STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 346206 243350 SO 46206 43350
Data Type	Point
Maximum Rainfall (mm/hr)	75
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 1

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.022	8-12	0.898	12-16	0.214

Total Area Contributing (ha) = 1.134

Total Pipe Volume (m³) = 75.889

Network Design Table for Surface Network 1

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	19.197	0.932	20.6	0.059	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	54.73	5.14	81.493	0.059	0.0	0.0	0.0	2.23	39.4	8.7

Network Design Table for Surface Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.001	18.559	1.124	16.5	0.023	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	17.958	0.120	149.7	0.081	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	14.828	0.450	33.0	0.059	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	57.274	3.131	18.3	0.085	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	33.765	0.202	167.2	0.080	5.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	18.027	1.078	16.7	0.057	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	15.329	0.063	243.3	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	32.778	0.302	108.5	0.069	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.000	28.008	0.168	166.7	0.061	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	9.427	0.152	62.0	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	17.609	0.308	57.2	0.022	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.000	3.835	0.015	255.7	0.000	5.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.001	54.15	5.27	80.561	0.082	0.0	0.0	0.0	2.49	44.0	12.0
1.002	53.11	5.50	79.287	0.163	0.0	0.0	0.0	1.28	90.7	23.4
2.000	54.75	5.14	79.767	0.059	0.0	0.0	0.0	1.76	31.1	8.7
1.003	52.01	5.76	79.167	0.307	0.0	0.0	0.0	3.69	261.1	43.2
3.000	53.27	5.46	76.301	0.080	0.0	0.0	0.0	1.21	85.8	11.5
4.000	54.84	5.12	77.327	0.057	0.0	0.0	0.0	2.48	43.7	8.5
3.001	52.32	5.68	76.022	0.167	0.0	0.0	0.0	1.16	127.8	23.7
1.004	50.75	6.07	75.959	0.543	0.0	0.0	0.0	1.74	192.0	74.6
5.000	53.28	5.46	75.975	0.061	0.0	0.0	0.0	1.01	40.2	8.8
1.005	50.52	6.13	75.582	0.628	0.0	0.0	0.0	2.59	411.1	85.9
1.006	50.10	6.24	75.440	0.650	0.0	0.0	0.0	2.69	428.3	88.2
6.000	55.15	5.06	75.222	0.000	0.0	0.0	0.0	1.13	124.6	0.0

Network Design Table for Surface Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.007	11.946	0.048	248.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	16.286	0.065	250.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.000	30.899	0.185	167.0	0.059	5.00	0.0	0.600	o	300	Pipe/Conduit	
7.001	9.940	0.060	165.7	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.002	30.571	0.183	167.1	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.000	40.145	3.430	11.7	0.049	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.000	27.157	1.455	18.7	0.088	5.00	0.0	0.600	o	225	Pipe/Conduit	
7.003	4.984	0.209	23.8	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.004	37.112	1.559	23.8	0.046	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.005	9.588	0.403	23.8	0.005	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.006	10.431	0.444	23.5	0.006	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	21.048	0.341	61.7	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	7.155	0.129	55.5	0.028	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.011	10.492	1.049	10.0	0.046	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	3.461	0.035	98.9	0.000	5.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.007	49.53	6.40	75.132	0.650	0.0	0.0	0.0	1.28	204.2	88.2
1.008	48.76	6.61	75.084	0.650	0.0	0.0	0.0	1.28	203.5	88.2
7.000	53.45	5.42	78.212	0.059	0.0	0.0	0.0	1.21	85.8	8.5
7.001	52.85	5.56	78.027	0.121	0.0	0.0	0.0	1.22	86.1	17.3
7.002	51.12	5.98	77.967	0.181	0.0	0.0	0.0	1.21	85.8	25.1
8.000	54.35	5.23	81.364	0.049	0.0	0.0	0.0	2.96	52.3	7.2
9.000	54.71	5.15	79.314	0.088	0.0	0.0	0.0	3.04	121.0	13.0
7.003	51.02	6.01	77.784	0.329	0.0	0.0	0.0	3.24	228.8	45.5
7.004	50.28	6.20	77.575	0.375	0.0	0.0	0.0	3.24	228.7	51.1
7.005	50.09	6.25	76.016	0.380	0.0	0.0	0.0	3.24	228.8	51.6
7.006	49.89	6.30	75.613	0.386	0.0	0.0	0.0	3.26	230.3	52.2
1.009	48.29	6.75	75.019	1.060	0.0	0.0	0.0	2.59	412.1	138.6
1.010	48.14	6.79	74.678	1.088	0.0	0.0	0.0	2.73	434.9	141.8
1.011	48.04	6.82	74.549	1.134	0.0	0.0	0.0	6.46	1026.9	147.6
10.000	55.29	5.03	73.535	0.000	0.0	0.0	0.0	2.04	325.2	0.0

Network Design Table for Surface Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.012	7.749	0.032	242.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.013	22.890	0.094	243.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.014	80.051	0.329	243.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.015	87.134	0.359	242.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.016	79.603	0.328	242.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.017	79.603	0.331	240.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.018	68.354	0.281	243.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.019	46.624	2.446	19.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.012	47.61	6.94	73.500	1.134	0.0	0.0	0.0	1.01	71.1«	147.6
1.013	46.38	7.33	73.468	1.134	0.0	0.0	0.0	1.00	70.9«	147.6
1.014	42.60	8.65	73.374	1.134	0.0	0.0	0.0	1.00	70.9«	147.6
1.015	39.24	10.10	73.045	1.134	0.0	0.0	0.0	1.00	71.0«	147.6
1.016	36.67	11.42	72.686	1.134	0.0	0.0	0.0	1.00	71.0«	147.6
1.017	34.48	12.73	72.358	1.134	0.0	0.0	0.0	1.01	71.4«	147.6
1.018	32.82	13.87	72.027	1.134	0.0	0.0	0.0	1.00	70.9«	147.6
1.019	32.53	14.08	71.746	1.134	0.0	0.0	0.0	3.62	255.7	147.6

Simulation Criteria for Surface Network 1

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 346206 243350 SO 46206 43350
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: HB S29, DS/PN: 1.012, Volume (m³): 6.5

Unit Reference	MD-SHE-0127-1110-2800-1110
Design Head (m)	2.800
Design Flow (l/s)	11.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	127
Invert Level (m)	73.500
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.800	11.1
Flush-Flo™	0.551	9.2
Kick-Flo®	1.135	7.3
Mean Flow over Head Range	-	8.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.6	1.200	7.4	3.000	11.5	7.000	17.2
0.200	7.8	1.400	8.0	3.500	12.3	7.500	17.8
0.300	8.6	1.600	8.5	4.000	13.1	8.000	18.3
0.400	9.0	1.800	9.0	4.500	13.9	8.500	18.8
0.500	9.2	2.000	9.5	5.000	14.6	9.000	19.4
0.600	9.2	2.200	9.9	5.500	15.3	9.500	19.9
0.800	8.9	2.400	10.3	6.000	16.0		
1.000	8.2	2.600	10.7	6.500	16.6		

Storage Structures for Surface Network 1

Cellular Storage Manhole: Tank S13, DS/PN: 6.000

Invert Level (m) 75.250 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1.0	360.0	1.201	0.0	451.2
1.200	1.0	451.2			

Cellular Storage Manhole: Tank 2 S28, DS/PN: 10.000

Invert Level (m) 73.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	170.0	180.0	2.001	0.0	292.0
2.000	170.0	292.0			

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 346206 243350 SO 46206 43350
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	15 Winter	2	+0%					81.541
1.001	S2	15 Winter	2	+0%					80.614
1.002	S3	15 Winter	2	+0%					79.393
2.000	S4	15 Winter	2	+0%					79.822
1.003	S5	15 Winter	2	+0%					79.247
3.000	S6	15 Winter	2	+0%					76.377
4.000	S7	15 Winter	2	+0%					77.372
3.001	S8	15 Winter	2	+0%	30/15 Winter				76.157
1.004	S9	15 Winter	2	+0%	30/15 Summer				76.125
5.000	S10	15 Winter	2	+0%					76.048
1.005	S11	15 Winter	2	+0%	30/15 Summer				75.770
1.006	S12	15 Winter	2	+0%	30/15 Summer				75.597
6.000	Tank S13	15 Winter	2	+0%	30/15 Summer				75.373
1.007	S14	15 Winter	2	+0%	30/15 Summer				75.373
1.008	S15	15 Winter	2	+0%	30/15 Summer				75.315
7.000	S16	15 Winter	2	+0%					78.277

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	-0.102	0.000	0.22			8.3	OK	
1.001	S2	-0.097	0.000	0.27			10.9	OK	
1.002	S3	-0.194	0.000	0.26			20.6	OK	
2.000	S4	-0.095	0.000	0.29			8.3	OK	
1.003	S5	-0.220	0.000	0.16			39.0	OK	
3.000	S6	-0.224	0.000	0.14			11.1	OK	
4.000	S7	-0.105	0.000	0.20			8.0	OK	
3.001	S8	-0.240	0.000	0.22			22.6	OK	
1.004	S9	-0.209	0.000	0.41			69.4	OK	
5.000	S10	-0.152	0.000	0.23			8.5	OK	
1.005	S11	-0.262	0.000	0.37			80.3	OK	
1.006	S12	-0.293	0.000	0.26			82.4	OK	
6.000	Tank S13	-0.224	0.000	0.01		6	1.0	OK	
1.007	S14	-0.209	0.000	0.56			83.0	OK	
1.008	S15	-0.219	0.000	0.52			82.5	OK	
7.000	S16	-0.235	0.000	0.10			8.1	OK	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.001	S17	15 Winter	2	+0%				
7.002	S18	15 Winter	2	+0%				
8.000	S19	15 Winter	2	+0%				
9.000	S20	15 Winter	2	+0%				
7.003	S21	15 Winter	2	+0%				
7.004	S22	15 Winter	2	+0%				
7.005	S23	15 Winter	2	+0%				
7.006	S24	15 Winter	2	+0%				
1.009	S25	15 Winter	2	+0%	30/15 Summer			
1.010	S26	15 Winter	2	+0%	30/15 Summer			
1.011	S27	15 Winter	2	+0%	30/15 Winter			
10.000	Tank 2 S28	240 Winter	2	+0%	2/15 Summer			
1.012	HB S29	240 Winter	2	+0%	2/15 Summer			
1.013	S30	240 Winter	2	+0%				
1.014	S31	480 Winter	2	+0%				
1.015	S32	480 Winter	2	+0%				
1.016	S33	960 Summer	2	+0%				
1.017	S34	960 Summer	2	+0%				
1.018	S35	960 Summer	2	+0%				
1.019	S36	960 Summer	2	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
7.001	S17	78.130	-0.197	0.000	0.25			15.6	OK
7.002	S18	78.077	-0.190	0.000	0.29			22.5	OK
8.000	S19	81.401	-0.113	0.000	0.14			6.9	OK
9.000	S20	79.364	-0.175	0.000	0.11			12.4	OK
7.003	S21	77.911	-0.173	0.000	0.37			42.6	OK
7.004	S22	77.672	-0.203	0.000	0.23			47.9	OK
7.005	S23	76.129	-0.187	0.000	0.30			48.3	OK
7.006	S24	75.724	-0.189	0.000	0.29			48.6	OK
1.009	S25	75.218	-0.251	0.000	0.40			133.0	OK
1.010	S26	74.950	-0.178	0.000	0.67			135.2	OK
1.011	S27	74.700	-0.299	0.000	0.24			140.4	OK
10.000	Tank 2 S28	74.441	0.456	0.000	0.08		139	12.9	SURCHARGED
1.012	HB S29	74.494	0.694	0.000	0.17			9.2	SURCHARGED
1.013	S30	73.544	-0.224	0.000	0.15			9.2	OK
1.014	S31	73.447	-0.227	0.000	0.13			9.2	OK
1.015	S32	73.118	-0.227	0.000	0.13			9.2	OK
1.016	S33	72.759	-0.227	0.000	0.13			9.2	OK
1.017	S34	72.431	-0.227	0.000	0.13			9.2	OK
1.018	S35	72.100	-0.227	0.000	0.14			9.2	OK
1.019	S36	71.784	-0.262	0.000	0.04			9.2	OK

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Level Exceeded
7.001	S17	
7.002	S18	
8.000	S19	
9.000	S20	
7.003	S21	
7.004	S22	
7.005	S23	
7.006	S24	
1.009	S25	
1.010	S26	
1.011	S27	
10.000	Tank 2 S28	
1.012	HB S29	
1.013	S30	
1.014	S31	
1.015	S32	
1.016	S33	
1.017	S34	
1.018	S35	
1.019	S36	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 346206 243350 SO 46206 43350
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30
Climate Change (%)	0, 0

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	15 Winter	30	+0%					81.575
1.001	S2	15 Winter	30	+0%					80.657
1.002	S3	15 Winter	30	+0%					79.488
2.000	S4	15 Winter	30	+0%					79.864
1.003	S5	15 Winter	30	+0%					79.310
3.000	S6	15 Winter	30	+0%					76.440
4.000	S7	15 Winter	30	+0%					77.402
3.001	S8	15 Winter	30	+0%	30/15 Winter				76.399
1.004	S9	15 Winter	30	+0%	30/15 Summer				76.369
5.000	S10	15 Winter	30	+0%					76.118
1.005	S11	15 Winter	30	+0%	30/15 Summer				76.078
1.006	S12	15 Winter	30	+0%	30/15 Summer				75.971
6.000	Tank S13	15 Winter	30	+0%	30/15 Summer				75.857

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	-0.068	0.000	0.57			21.0	OK	
1.001	S2	-0.054	0.000	0.72			29.5	OK	
1.002	S3	-0.099	0.000	0.77			60.2	OK	
2.000	S4	-0.053	0.000	0.73			21.0	OK	
1.003	S5	-0.157	0.000	0.45			112.3	OK	
3.000	S6	-0.161	0.000	0.35			27.5	OK	
4.000	S7	-0.075	0.000	0.50			20.3	OK	
3.001	S8	0.002	0.000	0.54			55.5	SURCHARGED	
1.004	S9	0.035	0.000	1.07			183.2	SURCHARGED	
5.000	S10	-0.082	0.000	0.57			21.3	OK	
1.005	S11	0.046	0.000	0.89			195.8	SURCHARGED	
1.006	S12	0.081	0.000	0.61			192.2	SURCHARGED	
6.000	Tank S13	0.260	0.000	0.11		5	8.9	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.007	S14	15 Winter	30	+0%	30/15 Summer			
1.008	S15	15 Winter	30	+0%	30/15 Summer			
7.000	S16	15 Winter	30	+0%				
7.001	S17	15 Winter	30	+0%				
7.002	S18	15 Winter	30	+0%				
8.000	S19	15 Winter	30	+0%				
9.000	S20	15 Winter	30	+0%				
7.003	S21	15 Winter	30	+0%				
7.004	S22	15 Winter	30	+0%				
7.005	S23	15 Winter	30	+0%				
7.006	S24	15 Winter	30	+0%				
1.009	S25	15 Winter	30	+0%	30/15 Summer			
1.010	S26	240 Winter	30	+0%	30/15 Summer			
1.011	S27	240 Winter	30	+0%	30/15 Winter			
10.000	Tank 2 S28	240 Winter	30	+0%	2/15 Summer			
1.012	HB S29	240 Winter	30	+0%	2/15 Summer			
1.013	S30	240 Winter	30	+0%				
1.014	S31	240 Winter	30	+0%				
1.015	S32	240 Winter	30	+0%				
1.016	S33	240 Winter	30	+0%				
1.017	S34	240 Winter	30	+0%				
1.018	S35	240 Winter	30	+0%				
1.019	S36	240 Winter	30	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.007	S14	75.857	0.275	0.000	1.29			192.1	SURCHARGED
1.008	S15	75.744	0.210	0.000	1.23			194.2	SURCHARGED
7.000	S16	78.318	-0.194	0.000	0.26			20.6	OK
7.001	S17	78.217	-0.110	0.000	0.70			43.2	OK
7.002	S18	78.181	-0.086	0.000	0.83			64.6	OK
8.000	S19	81.425	-0.089	0.000	0.34			17.4	OK
9.000	S20	79.395	-0.144	0.000	0.28			31.4	OK
7.003	S21	78.042	-0.042	0.000	1.00			114.6	OK
7.004	S22	77.747	-0.128	0.000	0.61			129.9	OK
7.005	S23	76.228	-0.088	0.000	0.83			131.9	OK
7.006	S24	75.882	-0.031	0.000	0.79			131.6	OK
1.009	S25	75.632	0.163	0.000	0.96			315.5	SURCHARGED
1.010	S26	75.643	0.515	0.000	0.37			74.6	SURCHARGED
1.011	S27	75.655	0.656	0.000	0.13			75.8	SURCHARGED
10.000	Tank 2 S28	75.606	1.621	0.000	0.07			11.3	SURCHARGED
1.012	HB S29	75.670	1.870	0.000	0.18			9.6	SURCHARGED
1.013	S30	73.546	-0.222	0.000	0.15			9.6	OK
1.014	S31	73.448	-0.226	0.000	0.14			9.6	OK
1.015	S32	73.119	-0.226	0.000	0.14			9.6	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.016	S33	72.760	-0.226	0.000	0.14			9.6	OK
1.017	S34	72.432	-0.226	0.000	0.14			9.6	OK
1.018	S35	72.102	-0.225	0.000	0.14			9.6	OK
1.019	S36	71.784	-0.262	0.000	0.04			9.6	OK

PN	US/MH Name	Level Exceeded
1.007	S14	
1.008	S15	
7.000	S16	
7.001	S17	
7.002	S18	
8.000	S19	
9.000	S20	
7.003	S21	
7.004	S22	
7.005	S23	
7.006	S24	
1.009	S25	
1.010	S26	
1.011	S27	
10.000	Tank 2 S28	
1.012	HB S29	
1.013	S30	
1.014	S31	
1.015	S32	
1.016	S33	
1.017	S34	
1.018	S35	
1.019	S36	