

### Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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	1.000	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)
SW1	0.154	5.00	182.500	1200	3.500
SW2			179.500	1200	1.300
SW3			179.100	1200	1.000
TANK			179.500	1200	1.200

### 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	SW1	TANK	8.000	0.600	179.000	178.900	0.100	80.0	225	5.09	50.0
1.001	TANK	SW2	14.000	0.600	178.300	178.200	0.100	140.0	225	5.30	50.0
1.002	SW2	SW3	20.000	0.600	178.200	178.100	0.100	200.0	150	5.77	0.0

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)
1.000	1.463	58.2	27.8	3.275	0.375	0.154	0.0	109	1.446
1.001	1.103	43.8	27.8	0.975	1.075	0.154	0.0	131	1.167
1.002	0.707	12.5	0.0	1.150	0.850	0.154	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)
1.000	8.000	80.0	225	Circular	182.500	179.000	3.275	179.500	178.900	0.375
1.001	14.000	140.0	225	Circular	179.500	178.300	0.975	179.500	178.200	1.075
1.002	20.000	200.0	150	Circular	179.500	178.200	1.150	179.100	178.100	0.850

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW1	1200	Manhole	Adoptable	TANK	1200	Manhole	Adoptable
1.001	TANK	1200	Manhole	Adoptable	SW2	1200	Manhole	Adoptable
1.002	SW2	1200	Manhole	Adoptable	SW3	1200	Manhole	Adoptable

### Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW1	182.500	3.500	1200	○			
				0	1.000	179.000	225
SW2	179.500	1.300	1200	○			
				1	1.001	178.200	225
				0	1.002	178.200	150
SW3	179.100	1.000	1200	○			
				1	1.002	178.100	150
TANK	179.500	1.200	1200	○			
				1	1.000	178.900	225
				0	1.001	178.300	225

### 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)	20.000	Additional Storage (m <sup>3</sup> /ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	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	40	0	0
100	50	0	0

### Node SW2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.900	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	178.200	Diameter (m)	0.022		

### Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	178.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )
0.000	200.0	0.0	0.800	200.0	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 (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute summer	SW1	10	179.122	0.122	27.4	0.1379	0.0000	OK
480 minute winter	SW2	456	178.437	0.237	0.7	0.2682	0.0000	SURCHARGED
15 minute summer	SW3	1	178.100	0.000	0.4	0.0000	0.0000	OK
480 minute winter	TANK	456	178.437	0.137	3.2	26.2041	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute summer	SW1	1.000	TANK	27.3	1.342	0.469	0.1627	
480 minute winter	SW2	Orifice	SW3	0.5				16.5
480 minute winter	TANK	1.001	SW2	0.7	0.133	0.016	0.4557	

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.91%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute summer	SW1	10	179.524	0.524	94.2	0.5928	0.0000	SURCHARGED
960 minute winter	SW2	915	178.806	0.606	0.8	0.6858	0.0000	SURCHARGED
15 minute summer	SW3	1	178.100	0.000	0.6	0.0000	0.0000	OK
960 minute winter	TANK	915	178.806	0.506	5.6	96.7930	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute summer	SW1	1.000	TANK	93.6	2.353	1.609	0.3150	
960 minute winter	SW2	Orifice	SW3	0.8				42.3
960 minute winter	TANK	1.001	SW2	0.8	0.139	0.018	0.5568	

**Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.95%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute summer	SW1	10	179.903	0.903	131.1	1.0208	0.0000	SURCHARGED
960 minute winter	SW2	930	179.029	0.829	0.9	0.9379	0.0000	SURCHARGED
15 minute summer	SW3	1	178.100	0.000	0.6	0.0000	0.0000	OK
960 minute winter	TANK	930	179.029	0.729	7.7	139.3982	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute summer	SW1	1.000	TANK	129.8	3.263	2.231	0.3150	
960 minute winter	SW2	Orifice	SW3	0.9				49.0
960 minute winter	TANK	1.001	SW2	0.9	0.144	0.021	0.5568	