

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	0.300	Preferred Cover Depth (m)	1.200
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)
TANK: SW 1.0	0.648	5.00	78.950	100	559408.340	141832.300	2.590
TANK: SW 2.0	0.351	5.00	78.900	100	559434.000	141810.000	2.600
TANK: SW 3.0	0.354	5.00	78.450	100	559394.700	141800.760	2.020
SW MH 1.0A			77.850	1200	559438.906	141804.965	1.600
SW MH 1.0			78.850	1200	559426.170	141824.080	2.527
SW MH 2.0			78.300	1200	559406.230	141801.150	1.876

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)
2.000	TANK: SW 1.0	SW MH 1.0	19.634	0.600	76.360	76.323	0.037	530.6	375	5.42	50.0
1.002	SW MH 1.0	TANK: SW 2.0	16.111	0.600	76.323	76.300	0.023	700.5	375	6.36	50.0
1.003	TANK: SW 2.0	SW MH 1.0A	7.030	0.600	76.300	76.250	0.050	140.6	375	6.44	50.0
1.000	TANK: SW 3.0	SW MH 2.0	11.537	0.600	76.430	76.424	0.006	1922.8	375	5.48	50.0
1.001	SW MH 2.0	SW MH 1.0	30.387	0.600	76.424	76.323	0.101	300.9	375	5.96	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)
2.000	0.779	86.1	87.8	2.215	2.152	0.648	0.0
1.002	0.677	74.8	135.8	2.152	2.225	1.002	0.0
1.003	1.526	168.5	183.4	2.225	1.225	1.353	0.0
1.000	0.404	44.6	48.0	1.645	1.501	0.354	0.0
1.001	1.039	114.8	48.0	1.501	2.152	0.354	0.0

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)
2.000	19.634	530.6	375	Circular	78.950	76.360	2.215	78.850	76.323	2.152
1.002	16.111	700.5	375	Circular	78.850	76.323	2.152	78.900	76.300	2.225
1.003	7.030	140.6	375	Circular	78.900	76.300	2.225	77.850	76.250	1.225
1.000	11.537	1922.8	375	Circular	78.450	76.430	1.645	78.300	76.424	1.501

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	TANK: SW 1.0	100	Manhole	Adoptable	SW MH 1.0	1200	Manhole	Adoptable
1.002	SW MH 1.0	1200	Manhole	Adoptable	TANK: SW 2.0	100	Manhole	Adoptable
1.003	TANK: SW 2.0	100	Manhole	Adoptable	SW MH 1.0A	1200	Manhole	Adoptable
1.000	TANK: SW 3.0	100	Manhole	Adoptable	SW MH 2.0	1200	Manhole	Adoptable

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	30.387	300.9	375	Circular	78.300	76.424	1.501	78.850	76.323	2.152

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	SW MH 2.0	1200	Manhole	Adoptable	SW MH 1.0	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TANK: SW 1.0	559408.340	141832.300	78.950	2.590	100				
						0	2.000	76.360	375
TANK: SW 2.0	559434.000	141810.000	78.900	2.600	100		1	1.002	76.300
						0	1.003	76.300	375
TANK: SW 3.0	559394.700	141800.760	78.450	2.020	100				
						0	1.000	76.430	375
SW MH 1.0A	559438.906	141804.965	77.850	1.600	1200		1	1.003	76.250
						1	2.000	76.323	375
						2	1.001	76.323	375
SW MH 1.0	559426.170	141824.080	78.850	2.527	1200		0	1.002	76.323
						1	1.000	76.424	375
SW MH 2.0	559406.230	141801.150	78.300	1.876	1200		0	1.001	76.424
						1	1.000	76.424	375

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	0.300	Additional Storage (m ³ /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	40	0	0

Node SW MH 1.0A Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	76.250	Product Number	CTL-SHE-0132-8700-1300-8700
Design Depth (m)	1.300	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	8.7	Min Node Diameter (mm)	1200

Node TANK: SW 1.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	76.360
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	330.0	0.0	1.200	330.0	0.0	1.201	0.0	0.0

Node TANK: SW 2.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	76.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	330.0	0.0	1.200	330.0	0.0	1.201	0.0	0.0

Node TANK: SW 3.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	76.430
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	227.5	0.0	1.200	227.5	0.0	1.201	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute winter	TANK: SW 1.0	272	76.559	0.199	16.1	63.4649	0.0000	OK
360 minute winter	TANK: SW 2.0	272	76.559	0.259	23.2	81.8002	0.0000	OK
360 minute winter	TANK: SW 3.0	272	76.559	0.129	8.8	28.4227	0.0000	OK
360 minute winter	SW MH 1.0A	272	76.558	0.308	10.4	0.3489	0.0000	OK
360 minute winter	SW MH 1.0	272	76.559	0.236	15.1	0.2670	0.0000	OK
360 minute winter	SW MH 2.0	272	76.559	0.135	7.5	0.1528	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)
360 minute winter	TANK: SW 1.0	2.000	SW MH 1.0	8.8	0.366	0.102	1.3009	
360 minute winter	TANK: SW 2.0	1.003	SW MH 1.0A	10.4	0.322	0.061	0.6260	
360 minute winter	TANK: SW 3.0	1.000	SW MH 2.0	7.5	0.470	0.169	0.4004	
360 minute winter	SW MH 1.0A	Hydro-Brake®		8.6				239.7
360 minute winter	SW MH 1.0	1.002	TANK: SW 2.0	14.7	0.534	0.196	1.2416	
360 minute winter	SW MH 2.0	1.001	SW MH 1.0	7.3	0.292	0.064	1.6526	

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute winter	TANK: SW 1.0	456	76.908	0.548	28.0	174.5737	0.0000	SURCHARGED
480 minute winter	TANK: SW 2.0	456	76.908	0.608	26.8	192.1754	0.0000	SURCHARGED
480 minute winter	TANK: SW 3.0	456	76.908	0.478	15.3	104.9978	0.0000	SURCHARGED
480 minute winter	SW MH 1.0A	456	76.907	0.657	13.7	0.7436	0.0000	OK
480 minute winter	SW MH 1.0	456	76.908	0.585	13.2	0.6615	0.0000	SURCHARGED
480 minute winter	SW MH 2.0	456	76.908	0.484	7.7	0.5475	0.0000	SURCHARGED

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)
480 minute winter	TANK: SW 1.0	2.000	SW MH 1.0	9.9	0.348	0.115	2.1656	
480 minute winter	TANK: SW 2.0	1.003	SW MH 1.0A	13.7	0.321	0.081	0.7754	
480 minute winter	TANK: SW 3.0	1.000	SW MH 2.0	7.7	0.470	0.172	1.2725	
480 minute winter	SW MH 1.0A	Hydro-Brake®		8.7				312.2
480 minute winter	SW MH 1.0	1.002	TANK: SW 2.0	12.8	0.502	0.171	1.7770	
480 minute winter	SW MH 2.0	1.001	SW MH 1.0	7.4	0.275	0.064	3.3516	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute winter	TANK: SW 1.0	915	77.560	1.200	30.1	382.3132	0.0000	SURCHARGED
960 minute winter	TANK: SW 2.0	915	77.560	1.260	28.3	379.7689	0.0000	SURCHARGED
960 minute winter	TANK: SW 3.0	915	77.560	1.130	16.4	248.2737	0.0000	SURCHARGED
960 minute winter	SW MH 1.0A	915	77.559	1.309	14.4	1.4803	0.0000	OK
960 minute winter	SW MH 1.0	915	77.560	1.237	21.0	1.3988	0.0000	SURCHARGED
960 minute winter	SW MH 2.0	915	77.561	1.137	7.4	1.2862	0.0000	SURCHARGED

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)
960 minute winter	TANK: SW 1.0	2.000	SW MH 1.0	13.6	0.337	0.158	2.1656	
960 minute winter	TANK: SW 2.0	1.003	SW MH 1.0A	14.4	0.343	0.086	0.7754	
960 minute winter	TANK: SW 3.0	1.000	SW MH 2.0	7.4	0.401	0.166	1.2725	
960 minute winter	SW MH 1.0A	Hydro-Brake®		8.7				540.5
960 minute winter	SW MH 1.0	1.002	TANK: SW 2.0	21.0	0.500	0.280	1.7770	
960 minute winter	SW MH 2.0	1.001	SW MH 1.0	7.4	0.227	0.065	3.3516	