

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	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	0.350	Preferred Cover Depth (m)	0.500
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)	Easting (m)	Northing (m)	Depth (m)
RE1	0.000	5.00	5.650	100	492370.967	100454.922	0.450
S1	0.006	5.00	5.750	450	492385.678	100451.881	0.740
S2			5.650	450	492392.612	100456.059	0.750
S3	0.012	5.00	5.570	450	492394.525	100464.229	0.780
S4	0.008	5.00	5.670	450	492388.525	100467.859	0.970
S5	0.020	5.00	5.580	600	492389.684	100472.808	1.701
S6	0.013	5.00	5.045	1200	492395.570	100498.624	1.287
S7	0.002	5.00	5.650	450	492371.526	100465.117	0.600
S8	0.017	5.00	5.650	600	492374.178	100476.441	0.716

Links (Input)

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	15.022	0.600	5.200	5.010	0.190	79.1	100	5.29	50.0
1.001	S1	S2	8.095	0.600	5.010	4.900	0.110	73.6	100	5.44	50.0
1.002	S2	S3	8.891	0.600	4.900	4.790	0.110	76.3	100	5.60	50.0
1.003	S3	S4	7.013	0.600	4.790	4.700	0.090	77.9	100	5.73	50.0
1.004	S4	S5	5.083	0.600	4.700	4.646	0.054	94.1	100	5.84	50.0
2.000	S7	S8	11.630	0.600	5.050	4.934	0.116	100.3	150	5.19	50.0
2.001	S8	S5	15.926	0.600	4.934	4.781	0.153	104.1	150	5.46	50.0
2.002	S5	S6	25.478	0.600	3.879	3.758	0.121	218.8	225	6.34	50.0

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	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	40	0	0

Node S6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	3.758	Product Number	CTL-SHE-0063-2000-1287-2000
Design Depth (m)	1.287	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node S5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	4.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	150

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	80.0	0.0	0.400	80.0	0.0	0.401	0.0	0.0

Node S5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	5.120	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.250
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	9.200		

Node S3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	5.210	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.250
Safety Factor	2.0	Width (m)	11.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.360		

Node S8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	5.180	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.250
Safety Factor	2.0	Width (m)	7.000	Inf Depth (m)	
Porosity	0.30	Length (m)	6.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 97.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE1	1	5.200	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S1	11	5.033	0.023	0.8	0.0075	0.0000	OK
15 minute winter	S2	11	4.923	0.023	0.8	0.0036	0.0000	OK
15 minute winter	S3	10	4.832	0.042	2.4	0.0194	0.0000	OK
15 minute winter	S4	11	4.757	0.057	3.4	0.0183	0.0000	OK
30 minute winter	S5	29	4.518	0.639	7.4	1.7054	0.0000	SURCHARGED
60 minute winter	S6	48	4.517	0.759	3.9	1.0116	0.0000	OK
15 minute winter	S7	11	5.064	0.014	0.3	0.0031	0.0000	OK
15 minute winter	S8	11	4.973	0.039	2.6	0.0299	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	RE1	1.000	S1	0.0	0.000	0.000	0.0100	
15 minute winter	S1	1.001	S2	0.8	0.590	0.114	0.0111	
15 minute winter	S2	1.002	S3	0.8	0.366	0.115	0.0186	
15 minute winter	S3	1.003	S4	2.3	0.608	0.339	0.0268	
15 minute winter	S4	1.004	S5	3.4	0.773	0.541	0.0221	
30 minute winter	S5	2.002	S6	4.4	0.280	0.127	1.0531	
60 minute winter	S6	Hydro-Brake®		1.7				8.3
15 minute winter	S7	2.000	S8	0.3	0.142	0.017	0.0261	
15 minute winter	S8	2.001	S5	2.5	0.696	0.146	0.0580	

Results for 30 year Critical Storm Duration. Lowest mass balance: 97.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE1	1	5.200	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S1	10	5.048	0.038	2.0	0.0121	0.0000	OK
15 minute winter	S2	11	4.936	0.036	2.0	0.0058	0.0000	OK
15 minute winter	S3	11	4.918	0.128	5.9	0.0597	0.0000	SURCHARGED
15 minute winter	S4	11	4.845	0.145	7.9	0.0468	0.0000	SURCHARGED
60 minute winter	S5	60	4.654	0.775	11.4	12.1189	0.0000	SURCHARGED
60 minute winter	S6	60	4.654	0.896	5.3	1.1940	0.0000	OK
15 minute winter	S7	10	5.070	0.020	0.7	0.0045	0.0000	OK
15 minute winter	S8	10	4.998	0.064	6.3	0.0483	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	RE1	1.000	S1	0.0	0.000	0.000	0.0194	
15 minute winter	S1	1.001	S2	2.0	0.752	0.278	0.0211	
15 minute winter	S2	1.002	S3	2.0	0.411	0.282	0.0436	
15 minute winter	S3	1.003	S4	5.4	0.692	0.790	0.0549	
15 minute winter	S4	1.004	S5	7.7	0.992	1.245	0.0385	
60 minute winter	S5	2.002	S6	3.9	0.299	0.110	1.0531	
60 minute winter	S6	Hydro-Brake®		1.7				20.2
15 minute winter	S7	2.000	S8	0.7	0.165	0.037	0.0494	
15 minute winter	S8	2.001	S5	6.1	0.882	0.349	0.1102	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 97.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE1	1	5.200	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S1	12	5.194	0.184	3.6	0.0590	0.0000	SURCHARGED
15 minute winter	S2	12	5.176	0.276	3.3	0.0439	0.0000	SURCHARGED
15 minute winter	S3	12	5.158	0.368	8.3	0.1720	0.0000	SURCHARGED
15 minute winter	S4	12	5.000	0.300	12.0	0.0973	0.0000	SURCHARGED
120 minute winter	S5	118	4.894	1.015	13.9	30.5277	0.0000	SURCHARGED
120 minute winter	S6	118	4.894	1.136	3.3	1.5142	0.0000	OK
15 minute winter	S7	10	5.076	0.026	1.2	0.0059	0.0000	OK
15 minute winter	S8	10	5.026	0.092	11.4	0.0698	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	RE1	1.000	S1	0.0	0.000	0.000	0.0588	
15 minute winter	S1	1.001	S2	3.3	0.810	0.462	0.0633	
15 minute winter	S2	1.002	S3	4.0	0.513	0.580	0.0657	
15 minute winter	S3	1.003	S4	8.0	1.017	1.161	0.0549	
15 minute winter	S4	1.004	S5	11.8	1.508	1.895	0.0394	
120 minute winter	S5	2.002	S6	2.5	0.301	0.071	1.0531	
120 minute winter	S6	Hydro-Brake®		1.9				37.0
15 minute winter	S7	2.000	S8	1.2	0.181	0.066	0.0779	
15 minute winter	S8	2.001	S5	11.1	1.016	0.637	0.1742	