

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
SB4	0.098	1.350	Type C	43.053	41.628	1.200	392387.054	164096.186
SB3	0.300	1.500	Type B	41.872	39.550	1.797	392412.267	164082.169
SB5	0.123	1.500	Type B	42.332	38.948	2.858	392396.898	164069.008
SB6	0.058	1.500	Type B	41.550	38.540	2.485	392429.449	164044.382
SB7	0.150	1.500	Type B	41.320	38.391	2.404	392439.814	164033.705
SB8	0.127	1.350	Type C	41.341	39.841	1.200	392494.780	164057.331
SB9	0.000	1.350	Type C	41.516	39.718	1.498	392501.697	164040.168
SB10	0.026	1.350	Type B	41.624	39.578	1.671	392506.615	164031.869
SB11	0.098	1.350	Type B	41.612	39.463	1.774	392513.070	164015.833
SB12	0.056	1.350	Type C	41.091	39.260	1.456	392485.097	164004.614
SB13	0.231	1.500	Type B	40.671	38.000	2.146	392456.254	163993.189
SB14	0.022	1.500	Type B	40.101	37.727	1.774	392470.461	163956.863
SB15	0.120	1.350	Type C	39.940	38.282	1.358	392470.088	163882.372
SB16	0.043	1.500	Type B	39.940	37.656	1.759	392471.460	163946.274
HW4	0.000	0.000	Type B	39.900	37.550	1.750	392455.566	163946.544
HW5	0.000	0.000	Type B	39.900	37.500	1.800	392429.967	163936.631
SB19 HB	0.000	1.500	Type C	39.300	37.459	1.616	392427.918	163930.791
HW6	0.000	0.000	Type C	38.000	37.230	0.545	392422.007	163898.520

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	SB4	41.628	SB5	39.248	Circ	0.225mØ	28.905	12	0.600	1.200	2.858
2.000	SB3	39.550	SB5	38.948	Circ	0.525mØ	20.233	34	0.600	1.797	2.858
1.001	SB5	38.948	SB6	38.540	Circ	0.525mØ	40.817	100	0.600	2.858	2.485
1.002	SB6	38.540	SB7	38.391	Circ	0.525mØ	14.881	100	0.600	2.485	2.404
1.003	SB7	38.391	SB13	38.000	Circ	0.525mØ	43.725	112	0.600	2.404	2.146
3.000	SB8	39.841	SB9	39.718	Circ	0.3mØ	18.504	150	0.600	1.200	1.498
3.001	SB9	39.718	SB10	39.653	Circ	0.3mØ	9.647	150	0.600	1.498	1.671
3.002	SB10	39.578	SB11	39.463	Circ	0.375mØ	17.286	150	0.600	1.671	1.774
3.003	SB11	39.463	SB12	39.260	Circ	0.375mØ	30.139	148	0.600	1.774	1.456
3.004	SB12	39.260	SB13	38.150	Circ	0.375mØ	31.024	28	0.600	1.456	2.146
1.004	SB13	38.000	SB14	37.727	Circ	0.6mØ	39.005	143	0.600	2.071	1.774
1.005	SB14	37.727	SB16	37.656	Circ	0.6mØ	10.636	150	0.600	1.774	1.684
4.000	SB15	38.282	SB16	37.881	Circ	0.3mØ	63.916	159	0.600	1.358	1.759
1.006	SB16	37.656	HW4	37.550	Circ	0.6mØ	15.897	150	0.600	1.684	1.750
1.007	HW4	37.550	HW5	37.500	Circ	0.6mØ	27.451	549	0.600	1.750	1.800
1.008	HW5	37.500	SB19 HB	37.459	Circ	0.6mØ	6.189	150	0.600	1.800	1.241
1.009	SB19 HB	37.459	HW6	37.230	Circ	0.225mØ	32.808	143	0.600	1.616	0.545

Outfall Details

Outfall Manhole HW6 : Free Discharge

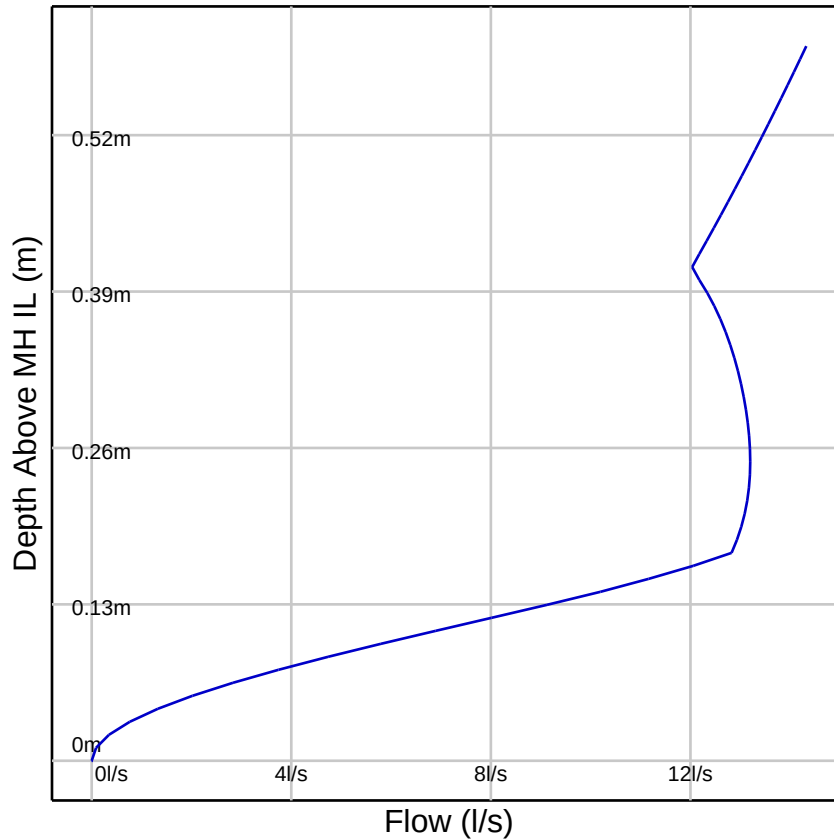
Flow Control Details

Controls within Manhole SB19 HB

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0171-1320-0500-1320	0.500	13.200	0.000	0.249	13.198	0.409	12.012

Hydro-Brake® Optimum Control from SB19 HB to HW6



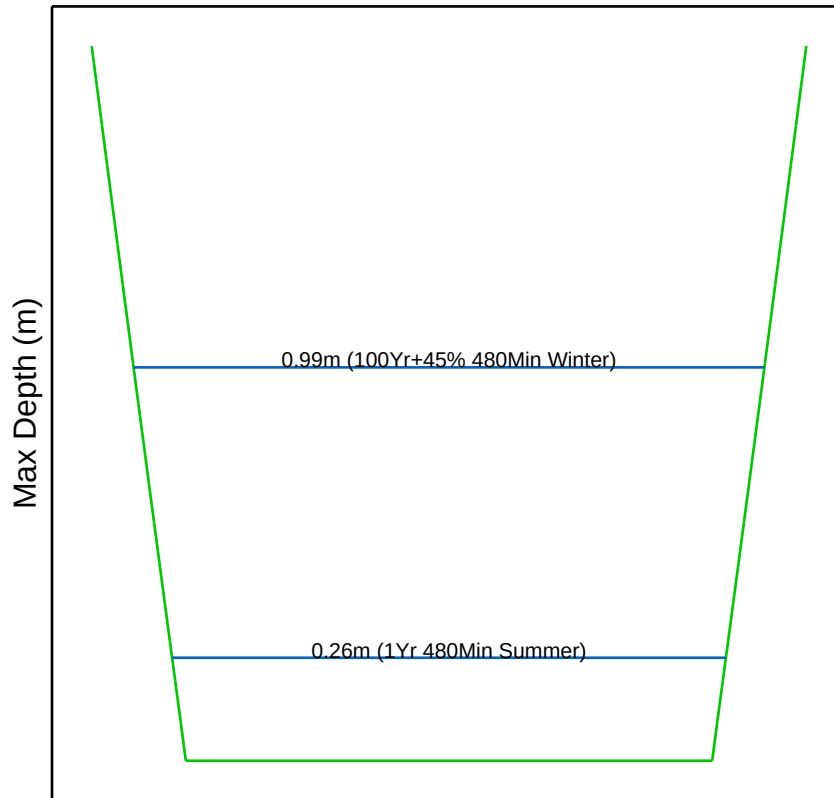
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.800	0.115	0.600

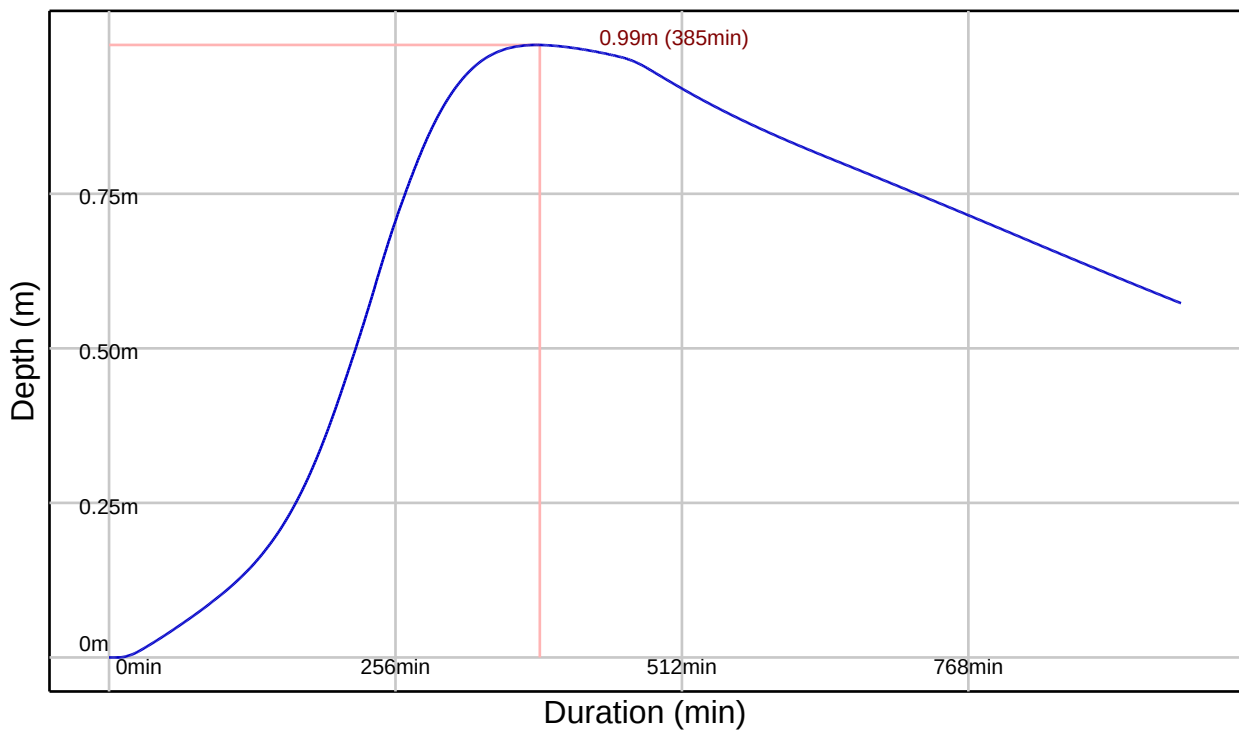
Pond Structure at Manhole SB19 HB

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
37.500	1.800	1505.990	38.900	0.400	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at SB19 HB



Pond 5 at SB19 HB (100Yr+45% 480Min Winter)



Simulation Settings

FSR: M5-60=20.00, R=0.40, Locale=England and Wales

Summer (Cv: 1.00), Winter (Cv: 1.00)

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: (1, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
1Yr 15Min Winter	36.405	0.00	-0.12	100Yr+45% 15Min Summer	143.087	0.00	-0.29
1Yr 15Min Summer	36.405	0.00	-0.12	100Yr+45% 15Min Winter	143.087	0.00	-0.22
1Yr 30Min Winter	23.138	0.00	-0.11	100Yr+45% 30Min Summer	93.944	0.00	-0.16
1Yr 30Min Summer	23.138	0.00	-0.09	100Yr+45% 30Min Winter	93.944	0.00	-0.13
1Yr 60Min Winter	14.222	0.00	-0.08	100Yr+45% 60Min Summer	58.739	0.00	0.08
1Yr 60Min Summer	14.222	0.00	-0.09	100Yr+45% 60Min Winter	58.739	0.00	-0.04
1Yr 120Min Winter	8.605	0.00	-0.07	100Yr+45% 120Min Summer	35.469	0.00	0.09
1Yr 120Min Summer	8.605	0.00	-0.07	100Yr+45% 120Min Winter	35.469	0.00	0.22
1Yr 180Min Summer	6.400	0.00	-0.05	100Yr+45% 180Min Summer	26.047	0.00	0.19
1Yr 180Min Winter	6.400	0.00	-0.05	100Yr+45% 180Min Winter	26.047	0.00	0.19
1Yr 240Min Summer	5.190	0.00	-0.04	100Yr+45% 240Min Summer	20.795	0.00	0.12
1Yr 240Min Winter	5.190	0.00	-0.04	100Yr+45% 240Min Winter	20.795	0.00	0.12
1Yr 360Min Summer	3.857	0.00	-0.02	100Yr+45% 360Min Summer	15.106	0.00	0.00
1Yr 360Min Winter	3.857	0.00	-0.02	100Yr+45% 360Min Winter	15.106	0.00	0.00
1Yr 480Min Winter	3.121	0.00	-0.02	100Yr+45% 480Min Summer	12.038	0.00	-0.05
1Yr 480Min Summer	3.121	0.00	-0.02	100Yr+45% 480Min Winter	12.038	0.00	-0.10
1Yr 600Min Summer	2.648	0.00	-0.01	100Yr+45% 600Min Summer	10.086	0.00	-0.05
1Yr 600Min Winter	2.648	0.00	-0.01	100Yr+45% 600Min Winter	10.086	0.00	-0.11
1Yr 720Min Summer	2.315	0.00	-0.01	100Yr+45% 720Min Summer	8.725	0.00	-0.12
1Yr 720Min Winter	2.315	0.00	-0.01	100Yr+45% 720Min Winter	8.725	0.00	0.12
1Yr 960Min Winter	1.872	0.00	-0.01	100Yr+45% 960Min Summer	6.936	0.00	0.05
1Yr 960Min Summer	1.872	0.00	-0.01	100Yr+45% 960Min Winter	6.936	0.00	0.20
1Yr 1440Min Summer	1.389	0.00	0.00	100Yr+45% 1440Min Winter	5.012	0.00	0.34
1Yr 1440Min Winter	1.389	0.00	0.00	100Yr+45% 1440Min Summer	5.012	0.00	0.27

Simulation Results

Return Period (yrs) + Climate Change (%):

1yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
SB4	15 min Summer	8	41.683	0.056	21.062		OK
SB3	15 min Summer	8	39.645	0.095	64.598		OK
SB5	15 min Summer	8	39.114	0.165	111.901		OK
SB6	15 min Summer	8	38.716	0.176	123.403		OK
SB7	15 min Summer	8	38.595	0.204	155.004		OK
SB8	15 min Summer	8	39.950	0.109	27.413		OK
SB9	15 min Summer	8	39.824	0.106	27.234		OK
SB10	15 min Summer	8	39.692	0.113	32.533		OK
SB11	15 min Summer	8	39.607	0.144	53.605		OK
SB12	15 min Summer	9	39.362	0.102	64.621		OK
SB13	15 min Summer	9	38.284	0.284	266.626		OK
SB14	15 min Summer	9	38.064	0.337	274.066		OK
SB15	15 min Summer	8	38.390	0.108	25.810		OK
SB16	15 min Summer	9	38.042	0.386	306.757		OK
HW4	15 min Summer	9	38.037	0.487	303.062		OK
HW5	15 min Summer	9	37.983	0.483	302.446		OK
SB19 HB	480 min Summer	313	37.759	0.259	4.730		Surcharged
HW6	480 min Summer	312	37.309	0.079	12.900		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	SB4	SB5	0.056	2.726	20.922	0.139	OK
2.000	15 min Summer	8	SB3	SB5	0.130	1.543	64.405	0.077	OK
1.001	15 min Summer	8	SB5	SB6	0.171	1.817	110.944	0.229	OK
1.002	15 min Summer	8	SB6	SB7	0.190	1.744	122.722	0.253	OK
1.003	15 min Summer	8	SB7	SB13	0.243	1.570	154.197	0.336	OK
3.000	15 min Summer	8	SB8	SB9	0.108	1.191	27.234	0.301	OK
3.001	15 min Summer	8	SB9	SB10	0.106	1.203	27.002	0.298	OK
3.002	15 min Summer	8	SB10	SB11	0.129	0.975	32.476	0.199	OK
3.003	15 min Summer	8	SB11	SB12	0.123	1.694	53.175	0.325	OK
3.004	15 min Summer	9	SB12	SB13	0.118	2.418	64.932	0.171	OK
1.004	15 min Summer	9	SB13	SB14	0.311	1.832	269.609	0.469	OK
1.005	15 min Summer	9	SB14	SB16	0.362	1.540	272.878	0.486	OK
4.000	15 min Summer	9	SB15	SB16	0.134	1.022	25.260	0.288	OK
1.006	15 min Summer	9	SB16	HW4	0.436	1.377	303.062	0.540	OK
1.007	15 min Summer	9	HW4	HW5	0.485	1.235	302.446	1.038	OK
1.008	15 min Summer	10	HW5	SB19 HB	0.282	2.701	352.657	0.628	OK
1.009	480 min Summer	313	SB19 HB	HW6	0.079	1.033	12.900	0.298	OK

Return Period (yrs) + Climate Change (%):

100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
SB4	15 min Summer	8	41.744	0.117	82.830		OK
SB3	15 min Summer	10	40.347	0.797	202.028		Surcharged
SB5	15 min Summer	10	40.318	1.370	356.660		Surcharged
SB6	15 min Summer	10	40.122	1.582	404.230		Surcharged
SB7	15 min Summer	10	40.038	1.646	508.083		Surcharged
SB8	15 min Summer	10	40.271	0.430	85.734		Surcharged
SB9	15 min Summer	10	40.177	0.460	86.301		Surcharged
SB10	15 min Summer	10	40.132	0.553	103.566		Surcharged
SB11	15 min Summer	10	40.092	0.629	169.051		Surcharged
SB12	15 min Summer	10	39.904	0.644	205.380		Surcharged
SB13	15 min Summer	10	39.612	1.612	869.616		Surcharged
SB14	15 min Summer	10	39.060	1.333	886.903		Surcharged
SB15	15 min Summer	10	39.275	0.993	80.720		Surcharged
SB16	15 min Summer	10	38.926	1.270	1004.907		Surcharged
HW4	15 min Summer	10	38.638	1.088	1002.501		Surcharged
HW5	480 min Winter	382	38.492	0.992	22.925		Surcharged
SB19 HB	480 min Winter	383	38.491	0.991	25.032		Surcharged
HW6	480 min Winter	383	37.343	0.113	24.405		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	SB4	SB5	0.171	3.666	82.614	0.551	OK
2.000	15 min Winter	10	SB3	SB5	0.525	1.986	220.557	0.263	OK
1.001	15 min Winter	8	SB5	SB6	0.525	2.166	343.972	0.710	OK
1.002	15 min Winter	10	SB6	SB7	0.525	1.858	379.357	0.783	OK
1.003	15 min Winter	10	SB7	SB13	0.525	2.205	477.230	1.041	OK
3.000	15 min Summer	9	SB8	SB9	0.300	1.622	107.031	1.183	Surcharged
3.001	15 min Summer	9	SB9	SB10	0.300	1.666	106.356	1.176	Surcharged
3.002	15 min Summer	9	SB10	SB11	0.375	1.269	120.851	0.742	Surcharged
3.003	15 min Winter	9	SB11	SB12	0.375	2.150	189.878	1.159	Surcharged
3.004	15 min Winter	9	SB12	SB13	0.375	2.362	221.563	0.584	Surcharged
1.004	15 min Winter	10	SB13	SB14	0.600	2.907	821.939	1.429	Surcharged
1.005	15 min Winter	10	SB14	SB16	0.600	2.987	844.487	1.505	Surcharged
4.000	15 min Winter	9	SB15	SB16	0.300	1.176	83.160	0.948	Surcharged
1.006	15 min Winter	10	SB16	HW4	0.600	3.367	951.894	1.696	Surcharged
1.007	15 min Winter	10	HW4	HW5	0.600	3.368	952.387	3.268	Surcharged
1.008	30 min Winter	23	HW5	SB19 HB	0.600	3.819	915.758	1.632	Surcharged
1.009	480 min Winter	383	SB19 HB	HW6	0.113	1.224	24.405	0.564	OK