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	5.00	189.900	450	372231.798	445476.887	0.700
S401	0.007	5.00	190.100	450	372226.408	445476.699	0.991
S400	0.003	5.00	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	5.393	0.600	189.200	189.109	0.091	59.3	100
S4.000	S400	S401	11.677	0.600	189.500	189.110	0.390	29.9	100
S4.001	S401	Tank North	11.901	0.600	189.109	188.909	0.200	59.5	100
S4.002	Tank North	S302	2.735	0.600	188.909	188.863	0.046	59.5	100
S4.003	S302	Outfall North	17.634	0.600	188.863	188.566	0.297	59.4	100

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	1.415	11.1	0.3	0.600	0.890	0.003	0.0	11	0.602
S4.001	1.000	7.9	1.9	0.891	1.691	0.019	0.0	34	0.830
S4.002	1.001	7.9	1.9	1.691	1.737	0.019	0.0	34	0.830
S4.003	1.001	7.9	1.9	1.737	1.284	0.019	0.0	33	0.820

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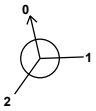
Pipeline Schedule

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	5.393	59.3	100	Circular	189.900	189.200	0.600	190.100	189.109	0.891
S4.000	11.677	29.9	100	Circular	190.200	189.500	0.600	190.100	189.110	0.890
S4.001	11.901	59.5	100	Circular	190.100	189.109	0.891	190.700	188.909	1.691
S4.002	2.735	59.5	100	Circular	190.700	188.909	1.691	190.700	188.863	1.737
S4.003	17.634	59.4	100	Circular	190.700	188.863	1.737	189.950	188.566	1.284

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S3.000	S300	450	Manhole	Adoptable	S401	450	Manhole	Adoptable
S4.000	S400	450	Manhole	Adoptable	S401	450	Manhole	Adoptable
S4.001	S401	450	Manhole	Adoptable	Tank North		Junction	
S4.002	Tank North		Junction		S302	450	Manhole	Adoptable
S4.003	S302	450	Manhole	Adoptable	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				
						0	S3.000	189.200	100
S401	372226.408	445476.699	190.100	0.991	450		1	S3.000	189.109	100
							2	S4.000	189.110	100
							0	S4.001	189.109	100
S400	372219.630	445467.191	190.200	0.700	450				
						0	S4.000	189.500	100
Tank North	372223.736	445488.296	190.700	1.791			1	S4.001	188.909	100
							0	S4.002	188.909	100
S302	372226.336	445489.145	190.700	1.837	450		1	S4.002	188.863	100
							0	S4.003	188.863	100
Outfall North	372234.937	445473.751	189.950	1.384			1	S4.003	188.566	100

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 (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

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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 (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	6.0	0.0	0.800	6.0	0.0	0.801	0.0	0.0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 95.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	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	SURCHARGED
15 minute summer	Outfall North	1	188.566	0.000	1.3	0.0000	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)
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	0.244	0.027	0.0166	
30 minute summer	Tank North	S4.002	S302	3.0	0.518	0.377	0.0151	
30 minute winter	S302	Orifice	Outfall North	1.4				1.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 95.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	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	SURCHARGED
30 minute winter	S302	23	189.089	0.226	2.5	0.0359	0.0000	SURCHARGED
15 minute summer	Outfall North	1	188.566	0.000	2.1	0.0000	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	S300	S3.000	S401	2.5	0.637	0.312	0.0208	
15 minute winter	S401	S4.001	Tank North	5.1	1.042	0.646	0.0746	
15 minute winter	S400	S4.000	S401	0.8	0.297	0.072	0.0329	
30 minute winter	Tank North	S4.002	S302	2.5	0.534	0.313	0.0214	
30 minute winter	S302	Orifice	Outfall North	2.3				3.5

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Results for 100 year Critical Storm Duration. Lowest mass balance: 95.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	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	SURCHARGED
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	1.4815	0.0000	SURCHARGED
30 minute winter	S302	24	189.161	0.298	2.8	0.0474	0.0000	SURCHARGED
15 minute summer	Outfall North	1	188.566	0.000	2.4	0.0000	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	S300	S3.000	S401	3.2	0.665	0.403	0.0262	
30 minute winter	S401	S4.001	Tank North	5.7	0.908	0.725	0.0931	
15 minute winter	S400	S4.000	S401	1.1	0.313	0.097	0.0437	
30 minute winter	Tank North	S4.002	S302	2.8	0.568	0.363	0.0214	
30 minute winter	S302	Orifice	Outfall North	2.7				4.5

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Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 95.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S300	21	189.442	0.242	4.1	0.1007	0.0000	SURCHARGED
30 minute winter	S401	21	189.424	0.315	7.9	0.0945	0.0000	SURCHARGED
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	2.4438	0.0000	SURCHARGED
60 minute winter	S302	43	189.326	0.463	3.6	0.0735	0.0000	SURCHARGED
15 minute summer	Outfall North	1	188.566	0.000	3.0	0.0000	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)
30 minute winter	S300	S3.000	S401	3.5	0.664	0.442	0.0422	
30 minute winter	S401	S4.001	Tank North	6.9	0.998	0.884	0.0931	
15 minute winter	S400	S4.000	S401	1.6	0.304	0.142	0.0549	
60 minute winter	Tank North	S4.002	S302	3.6	0.545	0.453	0.0214	
60 minute winter	S302	Orifice	Outfall North	3.5				9.7

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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	5.00	189.180	450	372227.703	445453.363	1.300
S101	0.017	5.00	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	5.00	189.040	450	372238.455	445442.147	1.300
Outfall South			188.070		372224.633	445429.275	0.720

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	7.331	0.600	187.880	187.750	0.130	56.4	100
S1.001	S101	Tank South	4.706	0.600	187.750	187.590	0.160	29.4	100
S1.002	Tank South	S102	3.304	0.600	187.590	187.534	0.056	59.0	100
S1.003	S102	Outfall South	10.561	0.600	187.534	187.350	0.184	57.4	100
S2.000	S200	Tank South	7.753	0.600	187.740	187.590	0.150	51.7	100

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	1.019	8.0	3.2	1.266	0.620	0.031	0.0	44	0.964
S2.000	1.074	8.4	0.6	1.200	1.200	0.006	0.0	18	0.623

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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	7.331	56.4	100	Circular	189.180	187.880	1.200	189.050	187.750	1.200
S1.001	4.706	29.4	100	Circular	189.050	187.750	1.200	188.890	187.590	1.200
S1.002	3.304	59.0	100	Circular	188.890	187.590	1.200	188.900	187.534	1.266
S1.003	10.561	57.4	100	Circular	188.900	187.534	1.266	188.070	187.350	0.620
S2.000	7.753	51.7	100	Circular	189.040	187.740	1.200	188.890	187.590	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1.000	S100	450	Manhole	Adoptable	S101	450	Manhole	Adoptable
S1.001	S101	450	Manhole	Adoptable	Tank South		Junction	
S1.002	Tank South		Junction		S102	600	Manhole	Adoptable
S1.003	S102	600	Manhole	Adoptable	Outfall South		Junction	
S2.000	S200	450	Manhole	Adoptable	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	0	S1.000	187.880	100
S101	372229.537	445446.265	189.050	1.300	450	1	S1.000	187.750	100
						0	S1.001	187.750	100
Tank South	372230.714	445441.709	188.890	1.300		1	S2.000	187.590	100
						2	S1.001	187.590	100
						0	S1.002	187.590	100
S102	372228.960	445438.909	188.900	1.366	600	1	S1.002	187.534	100
						0	S1.003	187.534	100
S200	372238.455	445442.147	189.040	1.300	450	0	S2.000	187.740	100
Outfall South	372224.633	445429.275	188.070	0.720		1	S1.003	187.350	100

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 (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

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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 (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	22.5	0.0	0.400	22.5	0.0	0.401	0.0	0.0

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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 (m³)	Flood (m³)	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	SURCHARGED
15 minute winter	S200	10	187.759	0.019	0.7	0.0048	0.0000	OK
15 minute summer	Outfall South	1	187.350	0.000	0.6	0.0000	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	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	
120 minute winter	Tank South	S1.002	S102	1.9	0.330	0.239	0.0252	
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	

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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 (m³)	Flood (m³)	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	SURCHARGED
180 minute winter	Tank South	132	187.856	0.266	3.0	5.6832	0.0000	SURCHARGED
180 minute winter	S102	132	187.855	0.321	1.8	0.0907	0.0000	SURCHARGED
180 minute winter	S200	132	187.856	0.116	0.6	0.0291	0.0000	SURCHARGED
15 minute summer	Outfall South	1	187.350	0.000	0.8	0.0000	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	S100	S1.000	S101	2.2	0.596	0.270	0.0269	
180 minute winter	S101	S1.001	Tank South	2.4	0.998	0.214	0.0368	
180 minute winter	Tank South	S1.002	S102	1.8	0.369	0.228	0.0259	
180 minute winter	S102	Orifice	Outfall South	1.0				12.6
180 minute winter	S200	S2.000	Tank South	0.6	0.448	0.070	0.0607	

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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 (m³)	Flood (m³)	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	SURCHARGED
180 minute winter	Tank South	132	187.957	0.367	3.5	7.8524	0.0000	SURCHARGED
180 minute winter	S102	132	187.956	0.422	1.9	0.1193	0.0000	SURCHARGED
180 minute winter	S200	132	187.957	0.217	0.7	0.0546	0.0000	SURCHARGED
15 minute summer	Outfall South	1	187.350	0.000	0.9	0.0000	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)
180 minute winter	S100	S1.000	S101	1.0	0.492	0.124	0.0531	
180 minute winter	S101	S1.001	Tank South	2.9	1.021	0.258	0.0368	
180 minute winter	Tank South	S1.002	S102	1.9	0.340	0.237	0.0259	
180 minute winter	S102	Orifice	Outfall South	1.2				16.4
180 minute winter	S200	S2.000	Tank South	0.7	0.591	0.082	0.0607	

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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 (m³)	Flood (m³)	Status
180 minute winter	S100	128	188.839	0.959	1.5	0.2704	0.0000	SURCHARGED
180 minute winter	S101	132	188.838	1.088	4.4	0.4581	0.0000	FLOOD RISK
180 minute winter	Tank South	132	188.834	1.244	5.2	8.5607	0.0000	FLOOD RISK
180 minute winter	S102	132	188.829	1.295	2.5	0.3664	0.0000	FLOOD RISK
180 minute winter	S200	132	188.835	1.095	1.1	0.2748	0.0000	FLOOD RISK
15 minute summer	Outfall South	1	187.350	0.000	1.0	0.0000	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)
180 minute winter	S100	S1.000	S101	1.3	0.513	0.164	0.0574	
180 minute winter	S101	S1.001	Tank South	4.2	1.067	0.379	0.0368	
180 minute winter	Tank South	S1.002	S102	2.5	0.408	0.312	0.0259	
180 minute winter	S102	Orifice	Outfall South	2.1				24.9
180 minute winter	S200	S2.000	Tank South	0.9	0.535	0.110	0.0607	

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