

Curtins Consulting Ltd		Page 1
		
Date 10/01/2022 14:55	Designed by Dan.Eddon	
File NMGH - MSCP AND ENABLING_V4.MDX	Checked by	
Innovyze	Network 2018.1.1	

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)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.356	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

« - 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	27.590	0.184	150.0	0.000	5.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	68.129	0.454	150.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	35.893	0.695	51.6	0.050	5.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	28.324	0.189	150.0	0.160	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.003	47.233	0.315	150.0	0.100	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	15.219	0.260	58.5	0.750	5.00	0.0	0.600	o	600	Pipe/Conduit	
3.001	31.501	0.258	122.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.004	30.708	0.205	149.8	0.300	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.005	36.668	0.244	150.3	0.180	0.00	0.0	0.600	o	600	Pipe/Conduit	
4.000	29.340	0.196	150.0	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit	
1.006	38.125	0.254	150.1	0.100	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.28	69.273	0.000	0.0	0.0	0.0	1.66	263.6	0.0
1.001	50.00	5.96	69.091	0.000	0.0	0.0	0.0	1.66	263.6	0.0
2.000	50.00	5.21	69.334	0.050	0.0	0.0	2.7	2.83	450.8	9.5
1.002	50.00	6.25	68.636	0.210	0.0	0.0	11.4	1.66	263.6	39.8
1.003	50.00	6.72	68.446	0.310	0.0	0.0	16.8	1.66	263.6	58.8
3.000	50.00	5.08	68.642	0.750	0.0	0.0	40.6	3.19	901.1	142.2
3.001	50.00	5.32	68.382	0.750	0.0	0.0	40.6	2.20	622.8	142.2
1.004	50.00	6.98	67.984	1.360	0.0	0.0	73.7	1.99	562.0	257.8
1.005	50.00	7.29	67.779	1.540	0.0	0.0	83.4	1.98	561.0	291.9
4.000	50.00	5.25	67.800	0.000	0.0	0.0	0.0	1.99	561.6	0.0
1.006	50.00	7.61	67.535	1.640	0.0	0.0	88.8	1.99	561.4	310.9

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
1.007	52.168	0.209	250.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.008	27.825	0.111	250.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.009	15.542	0.062	250.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.010	10.022	0.040	250.0	0.000	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)
1.007	50.00	8.17	63.902	1.640	0.0	0.0	88.8	1.54	434.2	310.9
1.008	50.00	8.48	63.693	1.640	0.0	0.0	88.8	1.54	434.2	310.9
1.009	50.00	8.64	63.581	1.640	0.0	0.0	88.8	1.54	434.2	310.9
1.010	50.00	8.77	63.520	1.640	0.0	0.0	88.8	1.28	203.8«	310.9

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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	Invert Level (m)	Diameter (mm)	Pipes In PN	Invert Level (m)	Diameter (mm)	Backdrop (mm)
SW MH02	71.267	1.994	Open Manhole	1350	1.000	69.273	450				
SW MH03	71.595	2.506	Open Manhole	1350	1.001	69.091	450	1.000	69.089	450	
SW MH05	73.562	4.228	Open Manhole	1350	2.000	69.334	450				
SW MH06	72.057	3.421	Open Manhole	1350	1.002	68.636	450	1.001	68.637	450	1
								2.000	68.639	450	3
SW MH07	71.652	3.206	Open Manhole	1350	1.003	68.446	450	1.002	68.447	450	1
DUMMY D	72.000	3.358	Open Manhole	1500	3.000	68.642	600				
DUMMY D	72.000	3.618	Open Manhole	1500	3.001	68.382	600	3.000	68.382	600	
SW MH08	70.297	2.313	Open Manhole	1500	1.004	67.984	600	1.003	68.131	450	
								3.001	68.124	600	140
SW MH09	70.407	2.628	Open Manhole	1500	1.005	67.779	600	1.004	67.779	600	
SW MH10	70.274	2.474	Open Manhole	1500	4.000	67.800	600				
SW MH11	70.400	2.865	Open Manhole	1500	1.006	67.535	600	1.005	67.535	600	
								4.000	67.604	600	69
SW MH12	71.026	7.124	Open Manhole	1500	1.007	63.902	600	1.006	67.281	600	3379
SW MH13	69.889	6.196	Open Manhole	1500	1.008	63.693	600	1.007	63.693	600	
SW MH14	71.064	7.483	Open Manhole	1500	1.009	63.581	600	1.008	63.582	600	1
SW MH15	68.285	4.766	Open Manhole	1500	1.010	63.520	450	1.009	63.519	600	
	72.000	8.520	Open Manhole	0		OUTFALL		1.010	63.480	450	

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PIPELINE SCHEDULES for StormUpstream 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	450	SW MH02	71.267	69.273	1.544	Open Manhole	1350
1.001	o	450	SW MH03	71.595	69.091	2.054	Open Manhole	1350
2.000	o	450	SW MH05	73.562	69.334	3.778	Open Manhole	1350
1.002	o	450	SW MH06	72.057	68.636	2.971	Open Manhole	1350
1.003	o	450	SW MH07	71.652	68.446	2.756	Open Manhole	1350
3.000	o	600	DUMMY D	72.000	68.642	2.758	Open Manhole	1500
3.001	o	600	DUMMY D	72.000	68.382	3.018	Open Manhole	1500
1.004	o	600	SW MH08	70.297	67.984	1.713	Open Manhole	1500
1.005	o	600	SW MH09	70.407	67.779	2.028	Open Manhole	1500
4.000	o	600	SW MH10	70.274	67.800	1.874	Open Manhole	1500
1.006	o	600	SW MH11	70.400	67.535	2.265	Open Manhole	1500
1.007	o	600	SW MH12	71.026	63.902	6.524	Open Manhole	1500
1.008	o	600	SW MH13	69.889	63.693	5.596	Open Manhole	1500
1.009	o	600	SW MH14	71.064	63.581	6.883	Open Manhole	1500
1.010	o	450	SW MH15	68.285	63.520	4.315	Open Manhole	1500

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	27.590	150.0	SW MH03	71.595	69.089	2.056	Open Manhole	1350
1.001	68.129	150.0	SW MH06	72.057	68.637	2.970	Open Manhole	1350
2.000	35.893	51.6	SW MH06	72.057	68.639	2.968	Open Manhole	1350
1.002	28.324	150.0	SW MH07	71.652	68.447	2.755	Open Manhole	1350
1.003	47.233	150.0	SW MH08	70.297	68.131	1.716	Open Manhole	1500
3.000	15.219	58.5	DUMMY D	72.000	68.382	3.018	Open Manhole	1500
3.001	31.501	122.1	SW MH08	70.297	68.124	1.573	Open Manhole	1500
1.004	30.708	149.8	SW MH09	70.407	67.779	2.028	Open Manhole	1500
1.005	36.668	150.3	SW MH11	70.400	67.535	2.265	Open Manhole	1500
4.000	29.340	150.0	SW MH11	70.400	67.604	2.196	Open Manhole	1500
1.006	38.125	150.1	SW MH12	71.026	67.281	3.145	Open Manhole	1500
1.007	52.168	250.0	SW MH13	69.889	63.693	5.596	Open Manhole	1500
1.008	27.825	250.0	SW MH14	71.064	63.582	6.882	Open Manhole	1500
1.009	15.542	250.0	SW MH15	68.285	63.519	4.166	Open Manhole	1500
1.010	10.022	250.0		72.000	63.480	8.070	Open Manhole	0

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)
1.010		72.000	63.480	0.000	0	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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 Offline Controls 0 Number of Time/Area Diagrams 0			
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0			

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.356		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: DUMMY D, DS/PN: 3.001, Volume (m³): 10.3

Unit Reference MD-SHE-0098-5000-1500-5000

Design Head (m)1.500

Design Flow (l/s)5.0

Flush-Flo™Calculated

ObjectiveMinimise upstream storage

ApplicationSurface

Sump AvailableYes

Diameter (mm)98

Invert Level (m)68.382

Minimum Outlet Pipe Diameter (mm)150

Suggested Manhole Diameter (mm)1200

Control Points			Head (m)	Flow (l/s)	Control Points			Head (m)	Flow (l/s)
Design Point (Calculated)			1.500	5.0	Kick-Flo®			0.878	3.9
Flush-Flo™			0.431	4.9	Mean Flow over Head Range			-	4.3

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	3.2	0.800	4.3	2.000	5.7	4.000	7.9	7.000	10.3
0.200	4.4	1.000	4.1	2.200	6.0	4.500	8.4	7.500	10.7
0.300	4.8	1.200	4.5	2.400	6.2	5.000	8.8	8.000	11.0
0.400	4.9	1.400	4.8	2.600	6.5	5.500	9.2	8.500	11.3
0.500	4.9	1.600	5.1	3.000	6.9	6.000	9.6	9.000	11.6
0.600	4.8	1.800	5.4	3.500	7.4	6.500	10.0	9.500	11.9

Hydro-Brake® Optimum Manhole: SW MH11, DS/PN: 1.006, Volume (m³): 22.9

Unit Reference MD-SHE-0127-1050-2500-1050

Design Head (m)2.500

Design Flow (l/s)10.5

Flush-Flo™Calculated

ObjectiveMinimise upstream storage

ApplicationSurface

Sump AvailableYes

Diameter (mm)127

Invert Level (m)67.535

Minimum Outlet Pipe Diameter (mm)150

Suggested Manhole Diameter (mm)1500

Control Points			Head (m)	Flow (l/s)	Control Points			Head (m)	Flow (l/s)
Design Point (Calculated)			2.500	10.5	Kick-Flo®			1.138	7.2
Flush-Flo™			0.555	9.2	Mean Flow over Head Range			-	8.5

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	4.6	0.800	8.9	2.000	9.4	4.000	13.1	7.000	17.1
0.200	7.8	1.000	8.2	2.200	9.9	4.500	13.9	7.500	17.7
0.300	8.6	1.200	7.4	2.400	10.3	5.000	14.6	8.000	18.3
0.400	9.0	1.400	8.0	2.600	10.7	5.500	15.3	8.500	18.8
0.500	9.1	1.600	8.5	3.000	11.4	6.000	15.9	9.000	19.3
0.600	9.2	1.800	9.0	3.500	12.3	6.500	16.5	9.500	19.8

Storage Structures for Storm

Tank or Pond Manhole: DUMMY D, DS/PN: 3.001

Invert Level (m) 68.450

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	3000.0	1.000	3000.0	1.010	0.0

Cellular Storage Manhole: SW MH10, DS/PN: 4.000

Invert Level (m) 67.800 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	225.0	0.0	1.500	225.0	0.0	1.501	0.0	0.0

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 Coefficient 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 2	Number of Storage Structures 2	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales	Ratio R 0.356 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	
1.000	SW MH02	180 Winter	1	+0%	100/180 Winter				69.273	-0.450	0.000	
1.001	SW MH03	180 Winter	1	+0%	100/180 Winter				69.089	-0.452	0.000	
2.000	SW MH05	15 Winter	1	+0%	100/180 Winter				69.367	-0.417	0.000	
1.002	SW MH06	15 Winter	1	+0%	100/120 Winter				68.731	-0.355	0.000	
1.003	SW MH07	15 Winter	1	+0%	100/15 Summer				68.556	-0.340	0.000	
3.000	DUMMY D	15 Winter	1	+0%					68.812	-0.430	0.000	
3.001	DUMMY D	360 Winter	1	+0%					68.477	-0.505	0.000	
1.004	SW MH08	15 Winter	1	+0%	30/120 Winter				68.155	-0.429	0.000	
1.005	SW MH09	15 Winter	1	+0%	30/15 Summer				68.110	-0.269	0.000	
4.000	SW MH10	120 Winter	1	+0%	30/60 Winter				68.037	-0.363	0.000	
1.006	SW MH11	15 Winter	1	+0%	30/15 Summer				68.094	-0.041	0.000	
1.007	SW MH12	30 Summer	1	+0%					63.964	-0.538	0.000	
1.008	SW MH13	30 Summer	1	+0%					63.758	-0.535	0.000	
1.009	SW MH14	30 Summer	1	+0%					63.649	-0.532	0.000	
1.010	SW MH15	30 Summer	1	+0%					63.594	-0.376	0.000	

						Pipe
		US/MH	Flow / Overflow	Flow	Level	
PN	Name	Cap.	(l/s)	(l/s)	Status	Exceeded
1.000	SW MH02	0.00		0.0	OK	
1.001	SW MH03	0.00		0.0	OK	
2.000	SW MH05	0.02		6.0	OK	
1.002	SW MH06	0.10		22.1	OK	
1.003	SW MH07	0.14		32.4	OK	
3.000	DUMMY D	0.18		89.8	OK	
3.001	DUMMY D	0.01		3.0	OK	
1.004	SW MH08	0.14		63.3	OK	
1.005	SW MH09	0.15		69.9	OK	
4.000	SW MH10	0.01		5.8	OK	
1.006	SW MH11	0.02		9.1	OK	

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

PN	US/MH Name	Flow / Overflow		Pipe Flow (l/s)	Status	Level Exceeded
		Cap.	(l/s)			
1.007	SW MH12	0.02		9.1	OK	
1.008	SW MH13	0.03		9.1	OK	
1.009	SW MH14	0.03		9.1	OK	
1.010	SW MH15	0.06		9.1	OK	

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 Online Controls	2	Number of Time/Area Diagrams 0
		Number of Storage Structures 2
		Number of Real Time Controls 0
Synthetic Rainfall Details		
Rainfall Model	FSR M5-60 (mm)	18.000 Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.356 Cv (Winter) 0.840
Margin for Flood Risk Warning (mm)		300.0
Analysis Timestep	2.5 Second Increment (Extended)	
DTS Status		ON
DVD Status		OFF
Inertia Status		OFF
Profile(s)		Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880	
Return Period(s) (years)		1, 30, 100
Climate Change (%)		0, 0, 40

									Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)
1.000	SW MH02	180 Winter	30	+0%	100/180 Winter				69.273	-0.450	0.000
1.001	SW MH03	180 Winter	30	+0%	100/180 Winter				69.089	-0.452	0.000
2.000	SW MH05	15 Winter	30	+0%	100/180 Winter				69.390	-0.394	0.000
1.002	SW MH06	15 Winter	30	+0%	100/120 Winter				68.801	-0.285	0.000
1.003	SW MH07	15 Winter	30	+0%	100/15 Summer				68.644	-0.252	0.000
3.000	DUMMY D	15 Winter	30	+0%					68.918	-0.324	0.000
3.001	DUMMY D	360 Winter	30	+0%					68.541	-0.441	0.000
1.004	SW MH08	360 Winter	30	+0%	30/120 Winter				68.641	0.057	0.000
1.005	SW MH09	180 Winter	30	+0%	30/15 Summer				68.947	0.568	0.000
4.000	SW MH10	480 Winter	30	+0%	30/60 Winter				68.638	0.238	0.000
1.006	SW MH11	240 Winter	30	+0%	30/15 Summer				68.928	0.793	0.000
1.007	SW MH12	2880 Summer	30	+0%					63.964	-0.538	0.000
1.008	SW MH13	2160 Winter	30	+0%					63.758	-0.535	0.000
1.009	SW MH14	2880 Summer	30	+0%					63.649	-0.532	0.000
1.010	SW MH15	2880 Summer	30	+0%					63.594	-0.376	0.000

Pipe						
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW MH02	0.00		0.0	OK	
1.001	SW MH03	0.00		0.0	OK	
2.000	SW MH05	0.04		14.7	OK	
1.002	SW MH06	0.29		64.1	OK	
1.003	SW MH07	0.39		92.8	OK	
3.000	DUMMY D	0.43		220.0	OK	
3.001	DUMMY D	0.01		3.7	OK	
1.004	SW MH08	0.07		29.5	SURCHARGED	
1.005	SW MH09	0.12		55.0	SURCHARGED	
4.000	SW MH10	0.07		29.0	SURCHARGED	
1.006	SW MH11	0.02		9.1	SURCHARGED	

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

PN	US/MH Name	Pipe		Status	Level Exceeded
		Flow / Overflow Cap. (l/s)	Flow (l/s)		
1.007	SW MH12	0.02	9.1	OK	
1.008	SW MH13	0.03	9.1	OK	
1.009	SW MH14	0.03	9.1	OK	
1.010	SW MH15	0.06	9.1	OK	

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 Online Controls	2	Number of Time/Area Diagrams	0
		Number of Storage Structures	2
		Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FSR M5-60 (mm)	18.000 Cv (Summer)	0.750
Region	England and Wales	Ratio R	0.356 Cv (Winter)
			0.840
Margin for Flood Risk Warning (mm)			300.0
Analysis Timestep	2.5 Second Increment	(Extended)	
DTS Status			ON
DVD Status			OFF
Inertia Status			OFF
Profile(s)			Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880		
Return Period(s) (years)			1, 30, 100
Climate Change (%)			0, 0, 40

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	
1.000	SW MH02	180 Winter	100	+40%	100/180 Winter				70.058	0.335	0.000	
1.001	SW MH03	180 Winter	100	+40%	100/180 Winter				70.058	0.517	0.000	
2.000	SW MH05	180 Winter	100	+40%	100/180 Winter				70.058	0.274	0.000	
1.002	SW MH06	180 Winter	100	+40%	100/120 Winter				70.058	0.972	0.000	
1.003	SW MH07	180 Winter	100	+40%	100/15 Summer				70.057	1.161	0.000	
3.000	DUMMY D	15 Winter	100	+40%					69.045	-0.197	0.000	
3.001	DUMMY D	720 Winter	100	+40%					68.739	-0.243	0.000	
1.004	SW MH08	180 Winter	100	+40%	30/120 Winter				70.054	1.470	0.000	
1.005	SW MH09	180 Winter	100	+40%	30/15 Summer				70.053	1.674	0.000	
4.000	SW MH10	180 Winter	100	+40%	30/60 Winter				70.051	1.651	0.000	
1.006	SW MH11	180 Winter	100	+40%	30/15 Summer				70.090	1.955	0.000	
1.007	SW MH12	180 Winter	100	+40%					63.968	-0.534	0.000	
1.008	SW MH13	2160 Winter	100	+40%					63.819	-0.474	0.000	
1.009	SW MH14	2160 Winter	100	+40%					63.696	-0.485	0.000	
1.010	SW MH15	2160 Winter	100	+40%					63.643	-0.327	0.000	

Pipe						
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SW MH02	0.00		0.9	SURCHARGED	
1.001	SW MH03	0.02		4.7	SURCHARGED	
2.000	SW MH05	0.02		6.9	SURCHARGED	
1.002	SW MH06	0.13		28.7	SURCHARGED	
1.003	SW MH07	0.17		39.5	SURCHARGED	
3.000	DUMMY D	0.78		397.7	OK	
3.001	DUMMY D	0.01		3.8	OK	
1.004	SW MH08	0.21		95.2	FLOOD RISK	
1.005	SW MH09	0.20		94.6	SURCHARGED	
4.000	SW MH10	0.12		53.4	FLOOD RISK	
1.006	SW MH11	0.02		10.5	SURCHARGED	

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

		Pipe		Level	
PN	US/MH Name	Flow / Overflow Cap.	Flow (l/s)	Status	Exceeded
1.007	SW MH12	0.03	10.5	OK	
1.008	SW MH13	0.08	26.7	OK	
1.009	SW MH14	0.07	21.1	OK	
1.010	SW MH15	0.16	23.2	OK	