STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.800	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 Storm

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	13.000	0.055	236.4	0.011	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	11.000	0.045	244.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	21.303	0.090	236.7	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	17.978	0.075	239.7	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	26.712	0.110	242.8	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	15.946	0.125	127.6	0.050	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	18.595	0.075	247.9	0.091	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	9.833	0.040	245.8	0.006	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	11.879	0.050	237.6	0.012	5.00	0.0	0.600	o	300	Pipe/Conduit	
3.001	29.464	0.120	245.5	0.031	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	13.233	0.055	241.2	0.008	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	9.000	0.040	225.0	0.005	5.00	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)
1.000	50.00	5.21	2.550	0.011	0.0	0.0	0.0	1.02	72.0	1.5
1.001	50.00	5.40	2.495	0.011	0.0	0.0	0.0	1.00	70.8	1.5
1.002	50.00	5.74	2.450	0.022	0.0	0.0	0.0	1.02	71.9	3.0
1.003	50.00	6.04	2.360	0.032	0.0	0.0	0.0	1.01	71.5	4.3
1.004	50.00	6.48	2.285	0.058	0.0	0.0	0.0	1.00	71.0	7.9
2.000	50.00	5.19	2.300	0.050	0.0	0.0	0.0	1.39	98.3	6.8
1.005	50.00	6.80	2.175	0.199	0.0	0.0	0.0	0.99	70.3	26.9
1.006	50.00	6.96	2.100	0.205	0.0	0.0	0.0	1.00	70.6	27.8
3.000	50.00	5.19	2.230	0.012	0.0	0.0	0.0	1.02	71.8	1.6
3.001	50.00	5.69	2.180	0.043	0.0	0.0	0.0	1.00	70.6	5.8
1.007	50.00	7.18	2.060	0.256	0.0	0.0	0.0	1.01	71.2	34.7
4.000	50.00	5.14	2.550	0.005	0.0	0.0	0.0	1.04	73.8	0.7

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Network Design Table for Storm

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
4.001	3.631	0.015	242.1	0.005	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	43.585	0.180	242.1	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	11.789	0.050	235.8	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.004	5.512	0.260	21.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	8.825	0.105	84.0	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)
4.001	50.00	5.20	2.510	0.010	0.0	0.0	0.0	1.01	71.1	1.4
4.002	50.00	5.93	2.495	0.032	0.0	0.0	0.0	1.01	71.1	4.3
4.003	50.00	6.12	2.315	0.036	0.0	0.0	0.0	1.02	72.1	4.9
4.004	50.00	6.15	2.265	0.036	0.0	0.0	0.0	3.43	242.4	4.9
1.008	50.00	5.13	2.005	0.000	0.8	0.0	0.0	1.10	19.4	0.8

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	3.200	0.650	Open Manhole	600	1.000	2.550	300				
2	3.200	0.705	Open Manhole	600	1.001	2.495	300	1.000	2.495	300	
3	3.200	0.750	Open Manhole	600	1.002	2.450	300	1.001	2.450	300	
4	3.200	0.840	Open Manhole	600	1.003	2.360	300	1.002	2.360	300	
5	3.200	0.915	Open Manhole	600	1.004	2.285	300	1.003	2.285	300	
6	3.250	0.950	Open Manhole	600	2.000	2.300	300				
7	3.250	1.075	Open Manhole	600	1.005	2.175	300	1.004	2.175	300	
								2.000	2.175	300	
8	3.170	1.070	Open Manhole	600	1.006	2.100	300	1.005	2.100	300	
9	3.400	1.170	Open Manhole	600	3.000	2.230	300				
10	3.250	1.070	Open Manhole	600	3.001	2.180	300	3.000	2.180	300	
11	3.250	1.190	Open Manhole	600	1.007	2.060	300	1.006	2.060	300	
								3.001	2.060	300	
12	3.200	0.650	Open Manhole	600	4.000	2.550	300				
13	3.200	0.690	Open Manhole	600	4.001	2.510	300	4.000	2.510	300	
14	3.200	0.705	Open Manhole	600	4.002	2.495	300	4.001	2.495	300	
15	3.200	0.885	Open Manhole	600	4.003	2.315	300	4.002	2.315	300	
16	3.350	1.085	Open Manhole	600	4.004	2.265	300	4.003	2.265	300	
17	3.350	1.345	Open Manhole	1200	1.008	2.005	150	1.007	2.005	300	
								4.004	2.005	300	
ds12	3.504	1.604	Open Manhole	600		OUTFALL		1.008	1.900	150	

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PIPELINE SCHEDULES for Storm

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	300	1	3.200	2.550	0.350	Open Manhole	600
1.001	o	300	2	3.200	2.495	0.405	Open Manhole	600
1.002	o	300	3	3.200	2.450	0.450	Open Manhole	600
1.003	o	300	4	3.200	2.360	0.540	Open Manhole	600
1.004	o	300	5	3.200	2.285	0.615	Open Manhole	600
2.000	o	300	6	3.250	2.300	0.650	Open Manhole	600
1.005	o	300	7	3.250	2.175	0.775	Open Manhole	600
1.006	o	300	8	3.170	2.100	0.770	Open Manhole	600
3.000	o	300	9	3.400	2.230	0.870	Open Manhole	600
3.001	o	300	10	3.250	2.180	0.770	Open Manhole	600
1.007	o	300	11	3.250	2.060	0.890	Open Manhole	600
4.000	o	300	12	3.200	2.550	0.350	Open Manhole	600
4.001	o	300	13	3.200	2.510	0.390	Open Manhole	600
4.002	o	300	14	3.200	2.495	0.405	Open Manhole	600
4.003	o	300	15	3.200	2.315	0.585	Open Manhole	600
4.004	o	300	16	3.350	2.265	0.785	Open Manhole	600
1.008	o	150	17	3.350	2.005	1.195	Open Manhole	1200

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	13.000	236.4	2	3.200	2.495	0.405	Open Manhole	600
1.001	11.000	244.4	3	3.200	2.450	0.450	Open Manhole	600
1.002	21.303	236.7	4	3.200	2.360	0.540	Open Manhole	600
1.003	17.978	239.7	5	3.200	2.285	0.615	Open Manhole	600
1.004	26.712	242.8	7	3.250	2.175	0.775	Open Manhole	600
2.000	15.946	127.6	7	3.250	2.175	0.775	Open Manhole	600
1.005	18.595	247.9	8	3.170	2.100	0.770	Open Manhole	600
1.006	9.833	245.8	11	3.250	2.060	0.890	Open Manhole	600
3.000	11.879	237.6	10	3.250	2.180	0.770	Open Manhole	600
3.001	29.464	245.5	11	3.250	2.060	0.890	Open Manhole	600
1.007	13.233	241.2	17	3.350	2.005	1.045	Open Manhole	1200
4.000	9.000	225.0	13	3.200	2.510	0.390	Open Manhole	600
4.001	3.631	242.1	14	3.200	2.495	0.405	Open Manhole	600
4.002	43.585	242.1	15	3.200	2.315	0.585	Open Manhole	600
4.003	11.789	235.8	16	3.350	2.265	0.785	Open Manhole	600
4.004	5.512	21.2	17	3.350	2.005	1.045	Open Manhole	1200
1.008	8.825	84.0	ds12	3.504	1.900	1.454	Open Manhole	600

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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.008	ds12	3.504	1.900	1.900	600	0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 17, DS/PN: 1.008, Volume (m³): 2.7

Unit Reference	MD-SHE-0041-8000-1000-8000
Design Head (m)	1.000
Design Flow (l/s)	0.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	41
Invert Level (m)	2.005
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	0.8	Kick-Flo®	0.369	0.5
Flush-Flo™	0.184	0.6	Mean Flow over Head Range	-	0.6

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	0.6	0.800	0.7	2.000	1.1	4.000	1.5	7.000	1.9
0.200	0.6	1.000	0.8	2.200	1.1	4.500	1.6	7.500	2.0
0.300	0.6	1.200	0.9	2.400	1.2	5.000	1.6	8.000	2.0
0.400	0.5	1.400	0.9	2.600	1.2	5.500	1.7	8.500	2.1
0.500	0.6	1.600	1.0	3.000	1.3	6.000	1.8	9.000	2.2
0.600	0.6	1.800	1.0	3.500	1.4	6.500	1.9	9.500	2.2

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Storage Structures for Storm

Porous Car Park Manhole: 6, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.6
Membrane Percolation (mm/hr)	1000	Length (m)	34.0
Max Percolation (l/s)	147.3	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	2.300	Membrane Depth (mm)	0

Porous Car Park Manhole: 7, DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.6
Membrane Percolation (mm/hr)	1000	Length (m)	31.8
Max Percolation (l/s)	137.8	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	2.175	Membrane Depth (mm)	0

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 18.800	Cv (Summer) 0.750
Region England and Wales		Ratio R 0.400	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, 40, 40

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)
1.000	1	15 Winter	1	+0%	100/240 Winter				2.582	-0.268
1.001	2	15 Winter	1	+0%	30/960 Winter				2.527	-0.268
1.002	3	15 Winter	1	+0%	30/360 Winter				2.489	-0.261
1.003	4	480 Winter	1	+0%	30/120 Winter				2.450	-0.210
1.004	5	480 Winter	1	+0%	30/30 Winter				2.450	-0.135
2.000	6	480 Winter	1	+0%	30/60 Summer				2.450	-0.150
1.005	7	480 Winter	1	+0%	30/15 Summer				2.450	-0.025
1.006	8	480 Winter	1	+0%	1/120 Winter				2.450	0.050
3.000	9	480 Winter	1	+0%	30/15 Summer				2.449	-0.081
3.001	10	480 Winter	1	+0%	30/15 Summer				2.450	-0.030
1.007	11	480 Winter	1	+0%	1/30 Winter				2.450	0.090
4.000	12	15 Winter	1	+0%	100/240 Winter				2.569	-0.281
4.001	13	15 Winter	1	+0%	30/960 Winter				2.546	-0.264
4.002	14	15 Winter	1	+0%	30/960 Winter				2.540	-0.255
4.003	15	480 Winter	1	+0%	30/30 Winter				2.449	-0.166
4.004	16	480 Winter	1	+0%	30/15 Summer				2.449	-0.116
1.008	17	480 Winter	1	+0%	1/15 Summer				2.449	0.294

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.02		1.4	OK	
1.001	2	0.000	0.03		1.4	OK	
1.002	3	0.000	0.04		2.6	OK	
1.003	4	0.000	0.01		0.5	OK	
1.004	5	0.000	0.01		0.9	OK	
2.000	6	0.000	0.01		0.6	OK	
1.005	7	0.000	0.02		0.9	OK	
1.006	8	0.000	0.02		0.9	SURCHARGED	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	9	0.000	0.00		0.2	OK	
3.001	10	0.000	0.01		0.6	OK	
1.007	11	0.000	0.01		0.8	SURCHARGED	
4.000	12	0.000	0.01		0.6	OK	
4.001	13	0.000	0.02		1.2	OK	
4.002	14	0.000	0.05		3.5	OK	
4.003	15	0.000	0.01		0.5	OK	
4.004	16	0.000	0.00		0.5	OK	
1.008	17	0.000	0.04		0.6	SURCHARGED	

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 18.800	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	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, 40, 40

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)
1.000	1	960 Winter	30	+40%	100/240 Winter				2.824	-0.026
1.001	2	960 Winter	30	+40%	30/960 Winter				2.824	0.029
1.002	3	960 Winter	30	+40%	30/360 Winter				2.824	0.074
1.003	4	960 Winter	30	+40%	30/120 Winter				2.824	0.164
1.004	5	960 Winter	30	+40%	30/30 Winter				2.824	0.239
2.000	6	960 Winter	30	+40%	30/60 Summer				2.824	0.224
1.005	7	960 Winter	30	+40%	30/15 Summer				2.824	0.349
1.006	8	960 Winter	30	+40%	1/120 Winter				2.826	0.426
3.000	9	240 Winter	30	+40%	30/15 Summer				2.831	0.301
3.001	10	240 Winter	30	+40%	30/15 Summer				2.827	0.347
1.007	11	240 Winter	30	+40%	1/30 Winter				2.835	0.475
4.000	12	960 Winter	30	+40%	100/240 Winter				2.824	-0.026
4.001	13	960 Winter	30	+40%	30/960 Winter				2.824	0.014
4.002	14	960 Winter	30	+40%	30/960 Winter				2.824	0.029
4.003	15	960 Winter	30	+40%	30/30 Winter				2.826	0.211
4.004	16	960 Winter	30	+40%	30/15 Summer				2.826	0.261
1.008	17	240 Winter	30	+40%	1/15 Summer				2.842	0.687

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.01		0.3	OK	
1.001	2	0.000	0.00		0.3	SURCHARGED	
1.002	3	0.000	0.01		0.5	SURCHARGED	
1.003	4	0.000	0.01		0.8	SURCHARGED	
1.004	5	0.000	0.02		1.5	SURCHARGED	
2.000	6	0.000	0.01		0.6	SURCHARGED	
1.005	7	0.000	0.03		2.0	SURCHARGED	
1.006	8	0.000	0.03		1.4	SURCHARGED	

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

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	9	0.000	0.02		1.2	SURCHARGED	
3.001	10	0.000	0.06		3.7	SURCHARGED	
1.007	11	0.000	0.01		0.8	SURCHARGED	
4.000	12	0.000	0.00		0.2	OK	
4.001	13	0.000	0.01		0.6	SURCHARGED	
4.002	14	0.000	0.01		0.9	SURCHARGED	
4.003	15	0.000	0.04		2.4	SURCHARGED	
4.004	16	0.000	0.02		2.0	SURCHARGED	
1.008	17	0.000	0.04		0.7	SURCHARGED	

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 18.800	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	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, 40, 40

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)
1.000	1	1440 Winter	100	+40%	100/240 Winter				2.996	0.146
1.001	2	1440 Winter	100	+40%	30/960 Winter				2.996	0.201
1.002	3	1440 Winter	100	+40%	30/360 Winter				2.996	0.246
1.003	4	1440 Winter	100	+40%	30/120 Winter				2.996	0.336
1.004	5	1440 Winter	100	+40%	30/30 Winter				2.996	0.411
2.000	6	1440 Winter	100	+40%	30/60 Summer				2.995	0.395
1.005	7	1440 Winter	100	+40%	30/15 Summer				2.997	0.522
1.006	8	1440 Winter	100	+40%	1/120 Winter				3.048	0.648
3.000	9	1440 Winter	100	+40%	30/15 Summer				3.061	0.531
3.001	10	1440 Winter	100	+40%	30/15 Summer				3.059	0.579
1.007	11	1440 Winter	100	+40%	1/30 Winter				3.063	0.703
4.000	12	1440 Winter	100	+40%	100/240 Winter				3.059	0.209
4.001	13	1440 Winter	100	+40%	30/960 Winter				3.058	0.248
4.002	14	1440 Winter	100	+40%	30/960 Winter				3.059	0.264
4.003	15	1440 Winter	100	+40%	30/30 Winter				3.068	0.453
4.004	16	1440 Winter	100	+40%	30/15 Summer				3.071	0.506
1.008	17	1440 Winter	100	+40%	1/15 Summer				3.073	0.918

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.00		0.3	FLOOD RISK	
1.001	2	0.000	0.00		0.2	FLOOD RISK	
1.002	3	0.000	0.01		0.5	FLOOD RISK	
1.003	4	0.000	0.01		0.7	FLOOD RISK	
1.004	5	0.000	0.02		1.4	FLOOD RISK	
2.000	6	0.000	0.01		0.6	FLOOD RISK	
1.005	7	0.000	0.07		4.5	FLOOD RISK	
1.006	8	0.000	0.07		3.6	FLOOD RISK	

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

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	9	0.000	0.02		0.9	SURCHARGED	
3.001	10	0.000	0.02		1.5	FLOOD RISK	
1.007	11	0.000	0.05		2.9	FLOOD RISK	
4.000	12	0.000	0.01		0.8	FLOOD RISK	
4.001	13	0.000	0.03		1.6	FLOOD RISK	
4.002	14	0.000	0.02		1.3	FLOOD RISK	
4.003	15	0.000	0.05		2.7	FLOOD RISK	
4.004	16	0.000	0.02		2.0	FLOOD RISK	
1.008	17	0.000	0.05		0.8	FLOOD RISK	

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