STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Surface Network 2

« - 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	36.872	0.317	116.5	0.213	5.00	0.0	0.600	o	375	Pipe/Conduit	🔒
1.001	21.400	0.178	119.9	0.147	0.00	0.0	0.600	o	375	Pipe/Conduit	🔒
2.000	26.543	0.775	34.3	0.069	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
2.001	21.250	1.815	11.7	0.067	0.00	0.0	0.600	o	150	Pipe/Conduit	🔒
1.002	20.547	0.171	120.1	0.074	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
1.003	25.058	0.209	120.0	0.017	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
1.004	17.718	0.148	120.0	0.077	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
1.005	33.483	0.282	118.6	0.119	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
1.006	37.282	0.550	67.8	0.058	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)
1.000	50.00	5.37	106.815	0.213	0.0	0.0	0.0	1.68	185.3	28.9
1.001	50.00	5.58	106.498	0.360	0.0	0.0	0.0	1.65	182.6	48.8
2.000	50.00	5.26	109.135	0.069	0.0	0.0	0.0	1.73	30.5	9.4
2.001	50.00	5.38	108.360	0.136	0.0	0.0	0.0	2.96	52.3	18.4
1.002	50.00	5.77	106.245	0.571	0.0	0.0	0.0	1.85	294.9	77.3
1.003	50.00	5.99	106.074	0.587	0.0	0.0	0.0	1.85	295.0	79.6
1.004	49.78	6.15	105.865	0.664	0.0	0.0	0.0	1.85	295.0	89.5
1.005	48.66	6.45	105.717	0.783	0.0	0.0	0.0	1.87	296.8	103.2
1.006	47.76	6.70	105.435	0.841	0.0	0.0	0.0	2.47	393.2	108.8

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Network Design Table for Surface Network 2

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	14.156	0.125	113.3	0.247	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	25.261	0.020	1263.0	0.000	0.00	0.0	0.600	\/	38	Pipe/Conduit	
1.009	6.480	0.044	146.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.010	10.691	0.074	144.1	0.000	0.00	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)
1.007	47.33	6.82	104.795	1.088	0.0	0.0	0.0	1.91	303.7	139.4
1.008	46.20	7.16	104.670	1.088	0.0	0.0	0.0	1.24	1902.7	139.4
1.009	45.78	7.30	104.650	1.088	0.0	0.0	0.0	0.83	14.6«	139.4
1.010	45.11	7.51	104.606	1.088	0.0	0.0	0.0	0.84	14.8«	139.4

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Manhole Schedules for Surface Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S3	108.411	1.596	Open Manhole	1350	1.000	106.815	375				
S4	109.234	2.736	Open Manhole	1350	1.001	106.498	375	1.000	106.498	375	
S5	110.506	1.371	Open Manhole	1350	2.000	109.135	150				
S6	109.954	1.594	Open Manhole	1350	2.001	108.360	150	2.000	108.360	150	
S7	109.430	3.185	Open Manhole	1350	1.002	106.245	450	1.001	106.320	375	
								2.001	106.545	150	
S8	108.854	2.780	Open Manhole	1350	1.003	106.074	450	1.002	106.074	450	
S9	108.235	2.370	Open Manhole	1350	1.004	105.865	450	1.003	105.865	450	
S10	107.851	2.134	Open Manhole	1350	1.005	105.717	450	1.004	105.717	450	
S11	107.399	1.964	Open Manhole	1350	1.006	105.435	450	1.005	105.435	450	
S12	106.655	1.860	Open Manhole	1350	1.007	104.795	450	1.006	104.885	450	90
S13	106.150	1.480	Open Manhole	10000	1.008	104.670	38	1.007	104.670	450	
S14	106.150	1.500	Open Manhole	10000	1.009	104.650	150	1.008	104.650	38	
S15	106.300	1.694	Open Manhole	3000	1.010	104.606	150	1.009	104.606	150	
S16	106.150	1.618	Open Manhole	1350		OUTFALL		1.010	104.532	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S3	440085.961	296776.074	440085.961	296776.074	Required	
S4	440056.650	296798.442	440056.650	296798.442	Required	
S5	439998.075	296803.785	439998.075	296803.785	Required	
S6	440023.940	296809.746	440023.940	296809.746	Required	
S7	440044.278	296815.904	440044.278	296815.904	Required	
S8	440060.373	296828.677	440060.373	296828.677	Required	
S9	440082.992	296839.460	440082.992	296839.460	Required	

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Manhole Schedules for Surface Network 2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S10	440100.642	296837.911	440100.642	296837.911	Required	
S11	440122.188	296812.281	440122.188	296812.281	Required	
S12	440156.232	296797.086	440156.232	296797.086	Required	
S13	440170.117	296799.842	440170.117	296799.842	Required	
S14	440195.304	296797.905	440195.304	296797.905	Required	
S15	440201.020	296800.956	440201.020	296800.956	Required	
S16	440211.198	296797.684			No Entry	

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PIPELINE SCHEDULES for Surface Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	375	S3	108.411	106.815	1.221	Open Manhole	1350
1.001	o	375	S4	109.234	106.498	2.361	Open Manhole	1350
2.000	o	150	S5	110.506	109.135	1.221	Open Manhole	1350
2.001	o	150	S6	109.954	108.360	1.444	Open Manhole	1350
1.002	o	450	S7	109.430	106.245	2.735	Open Manhole	1350
1.003	o	450	S8	108.854	106.074	2.330	Open Manhole	1350
1.004	o	450	S9	108.235	105.865	1.920	Open Manhole	1350
1.005	o	450	S10	107.851	105.717	1.684	Open Manhole	1350
1.006	o	450	S11	107.399	105.435	1.514	Open Manhole	1350
1.007	o	450	S12	106.655	104.795	1.410	Open Manhole	1350
1.008	\/	38	S13	106.150	104.670	0.880	Open Manhole	10000
1.009	o	150	S14	106.150	104.650	1.350	Open Manhole	10000
1.010	o	150	S15	106.300	104.606	1.544	Open Manhole	3000

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	36.872	116.5	S4	109.234	106.498	2.361	Open Manhole	1350
1.001	21.400	119.9	S7	109.430	106.320	2.735	Open Manhole	1350
2.000	26.543	34.3	S6	109.954	108.360	1.444	Open Manhole	1350
2.001	21.250	11.7	S7	109.430	106.545	2.735	Open Manhole	1350
1.002	20.547	120.1	S8	108.854	106.074	2.330	Open Manhole	1350
1.003	25.058	120.0	S9	108.235	105.865	1.920	Open Manhole	1350
1.004	17.718	120.0	S10	107.851	105.717	1.684	Open Manhole	1350
1.005	33.483	118.6	S11	107.399	105.435	1.514	Open Manhole	1350
1.006	37.282	67.8	S12	106.655	104.885	1.320	Open Manhole	1350
1.007	14.156	113.3	S13	106.150	104.670	1.030	Open Manhole	10000
1.008	25.261	1263.0	S14	106.150	104.650	0.900	Open Manhole	10000
1.009	6.480	146.7	S15	106.300	104.606	1.544	Open Manhole	3000
1.010	10.691	144.1	S16	106.150	104.532	1.468	Open Manhole	1350

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010	S16	106.150	104.532	0.000	1350	0

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Simulation Criteria for Surface Network 2

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 Storage Structures	1
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	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: S14, DS/PN: 1.009, Volume (m³): 141.2

Unit Reference	MD-SHE-0138-9300-1200-9300
Design Head (m)	1.200
Design Flow (l/s)	9.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	138
Invert Level (m)	104.650
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	9.3
Flush-Flo™	0.356	9.3
Kick-Flo®	0.773	7.6
Mean Flow over Head Range	-	8.1

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	5.0	1.200	9.3	3.000	14.3	7.000	21.5
0.200	8.8	1.400	10.0	3.500	15.4	7.500	22.2
0.300	9.2	1.600	10.6	4.000	16.5	8.000	22.9
0.400	9.3	1.800	11.3	4.500	17.4	8.500	23.6
0.500	9.1	2.000	11.8	5.000	18.3	9.000	24.3
0.600	8.9	2.200	12.4	5.500	19.2	9.500	24.9
0.800	7.7	2.400	12.9	6.000	20.0		
1.000	8.5	2.600	13.4	6.500	20.8		

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Storage Structures for Surface Network 2

Tank or Pond Manhole: S14, DS/PN: 1.009

Invert Level (m) 104.650

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	303.8	0.400	396.6	0.800	498.4	1.200	609.3
0.100	326.1	0.500	421.2	0.900	525.3	1.300	638.4
0.200	349.0	0.600	446.4	1.000	552.7	1.399	667.8
0.300	372.5	0.700	472.1	1.100	580.7	1.400	668.1

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

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 Storage Structures 1
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 FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S3	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
1.001	S4	15 Winter	1	+0%	100/15 Summer			
2.000	S5	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
2.001	S6	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
1.002	S7	15 Winter	1	+0%	100/15 Summer			
1.003	S8	15 Winter	1	+0%	100/15 Summer			
1.004	S9	15 Winter	1	+0%	100/15 Summer			
1.005	S10	15 Winter	1	+0%	100/15 Summer			
1.006	S11	15 Winter	1	+0%	100/15 Summer			
1.007	S12	15 Winter	1	+0%	30/15 Summer			
1.008	S13	15 Winter	1	+0%	100/60 Winter			
1.009	S14	240 Winter	1	+0%	1/30 Summer			
1.010	S15	240 Winter	1	+0%				

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

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
1.000	S3	106.922	-0.268	0.000	0.17			29.2	OK
1.001	S4	106.640	-0.233	0.000	0.30			46.7	OK
2.000	S5	109.194	-0.090	0.000	0.33			9.6	OK
2.001	S6	108.422	-0.088	0.000	0.35			17.4	OK
1.002	S7	106.419	-0.276	0.000	0.31			73.0	OK
1.003	S8	106.243	-0.281	0.000	0.30			75.2	OK
1.004	S9	106.059	-0.256	0.000	0.39			83.6	OK
1.005	S10	105.909	-0.259	0.000	0.37			96.3	OK
1.006	S11	105.603	-0.282	0.000	0.30			103.1	OK
1.007	S12	105.062	-0.183	0.000	0.65			129.5	OK
1.008	S13	104.902	-0.562	0.000	0.13			114.0	OK
1.009	S14	104.894	0.094	0.000	0.68			8.4	SURCHARGED
1.010	S15	104.693	-0.063	0.000	0.64			8.4	OK

PN	US/MH Name	Level Exceeded
1.000	S3	2
1.001	S4	
2.000	S5	3
2.001	S6	2
1.002	S7	
1.003	S8	
1.004	S9	
1.005	S10	
1.006	S11	
1.007	S12	
1.008	S13	
1.009	S14	
1.010	S15	

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

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 Storage Structures 1
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 FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S3	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
1.001	S4	15 Winter	30	+0%	100/15 Summer			
2.000	S5	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
2.001	S6	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
1.002	S7	15 Winter	30	+0%	100/15 Summer			
1.003	S8	15 Winter	30	+0%	100/15 Summer			
1.004	S9	15 Winter	30	+0%	100/15 Summer			
1.005	S10	15 Winter	30	+0%	100/15 Summer			
1.006	S11	15 Winter	30	+0%	100/15 Summer			
1.007	S12	15 Winter	30	+0%	30/15 Summer			
1.008	S13	240 Winter	30	+0%	100/60 Winter			
1.009	S14	240 Winter	30	+0%	1/30 Summer			
1.010	S15	960 Winter	30	+0%				

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

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
1.000	S3	106.989	-0.201	0.000	0.43			71.7	OK
1.001	S4	106.758	-0.115	0.000	0.80			123.3	OK
2.000	S5	109.239	-0.046	0.000	0.81			23.6	OK
2.001	S6	108.478	-0.032	0.000	0.97			47.8	OK
1.002	S7	106.568	-0.127	0.000	0.84			195.5	OK
1.003	S8	106.417	-0.107	0.000	0.80			197.6	OK
1.004	S9	106.297	-0.018	0.000	1.00			216.6	OK
1.005	S10	106.078	-0.089	0.000	0.99			255.1	OK
1.006	S11	105.799	-0.086	0.000	0.78			271.2	OK
1.007	S12	105.469	0.224	0.000	1.70			337.8	SURCHARGED
1.008	S13	105.222	-0.242	0.000	0.07			60.9	OK
1.009	S14	105.219	0.419	0.000	0.75			9.3	SURCHARGED
1.010	S15	104.698	-0.057	0.000	0.70			9.3	OK

PN	US/MH Name	Level Exceeded
1.000	S3	2
1.001	S4	
2.000	S5	3
2.001	S6	2
1.002	S7	
1.003	S8	
1.004	S9	
1.005	S10	
1.006	S11	
1.007	S12	
1.008	S13	
1.009	S14	
1.010	S15	

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

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 Storage Structures 1
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 FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S3	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
1.001	S4	15 Winter	100	+40%	100/15 Summer			
2.000	S5	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
2.001	S6	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
1.002	S7	15 Winter	100	+40%	100/15 Summer			
1.003	S8	15 Winter	100	+40%	100/15 Summer			
1.004	S9	15 Winter	100	+40%	100/15 Summer			
1.005	S10	15 Winter	100	+40%	100/15 Summer			
1.006	S11	15 Winter	100	+40%	100/15 Summer			
1.007	S12	15 Winter	100	+40%	30/15 Summer			
1.008	S13	480 Winter	100	+40%	100/60 Winter			
1.009	S14	480 Winter	100	+40%	1/30 Summer			
1.010	S15	1440 Winter	100	+40%				

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

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
1.000	S3	108.414	1.224	3.220	0.76			127.1	FLOOD
1.001	S4	108.347	1.474	0.000	1.16			178.7	SURCHARGED
2.000	S5	110.507	1.223	1.856	1.22			35.6	FLOOD
2.001	S6	109.955	1.445	1.077	1.17			57.6	FLOOD
1.002	S7	108.148	1.453	0.000	1.15			268.3	SURCHARGED
1.003	S8	107.956	1.432	0.000	1.11			274.1	SURCHARGED
1.004	S9	107.735	1.420	0.000	1.43			310.4	SURCHARGED
1.005	S10	107.437	1.270	0.000	1.43			370.8	SURCHARGED
1.006	S11	106.835	0.950	0.000	1.16			401.9	SURCHARGED
1.007	S12	106.085	0.840	0.000	2.61			521.0	SURCHARGED
1.008	S13	105.703	0.239	0.000	0.07			65.2	SURCHARGED
1.009	S14	105.703	0.903	0.000	0.75			9.3	SURCHARGED
1.010	S15	104.698	-0.057	0.000	0.70			9.3	OK

PN	US/MH Name	Level Exceeded
1.000	S3	2
1.001	S4	
2.000	S5	3
2.001	S6	2
1.002	S7	
1.003	S8	
1.004	S9	
1.005	S10	
1.006	S11	
1.007	S12	
1.008	S13	
1.009	S14	
1.010	S15	

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