

### Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	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)	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)
S1	0.003	5.00	78.000	450	414828.276	415704.781	0.230
S2	0.004	5.00	78.000	450	414814.423	415702.516	0.379
S3	0.003	5.00	78.000	450	414815.241	415693.226	0.478
S4	0.001	5.00	78.000	450	414811.179	415692.892	2.086
S5			78.000	450	414810.759	415697.176	2.458
S6			78.000	1200	414810.369	415701.157	2.478
S7	0.001	5.00	78.000	1200	414810.264	415702.220	2.496
S8			78.000	450	414808.212	415702.192	2.530
S9	0.003	5.00	78.000	450	414830.056	415694.531	0.230

### 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)
1.001	S1	S2	14.037	0.600	77.770	77.621	0.149	94.0	100	5.29	56.3
1.002	S2	S3	9.326	0.600	77.621	77.522	0.099	94.0	100	5.49	55.5
2.001	S9	S3	14.872	0.600	77.770	77.522	0.248	60.0	100	5.25	56.5
1.003	S3	S4	4.076	0.600	77.522	77.454	0.068	60.0	100	5.56	55.2
1.004	S4	S5	4.305	0.600	75.914	75.842	0.072	60.0	100	5.63	54.9
1.005	S5	S6	4.000	0.600	75.542	75.522	0.020	200.0	400	5.66	54.8
1.006	S6	S7	1.068	0.600	75.522	75.504	0.018	60.0	150	5.67	54.8
1.007	S7	S8	2.052	0.600	75.504	75.470	0.034	60.0	150	5.70	54.7

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)
1.001	0.793	6.2	0.5	0.130	0.279	0.003	0.0	18	0.459
1.002	0.793	6.2	1.1	0.279	0.378	0.007	0.0	28	0.588
2.001	0.996	7.8	0.5	0.130	0.378	0.003	0.0	17	0.546
1.003	0.996	7.8	1.9	0.378	0.446	0.013	0.0	34	0.826
1.004	0.996	7.8	2.1	1.986	2.058	0.014	0.0	36	0.846
1.005	2.658	2657.8	2.1	2.058	2.078	0.014	0.0	5	0.175
1.006	1.301	23.0	2.1	2.328	2.346	0.014	0.0	30	0.805
1.007	1.301	23.0	2.2	2.346	2.380	0.015	0.0	31	0.823

### 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)
1.001	14.037	94.0	100	Circular_Default Sewer Type	78.000	77.770	0.130	78.000	77.621	0.279
1.002	9.326	94.0	100	Circular_Default Sewer Type	78.000	77.621	0.279	78.000	77.522	0.378
2.001	14.872	60.0	100	Circular_Default Sewer Type	78.000	77.770	0.130	78.000	77.522	0.378
1.003	4.076	60.0	100	Circular_Default Sewer Type	78.000	77.522	0.378	78.000	77.454	0.446
1.004	4.305	60.0	100	Circular_Default Sewer Type	78.000	75.914	1.986	78.000	75.842	2.058
1.005	4.000	200.0	400	aTTENUATION tANK	78.000	75.542	2.058	78.000	75.522	2.078
1.006	1.068	60.0	150	Circular_Default Sewer Type	78.000	75.522	2.328	78.000	75.504	2.346
1.007	2.052	60.0	150	Circular_Default Sewer Type	78.000	75.504	2.346	78.000	75.470	2.380

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	S1	450	Manhole	Adoptable	S2	450	Manhole	Adoptable
1.002	S2	450	Manhole	Adoptable	S3	450	Manhole	Adoptable
2.001	S9	450	Manhole	Adoptable	S3	450	Manhole	Adoptable
1.003	S3	450	Manhole	Adoptable	S4	450	Manhole	Adoptable
1.004	S4	450	Manhole	Adoptable	S5	450	Manhole	Adoptable
1.005	S5	450	Manhole	Adoptable	S6	1200	Manhole	Adoptable
1.006	S6	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
1.007	S7	1200	Manhole	Adoptable	S8	450	Manhole	Adoptable

### Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	Drain Down Time (mins)	240
Ratio-R	0.300	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 %)
100	40	0	0

### Node S6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	75.522	Product Number	CTL-SHE-0082-3000-1050-3000
Design Depth (m)	1.050	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200

**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 (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	10	77.804	0.034	1.6	0.0144	0.0000	OK
15 minute winter	S2	10	77.676	0.055	3.7	0.0202	0.0000	OK
15 minute winter	S3	11	77.604	0.082	6.8	0.0234	0.0000	OK
15 minute winter	S4	11	76.002	0.088	7.2	0.0149	0.0000	OK
30 minute winter	S5	24	75.725	0.183	6.0	0.0291	0.0000	OK
30 minute winter	S6	24	75.725	0.203	4.5	0.2294	0.0000	SURCHARGED
30 minute winter	S7	22	75.546	0.042	3.0	0.0475	0.0000	OK
30 minute winter	S8	22	75.507	0.037	3.0	0.0000	0.0000	OK
15 minute winter	S9	10	77.800	0.030	1.6	0.0128	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 winter	S1	1.001	S2	1.6	0.466	0.251	0.0473	
15 minute winter	S2	1.002	S3	3.6	0.641	0.580	0.0523	
15 minute winter	S3	1.003	S4	6.7	1.040	0.856	0.0262	
15 minute winter	S4	1.004	S5	7.2	1.050	0.921	0.0294	
30 minute winter	S5	1.005	S6	4.5	0.062	0.002	1.9294	
30 minute winter	S6	1.006	S7	2.8	0.696	0.121	0.0044	
30 minute winter	S7	1.007	S8	3.0	0.827	0.132	0.0075	5.1
15 minute winter	S9	2.001	S3	1.6	0.363	0.201	0.0658	