



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)	18.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.357	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)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
OU 1	0.062	5.00	64.593	2100	730	388247.886	396880.003	0.593
OU 2	0.062	5.00	64.592	2100	730	388255.616	396877.939	0.592
W01			64.603	1200		388247.363	396874.788	1.433
W02			64.659	1200		388245.187	396866.635	1.623
W03		5.00	64.635	600		388251.742	396874.443	1.795
TANK			64.530			388248.130	396860.913	1.750
W04			64.453	600		388247.600	396858.925	1.681
W05			64.702	1200		388239.060	396855.502	1.973
W06			64.720	1200		388238.179	396852.455	2.226
EX BS4			64.780	1200		388237.159	396848.964	2.650

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)
4.000	OU 1	W01	5.241	0.600	64.000	63.725	0.275	19.1	150	5.04	50.0
5.000	OU 2	W01	8.834	0.600	64.000	63.725	0.275	32.1	150	5.08	50.0
4.001	W01	W02	8.438	0.600	63.170	63.036	0.134	63.0	225	5.17	50.0
4.002	W02	W05	12.708	0.600	63.036	62.886	0.150	84.7	225	5.32	50.0
6.000	W03	TANK	14.004	0.600	62.840	62.784	0.056	250.1	300	5.24	50.0
6.001	TANK	W04	2.057	0.600	62.780	62.772	0.008	257.1	300	5.27	50.0
6.002	W04	W05	9.200	0.600	62.772	62.735	0.037	248.6	300	5.43	50.0
4.003	W05	W06	3.172	0.600	62.729	62.494	0.235	13.5	150	5.44	50.0
4.004	W06	EX BS4	3.637	0.600	62.494	62.130	0.364	10.0	150	5.46	50.0

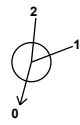
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
4.000	2.318	41.0	11.2	0.443	0.728	0.062	0.0
5.000	1.782	31.5	11.2	0.442	0.728	0.062	0.0
4.001	1.651	65.6	22.4	1.208	1.398	0.124	0.0
4.002	1.421	56.5	22.4	1.398	1.591	0.124	0.0
6.000	0.989	69.9	0.0	1.495	1.446	0.000	0.0
6.001	0.976	69.0	0.0	1.450	1.381	0.000	0.0
6.002	0.992	70.1	0.0	1.381	1.667	0.000	0.0
4.003	2.756	48.7	22.4	1.823	2.076	0.124	0.0
4.004	3.206	56.6	22.4	2.076	2.500	0.124	0.0

Pipeline Schedule

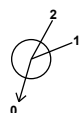
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
4.000	5.241	19.1	150	1 STANDARD	64.593	64.000	0.443	64.603	63.725	0.728
5.000	8.834	32.1	150	1 STANDARD	64.592	64.000	0.442	64.603	63.725	0.728
4.001	8.438	63.0	225	1 STANDARD	64.603	63.170	1.208	64.659	63.036	1.398
4.002	12.708	84.7	225	1 STANDARD	64.659	63.036	1.398	64.702	62.886	1.591
6.000	14.004	250.1	300	1 STANDARD	64.635	62.840	1.495	64.530	62.784	1.446
6.001	2.057	257.1	300	1 STANDARD	64.530	62.780	1.450	64.453	62.772	1.381
6.002	9.200	248.6	300	1 STANDARD	64.453	62.772	1.381	64.702	62.735	1.667
4.003	3.172	13.5	150	1 STANDARD	64.702	62.729	1.823	64.720	62.494	2.076
4.004	3.637	10.0	150	1 STANDARD	64.720	62.494	2.076	64.780	62.130	2.500

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.000	OU 1	2100	730	Manhole	1 STANDARD	W01	1200	Manhole	1 STANDARD
5.000	OU 2	2100	730	Manhole	1 STANDARD	W01	1200	Manhole	1 STANDARD
4.001	W01	1200		Manhole	1 STANDARD	W02	1200	Manhole	1 STANDARD
4.002	W02	1200		Manhole	1 STANDARD	W05	1200	Manhole	1 STANDARD
6.000	W03	600		Manhole	1 STANDARD	TANK		Junction	
6.001	TANK			Junction		W04	600	Manhole	1 STANDARD
6.002	W04	600		Manhole	1 STANDARD	W05	1200	Manhole	1 STANDARD
4.003	W05	1200		Manhole	1 STANDARD	W06	1200	Manhole	1 STANDARD
4.004	W06	1200		Manhole	1 STANDARD	EX BS4	1200	Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
OU 1	388247.886	396880.003	64.593	0.593	2100	730				
							0	4.000	64.000	150
OU 2	388255.616	396877.939	64.592	0.592	2100	730				
							0	5.000	64.000	150
W01	388247.363	396874.788	64.603	1.433	1200			1	5.000	63.725
							2	4.000	63.725	150
							0	4.001	63.170	225
W02	388245.187	396866.635	64.659	1.623	1200			1	4.001	63.036
							0	4.002	63.036	225
W03	388251.742	396874.443	64.635	1.795	600			0	6.000	62.840
TANK	388248.130	396860.913	64.530	1.750				1	6.000	62.784
							0	6.001	62.780	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
W04	388247.600	396858.925	64.453	1.681	600		1	6.001	62.772	300
							0	6.002	62.772	300
W05	388239.060	396855.502	64.702	1.973	1200		1	6.002	62.735	300
							2	4.002	62.886	225
							0	4.003	62.729	150
W06	388238.179	396852.455	64.720	2.226	1200		1	4.003	62.494	150
							0	4.004	62.494	150
EX BS4	388237.159	396848.964	64.780	2.650	1200		1	4.004	62.130	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	18.000	Drain Down Time (mins)	240
Ratio-R	0.357	Additional Storage (m³/ha)	20.0
Summer CV	1.000	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
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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 EX BS4 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to 30yr, 100yr+40% CC 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 minute storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.145	300	0.145	600	0.145	900	0.145	1200	0.145
60	0.145	360	0.145	660	0.145	960	0.145	1260	0.145
120	0.145	420	0.145	720	0.145	1020	0.145	1320	0.145
180	0.145	480	0.145	780	0.145	1080	0.145	1380	0.145
240	0.145	540	0.145	840	0.145	1140	0.145	1440	0.145

Node W05 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	62.729	Product Number	CTL-SHE-0100-5000-1400-5000
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	62.780
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	140

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	55.0	0.0	0.750	55.0	0.0	0.751	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	94.544	26.753	30 year 240 minute winter	26.043	10.359
1 year 15 minute winter	66.347	26.753	30 year 360 minute summer	29.730	7.651
1 year 30 minute summer	62.472	17.677	30 year 360 minute winter	19.326	7.651
1 year 30 minute winter	43.840	17.677	30 year 480 minute summer	23.349	6.171
1 year 60 minute summer	43.047	11.376	30 year 480 minute winter	15.513	6.171
1 year 60 minute winter	28.599	11.376	30 year 600 minute summer	19.082	5.219
1 year 120 minute summer	27.254	7.202	30 year 600 minute winter	13.038	5.219
1 year 120 minute winter	18.107	7.202	30 year 720 minute summer	16.978	4.550
1 year 180 minute summer	21.332	5.490	30 year 720 minute winter	11.410	4.550
1 year 180 minute winter	13.867	5.490	30 year 960 minute summer	13.908	3.662
1 year 240 minute summer	17.118	4.524	30 year 960 minute winter	9.213	3.662
1 year 240 minute winter	11.373	4.524	30 year 1440 minute summer	10.051	2.694
1 year 360 minute summer	13.366	3.440	30 year 1440 minute winter	6.755	2.694
1 year 360 minute winter	8.688	3.440	100 year +40% CC 15 minute summer	417.952	118.266
1 year 480 minute summer	10.646	2.814	100 year +40% CC 15 minute winter	293.299	118.266
1 year 480 minute winter	7.073	2.814	100 year +40% CC 30 minute summer	280.222	79.293
1 year 600 minute summer	8.802	2.408	100 year +40% CC 30 minute winter	196.647	79.293
1 year 600 minute winter	6.014	2.408	100 year +40% CC 60 minute summer	192.272	50.812
1 year 720 minute summer	7.910	2.120	100 year +40% CC 60 minute winter	127.741	50.812
1 year 720 minute winter	5.316	2.120	100 year +40% CC 120 minute summer	119.247	31.514
1 year 960 minute summer	6.587	1.734	100 year +40% CC 120 minute winter	79.225	31.514
1 year 960 minute winter	4.363	1.734	100 year +40% CC 180 minute summer	91.385	23.516
1 year 1440 minute summer	4.881	1.308	100 year +40% CC 180 minute winter	59.403	23.516
1 year 1440 minute winter	3.280	1.308	100 year +40% CC 240 minute summer	71.853	18.989
30 year 15 minute summer	231.260	65.439	100 year +40% CC 240 minute winter	47.737	18.989
30 year 15 minute winter	162.288	65.439	100 year +40% CC 360 minute summer	54.124	13.928
30 year 30 minute summer	153.527	43.443	100 year +40% CC 360 minute winter	35.182	13.928
30 year 30 minute winter	107.738	43.443	100 year +40% CC 480 minute summer	42.325	11.185
30 year 60 minute summer	104.640	27.653	100 year +40% CC 480 minute winter	28.120	11.185
30 year 60 minute winter	69.521	27.653	100 year +40% CC 600 minute summer	34.468	9.428
30 year 120 minute summer	64.756	17.113	100 year +40% CC 600 minute winter	23.551	9.428
30 year 120 minute winter	43.023	17.113	100 year +40% CC 720 minute summer	30.577	8.195
30 year 180 minute summer	49.709	12.792	100 year +40% CC 720 minute winter	20.549	8.195
30 year 180 minute winter	32.312	12.792	100 year +40% CC 960 minute summer	24.924	6.563
30 year 240 minute summer	39.200	10.359	100 year +40% CC 960 minute winter	16.510	6.563

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 1440 minute summer	17.875	4.791	100 year +40% CC 1440 minute winter	12.013	4.791

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU 1	10	64.054	0.054	9.6	0.1959	0.0000	OK
15 minute summer	OU 2	10	64.060	0.060	9.6	0.2189	0.0000	OK
15 minute summer	W01	10	63.261	0.091	18.9	0.1025	0.0000	OK
15 minute summer	W02	11	63.131	0.095	18.8	0.1078	0.0000	OK
60 minute summer	W03	43	62.885	0.045	0.5	0.0128	0.0000	OK
60 minute summer	TANK	42	62.885	0.105	9.3	5.4776	0.0000	OK
60 minute summer	W04	42	62.885	0.113	9.5	0.0319	0.0000	OK
15 minute summer	W05	11	62.901	0.172	18.8	0.1946	0.0000	SURCHARGED
15 minute summer	W06	11	62.524	0.030	4.2	0.0334	0.0000	OK
15 minute summer	EX BS4	11	62.158	0.028	4.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU 1	4.000	W01	9.5	1.768	0.231	0.0281	
15 minute summer	OU 2	5.000	W01	9.4	1.492	0.300	0.0559	
15 minute summer	W01	4.001	W02	18.8	1.218	0.287	0.1304	
15 minute summer	W02	4.002	W05	18.8	1.231	0.332	0.1939	
30 minute summer	W03	6.000	TANK	-0.6	-0.103	-0.009	0.1745	
15 minute summer	TANK	6.001	W04	-14.8	-1.379	-0.214	0.0374	
15 minute summer	W04	6.002	W05	-14.8	-0.509	-0.210	0.2685	
15 minute summer	W05	4.003	W06	4.2	1.589	0.085	0.0083	
15 minute summer	W06	4.004	EX BS4	4.2	1.784	0.073	0.0085	8.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU 1	10	64.095	0.095	23.4	0.3459	0.0000	OK
15 minute summer	OU 2	10	64.108	0.108	23.4	0.3927	0.0000	OK
15 minute summer	W01	10	63.338	0.168	46.2	0.1901	0.0000	OK
15 minute summer	W02	11	63.208	0.172	46.0	0.1946	0.0000	OK
120 minute summer	W03	82	63.128	0.288	0.9	0.0815	0.0000	OK
120 minute summer	TANK	84	63.128	0.348	15.3	18.1728	0.0000	SURCHARGED
120 minute summer	W04	84	63.128	0.356	16.0	0.1007	0.0000	SURCHARGED
120 minute summer	W05	86	63.129	0.400	21.4	0.4526	0.0000	SURCHARGED
120 minute summer	W06	82	62.524	0.030	5.0	0.0341	0.0000	OK
15 minute summer	EX BS4	1	62.275	0.145	4.8	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU 1	4.000	W01	23.2	2.154	0.565	0.0563	
15 minute summer	OU 2	5.000	W01	23.1	1.812	0.732	0.1122	
15 minute summer	W01	4.001	W02	46.0	1.429	0.700	0.2715	
15 minute summer	W02	4.002	W05	45.8	1.497	0.811	0.3885	
15 minute summer	W03	6.000	TANK	-2.8	-0.221	-0.041	0.7840	
15 minute summer	TANK	6.001	W04	-39.4	-1.668	-0.571	0.1335	
15 minute summer	W04	6.002	W05	-40.8	-0.800	-0.582	0.6260	
120 minute summer	W05	4.003	W06	5.0	1.728	0.102	0.0092	
120 minute summer	W06	4.004	EX BS4	5.0	0.467	0.088	0.0363	42.2

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU 1	11	64.278	0.278	42.3	1.0072	0.0000	SURCHARGED
15 minute summer	OU 2	11	64.425	0.425	42.3	1.5415	0.0000	FLOOD RISK
120 minute summer	W01	98	64.155	0.985	39.2	1.1142	0.0000	SURCHARGED
120 minute summer	W02	98	64.154	1.118	38.5	1.2644	0.0000	SURCHARGED
120 minute summer	W03	98	64.152	1.312	1.7	0.3714	0.0000	SURCHARGED
120 minute summer	TANK	98	64.152	1.372	31.6	39.2136	0.0000	SURCHARGED
120 minute summer	W04	98	64.152	1.380	32.2	0.3906	0.0000	SURCHARGED
120 minute summer	W05	98	64.152	1.423	37.9	1.6098	0.0000	SURCHARGED
240 minute summer	W06	300	62.524	0.030	5.0	0.0341	0.0000	OK
15 minute summer	EX BS4	1	62.275	0.145	5.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU 1	4.000	W01	39.7	2.286	0.969	0.0923	
15 minute summer	OU 2	5.000	W01	38.7	2.197	1.228	0.1555	
15 minute summer	W01	4.001	W02	76.6	1.927	1.168	0.3356	
15 minute summer	W02	4.002	W05	75.1	1.889	1.329	0.5054	
15 minute summer	W03	6.000	TANK	-4.8	-0.242	-0.068	0.9862	
15 minute summer	TANK	6.001	W04	-68.0	-1.705	-0.986	0.1449	
15 minute summer	W04	6.002	W05	-69.1	-0.981	-0.985	0.6479	
240 minute summer	W05	4.003	W06	5.0	1.730	0.103	0.0092	
240 minute summer	W06	4.004	EX BS4	5.0	0.469	0.088	0.0363	93.6