

Woods Hardwick		Page 1
15-17 Goldington Road Bedford MK40 3NH	SWS Net 1 17748 Yapton Road Barnham	
Date 17/07/2020 09:58 File SWS BARNHAM 160720 test.MDX	Designed by C.Smith Checked by	
Micro Drainage	Network 2018.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

- Indicates pipe length does not match coordinates

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	7.249	0.075	96.7	0.027	6.00	0.0	0.600	o	150	Pipe/Conduit		
1.001	4.810	0.048	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
2.000	8.832	0.088	100.4	0.038	6.00	0.0	0.600	o	150	Pipe/Conduit		
2.001	12.200	0.122	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
1.002	45.400	0.184	246.7	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit		
3.000	5.000#	0.100	50.0	0.052	6.00	0.0	0.600	o	150	Pipe/Conduit		
3.001	6.000#	0.254	23.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
4.000	3.000	0.025	120.0	0.066	6.00	0.0	0.600	o	150	Pipe/Conduit		
4.001	7.000	0.104	67.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.003	41.039	0.171	240.0	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit		
5.000	10.000#	0.215	46.5	0.047	6.00	0.0	0.600	o	150	Pipe/Conduit		
5.001	6.700	0.350	19.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
6.000	5.000	0.335	14.9	0.027	6.00	0.0	0.600	o	150	Pipe/Conduit		
6.001	3.000	0.165	18.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
1.004	32.806	0.134	244.8	0.049	0.00	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	6.12	8.053	0.027	0.0	0.0	0.0	1.02	18.1	3.7
1.001	50.00	6.20	7.978	0.027	0.0	0.0	0.0	1.00	17.8	3.7
2.000	50.00	6.15	8.140	0.038	0.0	0.0	0.0	1.00	17.7	5.1
2.001	50.00	6.35	8.052	0.038	0.0	0.0	0.0	1.00	17.8	5.1
1.002	47.03	7.11	7.780	0.082	0.0	0.0	0.0	1.00	70.4	10.4
3.000	50.00	6.06	8.100	0.052	0.0	0.0	0.0	1.43	25.2	7.0
3.001	50.00	6.10	7.925	0.052	0.0	0.0	0.0	2.70	107.5	7.0
4.000	50.00	6.05	7.875	0.066	0.0	0.0	0.0	0.92	16.2	8.9
4.001	50.00	6.13	7.775	0.066	0.0	0.0	0.0	1.60	63.5	8.9
1.003	44.48	7.79	7.596	0.236	0.0	0.0	0.0	1.01	71.4	28.4
5.000	50.00	6.11	8.140	0.047	0.0	0.0	0.0	1.48	26.1	6.4
5.001	50.00	6.16	7.925	0.047	0.0	0.0	0.0	2.31	40.9	6.4
6.000	50.00	6.03	8.075	0.027	0.0	0.0	0.0	2.62	46.3	3.7
6.001	50.00	6.05	7.740	0.027	0.0	0.0	0.0	2.37	41.9	3.7
1.004	42.66	8.33	7.425	0.359	0.0	0.0	0.0	1.00	70.7	41.5

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Micro Drainage		Network 2018.1.1

STORM SEWER DESIGN by the Modified Rational Method

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
7.000	6.272	0.175	35.8	0.024	6.00	0.0	0.600	o	150	Pipe/Conduit	
7.001	4.928	0.110	44.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.002	12.000	0.074	162.2	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	10.462	0.033	317.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.000	5.288	0.053	99.8	0.051	6.00	0.0	0.600	o	150	Pipe/Conduit	
8.001	7.275	0.072	101.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
8.002	28.500	0.117	243.6	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.000	3.000#	0.082	36.6	0.027	6.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	3.000#	0.085	35.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	30.532	0.075	407.1	0.016	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	20.088	0.057	352.4	0.000	6.00	0.0	0.600	o	450	Pipe/Conduit	
11.000	11.000	0.115	95.7	0.024	6.00	0.0	0.600	o	150	Pipe/Conduit	
11.001	3.600	0.052	69.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.007	3.548	0.033	107.5	0.034	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)
7.000	50.00	6.06	7.800	0.024	0.0	0.0	0.0	1.69	29.8	3.2
7.001	50.00	6.10	7.550	0.024	0.0	0.0	0.0	1.96	77.9	3.2
7.002	50.00	6.30	7.440	0.035	0.0	0.0	0.0	1.02	40.7	4.7
1.005	42.13	8.50	7.216	0.394	0.0	0.0	0.0	1.01	111.8	45.0
8.000	50.00	6.09	7.650	0.051	0.0	0.0	0.0	1.01	17.8	6.9
8.001	50.00	6.18	7.522	0.051	0.0	0.0	0.0	1.30	51.7	6.9
8.002	48.98	6.65	7.375	0.078	0.0	0.0	0.0	1.00	70.9	10.3
9.000	50.00	6.03	7.575	0.027	0.0	0.0	0.0	1.67	29.5	3.7
9.001	50.00	6.06	7.493	0.027	0.0	0.0	0.0	1.70	30.0	3.7
1.006	40.65	9.01	7.108	0.515	0.0	0.0	0.0	1.00	159.3	56.7
10.000	50.00	6.31	7.090	0.000	0.0	0.0	0.0	1.08	171.3	0.0
11.000	50.00	6.18	7.500	0.024	0.0	0.0	0.0	1.03	18.2	3.2
11.001	50.00	6.23	7.385	0.024	0.0	0.0	0.0	1.21	21.4	3.2
1.007	50.00	6.06	7.033	0.000	5.0	0.0	0.0	0.97	17.1	5.0

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)
3A	8.665	0.612	Open Manhole	600	1.000	8.053			
3B	8.665	0.687	Open Manhole	600	1.001	7.978	1.000	7.978	150
3C	8.900	0.760	Open Manhole	600	2.000	8.140			
3D	8.750	0.698	Open Manhole	600	2.001	8.052	2.000	8.052	150
3	9.088	1.308	Open Manhole	1200	1.002	7.780	1.001	7.930	150
							2.001	7.930	150
4A	8.900	0.800	Open Manhole	600	3.000	8.100			
4B	8.900	0.975	Open Manhole	600	3.001	7.925	3.000	8.000	150
4C	9.000	1.125	Open Manhole	1200	4.000	7.875			
4D	9.000	1.225	Open Manhole	1200	4.001	7.775	4.000	7.850	150
4	8.898	1.302	Open Manhole	1500	1.003	7.596	1.002	7.596	300
							3.001	7.671	225
							4.001	7.671	225
10A	8.850	0.710	Open Manhole	1200	5.000	8.140			
10B	8.850	0.925	Open Manhole	1200	5.001	7.925	5.000	7.925	150
10C	8.775	0.700	Open Manhole	1200	6.000	8.075			
10D	8.775	1.035	Open Manhole	1200	6.001	7.740	6.000	7.740	150
5	8.736	1.311	Open Manhole	1500	1.004	7.425	1.003	7.425	300
							5.001	7.575	150
							6.001	7.575	150
32A	8.600	0.800	Open Manhole	600	7.000	7.800			
32B	8.625	1.075	Open Manhole	600	7.001	7.550	7.000	7.625	150
32	8.612	1.172	Open Manhole	1200	7.002	7.440	7.001	7.440	225
6	8.790	1.574	Open Manhole	1500	1.005	7.216	1.004	7.291	300
							7.002	7.366	225
42A	8.550	0.900	Open Manhole	600	8.000	7.650			
42B	8.550	1.028	Open Manhole	600	8.001	7.522	8.000	7.597	150
42	8.577	1.202	Open Manhole	1500	8.002	7.375	8.001	7.450	225
7A	8.400	0.825	Open Manhole	600	9.000	7.575			
7B	8.400	0.907	Open Manhole	600	9.001	7.493	9.000	7.493	150
7	8.641	1.533	Open Manhole	1800	1.006	7.108	1.005	7.183	375
							8.002	7.258	300
							9.001	7.408	150
8A	8.250	1.160	Open Manhole	1500	10.000	7.090			
8B	8.325	0.825	Open Manhole	1200	11.000	7.500			
8C	8.200	0.815	Open Manhole	1200	11.001	7.385	11.000	7.385	150
8	8.250	1.217	Open Manhole	1800	1.007	7.033	1.006	7.033	450
							10.000	7.033	450
							11.001	7.333	150
	7.820	0.820	Open Manhole	0		OUTFALL	1.007	7.000	150

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.007	7.820	7.000	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 * 10m³/ha Storage	1.000
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 8 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	E (1km)	0.308
Return Period (years)	2	F (1km)	2.327
FEH Rainfall Version	1999	Summer Storms	Yes
Site Location	GB 495800 104050 SU 95800 04050	Winter Storms	No
C (1km)	-0.025	Cv (Summer)	0.750
D1 (1km)	0.403	Cv (Winter)	0.840
D2 (1km)	0.246	Storm Duration (mins)	30
D3 (1km)	0.396		

SWS Net 1
17748 Yapton Road
Barnham



Micro
Drainage

Designed by C.Smith
Checked by

Network 2018.1.1

Orifice Manhole: 3B, DS/PN: 1.001, Volume (m³): 0.3

Orifice Manhole: 3D, DS/PN: 2.001, Volume (m³): 0.3

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 8.052

Orifice Manhole: 10B, DS/PN: 5.001, Volume (m³): 1.2

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.925

Orifice Manhole: 10D, DS/PN: 6.001, Volume (m³): 1.2

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 7.740

Orifice Manhole: 32B, DS/PN: 7.001, Volume (m³): 0.4

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 7.625

Orifice Manhole: 42B, DS/PN: 8.001, Volume (m³): 0.4

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 7.597

Orifice Manhole: 7B, DS/PN: 9.001, Volume (m³): 0.3

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 7.493

Hydro-Brake® Optimum Manhole: 8, DS/PN: 1.007, Volume (m³): 10.6

Unit Reference	MD-SHE-0103-5000-1200-5000
Design Head (m)	1.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	7.033
Pipe Diameter (mm)	150
hole Diameter (mm)	1200

Control Points		Head (m)	Flow (l/s)	Control Points		Head (m)	Flow (l/s)
Design Point	(Calculated)	1.200	5.0	Kick-Flo®		0.745	4.0
	Flush-Flo™	0.354	5.0	Mean Flow over Head Range		-	4.4

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	3.4	0.800	4.1	2.000	6.3	4.000	8.8	7.000	11.5
0.200	4.7	1.000	4.6	2.200	6.6	4.500	9.3	7.500	11.8
0.300	5.0	1.200	5.0	2.400	6.9	5.000	9.8	8.000	12.2
0.400	5.0	1.400	5.4	2.600	7.2	5.500	10.2	8.500	12.6
0.500	4.9	1.600	5.7	3.000	7.7	6.000	10.7	9.000	12.9
0.600	4.7	1.800	6.0	3.500	8.3	6.500	11.1	9.500	13.3

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Storage Structures for Storm

Porous Car Park Manhole: 3B, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.5
Max Percolation (l/s)	34.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.984	Cap Volume Depth (m)	0.430

Porous Car Park Manhole: 3D, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	25.0
Membrane Percolation (mm/hr)	1000	Length (m)	8.0
Max Percolation (l/s)	55.6	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.058	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: 4B, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	111.1	Slope (1:X)	250.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.925	Cap Volume Depth (m)	0.540

Porous Car Park Manhole: 10B, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	12.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.5
Max Percolation (l/s)	41.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.730	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: 10D, DS/PN: 6.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.740	Cap Volume Depth (m)	0.375

Porous Car Park Manhole: 32B, DS/PN: 7.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	11.3
Max Percolation (l/s)	31.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.610	Cap Volume Depth (m)	0.615

Porous Car Park Manhole: 42B, DS/PN: 8.001

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30
Membrane Percolation (mm/hr)	1000	Invert Level (m)	7.596
Max Percolation (l/s)	50.0	Width (m)	10.0
Safety Factor	2.0	Length (m)	18.0

Porous Car Park Manhole: 42B, DS/PN: 8.001

Slope (1:X) 100.0 Evaporation (mm/day) 3
 Depression Storage (mm) 5 Cap Volume Depth (m) 0.590

Porous Car Park Manhole: 7B, DS/PN: 9.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	27.8	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.473	Cap Volume Depth (m)	0.400

Complex Manhole: 8, DS/PN: 1.007

Tank or Pond

Invert Level (m) 7.033

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	95.0	1.130	248.2	1.132	248.6

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	10.0	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.500	Cap Volume Depth (m)	0.580

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	1.000
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	8	Number of Storage Structures	9
Number of Time/Area Diagrams	0	Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FEH	D3 (1km)	0.396
FEH Rainfall Version	1999	E (1km)	0.308
Site Location	GB 495800 104050 SU 95800 04050	F (1km)	2.327
C (1km)	-0.025	Cv (Summer)	0.750
D1 (1km)	0.403	Cv (Winter)	0.840
D2 (1km)	0.246		
Margin for Flood Risk Warning (mm)	450.0		
Analysis Timestep	2.5 Second	Increment (Extended)	
DTS Status	ON		
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, 30		

										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	3A	15 Winter	1	+0%	100/15 Summer				8.094	-0.109	0.000	
1.001	3B	30 Winter	1	+0%	100/15 Summer				8.052	-0.076	0.000	
2.000	3C	15 Winter	1	+0%	100/15 Summer				8.189	-0.101	0.000	
2.001	3D	60 Winter	1	+0%	100/15 Summer				8.121	-0.081	0.000	
1.002	3	30 Winter	1	+0%	100/240 Winter				7.822	-0.258	0.000	
3.000	4A	15 Winter	1	+0%	100/15 Summer				8.151	-0.099	0.000	
3.001	4B	15 Winter	1	+0%	100/360 Winter				7.959	-0.191	0.000	
4.000	4C	15 Winter	1	+0%	30/15 Summer				7.958	-0.067	0.000	
4.001	4D	15 Winter	1	+0%	100/15 Summer				7.831	-0.169	0.000	
1.003	4	15 Winter	1	+0%	100/15 Summer				7.694	-0.202	0.000	
5.000	10A	15 Winter	1	+0%	100/15 Summer				8.185	-0.105	0.000	
5.001	10B	960 Winter	1	+0%	100/30 Winter				7.953	-0.122	0.000	
6.000	10C	15 Winter	1	+0%					8.101	-0.124	0.000	
6.001	10D	15 Winter	1	+0%	100/15 Summer				7.799	-0.091	0.000	
1.004	5	15 Winter	1	+0%	30/120 Winter				7.541	-0.184	0.000	
7.000	32A	15 Winter	1	+0%	100/120 Summer				7.831	-0.119	0.000	
7.001	32B	30 Winter	1	+0%	30/240 Winter				7.685	-0.090	0.000	
7.002	32	30 Winter	1	+0%	30/120 Summer				7.470	-0.195	0.000	
1.005	6	15 Winter	1	+0%	30/60 Winter				7.348	-0.243	0.000	
8.000	42A	15 Winter	1	+0%	30/15 Summer				7.711	-0.089	0.000	
8.001	42B	30 Winter	1	+0%	30/15 Summer				7.703	-0.044	0.000	
8.002	42	15 Winter	1	+0%	30/120 Summer				7.420	-0.255	0.000	
9.000	7A	15 Winter	1	+0%	30/240 Summer				7.613	-0.112	0.000	
9.001	7B	30 Winter	1	+0%	30/15 Summer				7.573	-0.070	0.000	
1.006	7	240 Winter	1	+0%	30/60 Summer				7.327	-0.231	0.000	
10.000	8A	240 Winter	1	+0%	30/60 Summer				7.325	-0.215	0.000	
11.000	8B	15 Winter	1	+0%	30/120 Summer				7.538	-0.112	0.000	
11.001	8C	15 Winter	1	+0%	30/60 Summer				7.425	-0.110	0.000	
1.007	8	240 Winter	1	+0%	1/15 Winter				7.325	0.142	0.000	

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

		US/MH Flow / Overflow		Pipe Flow	Level	
PN	Name	Cap.	(l/s)	(l/s)	Status	Exceeded
1.000	3A	0.17		2.6	OK	
1.001	3B	0.08		1.2	OK	
2.000	3C	0.24		3.7	OK	
2.001	3D	0.07		1.1	OK	
1.002	3	0.05		3.1	OK	
3.000	4A	0.26		5.1	OK	
3.001	4B	0.05		3.8	OK	
4.000	4C	0.59		6.4	OK	
4.001	4D	0.14		6.4	OK	
1.003	4	0.23		15.4	OK	
5.000	10A	0.20		4.6	OK	
5.001	10B	0.01		0.4	OK	
6.000	10C	0.07		2.6	OK	
6.001	10D	0.07		1.7	OK	
1.004	5	0.31		20.2	OK	
7.000	32A	0.09		2.3	OK	
7.001	32B	0.02		0.9	OK	
7.002	32	0.04		1.5	OK	
1.005	6	0.27		21.8	OK	
8.000	42A	0.34		5.0	OK	
8.001	42B	0.04		1.5	OK	
8.002	42	0.05		3.5	OK	
9.000	7A	0.15		2.6	OK	
9.001	7B	0.07		1.2	OK	
1.006	7	0.08		11.4	OK	
10.000	8A	0.00		0.1	OK	
11.000	8B	0.14		2.3	OK	
11.001	8C	0.16		2.3	OK	
1.007	8	0.44		5.0	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	1.000
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	8	Number of Storage Structures	9
Number of Time/Area Diagrams	0	Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FEH	D3 (1km)	0.396
FEH Rainfall Version	1999	E (1km)	0.308
Site Location	GB 495800 104050 SU 95800 04050	F (1km)	2.327
C (1km)	-0.025	Cv (Summer)	0.750
D1 (1km)	0.403	Cv (Winter)	0.840
D2 (1km)	0.246		
Margin for Flood Risk Warning (mm)	450.0		
Analysis Timestep	2.5 Second	Increment (Extended)	
DTS Status	ON		
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, 30		

										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	3A	30 Winter	30	+0%	100/15 Summer				8.134	-0.069	0.000	
1.001	3B	30 Winter	30	+0%	100/15 Summer				8.127	-0.001	0.000	
2.000	3C	15 Winter	30	+0%	100/15 Summer				8.238	-0.052	0.000	
2.001	3D	60 Winter	30	+0%	100/15 Summer				8.189	-0.013	0.000	
1.002	3	15 Winter	30	+0%	100/240 Winter				7.853	-0.227	0.000	
3.000	4A	15 Winter	30	+0%	100/15 Summer				8.203	-0.047	0.000	
3.001	4B	15 Winter	30	+0%	100/360 Winter				7.987	-0.163	0.000	
4.000	4C	15 Winter	30	+0%	30/15 Summer				8.101	0.076	0.000	
4.001	4D	15 Winter	30	+0%	100/15 Summer				7.881	-0.119	0.000	
1.003	4	360 Winter	30	+0%	100/15 Summer				7.816	-0.080	0.000	
5.000	10A	15 Winter	30	+0%	100/15 Summer				8.226	-0.064	0.000	
5.001	10B	120 Winter	30	+0%	100/30 Winter				8.002	-0.073	0.000	
6.000	10C	15 Winter	30	+0%					8.124	-0.101	0.000	
6.001	10D	15 Winter	30	+0%	100/15 Summer				7.855	-0.035	0.000	
1.004	5	360 Winter	30	+0%	30/120 Winter				7.813	0.088	0.000	
7.000	32A	15 Winter	30	+0%	100/120 Summer				7.856	-0.094	0.000	
7.001	32B	480 Winter	30	+0%	30/240 Winter				7.816	0.041	0.000	
7.002	32	360 Winter	30	+0%	30/120 Summer				7.809	0.144	0.000	
1.005	6	360 Winter	30	+0%	30/60 Winter				7.809	0.218	0.000	
8.000	42A	480 Winter	30	+0%	30/15 Summer				7.827	0.027	0.000	
8.001	42B	480 Winter	30	+0%	30/15 Summer				7.826	0.079	0.000	
8.002	42	360 Winter	30	+0%	30/120 Summer				7.808	0.133	0.000	
9.000	7A	480 Winter	30	+0%	30/240 Summer				7.816	0.091	0.000	
9.001	7B	480 Winter	30	+0%	30/15 Summer				7.816	0.173	0.000	
1.006	7	360 Winter	30	+0%	30/60 Summer				7.808	0.250	0.000	
10.000	8A	360 Winter	30	+0%	30/60 Summer				7.806	0.266	0.000	
11.000	8B	360 Winter	30	+0%	30/120 Summer				7.807	0.157	0.000	
11.001	8C	360 Winter	30	+0%	30/60 Summer				7.806	0.271	0.000	
1.007	8	360 Winter	30	+0%	1/15 Winter				7.806	0.623	0.000	

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

		US/MH Flow / Overflow		Pipe Flow	Level	
PN	Name	Cap.	(l/s)	(l/s)	Status	Exceeded
1.000	3A	0.42		6.6	OK	
1.001	3B	0.13		1.8	OK	
2.000	3C	0.76		11.8	OK	
2.001	3D	0.11		1.7	OK	
1.002	3	0.13		8.3	OK	
3.000	4A	0.82		16.1	OK	
3.001	4B	0.17		11.9	OK	
4.000	4C	1.89		20.5	SURCHARGED	
4.001	4D	0.45		20.5	OK	
1.003	4	0.17		11.1	OK	
5.000	10A	0.63		14.6	OK	
5.001	10B	0.07		2.4	OK	
6.000	10C	0.23		8.4	OK	
6.001	10D	0.18		4.6	OK	
1.004	5	0.26		16.7	SURCHARGED	
7.000	32A	0.30		7.4	OK	
7.001	32B	0.02		0.9	SURCHARGED	
7.002	32	0.05		1.6	SURCHARGED	
1.005	6	0.23		18.3	SURCHARGED	
8.000	42A	0.15		2.1	SURCHARGED	
8.001	42B	0.04		1.7	SURCHARGED	
8.002	42	0.05		3.1	SURCHARGED	
9.000	7A	0.06		1.1	SURCHARGED	
9.001	7B	0.06		1.0	SURCHARGED	
1.006	7	0.16		22.5	SURCHARGED	
10.000	8A	0.00		0.1	FLOOD RISK	
11.000	8B	0.07		1.2	SURCHARGED	
11.001	8C	0.08		1.1	FLOOD RISK	
1.007	8	0.44		5.0	FLOOD RISK	

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	1.000
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	8	Number of Storage Structures	9
Number of Time/Area Diagrams	0	Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FEH	D3 (1km)	0.396
FEH Rainfall Version	1999	E (1km)	0.308
Site Location	GB 495800 104050 SU 95800 04050	F (1km)	2.327
C (1km)	-0.025	Cv (Summer)	0.750
D1 (1km)	0.403	Cv (Winter)	0.840
D2 (1km)	0.246		
Margin for Flood Risk Warning (mm)	450.0		
Analysis Timestep	2.5 Second	Increment (Extended)	
DTS Status	ON		
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, 30		

										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	3A	15 Winter	100	+30%	100/15 Summer				8.247	0.044	0.000	
1.001	3B	30 Winter	100	+30%	100/15 Summer				8.234	0.106	0.000	
2.000	3C	15 Winter	100	+30%	100/15 Summer				8.394	0.104	0.000	
2.001	3D	60 Winter	100	+30%	100/15 Summer				8.292	0.090	0.000	
1.002	3	480 Winter	100	+30%	100/240 Winter				8.182	0.102	0.000	
3.000	4A	15 Winter	100	+30%	100/15 Summer				8.404	0.154	0.000	
3.001	4B	480 Winter	100	+30%	100/360 Winter				8.181	0.031	0.000	
4.000	4C	15 Winter	100	+30%	30/15 Summer				8.565	0.540	0.000	
4.001	4D	480 Winter	100	+30%	100/15 Summer				8.181	0.181	0.000	
1.003	4	480 Winter	100	+30%	100/15 Summer				8.181	0.285	0.000	
5.000	10A	15 Winter	100	+30%	100/15 Summer				8.395	0.105	0.000	
5.001	10B	480 Winter	100	+30%	100/30 Winter				8.185	0.110	0.000	
6.000	10C	480 Winter	100	+30%					8.182	-0.043	0.000	
6.001	10D	480 Winter	100	+30%	100/15 Summer				8.181	0.291	0.000	
1.004	5	480 Winter	100	+30%	30/120 Winter				8.177	0.452	0.000	
7.000	32A	480 Winter	100	+30%	100/120 Summer				8.184	0.234	0.000	
7.001	32B	480 Winter	100	+30%	30/240 Winter				8.184	0.409	0.000	
7.002	32	480 Winter	100	+30%	30/120 Summer				8.174	0.509	0.000	
1.005	6	480 Winter	100	+30%	30/60 Winter				8.173	0.582	0.000	
8.000	42A	480 Winter	100	+30%	30/15 Summer				8.199	0.399	0.000	
8.001	42B	480 Winter	100	+30%	30/15 Summer				8.199	0.452	0.000	
8.002	42	480 Winter	100	+30%	30/120 Summer				8.173	0.498	0.000	
9.000	7A	480 Winter	100	+30%	30/240 Summer				8.198	0.473	0.000	
9.001	7B	480 Winter	100	+30%	30/15 Summer				8.204	0.561	0.000	
1.006	7	480 Winter	100	+30%	30/60 Summer				8.172	0.614	0.000	
10.000	8A	480 Winter	100	+30%	30/60 Summer				8.170	0.630	0.000	
11.000	8B	480 Winter	100	+30%	30/120 Summer				8.171	0.521	0.000	
11.001	8C	480 Winter	100	+30%	30/60 Summer				8.170	0.635	0.000	
1.007	8	480 Winter	100	+30%	1/15 Winter				8.170	0.987	0.000	

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

		US/MH Flow / Overflow		Pipe Flow	Level	
PN	Name	Cap.	(l/s)	(l/s)	Status	Exceeded
1.000	3A	1.05		16.2	FLOOD RISK	
1.001	3B	0.18		2.5	FLOOD RISK	
2.000	3C	1.50		23.3	SURCHARGED	
2.001	3D	0.15		2.4	SURCHARGED	
1.002	3	0.07		4.6	SURCHARGED	
3.000	4A	1.61		31.9	SURCHARGED	
3.001	4B	0.05		3.8	SURCHARGED	
4.000	4C	3.57		38.7	FLOOD RISK	
4.001	4D	0.11		4.9	SURCHARGED	
1.003	4	0.22		14.8	SURCHARGED	
5.000	10A	1.21		28.3	SURCHARGED	
5.001	10B	0.10		3.3	SURCHARGED	
6.000	10C	0.05		2.0	OK	
6.001	10D	0.08		1.9	SURCHARGED	
1.004	5	0.32		20.4	SURCHARGED	
7.000	32A	0.07		1.8	FLOOD RISK	
7.001	32B	0.02		1.2	FLOOD RISK	
7.002	32	0.05		1.8	FLOOD RISK	
1.005	6	0.26		20.8	SURCHARGED	
8.000	42A	0.26		3.7	FLOOD RISK	
8.001	42B	0.05		1.8	FLOOD RISK	
8.002	42	0.05		3.3	FLOOD RISK	
9.000	7A	0.11		1.9	FLOOD RISK	
9.001	7B	0.08		1.4	FLOOD RISK	
1.006	7	0.18		24.5	SURCHARGED	
10.000	8A	0.00		0.1	FLOOD RISK	
11.000	8B	0.10		1.6	FLOOD RISK	
11.001	8C	0.10		1.5	FLOOD RISK	
1.007	8	0.44		5.0	FLOOD RISK	