

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)	18.100	Add Flow / Climate Change (%)	0
Ratio R	0.359	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	0	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.	1.000	Min Slope for Optimisation (1:X)	400

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	22.071	0.221	100.0	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	21.217	0.088	240.0	0.076	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	8.624	0.036	240.0	0.032	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	14.571	1.190	12.2	0.002	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	13.702	0.137	100.0	0.008	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	39.360	1.463	26.9	0.059	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	38.120	0.300	127.1	0.009	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	20.373	0.085	239.7	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	17.638	1.393	12.7	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	15.941	0.121	131.7	0.032	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	31.703	0.319	99.4	0.006	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	27.007	0.502	53.8	0.011	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)
1.000	0.00	5.37	28.950	0.016	0.0	0.0	0.0	1.00	17.8	0.0
1.001	0.00	5.72	28.579	0.092	0.0	0.0	0.0	1.01	71.4	0.0
1.002	0.00	5.86	28.491	0.124	0.0	0.0	0.0	1.01	71.4	0.0
1.003	0.00	5.91	28.455	0.126	0.0	0.0	0.0	4.52	319.3	0.0
2.000	0.00	5.23	29.100	0.008	0.0	0.0	0.0	1.00	17.8	0.0
2.001	0.00	5.44	28.813	0.067	0.0	0.0	0.0	3.04	215.1	0.0
3.000	0.00	5.55	27.725	0.009	0.0	0.0	0.0	1.16	46.1	0.0
2.002	0.00	5.88	27.350	0.110	0.0	0.0	0.0	1.01	71.5	0.0
1.004	0.00	5.98	27.265	0.293	0.0	0.0	0.0	4.44	314.0	0.0
4.000	0.00	5.23	27.475	0.032	0.0	0.0	0.0	1.14	45.2	0.0
5.000	0.00	5.52	28.250	0.006	0.0	0.0	0.0	1.01	17.8	0.0
5.001	0.00	5.85	27.931	0.017	0.0	0.0	0.0	1.37	24.3	0.0

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	16.752	0.070	239.3	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	15.446	1.309	11.8	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	4.323	0.018	240.2	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	21.675	0.090	240.0	0.075	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	3.486	0.019	180.0	0.002	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)
4.001	0.00	6.13	27.279	0.060	0.0	0.0	0.0	1.01	71.5	0.0
4.002	0.00	6.18	27.209	0.117	0.0	0.0	0.0	4.60	325.3	0.0
4.003	0.00	6.25	25.900	0.129	0.0	0.0	0.0	1.01	71.4	0.0
1.005	0.00	6.61	25.872	0.497	0.0	0.0	0.0	1.01	71.4	0.0
1.006	0.00	6.67	25.782	0.499	0.0	0.0	0.0	0.97	38.6	0.0

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)
100	29.550	0.600	Open Manhole	1200	1.000	28.950	150				
101	29.850	1.271	Open Manhole	1200	1.001	28.579	300	1.000	28.729	150	
102	29.850	1.359	Open Manhole	1200	1.002	28.491	300	1.001	28.491	300	
103	29.750	1.295	Open Manhole	1200	1.003	28.455	300	1.002	28.455	300	
200	29.850	0.750	Open Manhole	1200	2.000	29.100	150				
201	29.850	1.037	Open Manhole	1200	2.001	28.813	300	2.000	28.963	150	
400	28.850	1.125	Open Manhole	1200	3.000	27.725	225				
202	28.850	1.500	Open Manhole	1200	2.002	27.350	300	2.001	27.350	300	
								3.000	27.425	225	
104	29.600	2.335	Open Manhole	1200	1.004	27.265	300	1.003	27.265	300	
								2.002	27.265	300	
700	29.300	1.825	Open Manhole	1200	4.000	27.475	225				
800	28.850	0.600	Open Manhole	1200	5.000	28.250	150				
801	29.000	1.069	Open Manhole	1200	5.001	27.931	150	5.000	27.931	150	
701	29.250	1.971	Open Manhole	1200	4.001	27.279	300	4.000	27.354	225	
								5.001	27.429	150	
702	28.925	1.716	Open Manhole	1200	4.002	27.209	300	4.001	27.209	300	
703	29.000	3.100	Open Manhole	1200	4.003	25.900	300	4.002	25.900	300	
105	29.150	3.278	Open Manhole	1200	1.005	25.872	300	1.004	25.872	300	
								4.003	25.882	300	
106	29.000	3.218	Open Manhole	1500	1.006	25.782	225	1.005	25.782	300	
Outfall	29.000	3.238	Open Manhole	0		OUTFALL		1.006	25.762	225	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
100	383803.612	399299.030	383803.612	399299.030	Required	
101	383812.730	399278.930	383812.730	399278.930	Required	
102	383793.435	399270.107	383793.435	399270.107	Required	
103	383796.532	399262.060	383796.532	399262.060	Required	
200	383824.380	399262.360	383824.380	399262.360	Required	
201	383830.077	399249.899	383830.077	399249.899	Required	
400	383759.193	399218.620	383759.193	399218.620	Required	
202	383794.161	399233.797	383794.161	399233.797	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
104	383785.689	399252.326	383785.689	399252.326	Required	
700	383770.385	399284.883	383770.385	399284.883	Required	
800	383743.017	399239.082	383743.017	399239.082	Required	
801	383730.760	399268.319	383730.760	399268.319	Required	
701	383755.678	399278.734	383755.678	399278.734	Required	
702	383762.086	399263.256	383762.086	399263.256	Required	
703	383767.995	399248.985	383767.995	399248.985	Required	
105	383769.649	399244.991	383769.649	399244.991	Required	
106	383749.737	399236.429	383749.737	399236.429	Required	
Outfall	383747.801	399233.529			No Entry	

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	150	100	29.550	28.950	0.450	Open Manhole	1200
1.001	o	300	101	29.850	28.579	0.971	Open Manhole	1200
1.002	o	300	102	29.850	28.491	1.059	Open Manhole	1200
1.003	o	300	103	29.750	28.455	0.995	Open Manhole	1200
2.000	o	150	200	29.850	29.100	0.600	Open Manhole	1200
2.001	o	300	201	29.850	28.813	0.737	Open Manhole	1200
3.000	o	225	400	28.850	27.725	0.900	Open Manhole	1200
2.002	o	300	202	28.850	27.350	1.200	Open Manhole	1200
1.004	o	300	104	29.600	27.265	2.035	Open Manhole	1200
4.000	o	225	700	29.300	27.475	1.600	Open Manhole	1200
5.000	o	150	800	28.850	28.250	0.450	Open Manhole	1200
5.001	o	150	801	29.000	27.931	0.919	Open Manhole	1200
4.001	o	300	701	29.250	27.279	1.671	Open Manhole	1200
4.002	o	300	702	28.925	27.209	1.416	Open Manhole	1200
4.003	o	300	703	29.000	25.900	2.800	Open Manhole	1200
1.005	o	300	105	29.150	25.872	2.978	Open Manhole	1200
1.006	o	225	106	29.000	25.782	2.993	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	22.071	100.0	101	29.850	28.729	0.971	Open Manhole	1200
1.001	21.217	240.0	102	29.850	28.491	1.059	Open Manhole	1200
1.002	8.624	240.0	103	29.750	28.455	0.995	Open Manhole	1200
1.003	14.571	12.2	104	29.600	27.265	2.035	Open Manhole	1200
2.000	13.702	100.0	201	29.850	28.963	0.737	Open Manhole	1200
2.001	39.360	26.9	202	28.850	27.350	1.200	Open Manhole	1200
3.000	38.120	127.1	202	28.850	27.425	1.200	Open Manhole	1200
2.002	20.373	239.7	104	29.600	27.265	2.035	Open Manhole	1200
1.004	17.638	12.7	105	29.150	25.872	2.978	Open Manhole	1200
4.000	15.941	131.7	701	29.250	27.354	1.671	Open Manhole	1200
5.000	31.703	99.4	801	29.000	27.931	0.919	Open Manhole	1200
5.001	27.007	53.8	701	29.250	27.429	1.671	Open Manhole	1200
4.001	16.752	239.3	702	28.925	27.209	1.416	Open Manhole	1200
4.002	15.446	11.8	703	29.000	25.900	2.800	Open Manhole	1200
4.003	4.323	240.2	105	29.150	25.882	2.968	Open Manhole	1200
1.005	21.675	240.0	106	29.000	25.782	2.918	Open Manhole	1500
1.006	3.486	180.0	Outfall	29.000	25.762	3.013	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)
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1.006	Outfall	29.000	25.762	0.000	0	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	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 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	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	18.100	Storm Duration (mins)	30
Ratio R	0.359		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 106, DS/PN: 1.006, Volume (m³): 7.1

Unit Reference	MD-SHE-0082-5000-3200-5000
Design Head (m)	3.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	82
Invert Level (m)	25.782
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	3.200	5.0	Kick-Flo®	0.733	2.5
Flush-Flo™	0.354	3.2	Mean Flow over Head Range	-	3.6

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	2.4	0.800	2.6	2.000	4.0	4.000	5.5	7.000	7.2
0.200	3.0	1.000	2.9	2.200	4.2	4.500	5.9	7.500	7.5
0.300	3.2	1.200	3.2	2.400	4.4	5.000	6.2	8.000	7.7
0.400	3.2	1.400	3.4	2.600	4.5	5.500	6.4	8.500	7.9
0.500	3.1	1.600	3.6	3.000	4.8	6.000	6.7	9.000	8.1
0.600	3.0	1.800	3.8	3.500	5.2	6.500	7.0	9.500	8.3

Storage Structures for Storm

Cellular Storage Manhole: 703, DS/PN: 4.003

Invert Level (m) 25.900 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)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	220.5	220.5	1.500	220.5	315.0	1.501	0.0	315.0

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 Online Controls	1	Number of Time/Area Diagrams	0
		Number of Storage Structures	1
		Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FSR M5-60 (mm)	18.100 Cv (Summer)	1.000
Region	England and Wales	Ratio R	0.359 Cv (Winter)
			1.000
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, 180, 240, 360, 480, 600, 720		
Return Period(s) (years)			1, 30, 100
Climate Change (%)			0, 0, 40

US/MH			Return Climate		First (X)	First (Y)	First (Z)	Overflow	Water	Surcharged	Flooded
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level	Depth	Volume
									(m)	(m)	(m³)
1.000	100	15 Summer	1	+0%					28.988	-0.112	0.000
1.001	101	15 Summer	1	+0%	100/15 Summer				28.670	-0.210	0.000
1.002	102	15 Summer	1	+0%	100/15 Summer				28.603	-0.188	0.000
1.003	103	15 Summer	1	+0%					28.503	-0.252	0.000
2.000	200	15 Summer	1	+0%					29.127	-0.123	0.000
2.001	201	15 Summer	1	+0%					28.854	-0.259	0.000
3.000	400	15 Summer	1	+0%	100/360 Summer				27.751	-0.199	0.000
2.002	202	15 Summer	1	+0%	100/15 Summer				27.449	-0.201	0.000
1.004	104	15 Summer	1	+0%	100/15 Summer				27.340	-0.225	0.000
4.000	700	15 Summer	1	+0%	100/360 Summer				27.527	-0.173	0.000
5.000	800	15 Summer	1	+0%	100/480 Winter				28.272	-0.128	0.000
5.001	801	15 Summer	1	+0%	100/360 Summer				27.963	-0.118	0.000
4.001	701	15 Summer	1	+0%	100/240 Summer				27.354	-0.225	0.000
4.002	702	15 Summer	1	+0%	100/240 Summer				27.256	-0.253	0.000
4.003	703	360 Summer	1	+0%	30/15 Summer				26.144	-0.056	0.000
1.005	105	15 Summer	1	+0%	1/15 Summer				26.264	0.092	0.000
1.006	106	15 Summer	1	+0%	1/15 Summer				26.296	0.289	0.000

US/MH			Half Drain	Pipe	Level	
PN	Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status
						Exceeded
1.000	100	0.15			2.4	OK
1.001	101	0.19			12.1	OK
1.002	102	0.30			16.2	OK
1.003	103	0.06			16.4	OK
2.000	200	0.07			1.2	OK
2.001	201	0.04			8.9	OK
3.000	400	0.03			1.4	OK
2.002	202	0.23			14.5	OK
1.004	104	0.14			38.1	OK
4.000	700	0.12			4.9	OK

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.000	800	0.05			0.9	OK	
5.001	801	0.10			2.3	OK	
4.001	701	0.14			8.6	OK	
4.002	702	0.06			15.8	OK	
4.003	703	0.11		215	5.1	OK	
1.005	105	0.21			13.4	SURCHARGED	
1.006	106	0.12			3.2	SURCHARGED	

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 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 Online Controls	1	Number of Storage Structures	1
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FSR M5-60 (mm)	18.100	Cv (Summer) 1.000
Region	England and Wales	Ratio R	0.359
		Cv (Winter)	1.000
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, 180, 240, 360, 480, 600, 720		
Return Period(s) (years)			1, 30, 100
Climate Change (%)			0, 0, 40

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

									Water	Surcharged	Flooded	
US/MH			Return	Climate	First (X)		First (Y)	First (Z)	Overflow	Level	Depth	Volume
PN	Name	Storm	Period	Change	Surcharge		Flood	Overflow	Act.	(m)	(m)	(m³)
1.000	100	15 Summer	30	+0%						29.012	-0.088	0.000
1.001	101	15 Summer	30	+0%	100/15	Summer				28.766	-0.113	0.000
1.002	102	15 Summer	30	+0%	100/15	Summer				28.721	-0.070	0.000
1.003	103	15 Summer	30	+0%						28.544	-0.211	0.000
2.000	200	15 Summer	30	+0%						29.144	-0.106	0.000
2.001	201	15 Summer	30	+0%						28.887	-0.226	0.000
3.000	400	15 Summer	30	+0%	100/360	Summer				27.767	-0.183	0.000
2.002	202	15 Summer	30	+0%	100/15	Summer				27.541	-0.109	0.000
1.004	104	15 Summer	30	+0%	100/15	Summer				27.406	-0.159	0.000
4.000	700	15 Summer	30	+0%	100/360	Summer				27.560	-0.140	0.000
5.000	800	15 Summer	30	+0%	100/480	Winter				28.286	-0.114	0.000
5.001	801	15 Summer	30	+0%	100/360	Summer				27.987	-0.094	0.000
4.001	701	15 Summer	30	+0%	100/240	Summer				27.408	-0.171	0.000
4.002	702	15 Summer	30	+0%	100/240	Summer				27.293	-0.216	0.000
4.003	703	360 Winter	30	+0%	30/15	Summer				26.680	0.480	0.000
1.005	105	360 Winter	30	+0%	1/15	Summer				26.710	0.538	0.000
1.006	106	360 Winter	30	+0%	1/15	Summer				26.735	0.728	0.000

Half Drain Pipe							
PN	US/MH Name	Flow Cap.	Overflow (l/s)	Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	100	0.35			5.9	OK	
1.001	101	0.59			37.2	OK	
1.002	102	0.91			49.2	OK	
1.003	103	0.19			50.5	OK	
2.000	200	0.18			3.0	OK	
2.001	201	0.14			27.9	OK	
3.000	400	0.08			3.3	OK	

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
				Time (mins)	Flow (l/s)		
2.002	202	0.72			44.8	OK	
1.004	104	0.43			116.1	OK	
4.000	700	0.30			12.0	OK	
5.000	800	0.13			2.2	OK	
5.001	801	0.29			6.7	OK	
4.001	701	0.38			22.9	OK	
4.002	702	0.17			46.6	OK	
4.003	703	0.20			9.6	SURCHARGED	
1.005	105	0.14			8.8	SURCHARGED	
1.006	106	0.12			3.2	SURCHARGED	

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 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 Online Controls	1	Number of Time/Area Diagrams	0
		Number of Storage Structures	1
		Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FSR M5-60 (mm)	18.100	Cv (Summer) 1.000
Region	England and Wales	Ratio R	0.359
		Cv (Winter)	1.000
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, 180, 240, 360, 480, 600, 720		
Return Period(s) (years)			1, 30, 100
Climate Change (%)			0, 0, 40

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

									Water	Surcharged	Flooded		
	US/MH			Return	Climate	First (X)		First (Y)	First (Z)	Overflow	Level	Depth	Volume
PN	Name	Storm	Period	Change		Surcharge		Flood	Overflow	Act.	(m)	(m)	(m³)
1.000	100	15 Summer	100	+40%							29.068	-0.032	0.000
1.001	101	15 Summer	100	+40%		100/15	Summer				28.979	0.100	0.000
1.002	102	15 Summer	100	+40%		100/15	Summer				28.875	0.084	0.000
1.003	103	15 Summer	100	+40%							28.577	-0.178	0.000
2.000	200	15 Summer	100	+40%							29.160	-0.090	0.000
2.001	201	15 Summer	100	+40%							28.915	-0.198	0.000
3.000	400	600 Winter	100	+40%		100/360	Summer				28.542	0.592	0.000
2.002	202	600 Winter	100	+40%		100/15	Summer				28.542	0.892	0.000
1.004	104	600 Winter	100	+40%		100/15	Summer				28.541	0.976	0.000
4.000	700	600 Winter	100	+40%		100/360	Summer				28.541	0.841	0.000
5.000	800	600 Winter	100	+40%		100/480	Winter				28.541	0.141	0.000
5.001	801	600 Winter	100	+40%		100/360	Summer				28.541	0.460	0.000
4.001	701	600 Winter	100	+40%		100/240	Summer				28.541	0.962	0.000
4.002	702	600 Winter	100	+40%		100/240	Summer				28.540	1.031	0.000
4.003	703	600 Winter	100	+40%		30/15	Summer				28.539	2.339	0.000
1.005	105	600 Winter	100	+40%		1/15	Summer				28.539	2.367	0.000
1.006	106	600 Winter	100	+40%		1/15	Summer				28.534	2.527	0.000

Half Drain Pipe							
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	100	0.66			11.1	OK	
1.001	101	1.04			65.4	SURCHARGED	
1.002	102	1.63			88.3	SURCHARGED	
1.003	103	0.34			90.3	OK	
2.000	200	0.33			5.4	OK	
2.001	201	0.25			50.5	OK	
3.000	400	0.01			0.6	SURCHARGED	

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.002	202	0.12			7.3	SURCHARGED	
1.004	104	0.07			19.4	SURCHARGED	
4.000	700	0.05			2.1	SURCHARGED	
5.000	800	0.02			0.4	SURCHARGED	
5.001	801	0.05			1.1	SURCHARGED	
4.001	701	0.07			4.0	SURCHARGED	
4.002	702	0.03			7.8	SURCHARGED	
4.003	703	0.22			10.7	SURCHARGED	
1.005	105	0.14			8.6	SURCHARGED	
1.006	106	0.18			4.7	SURCHARGED	