

## Network Details

### Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
Smh6	0.023	0.180	Type E	169.200	168.200	0.900	400896.605	291156.994
Smh4	0.012	0.180	Type E	169.246	168.084	1.062	400891.830	291164.190
Smh10	0.010	0.180	Type E	167.500	166.700	0.700	400881.227	291160.833
Smh11	0.000	0.180	Type E	167.500	166.699	0.701	400874.621	291156.205
Smh7	0.006	0.180	Type E	169.049	168.049	0.900	400896.414	291144.877
Smh1	0.017	0.180	Type E	168.940	167.894	0.946	400887.734	291149.793
Smh14	0.000	0.180	Type E	167.800	167.000	0.700	400876.137	291150.264
Smh13	0.000	0.180	Type E	167.800	167.000	0.700	400872.319	291150.418
Smh8	0.000	1.200	Type E	168.266	166.652	1.464	400870.452	291150.505
Smh12	0.000	0.180	Type E	168.029	166.621	1.257	400865.857	291150.518
Smh3	0.000	0.180	Type E	167.785	166.572	1.062	400858.502	291150.625
S1	0.000	1.350	Type C	167.260	165.955	1.155	400825.908	291098.046

### Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Diameter (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	Smh6	168.200	Smh11	166.699	0.100	21.998	14.7	0.600	0.900	0.701
2.000	Smh4	168.084	Smh10	166.700	0.100	11.122	8.0	0.600	1.062	0.700
2.001	Smh10	166.700	Smh11	166.699	0.100	8.065	8065.4	0.600	0.700	0.701
1.001	Smh11	166.699	Smh8	166.652	0.150	7.062	150.0	0.600	0.651	1.464
3.000	Smh7	168.049	Smh1	167.894	0.100	9.976	64.0	0.600	0.900	0.946
3.001	Smh1	167.894	Smh14	167.000	0.100	11.607	13.0	0.600	0.946	0.700
3.002	Smh14	167.000	Smh13	167.000	0.100	3.821		0.600	0.700	0.700
3.003	Smh13	167.000	Smh8	166.702	0.100	1.869	6.3	0.600	0.700	1.464
1.002	Smh8	166.652	Smh12	166.621	0.150	4.596	150.0	0.600	1.464	1.257
1.003	Smh12	166.621	Smh3	166.572	0.150	7.356	150.0	0.600	1.257	1.062
1.004	Smh3	166.572	S1	165.955	0.150	61.862	100.2	0.600	1.062	1.155

## Outfall Details

Outfall Manhole S1 : Free Discharge

## Flow Control Details

### Tank Structure at Manhole Smh11

Tank Invert (m)	Tank Height (m)	Void Ratio (%)	Area (m2)	Effective Area (m2) Area x Void Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
166.699	0.800	95.00	38.151	36.243	28.994	0.00000000	0.00000000	2.00

### Tank Structure at Manhole Smh13

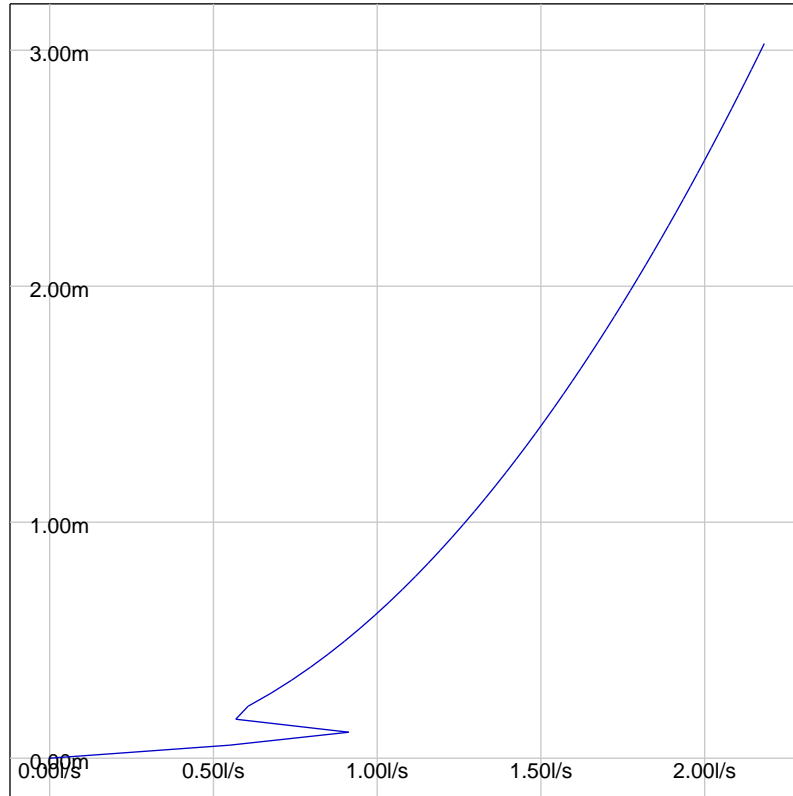
Tank Invert (m)	Tank Height (m)	Void Ratio (%)	Area (m2)	Effective Area (m2) Area x Void Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
167.000	0.800	95.00	4.000	3.800	3.040	0.00000000	0.00000000	2.00

### Controls within Manhole Smh8

## Hydro-Brake® Optimum Control at Manhole Smh8

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
CHE-0051-2000-2549-2000 ID:578554	2.549	2.000	0.000	0.123	0.938	0.176	0.555

## Hydro-Brake® Optimum Control at Smh8



## Simulation Settings

FSR: M5-60=19.50, R=0.40, Locale=England and Wales

Summer (Cv: 0.75), Winter (Cv: 0.84)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (30, +0%), (100, +40%)

## Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	41.269	0.00	0.00	30Yr 360Min Summer	7.850	0.00	0.00
2Yr 15Min Summer	41.269	0.00	0.00	30Yr 360Min Winter	7.850	0.00	0.00
2Yr 30Min Winter	26.355	0.00	0.84	30Yr 480Min Summer	6.282	0.00	0.00
2Yr 30Min Summer	26.355	0.00	0.00	30Yr 480Min Winter	6.282	0.00	0.00
2Yr 60Min Winter	16.236	0.00	1.34	30Yr 600Min Summer	5.281	0.00	0.00
2Yr 60Min Summer	16.236	0.00	0.39	30Yr 600Min Winter	5.281	0.00	0.00
2Yr 120Min Summer	9.816	0.00	0.00	30Yr 720Min Summer	4.582	0.00	0.00
2Yr 120Min Winter	9.816	0.00	0.00	30Yr 720Min Winter	4.582	0.00	0.00
2Yr 180Min Winter	7.283	0.00	0.00	30Yr 960Min Summer	3.659	0.00	0.00
2Yr 180Min Summer	7.283	0.00	0.00	30Yr 960Min Winter	3.659	0.00	0.00
2Yr 240Min Winter	5.890	0.00	0.00	30Yr 1440Min Summer	2.663	0.00	0.00
2Yr 240Min Summer	5.890	0.00	0.00	30Yr 1440Min Winter	2.663	0.00	0.00
2Yr 360Min Winter	4.363	0.00	0.00	100Yr +40% 15Min Summer	134.372	0.00	3.49
2Yr 360Min Summer	4.363	0.00	0.00	100Yr +40% 15Min Winter	134.372	0.00	3.96
2Yr 480Min Summer	3.522	0.00	0.00	100Yr +40% 30Min Summer	88.266	0.00	4.23
2Yr 480Min Winter	3.522	0.00	0.00	100Yr +40% 30Min Winter	88.266	0.00	4.74
2Yr 600Min Winter	2.982	0.00	0.00	100Yr +40% 60Min Summer	55.250	0.00	4.61
2Yr 600Min Summer	2.982	0.00	0.00	100Yr +40% 60Min Winter	55.250	0.00	5.07
2Yr 720Min Summer	2.603	0.00	0.00	100Yr +40% 120Min Summer	33.426	0.00	3.58
2Yr 720Min Winter	2.603	0.00	0.00	100Yr +40% 120Min Winter	33.426	0.00	4.09
2Yr 960Min Summer	2.100	0.00	0.00	100Yr +40% 180Min Summer	24.587	0.00	2.56
2Yr 960Min Winter	2.100	0.00	0.00	100Yr +40% 180Min Winter	24.587	0.00	3.13
2Yr 1440Min Winter	1.551	0.00	0.00	100Yr +40% 240Min Summer	19.657	0.00	1.75
2Yr 1440Min Summer	1.551	0.00	0.00	100Yr +40% 240Min Winter	19.657	0.00	2.24
30Yr 15Min Winter	74.023	0.00	2.54	100Yr +40% 360Min Summer	14.271	0.00	0.58
30Yr 15Min Summer	74.023	0.00	1.71	100Yr +40% 360Min Winter	14.271	0.00	0.98
30Yr 30Min Summer	48.204	0.00	2.71	100Yr +40% 480Min Summer	11.374	0.00	0.00
30Yr 30Min Winter	48.204	0.00	3.13	100Yr +40% 480Min Winter	11.374	0.00	0.16
30Yr 60Min Summer	30.026	0.00	2.90	100Yr +40% 600Min Summer	9.532	0.00	0.00
30Yr 60Min Winter	30.026	0.00	3.31	100Yr +40% 600Min Winter	9.532	0.00	0.00
30Yr 120Min Summer	18.162	0.00	1.76	100Yr +40% 720Min Summer	8.247	0.00	0.00
30Yr 120Min Winter	18.162	0.00	2.22	100Yr +40% 720Min Winter	8.247	0.00	0.00
30Yr 180Min Winter	13.395	0.00	1.28	100Yr +40% 960Min Summer	6.558	0.00	0.00
30Yr 180Min Summer	13.395	0.00	0.77	100Yr +40% 960Min Winter	6.558	0.00	0.00
30Yr 240Min Summer	10.747	0.00	0.00	100Yr +40% 1440Min Winter	4.740	0.00	0.00
30Yr 240Min Winter	10.747	0.00	0.49	100Yr +40% 1440Min Summer	4.740	0.00	0.00

## Simulation Results

Return Period Yrs: 2.0

Climate Change %: 0

### Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Smh6	15 min Winter	8	168.235	0.035	4.175		OK
Smh4	15 min Winter	8	168.105	0.022	2.274		OK
Smh10	120 min Winter	104	166.890	0.190	0.200		Surcharged
Smh11	120 min Winter	105	166.890	0.191	0.395		Surcharged
Smh7	15 min Winter	8	168.074	0.025	1.019		OK
Smh1	15 min Winter	8	167.927	0.033	4.044		OK
Smh14	15 min Winter	8	167.067	0.067	4.022		OK
Smh13	15 min Winter	9	167.027	0.027	3.887		OK
Smh8	120 min Winter	104	166.890	0.238	0.604		Surcharged
Smh12	120 min Summer	181	166.647	0.025	0.912		OK
Smh3	480 min Winter	263	166.595	0.023	0.912		OK
S1	480 min Winter	263	165.978	0.023	0.911		Outfall

### Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Velocity (m/s)	Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	8	Smh6	Smh11	0.046	1.189	4.153	0.261	OK
2.000	15 min Winter	8	Smh4	Smh10	0.061	0.451	2.261	0.105	OK
2.001	120 min Winter	104	Smh10	Smh11	0.100	0.025	0.200	0.332	Surcharged
1.001	120 min Winter	105	Smh11	Smh8	0.150	0.023	0.400	0.028	Surcharged
3.000	15 min Winter	8	Smh7	Smh1	0.029	0.534	1.003	0.133	OK
3.001	15 min Winter	8	Smh1	Smh14	0.050	1.018	4.022	0.238	OK
3.002	15 min Winter	8	Smh14	Smh13	0.047	1.092	3.977		OK
3.003	15 min Winter	9	Smh13	Smh8	0.051	0.966	3.936	0.161	OK
1.002	120 min Winter	104	Smh8	Smh12	0.021	0.406	0.604	0.042	OK
1.003	120 min Summer	181	Smh12	Smh3	0.024	0.493	0.911	0.063	OK
1.004	480 min Winter	263	Smh3	S1	0.023	0.532	0.911	0.051	OK

Return Period Yrs: 30.0

Climate Change %: 0

## Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Smh6	15 min Winter	8	168.248	0.048	7.492		OK
Smh4	15 min Winter	8	168.113	0.029	4.079		OK
Smh10	180 min Winter	154	167.099	0.399	0.280		Surcharged
Smh11	180 min Winter	155	167.099	0.400	0.555		Surcharged
Smh7	15 min Winter	8	168.083	0.033	1.829		OK
Smh1	15 min Winter	8	167.939	0.046	7.262		OK
Smh14	15 min Winter	9	167.106	0.106	6.885		Surcharged
Smh13	180 min Winter	155	167.099	0.099	0.273		OK
Smh8	180 min Winter	155	167.099	0.447	0.832		Surcharged
Smh12	1440 min Winter	760	166.647	0.026	0.913		OK
Smh3	1440 min Winter	761	166.595	0.023	0.913		OK
S1	1440 min Winter	761	165.978	0.023	0.913		Outfall

## Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Velocity (m/s)	Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	8	Smh6	Smh11	0.074	1.196	7.458	0.468	OK
2.000	15 min Winter	8	Smh4	Smh10	0.065	0.756	4.061	0.189	OK
2.001	180 min Winter	154	Smh10	Smh11	0.100	0.036	0.280	0.464	Surcharged
1.001	180 min Winter	155	Smh11	Smh8	0.150	0.032	0.559	0.039	Surcharged
3.000	15 min Winter	8	Smh7	Smh1	0.039	0.628	1.807	0.239	OK
3.001	15 min Winter	8	Smh1	Smh14	0.073	1.180	7.230	0.427	OK
3.002	15 min Winter	9	Smh14	Smh13	0.068	1.226	7.013		OK
3.003	180 min Winter	155	Smh13	Smh8	0.099	0.035	0.273	0.011	OK
1.002	180 min Winter	155	Smh8	Smh12	0.024	0.447	0.833	0.058	OK
1.003	1440 min Winter	760	Smh12	Smh3	0.024	0.492	0.913	0.063	OK
1.004	1440 min Winter	761	Smh3	S1	0.023	0.532	0.913	0.052	OK

Return Period Yrs: 100.0

Climate Change %: 40

## Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Smh6	15 min Winter	8	168.271	0.071	13.601		OK
Smh4	15 min Winter	8	168.124	0.040	7.406		OK
Smh10	180 min Winter	170	167.486	0.786	0.394		Flood Risk
Smh11	180 min Winter	171	167.486	0.787	0.764		Flood Risk
Smh7	15 min Winter	8	168.095	0.046	3.320		OK
Smh1	15 min Winter	8	167.960	0.066	13.192		OK
Smh14	180 min Winter	171	167.486	0.486	0.378		Surcharged
Smh13	180 min Winter	171	167.486	0.486	0.378		Surcharged
Smh8	180 min Winter	171	167.486	0.834	1.141		Surcharged
Smh12	180 min Winter	171	166.650	0.028	1.141		OK
Smh3	180 min Winter	172	166.598	0.026	1.141		OK
S1	180 min Winter	172	165.981	0.026	1.141		Outfall

## Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Velocity (m/s)	Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	8	Smh6	Smh11	0.085	1.894	13.532	0.850	OK
2.000	15 min Winter	8	Smh4	Smh10	0.070	1.253	7.379	0.343	OK
2.001	180 min Winter	170	Smh10	Smh11	0.100	0.050	0.393	0.652	Surcharged
1.001	180 min Winter	171	Smh11	Smh8	0.150	0.043	0.762	0.053	Surcharged
3.000	15 min Winter	8	Smh7	Smh1	0.056	0.725	3.288	0.435	OK
3.001	15 min Winter	8	Smh1	Smh14	0.083	1.881	13.124	0.776	OK
3.002	180 min Winter	171	Smh14	Smh13	0.100	0.048	0.378		Surcharged
3.003	180 min Winter	171	Smh13	Smh8	0.100	0.048	0.379	0.016	Surcharged
1.002	180 min Winter	171	Smh8	Smh12	0.028	0.491	1.141	0.079	OK
1.003	180 min Winter	171	Smh12	Smh3	0.027	0.527	1.141	0.079	OK
1.004	180 min Winter	172	Smh3	S1	0.026	0.569	1.141	0.064	OK