	0.0000	SURCHARGED
60 minute winter	S4	49	149.305	0.320	10.9	5.3391	0.0000	SURCHARGED
60 minute winter	S5	50	149.305	0.773	10.8	0.8738	0.0000	SURCHARGED
60 minute winter	RE8	49	149.307	0.107	2.2	0.0019	0.0000	SURCHARGED
60 minute winter	S8	48	149.305	0.368	4.1	0.0586	0.0000	SURCHARGED
60 minute winter	S10	49	149.306	0.161	3.5	1.4472	0.0000	SURCHARGED
60 minute winter	S9	50	149.306	0.216	5.6	1.7127	0.0000	SURCHARGED
60 minute winter	RE11	50	149.306	0.606	5.9	0.0109	0.0000	SURCHARGED
60 minute winter	S11	50	149.305	0.734	5.2	0.1167	0.0000	SURCHARGED
15 minute winter	S7	10	149.322	0.047	3.3	0.1374	0.0000	OK
60 minute winter	S6	50	149.305	0.864	10.6	1.5260	0.0000	SURCHARGED
30 minute winter	C1	76	148.389	0.057	5.5	0.0161	0.0000	OK
30 minute winter	OUT	76	148.343	0.053	5.5	0.0000	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	RE1	1.000	S1	1.9	0.424	0.107	0.0323	
15 minute winter	S1	1.001	S2	5.2	0.828	0.294	0.1922	
15 minute summer	S2	1.002	S3	5.2	0.804	0.293	0.1908	
30 minute summer	S3	1.003	S5	-7.3	0.752	-0.409	0.1194	
15 minute summer	S4	2.000	S5	11.7	1.687	0.296	0.0553	
15 minute summer	S5	1.004	S6	16.2	0.439	0.080	3.5981	
15 minute summer	RE8	3.000	S8	4.3	1.080	0.546	0.0902	
15 minute winter	S8	3.001	S6	3.9	0.908	0.373	0.0906	
15 minute winter	S10	4.000	RE11	5.1	0.772	0.113	0.0977	
15 minute summer	S9	5.000	RE11	8.9	1.724	0.157	0.0153	
15 minute winter	RE11	4.001	S11	8.3	0.726	0.470	0.2279	
60 minute summer	S11	5.002	S6	6.3	0.510	0.352	0.0505	
15 minute winter	S7	6.000	S6	3.2	0.725	0.178	0.0160	
240 minute winter	S6	1.005	C1	5.5	0.868	0.305	0.0672	
30 minute winter	C1	1.006	OUT	5.5	0.733	0.123	0.0426	25.2

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	RE1	58	149.564	0.364	1.4	0.0066	0.0000	FLOOD RISK
60 minute winter	S1	58	149.564	0.416	3.7	0.0662	0.0000	SURCHARGED
60 minute winter	S2	58	149.564	0.556	3.5	0.0884	0.0000	FLOOD RISK
60 minute winter	S3	54	149.564	0.664	4.8	0.1055	0.0000	FLOOD RISK
60 minute winter	S4	54	149.564	0.579	14.1	6.0640	0.0000	FLOOD RISK
60 minute winter	S5	54	149.564	1.032	12.7	1.1666	0.0000	FLOOD RISK
60 minute winter	RE8	53	149.566	0.366	3.1	0.0066	0.0000	FLOOD RISK
60 minute winter	S8	54	149.565	0.628	3.5	0.0998	0.0000	FLOOD RISK
60 minute winter	S10	54	149.565	0.420	6.0	3.8698	0.0000	FLOOD RISK
60 minute winter	S9	54	149.565	0.475	6.1	2.9900	0.0000	FLOOD RISK
60 minute winter	RE11	54	149.565	0.865	7.3	0.0156	0.0000	FLOOD RISK
60 minute winter	S11	54	149.564	0.993	6.1	0.1579	0.0000	SURCHARGED
60 minute winter	S7	58	149.564	0.289	5.6	2.6503	0.0000	SURCHARGED
60 minute winter	S6	54	149.564	1.122	13.4	1.9834	0.0000	SURCHARGED
15 minute summer	C1	63	148.389	0.057	5.5	0.0161	0.0000	OK
120 minute summer	OUT	178	148.343	0.053	5.5	0.0000	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	RE1	1.000	S1	2.5	0.450	0.141	0.0885	
15 minute summer	S1	1.001	S2	7.0	0.885	0.395	0.2449	
15 minute winter	S2	1.002	S3	6.7	0.818	0.380	0.1908	
15 minute summer	S3	1.003	S5	6.4	0.743	0.361	0.1194	
15 minute winter	S4	2.000	S5	-14.3	1.718	-0.362	0.0553	
30 minute winter	S5	1.004	S6	14.1	0.443	0.069	3.5981	
15 minute winter	RE8	3.000	S8	5.6	1.111	0.719	0.1224	
15 minute winter	S8	3.001	S6	4.2	0.893	0.399	0.0906	
15 minute summer	S10	4.000	RE11	6.8	0.787	0.150	0.1220	
15 minute winter	S9	5.000	RE11	7.9	1.726	0.139	0.0176	
30 minute summer	RE11	4.001	S11	9.0	0.620	0.507	0.2279	
15 minute summer	S11	5.002	S6	8.0	0.666	0.449	0.0505	
15 minute winter	S7	6.000	S6	4.2	0.780	0.236	0.0336	
720 minute summer	S6	1.005	C1	5.5	0.867	0.305	0.0672	
120 minute summer	C1	1.006	OUT	5.5	0.733	0.123	0.0426	50.6