



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	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	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)
POND			53.000	50	450849.190	118937.580	1.475
SW MH 01.00			53.600	1500	450835.100	118936.370	1.981
SW TANK 01.00	0.154	5.00	52.488	50	450829.000	118937.120	0.800
CULVERT			53.200	50	450852.270	118883.000	1.996
SW MH 01.01			53.200	1800	450846.760	118882.970	1.959
SW TANK 01.01	0.139	5.00	52.062	50	450844.730	118882.970	0.800

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)
1.001	SW MH 01.00	POND	14.142	0.600	51.619	51.525	0.094	150.4	225	5.32	50.0
1.000	SW TANK 01.00	SW MH 01.00	6.146	0.600	51.688	51.619	0.069	89.1	150	5.10	50.0
2.000	SW TANK 01.01	SW MH 01.01	2.030	0.600	51.262	51.241	0.021	96.7	150	5.03	50.0
2.001	SW MH 01.01	CULVERT	5.510	0.600	51.241	51.204	0.037	148.9	225	5.12	50.0

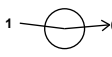
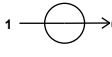
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	1.063	42.3	20.9	1.756	1.250	0.154	0.0	112	1.062
1.000	1.065	18.8	20.9	0.650	1.831	0.154	0.0	150	1.085
2.000	1.022	18.1	18.8	0.650	1.809	0.139	0.0	130	1.156
2.001	1.069	42.5	18.8	1.734	1.771	0.139	0.0	105	1.038

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)
1.001	14.142	150.4	225	Circular	53.600	51.619	1.756	53.000	51.525	1.250
1.000	6.146	89.1	150	Circular	52.488	51.688	0.650	53.600	51.619	1.831
2.000	2.030	96.7	150	Circular	52.062	51.262	0.650	53.200	51.241	1.809
2.001	5.510	148.9	225	Circular	53.200	51.241	1.734	53.200	51.204	1.771

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	SW MH 01.00	1500	Manhole	Adoptable	POND	50	Manhole	Adoptable
1.000	SW TANK 01.00	50	Manhole	Adoptable	SW MH 01.00	1500	Manhole	Adoptable
2.000	SW TANK 01.01	50	Manhole	Adoptable	SW MH 01.01	1800	Manhole	Adoptable
2.001	SW MH 01.01	1800	Manhole	Adoptable	CULVERT	50	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
POND	450849.190	118937.580	53.000	1.475	50	1 	1.001	51.525	225
SW MH 01.00	450835.100	118936.370	53.600	1.981	1500	1 	1.000	51.619	150
SW TANK 01.00	450829.000	118937.120	52.488	0.800	50	0 	1.001	51.619	225
CULVERT	450852.270	118883.000	53.200	1.996	50	0 	1.000	51.688	150
						1 	2.001	51.204	225
SW MH 01.01	450846.760	118882.970	53.200	1.959	1800	1 	2.000	51.241	150
						0 	2.001	51.241	225
SW TANK 01.01	450844.730	118882.970	52.062	0.800	50	0 	2.000	51.262	150

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	0.400	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	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Node SW MH 01.00 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	51.619	Product Number	CTL-SHE-0190-1780-0869-1780
Design Depth (m)	0.869	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	17.8	Min Node Diameter (mm)	1500

Node SW MH 01.01 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	51.241	Product Number	CTL-SHE-0190-1760-0822-1760
Design Depth (m)	0.822	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	17.6	Min Node Diameter (mm)	1200

Node SW TANK 01.00 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.5	Invert Level (m)	51.688
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	28

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	54.0	0.0	0.800	54.0	0.0	0.801	0.0	0.0

Node SW TANK 01.01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.5	Invert Level (m)	51.262
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	26

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	45.0	0.0	0.800	45.0	0.0	0.801	0.0	0.0



Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	POND	1	51.525	0.000	10.4	0.0000	0.0000	OK
15 minute winter	SW MH 01.00	14	51.757	0.138	11.3	0.2445	0.0000	OK
15 minute winter	SW TANK 01.00	13	51.789	0.101	21.7	5.5866	0.0000	OK
15 minute summer	CULVERT	1	51.204	0.000	8.2	0.0000	0.0000	OK
30 minute winter	SW MH 01.01	22	51.364	0.123	9.4	0.3137	0.0000	OK
30 minute winter	SW TANK 01.01	22	51.378	0.116	15.1	5.3654	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	SW MH 01.00	Hydro-Brake®	POND	11.2				9.8
15 minute winter	SW TANK 01.00	1.000	SW MH 01.00	11.3	0.748	0.599	0.0910	
30 minute winter	SW MH 01.01	Hydro-Brake®	CULVERT	9.4				11.7
30 minute winter	SW TANK 01.01	2.000	SW MH 01.01	9.4	0.625	0.519	0.0306	



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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	POND	1	51.525	0.000	17.4	0.0000	0.0000	OK
30 minute winter	SW MH 01.00	24	51.877	0.258	18.0	0.4554	0.0000	SURCHARGED
30 minute winter	SW TANK 01.00	23	51.968	0.280	40.9	15.4196	0.0000	SURCHARGED
15 minute summer	CULVERT	1	51.204	0.000	17.3	0.0000	0.0000	OK
30 minute winter	SW MH 01.01	23	51.504	0.263	18.1	0.6691	0.0000	SURCHARGED
30 minute winter	SW TANK 01.01	23	51.550	0.288	37.0	13.3346	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)
30 minute winter	SW MH 01.00	Hydro-Brake®	POND	17.7				31.8
30 minute winter	SW TANK 01.00	1.000	SW MH 01.00	18.0	1.021	0.954	0.1082	
30 minute winter	SW MH 01.01	Hydro-Brake®	CULVERT	17.5				28.8
30 minute winter	SW TANK 01.01	2.000	SW MH 01.01	18.1	1.027	1.001	0.0357	



Results for 100 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 (m³)	Flood (m³)	Status
15 minute summer	POND	1	51.525	0.000	17.8	0.0000	0.0000	OK
30 minute winter	SW MH 01.00	28	52.302	0.683	19.6	1.2065	0.0000	SURCHARGED
30 minute winter	SW TANK 01.00	28	52.375	0.687	77.6	37.9022	0.0000	FLOOD RISK
15 minute summer	CULVERT	1	51.204	0.000	17.6	0.0000	0.0000	OK
30 minute winter	SW MH 01.01	27	51.927	0.686	20.3	1.7462	0.0000	SURCHARGED
30 minute winter	SW TANK 01.01	27	51.966	0.704	70.0	32.5649	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	SW MH 01.00	Hydro-Brake®	POND	17.8				60.6
30 minute winter	SW TANK 01.00	1.000	SW MH 01.00	19.6	1.113	1.040	0.1082	
30 minute winter	SW MH 01.01	Hydro-Brake®	CULVERT	17.6				54.7
30 minute winter	SW TANK 01.01	2.000	SW MH 01.01	20.3	1.151	1.122	0.0357	