

### 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	0.200	Preferred Cover Depth (m)	0.600
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)
S300	0.009		189.900	450	372231.798	445476.887	0.700
S401	0.007		190.100	450	372226.408	445476.699	0.991
S400	0.003		190.200	450	372219.630	445467.191	0.700
Tank North			190.700		372223.736	445488.296	1.791
S302			190.700	450	372226.336	445489.145	1.837
Outfall North			189.950		372234.937	445473.751	1.384

### Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
S3.000	S300	S401			189.200				
S4.000	S400	S401							
S4.001	S401	Tank North							
S4.002	Tank North	S302							
S4.003	S302	Outfall North							


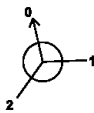



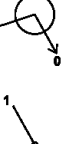
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S3.000	1.002	7.9	0.9	0.600	0.891	0.009	0.0	23	0.667
S4.000	1.417	11.1	0.3	0.600	0.891	0.003	0.0	11	0.603
S4.001	1.000	7.9	1.9	0.891		0.019	0.0	34	0.830
S4.002	1.001	7.9	1.9			0.019	0.0	34	0.830
S4.003	1.001	7.9	1.9			0.019	0.0	33	0.820

### 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)
S3.000					189.900	189.200	0.600	190.100		0.891
S4.000					190.200		0.600	190.100		0.891
S4.001					190.100		0.891	190.700		
S4.002					190.700			190.700		
S4.003					190.700			189.950		

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S3.000	S300	450			S401	450		
S4.000	S400	450			S401	450		
S4.001	S401	450			Tank North		Junction	
S4.002	Tank North		Junction		S302	450		
S4.003	S302	450			Outfall North		Junction	

### Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S300	372231.798	445476.887	189.900	0.700	450				
S401	372226.408	445476.699	190.100	0.991	450		0 S3.000 1 S3.000 2 S4.000		
S400	372219.630	445467.191	190.200	0.700	450		0 S4.001		
Tank North	372223.736	445488.296	190.700	1.791			0 S4.000 1 S4.001		
S302	372226.336	445489.145	190.700	1.837	450		0 S4.002 1 S4.002		
Outfall North	372234.937	445473.751	189.950	1.384			0 S4.003 1 S4.003		

### Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	✓
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.200	Additional Storage (m <sup>3</sup> /ha)	20.0
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 %)
1	0	0	0
30	0	0	0
100	0	0	0
100	50	0	0

**Node S302 Online Orifice Control**

Flap Valve	x	Design Depth (m)	0.801	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.7		
Invert Level (m)	188.863	Diameter (m)	0.050		

**Node Tank North Depth/Area Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	188.909
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	5

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> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )
0.000	6.0	0.0	0.800	6.0	0.0	0.801	0.0	0.0

**Results for 1 year Critical Storm Duration. Lowest mass balance: 95.61%**

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
30 minute summer	S300	18	189.224	0.024	1.0	0.0100	0.0000	OK
15 minute winter	S401	10	189.145	0.036	2.1	0.0107	0.0000	OK
15 minute summer	S400	12	189.511	0.011	0.3	0.0028	0.0000	OK
30 minute summer	Tank North	21	188.957	0.048	2.0	0.2715	0.0000	OK
30 minute winter	S302	20	188.965	0.102	2.8	0.0162	0.0000	
15 minute summer	Outfall North	1	188.566	0.000	1.3	0.0000	0.0000	OK

Link Event (Outflow)	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> )
30 minute summer	S300	S3.000	S401	1.0	0.516	0.127	0.0105	
15 minute winter	S401	S4.001	Tank North	2.0	0.893	0.260	0.0324	
15 minute summer	S400	S4.000	S401	0.3	0.236	0.027	0.0171	
30 minute summer	Tank North	S4.002	S302	3.0	0.518	0.376	0.0151	
30 minute winter	S302	Orifice	Outfall North	1.4				1.4

**Results for 30 year Critical Storm Duration. Lowest mass balance: 95.61%**

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 winter	S300	10	189.240	0.040	2.5	0.0168	0.0000	OK
15 minute winter	S401	10	189.168	0.059	5.2	0.0176	0.0000	OK
15 minute winter	S400	11	189.518	0.018	0.8	0.0045	0.0000	OK
30 minute winter	Tank North	23	189.094	0.185	4.4	1.0560	0.0000	
30 minute winter	S302	23	189.089	0.226	2.5	0.0359	0.0000	
15 minute summer	Outfall North	1	188.566	0.000	2.1	0.0000	0.0000	OK

Link Event (Outflow)	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 winter	S300	S3.000	S401	2.5	0.637	0.312	0.0208	
15 minute winter	S401	S4.001	Tank North	5.1	1.043	0.646	0.0746	
15 minute winter	S400	S4.000	S401	0.8	0.292	0.072	0.0334	
180 minute summer	Tank North	S4.002	S302	3.1	0.507	0.399	0.0214	
30 minute winter	S302	Orifice	Outfall North	2.3				3.5

**Results for 100 year Critical Storm Duration. Lowest mass balance: 95.61%**

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 winter	S300	10	189.247	0.047	3.2	0.0195	0.0000	OK
30 minute winter	S401	21	189.211	0.102	6.0	0.0306	0.0000	
15 minute winter	S400	10	189.521	0.021	1.1	0.0052	0.0000	OK
30 minute winter	Tank North	24	189.169	0.260	5.7	1.4816	0.0000	
30 minute winter	S302	24	189.161	0.298	2.8	0.0474	0.0000	
15 minute summer	Outfall North	1	188.566	0.000	2.4	0.0000	0.0000	OK

Link Event (Outflow)	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 winter	S300	S3.000	S401	3.2	0.665	0.403	0.0262	
15 minute winter	S401	S4.001	Tank North	6.5	1.038	0.833	0.0852	
15 minute winter	S400	S4.000	S401	1.1	0.309	0.097	0.0442	
30 minute summer	Tank North	S4.002	S302	3.4	0.552	0.438	0.0214	
30 minute winter	S302	Orifice	Outfall North	2.7				4.5

**Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 95.61%**

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
30 minute winter	S300	21	189.442	0.242	4.1	0.1007	0.0000	
30 minute winter	S401	21	189.424	0.315	7.9	0.0945	0.0000	
15 minute winter	S400	10	189.526	0.026	1.6	0.0063	0.0000	OK
60 minute winter	Tank North	43	189.338	0.429	5.5	2.4440	0.0000	
60 minute winter	S302	43	189.326	0.463	3.6	0.0735	0.0000	
15 minute summer	Outfall North	1	188.566	0.000	3.0	0.0000	0.0000	OK

Link Event (Outflow)	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	S300	S3.000	S401	4.3	0.676	0.543	0.0422	
15 minute winter	S401	S4.001	Tank North	7.6	1.068	0.967	0.0931	
15 minute winter	S400	S4.000	S401	1.6	0.300	0.142	0.0549	
30 minute winter	Tank North	S4.002	S302	3.7	0.610	0.465	0.0214	
60 minute winter	S302	Orifice	Outfall North	3.5				9.7

### 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	0.200	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)
S100	0.008		189.180	450	372227.703	445453.363	1.300
S101	0.017		189.050	450	372229.537	445446.265	1.300
Tank South			188.890		372230.714	445441.709	1.300
S102			188.900	600	372228.960	445438.909	1.366
S200	0.006		189.040	450	372238.455	445442.147	1.300
Outfall South			188.060		372224.633	445429.275	0.705

### Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
S1.000	S100	S101							
S1.001	S101	Tank South							
S1.002	Tank South	S102							
S1.003	S102	Outfall South						59.0	

S2.000 S200 Tank South



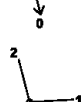



Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1.000	1.028	8.1	0.8	1.200	1.200	0.008	0.0	21	0.656
S1.001	1.428	11.2	2.6	1.200	1.200	0.025	0.0	32	1.156
S1.002	1.004	7.9	3.2	1.200	1.266	0.031	0.0	44	0.950
S1.003	1.004	7.9	3.2	1.266		0.031	0.0	44	0.950
S2.000	1.074	8.4	0.6	1.200	1.200	0.006	0.0	18	0.623

### 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)
S1.000					189.180		1.200	189.050		1.200
S1.001					189.050		1.200	188.890		1.200
S1.002					188.890		1.200	188.900		1.266
S1.003		59.0			188.900		1.266	188.060		
S2.000					189.040		1.200	188.890		1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.000	S100	450			S101	450		
S1.001	S101	450			Tank South		Junction	
S1.002	Tank South		Junction		S102	600		
S1.003	S102	600			Outfall South		Junction	
S2.000	S200	450			Tank South		Junction	

### Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S100	372227.703	445453.363	189.180	1.300	450				
S101	372229.537	445446.265	189.050	1.300	450		0 S1.000 1 S1.000		
Tank South	372230.714	445441.709	188.890	1.300			0 S1.001 1 S2.000 2 S1.001		
S102	372228.960	445438.909	188.900	1.366	600		0 S1.002 1 S1.002		
S200	372238.455	445442.147	189.040	1.300	450		0 S1.003		
Outfall South	372224.633	445429.275	188.060	0.705			0 S2.000 1 S1.003		

### Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	✓
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.200	Additional Storage (m <sup>3</sup> /ha)	20.0
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 %)
1	0	0	0
30	0	0	0
100	0	0	0
100	50	0	0

**Node S102 Online Orifice Control**

Flap Valve	x	Design Depth (m)	0.810	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	2.0		
Invert Level (m)	187.534	Diameter (m)	0.030		

**Node Tank South Depth/Area Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	187.590
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	184

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> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )
0.000	22.5	0.0	0.400	22.5	0.0	0.401	0.0	0.0

**Results for 1 year Critical Storm Duration. Lowest mass balance: 98.58%**

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 winter	S100	10	187.902	0.022	0.9	0.0063	0.0000	OK
15 minute winter	S101	10	187.786	0.036	2.8	0.0151	0.0000	OK
120 minute winter	Tank South	84	187.680	0.090	2.5	1.9270	0.0000	OK
120 minute winter	S102	84	187.680	0.146	1.9	0.0412	0.0000	
15 minute winter	S200	10	187.759	0.019	0.7	0.0048	0.0000	OK
15 minute summer	Outfall South	1	187.355	0.000	0.6	0.0000	0.0000	OK

Link Event (Outflow)	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 winter	S100	S1.000	S101	0.9	0.462	0.108	0.0140	
15 minute winter	S101	S1.001	Tank South	2.8	1.471	0.246	0.0122	
30 minute winter	Tank South	S1.002	S102	2.5	0.399	0.323	0.0224	
120 minute winter	S102	Orifice	Outfall South	0.7				4.9
15 minute winter	S200	S2.000	Tank South	0.7	0.691	0.079	0.0176	

**Results for 30 year Critical Storm Duration. Lowest mass balance: 98.58%**

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 winter	S100	10	187.916	0.036	2.2	0.0100	0.0000	OK
180 minute winter	S101	132	187.857	0.107	2.4	0.0451	0.0000	
180 minute winter	Tank South	132	187.856	0.266	3.0	5.6832	0.0000	
180 minute winter	S102	132	187.855	0.321	1.8	0.0907	0.0000	
180 minute winter	S200	132	187.856	0.116	0.6	0.0291	0.0000	
15 minute summer	Outfall South	1	187.355	0.000	0.8	0.0000	0.0000	OK

Link Event (Outflow)	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 winter	S100	S1.000	S101	2.2	0.596	0.270	0.0269	
15 minute winter	S101	S1.001	Tank South	6.8	1.607	0.609	0.0286	
30 minute summer	Tank South	S1.002	S102	2.8	0.449	0.355	0.0259	
180 minute winter	S102	Orifice	Outfall South	1.0				12.6
30 minute summer	S200	S2.000	Tank South	1.6	0.659	0.190	0.0377	

**Results for 100 year Critical Storm Duration. Lowest mass balance: 98.58%**

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
180 minute winter	S100	132	187.959	0.079	1.0	0.0223	0.0000	OK
180 minute winter	S101	132	187.959	0.209	3.1	0.0880	0.0000	
180 minute winter	Tank South	132	187.957	0.367	3.5	7.8524	0.0000	
180 minute winter	S102	132	187.956	0.422	1.9	0.1193	0.0000	
180 minute winter	S200	132	187.957	0.217	0.7	0.0546	0.0000	
15 minute summer	Outfall South	1	187.355	0.000	0.9	0.0000	0.0000	OK

Link Event (Outflow)	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 winter	S100	S1.000	S101	2.8	0.618	0.345	0.0329	
15 minute winter	S101	S1.001	Tank South	8.7	1.645	0.772	0.0327	
30 minute winter	Tank South	S1.002	S102	2.6	0.493	0.332	0.0259	
180 minute winter	S102	Orifice	Outfall South	1.2				16.4
15 minute winter	S200	S2.000	Tank South	2.1	0.762	0.247	0.0412	

**Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 98.58%**

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
180 minute winter	S100	128	188.839	0.959	1.5	0.2704	0.0000	
180 minute winter	S101	132	188.838	1.088	4.4	0.4581	0.0000	
180 minute winter	Tank South	132	188.834	1.244	5.2	8.5607	0.0000	
180 minute winter	S102	132	188.829	1.295	2.5	0.3664	0.0000	
180 minute winter	S200	132	188.835	1.095	1.1	0.2748	0.0000	
15 minute summer	Outfall South	1	187.355	0.000	1.0	0.0000	0.0000	OK

Link Event (Outflow)	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 winter	S100	S1.000	S101	3.9	0.629	0.481	0.0574	
15 minute winter	S101	S1.001	Tank South	11.4	1.712	1.013	0.0368	
180 minute summer	Tank South	S1.002	S102	3.3	0.423	0.420	0.0259	
180 minute winter	S102	Orifice	Outfall South	2.1				24.9
15 minute winter	S200	S2.000	Tank South	3.2	0.826	0.375	0.0607	