

### Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	0.0
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	0.400	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)	Depth (m)
S1	0.000	5.00	42.150	100	0.450
S2	0.006	5.00	42.060	450	0.574
S3	0.005	5.00	42.060	10	1.700
S4	0.000	5.00	42.150	100	0.450
S5	0.006	5.00	42.060	10	1.740
S6	0.011	5.00	42.060	450	1.790
S7	0.000	5.00	43.150	100	1.450
S8	0.000		43.150	100	1.578
S9	0.000	5.00	42.150	100	0.450
S10	0.012	5.00	42.060	450	0.503
S11	0.006	5.00	42.060	450	0.721
S12	0.000	5.00	42.150	100	0.450
S13	0.016	5.00	42.060	10	0.938
S14	0.000	5.00	42.060	1200	1.861
S15	0.000		41.950	450	1.775

### 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	12.857	0.600	41.700	41.486	0.214	60.0	100	5.22	0.0
1.001	S2	S3	5.386	0.600	41.486	41.060	0.426	12.6	100	5.26	0.0
1.002	S3	S5	8.000	0.600	40.360	40.320	0.040	200.0	800	5.32	0.0
2.000	S4	S5	12.407	0.600	41.700	41.020	0.680	18.2	100	5.11	0.0
1.003	S5	S6	10.000	0.600	40.320	40.270	0.050	200.0	800	5.39	0.0
3.000	S7	S8	7.675	0.600	41.700	41.572	0.128	60.0	100	5.13	0.0
3.001	S8	S11	13.995	0.600	41.572	41.339	0.233	60.0	100	5.36	0.0
4.000	S9	S10	8.598	0.600	41.700	41.557	0.143	60.1	100	5.14	0.0

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	0.996	7.8	0.0	0.350	0.474	0.000	0.0	0	0.000
1.001	2.185	17.2	0.0	0.474	0.900	0.006	0.0	0	0.000
1.002	2.195	1755.7	0.0	0.900	0.940	0.011	0.0	0	0.000
2.000	1.816	14.3	0.0	0.350	0.940	0.000	0.0	0	0.000
1.003	2.195	1755.7	0.0	0.940	0.990	0.017	0.0	0	0.000
3.000	0.996	7.8	0.0	1.350	1.478	0.000	0.0	0	0.000
3.001	0.996	7.8	0.0	1.478	0.621	0.000	0.0	0	0.000
4.000	0.995	7.8	0.0	0.350	0.403	0.000	0.0	0	0.000

### 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)
4.001	S10	S11	6.675	0.600	41.557	41.339	0.218	30.6	100	5.22	0.0
3.002	S11	S13	13.001	0.600	41.339	41.122	0.217	59.9	100	5.58	0.0
5.000	S12	S13	13.480	0.600	41.700	41.122	0.578	23.3	100	5.16	50.0
3.003	S13	S6	2.163	0.600	41.122	40.970	0.152	14.2	100	5.71	50.0
1.004	S6	S14	1.283	0.600	40.270	40.199	0.071	18.1	150	5.72	0.0
1.005	S14	S15	2.403	0.600	40.199	40.175	0.024	100.1	150	5.76	0.0














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)
4.001	1.399	11.0	0.0	0.403	0.621	0.012	0.0	0	0.000
3.002	0.997	7.8	0.0	0.621	0.838	0.018	0.0	0	0.000
5.000	1.605	12.6	0.0	0.350	0.838	0.000	0.0	0	0.000
3.003	2.058	16.2	4.6	0.838	0.990	0.034	0.0	36	1.771
1.004	2.380	42.1	0.0	1.640	1.711	0.062	0.0	0	0.000
1.005	1.004	17.7	0.0	1.711	1.625	0.062	0.0	0	0.000

### 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	12.857	60.0	100	Circular_Default Sewer Type	42.150	41.700	0.350	42.060	41.486	0.474
1.001	5.386	12.6	100	Circular_Default Sewer Type	42.060	41.486	0.474	42.060	41.060	0.900
1.002	8.000	200.0	800	Tank	42.060	40.360	0.900	42.060	40.320	0.940
2.000	12.407	18.2	100	Circular_Default Sewer Type	42.150	41.700	0.350	42.060	41.020	0.940
1.003	10.000	200.0	800	Tank	42.060	40.320	0.940	42.060	40.270	0.990
3.000	7.675	60.0	100	Circular_Default Sewer Type	43.150	41.700	1.350	43.150	41.572	1.478
3.001	13.995	60.0	100	Circular_Default Sewer Type	43.150	41.572	1.478	42.060	41.339	0.621
4.000	8.598	60.1	100	Circular_Default Sewer Type	42.150	41.700	0.350	42.060	41.557	0.403
4.001	6.675	30.6	100	Circular_Default Sewer Type	42.060	41.557	0.403	42.060	41.339	0.621
3.002	13.001	59.9	100	Circular_Default Sewer Type	42.060	41.339	0.621	42.060	41.122	0.838
5.000	13.480	23.3	100	Circular_Default Sewer Type	42.150	41.700	0.350	42.060	41.122	0.838
3.003	2.163	14.2	100	Circular_Default Sewer Type	42.060	41.122	0.838	42.060	40.970	0.990
1.004	1.283	18.1	150	Circular_Default Sewer Type	42.060	40.270	1.640	42.060	40.199	1.711
1.005	2.403	100.1	150	Circular_Default Sewer Type	42.060	40.199	1.711	41.950	40.175	1.625

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	100	Manhole	Adoptable	S2	450	Manhole	Adoptable
1.001	S2	450	Manhole	Adoptable	S3	10	Manhole	Adoptable
1.002	S3	10	Manhole	Adoptable	S5	10	Manhole	Adoptable
2.000	S4	100	Manhole	Adoptable	S5	10	Manhole	Adoptable
1.003	S5	10	Manhole	Adoptable	S6	450	Manhole	Adoptable
3.000	S7	100	Manhole	Adoptable	S8	100	Manhole	Adoptable
3.001	S8	100	Manhole	Adoptable	S11	450	Manhole	Adoptable
4.000	S9	100	Manhole	Adoptable	S10	450	Manhole	Adoptable
4.001	S10	450	Manhole	Adoptable	S11	450	Manhole	Adoptable
3.002	S11	450	Manhole	Adoptable	S13	10	Manhole	Adoptable
5.000	S12	100	Manhole	Adoptable	S13	10	Manhole	Adoptable
3.003	S13	10	Manhole	Adoptable	S6	450	Manhole	Adoptable
1.004	S6	450	Manhole	Adoptable	S14	1200	Manhole	Adoptable
1.005	S14	1200	Manhole	Adoptable	S15	450	Manhole	Adoptable

**Manhole Schedule**

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	42.150	0.450	100				
					0	1.000	41.700 100
S2	42.060	0.574	450				
					1	1.000	41.486 100
					0	1.001	41.486 100
S3	42.060	1.700	10				
					1	1.001	41.060 100
					0	1.002	40.360 800
S4	42.150	0.450	100				
					0	2.000	41.700 100
S5	42.060	1.740	10				
					1	2.000	41.020 100
					2	1.002	40.320 800
					0	1.003	40.320 800
S6	42.060	1.790	450				
					1	3.003	40.970 100
					2	1.003	40.270 800
					0	1.004	40.270 150
S7	43.150	1.450	100				
					0	3.000	41.700 100
S8	43.150	1.578	100				
					1	3.000	41.572 100
					0	3.001	41.572 100
S9	42.150	0.450	100				
					0	4.000	41.700 100
S10	42.060	0.503	450				
					1	4.000	41.557 100
					0	4.001	41.557 100
S11	42.060	0.721	450				
					1	4.001	41.339 100
					2	3.001	41.339 100
					0	3.002	41.339 100
S12	42.150	0.450	100				
					0	5.000	41.700 100
S13	42.060	0.938	10				
					1	5.000	41.122 100
					2	3.002	41.122 100
					0	3.003	41.122 100

### Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S14	42.060	1.861	1200	1 	1.004	40.199	150
				0	1.005	40.199	150
S15	41.950	1.775	450	1 	1.005	40.175	150

### 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	0.400	Additional Storage (m <sup>3</sup> /ha)	0.0
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 | 2160

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	30	0	0

### Node S14 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	40.199	Product Number	CTL-SHE-0092-3500-0800-3500
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

**Results for 1 year 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 summer	S1	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2	11	41.501	0.015	0.8	0.0024	0.0000	OK
15 minute winter	S3	14	40.393	0.033	1.5	0.0000	0.0000	OK
15 minute summer	S4	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S5	15	40.394	0.074	4.2	0.0000	0.0000	OK
15 minute winter	S6	14	40.395	0.125	9.0	0.0198	0.0000	OK
15 minute summer	S7	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S8	1	41.572	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S9	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S10	10	41.584	0.026	1.7	0.0042	0.0000	OK
15 minute winter	S11	11	41.378	0.039	2.5	0.0062	0.0000	OK
15 minute summer	S12	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S13	10	41.165	0.043	4.7	0.0000	0.0000	OK
15 minute winter	S14	14	40.394	0.195	5.7	0.2205	0.0000	SURCHARGED
15 minute summer	S15	1	40.175	0.000	3.5	0.0000	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 summer	S1	1.000	S2	0.0	0.000	0.000	0.0048	
15 minute winter	S2	1.001	S3	0.8	1.097	0.047	0.0039	
15 minute winter	S3	1.002	S5	1.9	0.182	0.001	0.4188	
15 minute summer	S4	2.000	S5	0.0	0.000	0.000	0.0000	
15 minute winter	S5	1.003	S6	2.8	0.062	0.002	0.9799	
15 minute winter	S6	1.004	S14	5.7	0.779	0.136	0.0213	
15 minute summer	S7	3.000	S8	0.0	0.000	0.000	0.0000	
15 minute summer	S8	3.001	S11	0.0	0.000	0.000	0.0191	
15 minute summer	S9	4.000	S10	0.0	0.000	0.000	0.0068	
15 minute winter	S10	4.001	S11	1.7	0.757	0.153	0.0149	
15 minute winter	S11	3.002	S13	2.4	0.820	0.313	0.0389	
15 minute summer	S12	5.000	S13	0.0	0.000	0.000	0.0204	
15 minute winter	S13	3.003	S6	4.6	1.603	0.287	0.0063	
15 minute winter	S14	Hydro-Brake®	S15	3.5				4.0

**Results for 30 year 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 summer	S1	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2	10	41.511	0.025	2.1	0.0039	0.0000	OK
30 minute winter	S3	28	40.656	0.296	4.8	0.0000	0.0000	OK
15 minute summer	S4	1	41.700	0.000	0.0	0.0000	0.0000	OK
30 minute winter	S5	28	40.656	0.336	7.8	0.0000	0.0000	OK
30 minute winter	S6	28	40.656	0.386	12.0	0.0614	0.0000	SURCHARGED
15 minute summer	S7	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S8	1	41.572	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S9	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S10	10	41.600	0.043	4.2	0.0068	0.0000	OK
15 minute winter	S11	10	41.408	0.069	6.3	0.0110	0.0000	OK
15 minute summer	S12	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S13	11	41.203	0.081	11.6	0.0000	0.0000	OK
30 minute winter	S14	28	40.655	0.456	9.9	0.5157	0.0000	SURCHARGED
15 minute summer	S15	1	40.175	0.000	3.5	0.0000	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 summer	S1	1.000	S2	0.0	0.000	0.000	0.0092	
15 minute winter	S2	1.001	S3	2.1	1.436	0.121	0.0078	
30 minute winter	S3	1.002	S5	2.4	0.171	0.001	2.5302	
15 minute summer	S4	2.000	S5	0.0	0.000	0.000	0.0000	
30 minute winter	S5	1.003	S6	-5.7	0.056	-0.003	3.6123	
30 minute winter	S6	1.004	S14	9.9	0.808	0.235	0.0226	
15 minute summer	S7	3.000	S8	0.0	0.000	0.000	0.0000	
15 minute summer	S8	3.001	S11	0.0	0.000	0.000	0.0386	
15 minute summer	S9	4.000	S10	0.0	0.000	0.000	0.0131	
15 minute winter	S10	4.001	S11	4.2	0.923	0.378	0.0299	
15 minute winter	S11	3.002	S13	6.1	0.966	0.777	0.0818	
15 minute summer	S12	5.000	S13	0.0	0.000	0.000	0.0443	
15 minute winter	S13	3.003	S6	11.4	1.897	0.706	0.0129	
30 minute winter	S14	Hydro-Brake®	S15	3.5				12.9

**Results for 100 year +30% 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 summer	S1	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2	10	41.518	0.032	3.5	0.0051	0.0000	OK
60 minute winter	S3	52	41.046	0.686	3.7	0.0000	0.0000	OK
15 minute summer	S4	1	41.700	0.000	0.0	0.0000	0.0000	OK
60 minute winter	S5	52	41.046	0.726	7.5	0.0000	0.0000	OK
60 minute winter	S6	52	41.046	0.776	13.5	0.1234	0.0000	SURCHARGED
15 minute summer	S7	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S8	12	41.622	0.050	1.1	0.0004	0.0000	OK
15 minute winter	S9	12	41.701	0.001	0.0	0.0000	0.0000	OK
15 minute winter	S10	12	41.697	0.140	7.0	0.0222	0.0000	SURCHARGED
15 minute winter	S11	12	41.617	0.278	9.5	0.0441	0.0000	SURCHARGED
15 minute summer	S12	1	41.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S13	11	41.351	0.229	16.9	0.0000	0.0000	SURCHARGED
60 minute winter	S14	52	41.044	0.845	6.5	0.9559	0.0000	SURCHARGED
15 minute summer	S15	1	40.175	0.000	3.5	0.0000	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 summer	S1	1.000	S2	0.0	0.000	0.000	0.0135	
15 minute winter	S2	1.001	S3	3.5	1.646	0.202	0.0113	
60 minute winter	S3	1.002	S5	2.8	0.153	0.002	5.6452	
15 minute summer	S4	2.000	S5	0.0	0.000	0.000	0.0000	
60 minute winter	S5	1.003	S6	8.5	0.062	0.005	7.5064	
60 minute winter	S6	1.004	S14	6.5	0.750	0.155	0.0226	
15 minute summer	S7	3.000	S8	0.0	0.000	0.000	0.0077	
15 minute winter	S8	3.001	S11	-1.1	-0.196	-0.138	0.0819	
15 minute winter	S9	4.000	S10	0.0	0.008	0.000	0.0337	
15 minute winter	S10	4.001	S11	6.2	0.976	0.560	0.0522	
15 minute winter	S11	3.002	S13	8.5	1.114	1.087	0.1017	
15 minute summer	S12	5.000	S13	0.0	0.000	0.000	0.0527	
15 minute winter	S13	3.003	S6	16.5	2.109	1.021	0.0169	
60 minute winter	S14	Hydro-Brake®	S15	3.6				27.3