STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Water.sws

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 402150 160150 SU 02150 60150
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
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 Water.sws

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.521	4-8	1.569	8-12	0.030

Total Area Contributing (ha) = 3.121

Total Pipe Volume (m³) = 149.229

Network Design Table for Surface Water.sws

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	13.632	0.195	70.0	0.082	6.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	26.656	0.381	70.0	0.052	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	32.082	0.494	65.0	0.100	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	5.864	0.065	90.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	16.664	0.124	134.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.005	24.781	0.165	150.2	0.057	0.00	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)
1.000	50.00	6.15	118.037	0.082	0.0	0.0	0.0	1.57	62.2	11.1
1.001	50.00	6.38	117.767	0.134	0.0	0.0	0.0	1.88	133.0	18.1
1.002	50.00	6.66	117.386	0.234	0.0	0.0	0.0	1.95	138.1	31.7
1.003	50.00	6.71	116.893	0.234	0.0	0.0	0.0	1.66	117.2	31.7
1.004	50.00	6.89	116.753	0.234	0.0	0.0	0.0	1.56	172.4	31.7
1.005	50.00	7.17	116.629	0.291	0.0	0.0	0.0	1.48	163.0	39.4

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Network Design Table for Surface Water.sws

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
1.006	26.775	0.179	149.6	0.165	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	33.210	0.368	90.2	0.052	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	15.348	0.260	59.0	0.017	6.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	6.111	0.218	28.0	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	12.248	0.207	59.2	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.003	18.331	0.303	60.5	0.253	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.004	15.128	0.243	62.3	0.031	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.005	15.658	0.218	71.8	0.056	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.006	34.258	0.669	51.2	0.129	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.008	39.290	0.382	102.9	0.136	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.009	43.931	0.436	100.8	0.152	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.010	10.863	0.105	103.5	0.025	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.011	15.862	0.137	115.8	0.024	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.012	7.936	0.055	144.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.013	81.834	0.477	171.6	0.032	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.000	16.740	0.161	104.0	0.106	6.00	0.0	0.600	o	300	Pipe/Conduit	
3.001	27.686	0.200	138.4	0.099	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.002	11.699	0.231	50.6	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.003	35.223	1.465	24.0	0.008	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	17.658	0.770	22.9	0.059	6.00	0.0	0.600	o	225	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)
1.006	50.00	7.47	116.464	0.456	0.0	0.0	0.0	1.48	163.4	61.7
1.007	50.00	7.76	116.285	0.508	0.0	0.0	0.0	1.91	210.7	68.8
2.000	50.00	6.15	118.185	0.017	0.0	0.0	0.0	1.71	67.8	2.3
2.001	50.00	6.19	117.925	0.030	0.0	0.0	0.0	2.48	98.6	4.1
2.002	50.00	6.31	117.707	0.044	0.0	0.0	0.0	1.70	67.7	6.0
2.003	50.00	6.44	117.350	0.297	0.0	0.0	0.0	2.33	257.7	40.2
2.004	50.00	6.55	117.047	0.328	0.0	0.0	0.0	2.30	254.0	44.4
2.005	50.00	6.67	116.804	0.384	0.0	0.0	0.0	2.14	236.4	52.0
2.006	50.00	6.90	116.586	0.513	0.0	0.0	0.0	2.54	280.2	69.5
1.008	50.00	8.04	115.692	1.157	0.0	0.0	0.0	2.40	678.9	156.7
1.009	50.00	8.34	115.310	1.309	0.0	0.0	0.0	2.43	686.0	177.3
1.010	50.00	8.41	114.874	1.334	0.0	0.0	0.0	2.39	676.9	180.6
1.011	50.00	8.53	114.769	1.358	0.0	0.0	0.0	2.26	639.7	183.9
1.012	50.00	8.60	114.632	1.358	0.0	0.0	0.0	2.03	572.6	183.9
1.013	50.00	9.33	114.577	1.390	0.0	0.0	0.0	1.86	524.9	188.2
3.000	50.00	6.18	117.915	0.106	0.0	0.0	0.0	1.54	109.0	14.4
3.001	50.00	6.53	117.754	0.205	0.0	0.0	0.0	1.33	94.3	27.8
3.002	50.00	6.61	117.554	0.232	0.0	0.0	0.0	2.21	156.5	31.4
3.003	50.00	6.80	117.323	0.240	0.0	0.0	0.0	3.22	227.6	32.5
4.000	50.00	6.11	117.020	0.059	0.0	0.0	0.0	2.74	109.1	8.0

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Network Design Table for Surface Water.sws

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
5.000	8.440	0.150	56.3	0.097	6.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	24.559	0.164	150.0	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	22.995	0.153	150.0	0.031	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.004	7.632	0.051	150.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.005	20.203	0.135	150.0	0.041	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.006	21.168	0.141	150.0	0.042	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.007	13.145	0.281	46.8	0.014	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.000	23.841	0.773	30.8	0.000	6.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	14.370	0.144	99.8	0.119	0.00	0.0	0.600	o	225	Pipe/Conduit	
6.002	20.322	0.371	54.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.003	17.341	0.191	90.8	0.120	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.008	10.404	0.116	89.7	0.006	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.009	27.387	0.884	31.0	0.084	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.000	29.085	0.291	100.0	0.197	6.00	0.0	0.600	o	300	Pipe/Conduit	
7.001	17.269	0.173	100.0	0.044	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.002	22.405	0.223	100.5	0.072	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.003	24.296	0.234	103.8	0.029	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.004	20.588	0.206	100.0	0.091	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.005	39.104	0.894	43.7	0.004	0.00	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)
5.000	50.00	6.08	116.400	0.097	0.0	0.0	0.0	1.75	69.5	13.1
4.001	50.00	6.43	116.175	0.160	0.0	0.0	0.0	1.28	90.6	21.7
4.002	50.00	6.73	116.011	0.191	0.0	0.0	0.0	1.28	90.6	25.9
3.004	50.00	6.87	115.708	0.431	0.0	0.0	0.0	1.66	263.6	58.4
3.005	50.00	7.08	115.657	0.472	0.0	0.0	0.0	1.66	263.6	63.9
3.006	50.00	7.29	115.522	0.514	0.0	0.0	0.0	1.66	263.6	69.6
3.007	50.00	7.36	115.381	0.528	0.0	0.0	0.0	2.98	473.7	71.5
6.000	50.00	6.17	116.804	0.000	0.0	0.0	0.0	2.36	94.0	0.0
6.001	50.00	6.35	115.956	0.119	0.0	0.0	0.0	1.31	52.0	16.1
6.002	50.00	6.51	115.812	0.119	0.0	0.0	0.0	2.13	150.5	16.1
6.003	50.00	6.69	115.441	0.239	0.0	0.0	0.0	1.65	116.7	32.4
3.008	50.00	7.44	115.100	0.773	0.0	0.0	0.0	2.15	341.5	104.7
3.009	50.00	7.57	114.984	0.857	0.0	0.0	0.0	3.66	582.6	116.0
7.000	50.00	6.31	116.270	0.197	0.0	0.0	0.0	1.57	111.1	26.7
7.001	50.00	6.49	115.979	0.241	0.0	0.0	0.0	1.57	111.1	32.6
7.002	50.00	6.70	115.731	0.313	0.0	0.0	0.0	1.81	199.6	42.4
7.003	50.00	6.93	115.508	0.342	0.0	0.0	0.0	1.78	196.4	46.3
7.004	50.00	7.09	115.199	0.433	0.0	0.0	0.0	2.03	323.4	58.6
7.005	50.00	7.31	114.994	0.437	0.0	0.0	0.0	3.08	490.0	59.2

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Network Design Table for Surface Water.sws

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
8.000	39.012	0.379	102.9	0.118	6.00	0.0	0.600	o	225	Pipe/Conduit	
8.001	31.968	0.326	98.1	0.105	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.002	11.129	0.099	112.4	0.021	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.003	15.441	0.471	32.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
9.000	16.998	0.159	106.9	0.095	6.00	0.0	0.600	o	225	Pipe/Conduit	
8.004	15.736	0.105	149.9	0.025	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.005	23.433	0.156	150.2	0.073	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.006	39.955	0.614	65.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.014	22.133	0.100	221.3	0.000	0.00	0.0	0.600	o	225	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)
8.000	50.00	6.50	116.400	0.118	0.0	0.0	0.0	1.29	51.2	16.0
8.001	50.00	6.84	115.946	0.223	0.0	0.0	0.0	1.59	112.2	30.2
8.002	50.00	6.95	115.545	0.244	0.0	0.0	0.0	1.71	188.7	33.0
8.003	50.00	7.03	115.446	0.244	0.0	0.0	0.0	3.17	350.6	33.0
9.000	50.00	6.22	115.284	0.095	0.0	0.0	0.0	1.26	50.3	12.9
8.004	50.00	7.21	114.975	0.364	0.0	0.0	0.0	1.48	163.2	49.3
8.005	50.00	7.47	114.870	0.437	0.0	0.0	0.0	1.48	163.0	59.2
8.006	50.00	7.77	114.714	0.437	0.0	0.0	0.0	2.25	248.4	59.2
1.014	50.00	6.42	114.100	0.000	20.8	0.0	0.0	0.87	34.8	20.8

Free Flowing Outfall Details for Surface Water.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.014	S56	116.100	114.000	0.000	0	0

Simulation Criteria for Surface Water.sws

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Return Period (years) 2

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Synthetic Rainfall Details

FEH Rainfall Version	2013	Winter Storms	No
Site Location	GB 402150 160150 SU 02150 60150	Cv (Summer)	0.750
Data Type	Catchment	Cv (Winter)	0.840
Summer Storms	Yes	Storm Duration (mins)	30

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Online Controls for Surface Water.sws

Hydro-Brake® Optimum Manhole: HB, DS/PN: 1.014, Volume (m³): 46.5

Unit Reference	MD-SHE-0183-2080-2300-2080
Design Head (m)	2.300
Design Flow (l/s)	20.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	183
Invert Level (m)	114.100
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.300	20.8	Kick-Flo®	1.401	16.4
Flush-Flo™	0.672	20.8	Mean Flow over Head Range	-	18.2

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)	Depth (m)	Flow (l/s)
0.100	6.4	0.800	20.7	2.000	19.5	4.000	27.1	7.000	35.5
0.200	16.5	1.000	20.1	2.200	20.4	4.500	28.7	7.500	36.7
0.300	18.7	1.200	18.9	2.400	21.2	5.000	30.2	8.000	37.9
0.400	19.9	1.400	16.5	2.600	22.1	5.500	31.6	8.500	39.0
0.500	20.5	1.600	17.5	3.000	23.6	6.000	32.9	9.000	40.1
0.600	20.8	1.800	18.5	3.500	25.4	6.500	34.2	9.500	41.1

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Storage Structures for Surface Water.sws

Tank or Pond Manhole: HB, DS/PN: 1.014

Invert Level (m) 114.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	857.0	1.700	1468.0

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water.sws

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 402150 160150 SU 02150 60150	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 720, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
1.000	S1	15 Winter	30	+0%					118.146	-0.116	0.000	0.48
1.001	S2	15 Winter	30	+0%					117.894	-0.173	0.000	0.37
1.002	S3	15 Winter	30	+0%					117.562	-0.124	0.000	0.63
1.003	S4	15 Winter	30	+0%	30/15 Summer				117.217	0.024	0.000	1.24
1.004	S6	15 Winter	30	+0%					116.959	-0.169	0.000	0.58
1.005	S7	15 Winter	30	+0%					116.896	-0.107	0.000	0.67
1.006	S8	15 Winter	30	+0%					116.824	-0.014	0.000	1.00
1.007	S9	15 Winter	30	+0%					116.551	-0.109	0.000	0.84
2.000	HD1	15 Winter	30	+0%					118.230	-0.180	0.000	0.09
2.001	HD2	15 Winter	30	+0%					117.984	-0.166	0.000	0.15
2.002	HD3	15 Winter	30	+0%					117.785	-0.147	0.000	0.26
2.003	S11	15 Winter	30	+0%					117.538	-0.187	0.000	0.50
2.004	S12	15 Winter	30	+0%					117.260	-0.162	0.000	0.61
2.005	S13	15 Summer	30	+0%					117.051	-0.128	0.000	0.76
2.006	S14	15 Winter	30	+0%					116.827	-0.134	0.000	0.73
1.008	S15	15 Winter	30	+0%					116.056	-0.236	0.000	0.67
1.009	S16	15 Winter	30	+0%					115.797	-0.113	0.000	0.69
1.010	S17	15 Winter	30	+0%	30/15 Summer				115.623	0.149	0.000	1.13
1.011	S18	15 Winter	30	+0%	30/15 Summer				115.467	0.099	0.000	1.07
1.012	S19	240 Winter	30	+0%	30/15 Summer				115.323	0.092	0.000	0.27
1.013	S20	240 Winter	30	+0%	30/60 Winter				115.318	0.142	0.000	0.19
3.000	S29	15 Winter	30	+0%					118.039	-0.176	0.000	0.36
3.001	S30	15 Winter	30	+0%					117.961	-0.093	0.000	0.79
3.002	S31	15 Winter	30	+0%					117.731	-0.123	0.000	0.64
3.003	S32	15 Winter	30	+0%					117.452	-0.171	0.000	0.38
4.000	S33	15 Winter	30	+0%					117.086	-0.159	0.000	0.19
5.000	S34	15 Winter	30	+0%					116.520	-0.105	0.000	0.56

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water.sws

PN	US/MH Name	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1			25.8	OK	
1.001	S2			43.9	OK	
1.002	S3			79.4	OK	
1.003	S4			79.3	SURCHARGED	
1.004	S6			80.1	OK	
1.005	S7			94.6	OK	
1.006	S8			142.5	OK	
1.007	S9			158.8	OK	
2.000	HD1			5.4	OK	
2.001	HD2			9.9	OK	
2.002	HD3			14.9	OK	
2.003	S11			107.1	OK	
2.004	S12			118.4	OK	
2.005	S13			138.5	OK	
2.006	S14			184.5	OK	
1.008	S15			384.3	OK	
1.009	S16			405.4	OK	
1.010	S17			390.8	SURCHARGED	
1.011	S18			395.9	SURCHARGED	
1.012	S19			89.3	SURCHARGED	
1.013	S20			90.1	SURCHARGED	
3.000	S29			33.4	OK	
3.001	S30			67.0	OK	
3.002	S31			76.6	OK	
3.003	S32			79.7	OK	
4.000	S33			18.6	OK	
5.000	S34			30.5	OK	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water.sws

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
4.001	S35	15 Winter	30	+0%					116.347	-0.128	0.000	0.62
4.002	S36	15 Winter	30	+0%					116.207	-0.104	0.000	0.75
3.004	S37	15 Winter	30	+0%					116.019	-0.139	0.000	0.82
3.005	S38	15 Winter	30	+0%					115.946	-0.161	0.000	0.73
3.006	S39	15 Winter	30	+0%					115.824	-0.149	0.000	0.77
3.007	S40	15 Winter	30	+0%					115.676	-0.155	0.000	0.56
6.000	S41D	15 Summer	30	+0%					116.804	-0.225	0.000	0.00
6.001	S41C	15 Winter	30	+0%					116.130	-0.051	0.000	0.95
6.002	S41B	15 Summer	30	+0%					115.931	-0.181	0.000	0.33
6.003	S41A	15 Winter	30	+0%					115.726	-0.015	0.000	0.83
3.008	S41	15 Winter	30	+0%	30/15 Summer				115.602	0.052	0.000	1.26
3.009	S42	240 Winter	30	+0%					115.272	-0.162	0.000	0.12
7.000	S44	15 Winter	30	+0%					116.440	-0.130	0.000	0.62
7.001	S45	15 Winter	30	+0%					116.187	-0.092	0.000	0.80
7.002	S46	15 Winter	30	+0%					115.943	-0.164	0.000	0.59
7.003	S47	15 Winter	30	+0%					115.732	-0.151	0.000	0.65
7.004	S48	15 Winter	30	+0%					115.441	-0.208	0.000	0.55
7.005	S49	240 Winter	30	+0%					115.271	-0.172	0.000	0.07
8.000	S21	15 Winter	30	+0%					116.548	-0.077	0.000	0.76
8.001	S22	15 Winter	30	+0%					116.137	-0.109	0.000	0.70
8.002	S23	15 Winter	30	+0%					115.767	-0.153	0.000	0.64
8.003	S24	15 Winter	30	+0%					115.585	-0.236	0.000	0.30
9.000	S43	15 Winter	30	+0%					115.419	-0.090	0.000	0.67
8.004	S25	240 Winter	30	+0%					115.276	-0.074	0.000	0.19
8.005	S26	240 Winter	30	+0%	30/240 Winter				115.274	0.029	0.000	0.21
8.006	S27	240 Winter	30	+0%	30/60 Winter				115.272	0.183	0.000	0.13
1.014	HB	240 Winter	30	+0%	30/15 Summer				115.270	0.945	0.000	0.65

PN	US/MH Name	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.001	S35			50.4	OK	
4.002	S36			60.0	OK	
3.004	S37			139.1	OK	
3.005	S38			151.1	OK	
3.006	S39			162.3	OK	
3.007	S40			167.8	OK	
6.000	S41D			0.0	OK	
6.001	S41C			43.4	OK	
6.002	S41B			43.6	OK	
6.003	S41A			82.6	OK	
3.008	S41			241.5	SURCHARGED	
3.009	S42			58.1	OK	
7.000	S44			62.0	OK	
7.001	S45			76.4	OK	
7.002	S46			100.0	OK	
7.003	S47			110.5	OK	
7.004	S48			140.5	OK	
7.005	S49			29.6	OK	
8.000	S21			36.9	OK	
8.001	S22			71.4	OK	
8.002	S23			79.2	OK	
8.003	S24			79.7	OK	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water.sws

PN	US/MH Name	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
9.000	S43			29.9	OK	
8.004	S25			24.7	OK	
8.005	S26			29.6	SURCHARGED	
8.006	S27			28.4	SURCHARGED	
1.014	HB			20.8	SURCHARGED	

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