Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	30	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)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.010	4.00	52.390	450	146883.512	30626.649	0.600
S2			51.850	450	146890.821	30622.371	0.600
S3			51.000	450	146882.775	30608.623	0.600
S10	0.027	4.00	52.000	450	146873.811	30619.987	0.600
S11	0.020	4.00	51.000	450	146864.707	30604.431	0.500
S12			50.700	450	146859.900	30603.009	0.525
S13			50.500	1200	146857.330	30597.982	0.425
S14			50.500	1200	146868.327	30591.159	0.600
S4			50.500	1200	146874.393	30594.302	0.675
S5			50.500	1200	146877.813	30593.007	0.725
S6			50.800	1200	146887.510	30604.542	1.125
S7			51.000	1200	146895.189	30614.092	1.425
CSMH4			51.260	1200	146912.285	30629.815	1.871

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	S1	S2	8.469	0.600	51.790	51.250	0.540	15.7	150	4.00	50.0
1.001	S2	S3	15.929	0.600	51.250	50.400	0.850	18.7	150	4.00	50.0
1.002	S3	S4	16.594	0.600	50.400	49.900	0.500	33.2	150	4.00	50.0
2.000	S10	S11	18.024	0.600	51.400	50.500	0.900	20.0	150	4.00	50.0
2.001	S11	S12	5.013	0.600	50.500	50.250	0.250	20.1	150	4.00	50.0
2.002	S12	S13	5.646	0.600	50.175	50.075	0.100	56.5	225	4.00	50.0
2.003	S13	S14	12.942	0.600	50.075	49.900	0.175	74.0	225	4.00	50.0
2.004	S14	S4	6.832	0.600	49.900	49.825	0.075	91.1	225	4.00	50.0
1.003	S4	S5	3.657	0.600	49.825	49.775	0.050	73.1	225	4.00	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)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	2.556	45.2	1.4	0.450	0.450	0.010	0.0	18	1.146
1.001	2.337	41.3	1.4	0.450	0.450	0.010	0.0	18	1.069
1.002	1.753	31.0	1.4	0.450	0.450	0.010	0.0	21	0.879
2.000	2.260	39.9	3.7	0.450	0.350	0.027	0.0	31	1.419
2.001	2.259	39.9	6.4	0.350	0.300	0.047	0.0	40	1.653
2.002	1.744	69.3	6.4	0.300	0.200	0.047	0.0	46	1.100
2.003	1.522	60.5	6.4	0.200	0.375	0.047	0.0	49	0.992
2.004	1.370	54.5	6.4	0.375	0.450	0.047	0.0	51	0.920
1.003	1.531	60.9	7.7	0.450	0.500	0.057	0.0	54	1.058

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)
1.004	S5	S6	15.069	0.600	49.775	49.675	0.100	150.7	225	4.00	50.0
1.005	S6	S7	12.254	0.600	49.675	49.575	0.100	122.5	150	4.00	50.0
1.006	S7	CSMH4	23.227	0.600	49.575	49.389	0.186	124.9	150	4.00	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)	Pro Depth (mm)	Pro Velocity (m/s)
1.004	1.063	42.2	7.7	0.500	0.900	0.057	0.0	65	0.810
1.005	0.906	16.0	7.7	0.975	1.275	0.057	0.0	74	0.899
1.006	0.898	15.9	7.7	1.275	1.721	0.057	0.0	74	0.893

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	8.469	15.7	150	Circular_Default Sewer Type	52.390	51.790	0.450	51.850	51.250	0.450
1.001	15.929	18.7	150	Circular_Default Sewer Type	51.850	51.250	0.450	51.000	50.400	0.450
1.002	16.594	33.2	150	Circular_Default Sewer Type	51.000	50.400	0.450	50.500	49.900	0.450
2.000	18.024	20.0	150	Circular_Default Sewer Type	52.000	51.400	0.450	51.000	50.500	0.350
2.001	5.013	20.1	150	Circular_Default Sewer Type	51.000	50.500	0.350	50.700	50.250	0.300
2.002	5.646	56.5	225	Circular_Default Sewer Type	50.700	50.175	0.300	50.500	50.075	0.200
2.003	12.942	74.0	225	Circular_Default Sewer Type	50.500	50.075	0.200	50.500	49.900	0.375
2.004	6.832	91.1	225	Circular_Default Sewer Type	50.500	49.900	0.375	50.500	49.825	0.450
1.003	3.657	73.1	225	Circular_Default Sewer Type	50.500	49.825	0.450	50.500	49.775	0.500
1.004	15.069	150.7	225	Circular_Default Sewer Type	50.500	49.775	0.500	50.800	49.675	0.900
1.005	12.254	122.5	150	Circular_Default Sewer Type	50.800	49.675	0.975	51.000	49.575	1.275
1.006	23.227	124.9	150	Circular_Default Sewer Type	51.000	49.575	1.275	51.260	49.389	1.721

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	Adoptable	S2	450	Manhole	Adoptable
1.001	S2	450	Manhole	Adoptable	S3	450	Manhole	Adoptable
1.002	S3	450	Manhole	Adoptable	S4	1200	Manhole	Adoptable
2.000	S10	450	Manhole	Adoptable	S11	450	Manhole	Adoptable
2.001	S11	450	Manhole	Adoptable	S12	450	Manhole	Adoptable
2.002	S12	450	Manhole	Adoptable	S13	1200	Manhole	Adoptable
2.003	S13	1200	Manhole	Adoptable	S14	1200	Manhole	Adoptable
2.004	S14	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.003	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
1.004	S5	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
1.005	S6	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
1.006	S7	1200	Manhole	Adoptable	CSMH4	1200	Manhole	Adoptable

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 (m³/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 %)
100	40	0	0

Node S6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	49.675	Product Number	CTL-SHE-0106-5000-1000-5000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node S6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.675
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	35

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	40.0	0.0	0.400	40.0	0.0	0.401	0.0	0.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	51.828	0.038	6.0	0.0189	0.0000	OK
15 minute summer	S2	10	51.289	0.039	6.0	0.0062	0.0000	OK
15 minute winter	S3	10	50.445	0.045	6.0	0.0071	0.0000	OK
15 minute summer	S10	10	51.467	0.067	16.2	0.0704	0.0000	OK
15 minute winter	S11	10	50.614	0.114	28.2	0.1095	0.0000	OK
15 minute winter	S12	10	50.293	0.118	28.2	0.0188	0.0000	OK
15 minute winter	S13	10	50.193	0.118	28.2	0.1339	0.0000	OK
15 minute winter	S14	10	50.042	0.142	28.2	0.1604	0.0000	OK
60 minute winter	S4	47	50.030	0.205	18.7	0.2317	0.0000	OK
60 minute winter	S5	47	50.029	0.254	18.5	0.2876	0.0000	SURCHARGED
60 minute winter	S6	48	50.028	0.353	17.6	14.5038	0.0000	SURCHARGED
60 minute winter	S7	67	49.634	0.059	5.0	0.0667	0.0000	OK
60 minute winter	CSMH4	67	49.446	0.057	5.0	0.0000	0.0000	OK

Link Event (Velocity)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	6.0	1.682	0.133	0.0302	
15 minute winter	S2	1.001	S3	6.0	1.505	0.145	0.0637	
15 minute summer	S3	1.002	S4	6.0	1.153	0.194	0.1228	
15 minute summer	S10	2.000	S11	16.2	1.474	0.406	0.1976	
15 minute winter	S11	2.001	S12	28.2	2.172	0.706	0.0649	
15 minute summer	S12	2.002	S13	28.2	1.334	0.407	0.1194	
15 minute summer	S13	2.003	S14	28.2	1.186	0.466	0.3073	
15 minute summer	S14	2.004	S4	28.1	0.991	0.516	0.1936	
15 minute summer	S4	1.003	S5	33.8	1.126	0.555	0.1106	
15 minute summer	S5	1.004	S6	33.4	1.498	0.791	0.4869	
60 minute winter	S6	Hydro-Brake®	S7	5.0				
60 minute winter	S7	1.006	CSMH4	5.0	0.787	0.314	0.1467	27.0