



PROPOSED SURFACE WATER DRAINAGE LAYOUT

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.900	Minimum Backdrop Height (m)	2.000
Ratio-R	0.290	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)	Depth (m)
1	0.005	5.00	95.100	100	0.600
2	0.004	5.00	95.100	450	0.900
3	0.004	5.00	95.100	100	0.600
4	0.004	5.00	95.100	450	1.100
pond			94.700	1200	0.770
5			94.600	1200	0.755

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	1	2	18.000	0.600	94.500	94.200	0.300	60.0	100	5.30	55.0
1.001	2	4	12.000	0.600	94.200	94.000	0.200	60.0	100	5.50	54.2
2.000	3	4	18.000	0.600	94.500	94.000	0.500	36.0	100	5.23	55.3
1.002	4	pond	4.000	0.600	94.000	93.930	0.070	57.1	100	5.57	54.0
1.003	pond	5	5.000	0.600	93.930	93.845	0.085	58.8	100	5.65	53.7

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	0.996	7.8	0.7	0.500	0.800	0.005	0.0	21	0.621
1.001	0.996	7.8	1.3	0.800	1.000	0.009	0.0	28	0.739
2.000	1.289	10.1	0.6	0.500	1.000	0.004	0.0	17	0.708
1.002	1.021	8.0	2.5	1.000	0.670	0.017	0.0	38	0.896
1.003	1.006	7.9	2.5	0.670	0.655	0.017	0.0	39	0.892

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Additional Storage (m ³ /ha)	20.0
Rainfall Events	Singular	Winter CV	0.840	Starting Level (m)	
FSR Region	England and Wales	Analysis Speed	Normal	Check Discharge Rate(s)	x
M5-60 (mm)	18.900	Skip Steady State	x	Check Discharge Volume	x
Ratio-R	0.290	Drain Down Time (mins)	240		

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 %)
2	0	0	0	100	0	0	0
30	45	0	0	100	50	0	0

Node pond Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	93.930	Product Number	CTL-SHE-0071-2000-0750-2000
Design Depth (m)	0.750	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	93.930
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	27

Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	6.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	94.521	0.021	0.8	0.0037	0.0000	OK
15 minute winter	2	11	94.228	0.028	1.4	0.0070	0.0000	OK
15 minute summer	3	11	94.517	0.017	0.6	0.0023	0.0000	OK
15 minute winter	4	11	94.042	0.042	2.6	0.0097	0.0000	OK
30 minute winter	pond	23	94.028	0.098	2.1	0.7013	0.0000	OK
30 minute winter	5	23	93.873	0.028	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	0.8	0.514	0.097	0.0268	
15 minute winter	2	1.001	4	1.4	0.559	0.173	0.0295	
15 minute summer	3	2.000	4	0.6	0.325	0.059	0.0354	
15 minute winter	4	1.002	pond	2.6	0.963	0.325	0.0194	
30 minute winter	pond	1.003	5	1.3	0.729	0.171	0.0093	1.6

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	94.535	0.035	2.1	0.0062	0.0000	OK
15 minute winter	2	10	94.248	0.048	3.8	0.0120	0.0000	OK
15 minute winter	3	10	94.528	0.028	1.7	0.0039	0.0000	OK
30 minute winter	4	24	94.225	0.225	5.9	0.0523	0.0000	SURCHARGED
30 minute winter	pond	25	94.218	0.288	5.1	2.0540	0.0000	SURCHARGED
30 minute summer	5	24	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	2.1	0.668	0.265	0.0559	
15 minute winter	2	1.001	4	3.7	0.663	0.472	0.0695	
15 minute winter	3	2.000	4	1.7	0.385	0.165	0.0862	
30 minute winter	4	1.002	pond	5.1	0.942	0.638	0.0313	
30 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	4.6

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 (m ³)	Flood (m ³)	Status
15 minute winter	1	10	94.533	0.033	1.9	0.0058	0.0000	OK
15 minute winter	2	10	94.245	0.045	3.4	0.0112	0.0000	OK
15 minute winter	3	10	94.526	0.026	1.5	0.0036	0.0000	OK
30 minute winter	4	24	94.183	0.183	5.1	0.0424	0.0000	SURCHARGED
30 minute winter	pond	25	94.176	0.246	4.5	1.7517	0.0000	SURCHARGED
30 minute winter	5	25	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	1.9	0.655	0.239	0.0515	
15 minute winter	2	1.001	4	3.3	0.651	0.421	0.0675	
15 minute winter	3	2.000	4	1.5	0.383	0.145	0.0845	
30 minute winter	4	1.002	pond	4.5	0.900	0.560	0.0313	
30 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	4.1

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	94.541	0.041	2.8	0.0072	0.0000	OK
60 minute winter	2	45	94.360	0.160	2.9	0.0397	0.0000	SURCHARGED
15 minute winter	3	10	94.532	0.032	2.3	0.0045	0.0000	OK
60 minute winter	4	45	94.355	0.355	5.5	0.0824	0.0000	SURCHARGED
60 minute winter	pond	46	94.349	0.419	4.8	2.9906	0.0000	SURCHARGED
30 minute summer	5	40	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	2.8	0.716	0.355	0.0944	
60 minute winter	2	1.001	4	2.9	0.611	0.370	0.0939	
15 minute winter	3	2.000	4	2.3	0.397	0.223	0.0900	
60 minute winter	4	1.002	pond	4.8	0.900	0.600	0.0313	
60 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	8.1