

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.200	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
SW01	0.053	4.00	95.228	475	439303.449	302926.917	1.068	94.160
SW02	0.058	4.00	95.290	1350	439292.378	302930.187	1.240	94.050
SW03	0.089	4.00	95.152	1350	439283.663	302922.692	1.262	93.890
SW04	0.000	4.00	94.959	1350	439274.515	302892.223	1.339	93.620
SW05			95.000	1500	439268.884	302853.459	1.520	93.480
Pond Inlet 1			94.800		439260.374	302886.036	1.230	93.570
Pond Inlet 2	0.080		94.800		439261.697	302860.806	1.480	93.320
Pond Outlet	0.024	4.00	94.800		439260.374	302856.175	1.230	93.570
Outfall	0.000		94.981	1200	439268.709	302850.948	1.531	93.450
RE		4.00	95.010	300	439292.788	302851.428	0.710	94.300

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)
P01	SW01	SW02	10.445	0.600	94.160	94.050	0.110	95.0	225	4.13	50.0
P02	SW02	SW03	10.355	0.600	94.050	93.940	0.110	94.1	225	4.26	50.0
P03	SW03	SW04	30.614	0.600	93.890	93.620	0.270	113.4	300	4.60	50.0
P04	SW04	Pond Inlet 1	7.186	0.600	93.620	93.570	0.050	143.7	300	4.70	50.0
PO5	Pond Outlet	SW05	8.333	0.600	93.570	93.480	0.090	92.6	225	4.10	50.0
P06	SW05	Outfall	1.675	0.600	93.480	93.450	0.030	55.8	150	4.12	50.0
P07	RE	Pond Inlet 2	30.405	0.600	94.300	93.320	0.980	31.0	150	4.28	50.0

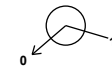
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
P01	1.342	53.3	10.1	0.843	1.015	0.053	0.0	66	1.039
P02	1.348	53.6	21.1	1.015	0.987	0.111	0.0	98	1.269
P03	1.475	104.3	37.9	0.962	1.039	0.200	0.0	125	1.363
P04	1.309	92.5	37.9	1.039	0.930	0.200	0.0	134	1.247
PO5	1.359	54.0	4.6	1.005	1.295	0.024	0.0	44	0.827
P06	1.349	23.8	4.6	1.370	1.381	0.024	0.0	44	1.041
P07	1.814	32.0	0.0	0.560	1.330	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
P01	10.445	95.0	225	Circular	95.228	94.160	0.843	95.290	94.050	1.015
P02	10.355	94.1	225	Circular	95.290	94.050	1.015	95.152	93.940	0.987
P03	30.614	113.4	300	Circular	95.152	93.890	0.962	94.959	93.620	1.039
P04	7.186	143.7	300	Circular	94.959	93.620	1.039	94.800	93.570	0.930
PO5	8.333	92.6	225	Circular	94.800	93.570	1.005	95.000	93.480	1.295
P06	1.675	55.8	150	Circular	95.000	93.480	1.370	94.981	93.450	1.381
P07	30.405	31.0	150	Circular	95.010	94.300	0.560	94.800	93.320	1.330

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
P01	SW01	475	Manhole	Adoptable	SW02	1350	Manhole	Adoptable
P02	SW02	1350	Manhole	Adoptable	SW03	1350	Manhole	Adoptable
P03	SW03	1350	Manhole	Adoptable	SW04	1350	Manhole	Adoptable
P04	SW04	1350	Manhole	Adoptable	Pond Inlet 1		Junction	
PO5	Pond Outlet		Junction		SW05	1500	Manhole	Adoptable
P06	SW05	1500	Manhole	Adoptable	Outfall	1200	Manhole	Adoptable
P07	RE	300	Manhole	Adoptable	Pond Inlet 2		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW01	439303.449	302926.917	95.228	1.068	475				
						0	P01	94.160	225
SW02	439292.378	302930.187	95.290	1.240	1350		1	P01	94.050
						0	P02	94.050	225
SW03	439283.663	302922.692	95.152	1.262	1350		1	P02	93.940
						0	P03	93.890	300
SW04	439274.515	302892.223	94.959	1.339	1350		1	P03	93.620
						0	P04	93.620	300
SW05	439268.884	302853.459	95.000	1.520	1500		1	PO5	93.480
						0	P06	93.480	150
Pond Inlet 1	439260.374	302886.036	94.800	1.230			1	P04	93.570
									300
Pond Inlet 2	439261.697	302860.806	94.800	1.480			1	P07	93.320
									150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
Pond Outlet	439260.374	302856.175	94.800	1.230			0	PO5	93.570	225
Outfall	439268.709	302850.948	94.981	1.531	1200		1	P06	93.450	150
RE	439292.788	302851.428	95.010	0.710	300		0	P07	94.300	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.200	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
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 %)
2	0	0	0
30	0	0	0
100	40	0	0

Node SW05 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	93.480	Product Number	CTL-SHE-0104-5000-1100-5000
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node Pond Outlet Pond Storage Structure

Invert Level (m) 93.570 | Time to half empty (mins) | Analyse flow through structure x

Inlets

Pond Inlet 1 | Pond Inlet 2

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	22.0	1.250	297.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	143.027	40.472	30 year 360 minute summer	31.507	8.108
2 year 15 minute winter	100.370	40.472	30 year 360 minute winter	20.480	8.108
2 year 30 minute summer	92.708	26.233	30 year 480 minute summer	24.545	6.486
2 year 30 minute winter	65.058	26.233	30 year 480 minute winter	16.307	6.486
2 year 60 minute summer	61.944	16.370	30 year 600 minute summer	19.934	5.452
2 year 60 minute winter	41.154	16.370	30 year 600 minute winter	13.620	5.452
2 year 120 minute summer	37.846	10.001	30 year 720 minute summer	17.647	4.730
2 year 120 minute winter	25.144	10.001	30 year 720 minute winter	11.860	4.730
2 year 180 minute summer	28.977	7.457	30 year 960 minute summer	14.342	3.777
2 year 180 minute winter	18.836	7.457	30 year 960 minute winter	9.500	3.777
2 year 240 minute summer	22.879	6.046	30 year 1440 minute summer	10.251	2.747
2 year 240 minute winter	15.200	6.046	30 year 1440 minute winter	6.889	2.747
2 year 360 minute summer	17.414	4.481	100 year +40% CC 15 minute summer	493.585	139.667
2 year 360 minute winter	11.319	4.481	100 year +40% CC 15 minute winter	346.375	139.667
2 year 480 minute summer	13.692	3.618	100 year +40% CC 30 minute summer	323.995	91.679
2 year 480 minute winter	9.096	3.618	100 year +40% CC 30 minute winter	227.365	91.679
2 year 600 minute summer	11.203	3.064	100 year +40% CC 60 minute summer	216.808	57.296
2 year 600 minute winter	7.655	3.064	100 year +40% CC 60 minute winter	144.042	57.296
2 year 720 minute summer	9.981	2.675	100 year +40% CC 120 minute summer	130.814	34.570
2 year 720 minute winter	6.708	2.675	100 year +40% CC 120 minute winter	86.910	34.570
2 year 960 minute summer	8.198	2.159	100 year +40% CC 180 minute summer	98.589	25.370
2 year 960 minute winter	5.431	2.159	100 year +40% CC 180 minute winter	64.085	25.370
2 year 1440 minute summer	5.953	1.595	100 year +40% CC 240 minute summer	76.601	20.243
2 year 1440 minute winter	4.001	1.595	100 year +40% CC 240 minute winter	50.892	20.243
30 year 15 minute summer	271.552	76.840	100 year +40% CC 360 minute summer	57.163	14.710
30 year 15 minute winter	190.562	76.840	100 year +40% CC 360 minute winter	37.157	14.710
30 year 30 minute summer	176.758	50.016	100 year +40% CC 480 minute summer	44.353	11.721
30 year 30 minute winter	124.040	50.016	100 year +40% CC 480 minute winter	29.467	11.721
30 year 60 minute summer	117.774	31.124	100 year +40% CC 600 minute summer	35.904	9.820
30 year 60 minute winter	78.247	31.124	100 year +40% CC 600 minute winter	24.531	9.820
30 year 120 minute summer	71.120	18.795	100 year +40% CC 720 minute summer	31.696	8.495
30 year 120 minute winter	47.250	18.795	100 year +40% CC 720 minute winter	21.302	8.495
30 year 180 minute summer	53.792	13.842	100 year +40% CC 960 minute summer	25.642	6.752
30 year 180 minute winter	34.966	13.842	100 year +40% CC 960 minute winter	16.986	6.752
30 year 240 minute summer	41.974	11.093	100 year +40% CC 1440 minute summer	18.202	4.878
30 year 240 minute winter	27.887	11.093	100 year +40% CC 1440 minute winter	12.233	4.878

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.48%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW01	9	94.228	0.068	10.3	0.0121	0.0000	OK
15 minute summer	SW02	10	94.158	0.108	21.6	0.1549	0.0000	OK
15 minute winter	SW03	10	94.021	0.131	38.9	0.1875	0.0000	OK
60 minute winter	SW04	57	93.948	0.328	18.8	0.4689	0.0000	SURCHARGED
60 minute winter	SW05	57	93.940	0.460	16.7	0.8136	0.0000	SURCHARGED
60 minute winter	Pond Inlet 1	57	93.948	0.378	17.0	0.0000	0.0000	OK
60 minute winter	Pond Inlet 2	57	93.945	0.625	7.6	0.0000	0.0000	OK
60 minute winter	Pond Outlet	57	93.941	0.371	14.1	23.6964	0.0000	SURCHARGED
15 minute winter	Outfall	13	93.497	0.047	5.0	0.0000	0.0000	OK
15 minute summer	RE	1	94.300	0.000	0.0	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	SW01	P01	SW02	10.3	0.715	0.193	0.1515	
15 minute summer	SW02	P02	SW03	21.6	1.214	0.403	0.1844	
15 minute winter	SW03	P03	SW04	39.0	1.150	0.374	1.2485	
15 minute summer	SW04	P04	Pond Inlet 1	36.9	1.348	0.399	0.4750	
15 minute summer	SW05	P06	Outfall	5.0	0.950	0.209	0.0088	22.5
30 minute winter	Pond Outlet	PO5	SW05	17.8	0.666	0.330	0.3314	
15 minute summer	RE	P07	Pond Inlet 2	0.0	0.000	0.000	0.2676	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW01	10	94.261	0.101	19.6	0.0178	0.0000	OK
15 minute summer	SW02	10	94.216	0.166	41.0	0.2377	0.0000	OK
120 minute winter	SW03	116	94.216	0.326	22.0	0.4661	0.0000	SURCHARGED
120 minute winter	SW04	116	94.216	0.596	21.1	0.8523	0.0000	SURCHARGED
120 minute winter	SW05	118	94.208	0.728	15.4	1.2871	0.0000	SURCHARGED
120 minute winter	Pond Inlet 1	116	94.216	0.646	20.4	0.0000	0.0000	OK
120 minute winter	Pond Inlet 2	118	94.213	0.893	8.8	0.0000	0.0000	OK
120 minute winter	Pond Outlet	118	94.209	0.639	14.2	59.5375	0.0000	SURCHARGED
180 minute winter	Outfall	80	93.497	0.047	5.0	0.0000	0.0000	OK
15 minute summer	RE	1	94.300	0.000	0.0	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	SW01	P01	SW02	19.6	0.800	0.367	0.2539	
15 minute summer	SW02	P02	SW03	41.0	1.397	0.766	0.3038	
15 minute summer	SW03	P03	SW04	74.7	1.284	0.716	1.8011	
15 minute summer	SW04	P04	Pond Inlet 1	72.8	1.301	0.786	0.5060	
15 minute summer	SW05	P06	Outfall	5.0	0.950	0.209	0.0088	43.2
30 minute winter	Pond Outlet	PO5	SW05	15.4	0.754	0.285	0.3314	
15 minute summer	RE	P07	Pond Inlet 2	0.0	0.000	0.000	0.2676	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW01	11	95.045	0.885	35.6	0.1566	0.0000	FLOOD RISK
15 minute winter	SW02	11	94.987	0.937	71.8	1.3411	0.0000	SURCHARGED
15 minute winter	SW03	11	94.732	0.842	127.7	1.2043	0.0000	SURCHARGED
180 minute winter	SW04	176	94.590	0.970	28.8	1.3876	0.0000	SURCHARGED
180 minute winter	SW05	176	94.581	1.101	11.4	1.9455	0.0000	SURCHARGED
180 minute winter	Pond Inlet 1	176	94.590	1.020	28.5	0.0000	0.0000	OK
180 minute winter	Pond Inlet 2	176	94.586	1.266	13.1	0.0000	0.0000	OK
180 minute winter	Pond Outlet	176	94.582	1.012	18.7	135.8983	0.0000	FLOOD RISK
180 minute summer	Outfall	72	93.497	0.047	5.0	0.0000	0.0000	OK
180 minute winter	RE	176	94.586	0.286	0.5	0.0203	0.0000	SURCHARGED

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	SW01	P01	SW02	32.8	0.825	0.615	0.4154	
15 minute winter	SW02	P02	SW03	67.9	1.708	1.268	0.4118	
15 minute winter	SW03	P03	SW04	124.5	1.768	1.194	2.1558	
15 minute winter	SW04	P04	Pond Inlet 1	122.2	1.735	1.320	0.5060	
15 minute summer	SW05	P06	Outfall	5.0	0.950	0.209	0.0088	69.6
30 minute summer	Pond Outlet	PO5	SW05	16.1	0.806	0.299	0.3314	
60 minute winter	RE	P07	Pond Inlet 2	-1.2	-0.106	-0.039	0.5353	