Existing Network Details 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
1.000	11.300	0.283	39.9	0.014	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	14.700	0.245	60.0	0.034	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	9.600	0.240	40.0	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit
1.002	23.200	0.574	40.4	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit
3.000	16.800	0.210	80.0	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit
3.001	10.700	0.134	79.9	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit
3.002	6.200	0.078	79.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
3.003	13.000	0.163	79.8	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit
3.004	9.200	0.359	25.6	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit
4.000	23.100	0.154	150.0	0.059	5.00	0.0	0.600	o	225	Pipe/Conduit
1.003	3.000	0.050	60.0	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit
5.000	6.100	0.076	80.3	0.026	5.00	0.0	0.600	o	225	Pipe/Conduit
1.004	1.500	0.000	0.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.005	1.600	0.019	84.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.006	4.150	0.120	34.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.007	18.400	0.123	149.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	16.333	0.014	0.0	1.22	9.6
1.001	16.050	0.048	0.0	1.30	23.0
2.000	16.045	0.016	0.0	1.60	28.2
1.002	15.805	0.094	0.0	2.06	82.1
3.000	16.250	0.014	0.0	1.12	19.9
3.001	16.040	0.030	0.0	1.13	19.9
3.002	15.906	0.030	0.0	1.13	19.9
3.003	15.828	0.041	0.0	1.13	19.9
3.004	15.665	0.052	0.0	2.00	35.3
4.000	15.385	0.059	0.0	1.07	42.4
1.003	15.156	0.219	0.0	2.03	143.7
5.000	15.182	0.026	0.0	1.46	58.1
1.004	14.206	0.245	0.0	0.00	0.0
1.005	14.206	0.245	0.0	1.71	121.2
1.006	14.187	0.245	0.0	2.68	189.6
1.007	14.015	0.245	0.0	1.28	90.7

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)
MHS1.0	17.300	0.967	Open Manhole	1200	1.000	16.333	100				
MHS1.1	17.100	1.050	Open Manhole	1200	1.001	16.050	150	1.000	16.050	100	
MHS2.0	16.850	0.805	Open Manhole	1200	2.000	16.045	150				
MHS1.2	16.900	1.095	Open Manhole	1200	1.002	15.805	225	1.001	15.805	150	
								2.000	15.805	150	
MHS3.0	16.850	0.600	Open Manhole	1200	3.000	16.250	150				
MHS3.1	16.700	0.660	Open Manhole	1200	3.001	16.040	150	3.000	16.040	150	
MHS3.2	16.700	0.794	Open Manhole	1200	3.002	15.906	150	3.001	15.906	150	
MHS3.3	16.700	0.872	Open Manhole	1200	3.003	15.828	150	3.002	15.828	150	
MHS3.4	16.700	1.035	Open Manhole	1200	3.004	15.665	150	3.003	15.665	150	
MHS4.0	16.600	1.215	Open Manhole	1200	4.000	15.385	225				
MHS1.3	16.600	1.444	Open Manhole	1200	1.003	15.156	300	1.002	15.231	225	
								3.004	15.306	150	
								4.000	15.231	225	
MHS5.0	16.500	1.318	Open Manhole	1200	5.000	15.182	225				
TANK	16.500	2.294	Open Manhole	1200	1.004	14.206	300	1.003	15.106	300	900
								5.000	15.106	225	825
Flow Control	16.500	2.294	Open Manhole	1200	1.005	14.206	300	1.004	14.206	300	
Interceptor	16.500	2.313	Open Manhole	1200	1.006	14.187	300	1.005	14.187	300	
MHS1.7	16.500	2.485	Open Manhole	1200	1.007	14.015	300	1.006	14.067	300	52
Public Sewer	15.720	1.828	Open Manhole	0		OUTFALL		1.007	13.892	300	

No coordinates have been specified, layout information cannot be produced.

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	100	MHS1.0	17.300	16.333	0.867	Open Manhole	1200
1.001	o	150	MHS1.1	17.100	16.050	0.900	Open Manhole	1200
2.000	o	150	MHS2.0	16.850	16.045	0.655	Open Manhole	1200
1.002	o	225	MHS1.2	16.900	15.805	0.870	Open Manhole	1200
3.000	o	150	MHS3.0	16.850	16.250	0.450	Open Manhole	1200
3.001	o	150	MHS3.1	16.700	16.040	0.510	Open Manhole	1200
3.002	o	150	MHS3.2	16.700	15.906	0.644	Open Manhole	1200
3.003	o	150	MHS3.3	16.700	15.828	0.722	Open Manhole	1200
3.004	o	150	MHS3.4	16.700	15.665	0.885	Open Manhole	1200
4.000	o	225	MHS4.0	16.600	15.385	0.990	Open Manhole	1200
1.003	o	300	MHS1.3	16.600	15.156	1.144	Open Manhole	1200
5.000	o	225	MHS5.0	16.500	15.182	1.093	Open Manhole	1200
1.004	o	300	TANK	16.500	14.206	1.994	Open Manhole	1200
1.005	o	300	Flow Control	16.500	14.206	1.994	Open Manhole	1200
1.006	o	300	Interceptor	16.500	14.187	2.013	Open Manhole	1200
1.007	o	300	MHS1.7	16.500	14.015	2.185	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	11.300	39.9	MHS1.1	17.100	16.050	0.950	Open Manhole	1200
1.001	14.700	60.0	MHS1.2	16.900	15.805	0.945	Open Manhole	1200
2.000	9.600	40.0	MHS1.2	16.900	15.805	0.945	Open Manhole	1200
1.002	23.200	40.4	MHS1.3	16.600	15.231	1.144	Open Manhole	1200
3.000	16.800	80.0	MHS3.1	16.700	16.040	0.510	Open Manhole	1200
3.001	10.700	79.9	MHS3.2	16.700	15.906	0.644	Open Manhole	1200
3.002	6.200	79.5	MHS3.3	16.700	15.828	0.722	Open Manhole	1200
3.003	13.000	79.8	MHS3.4	16.700	15.665	0.885	Open Manhole	1200
3.004	9.200	25.6	MHS1.3	16.600	15.306	1.144	Open Manhole	1200
4.000	23.100	150.0	MHS1.3	16.600	15.231	1.144	Open Manhole	1200
1.003	3.000	60.0	TANK	16.500	15.106	1.094	Open Manhole	1200
5.000	6.100	80.3	TANK	16.500	15.106	1.169	Open Manhole	1200
1.004	1.500	0.0	Flow Control	16.500	14.206	1.994	Open Manhole	1200
1.005	1.600	84.2	Interceptor	16.500	14.187	2.013	Open Manhole	1200
1.006	4.150	34.6	MHS1.7	16.500	14.067	2.133	Open Manhole	1200
1.007	18.400	149.6	Public Sewer	15.720	13.892	1.528	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)
1.007	Public Sewer	15.720	13.892	0.000	0	0

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	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)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: Flow Control, DS/PN: 1.005, Volume (m³): 2.6

Unit Reference	MD-SFP-0251-4000-1500-4000
Design Head (m)	1.500
Design Flow (l/s)	40.0
Flush-Flo™	Calculated
Objective	Future Proof
Application	Surface
Sump Available	Yes
Diameter (mm)	251
Invert Level (m)	14.206
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	40.0	Kick-Flo®	0.958	32.2
Flush-Flo™	0.409	39.8	Mean Flow over Head Range	-	33.4

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	8.6	0.800	36.5	2.000	45.9	4.000	64.1	7.000	84.1
0.200	27.1	1.000	32.9	2.200	48.0	4.500	67.9	7.500	87.0
0.300	39.1	1.200	35.9	2.400	50.1	5.000	71.4	8.000	89.8
0.400	39.8	1.400	38.7	2.600	52.1	5.500	74.8	8.500	92.4
0.500	39.5	1.600	41.2	3.000	55.8	6.000	78.0	9.000	95.1
0.600	38.7	1.800	43.6	3.500	60.1	6.500	81.1	9.500	97.6

Storage Structures for Storm

Cellular Storage Manhole: TANK, DS/PN: 1.004

Invert Level (m) 14.206 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	45.0	0.0	1.200	45.0	0.0	1.201	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 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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 26.250	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	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 20, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 1 year Winter I+0%	17.300	16.370	0.000	0.29	1.217	2.6	OK
1.001	15 minute 1 year Winter I+0%	17.100	16.114	0.000	0.37	4.173	7.9	OK
2.000	15 minute 1 year Winter I+0%	16.850	16.079	0.000	0.12	1.391	3.0	OK
1.002	15 minute 1 year Winter I+0%	16.900	15.875	0.000	0.21	8.172	15.6	OK
3.000	15 minute 1 year Winter I+0%	16.850	16.288	0.000	0.14	1.217	2.6	OK
3.001	15 minute 1 year Winter I+0%	16.700	16.095	0.000	0.29	2.608	5.1	OK
3.002	15 minute 1 year Winter I+0%	16.700	15.963	0.000	0.31	2.608	5.1	OK
3.003	15 minute 1 year Winter I+0%	16.700	15.892	0.000	0.38	3.564	6.8	OK
3.004	15 minute 1 year Winter I+0%	16.700	15.718	0.000	0.27	4.521	8.5	OK
4.000	15 minute 1 year Winter I+0%	16.600	15.467	0.000	0.28	5.129	10.8	OK
1.003	15 minute 1 year Winter I+0%	16.600	15.326	0.000	0.61	19.039	37.3	OK
5.000	15 minute 1 year Winter I+0%	16.500	15.235	0.000	0.12	2.260	4.8	OK
1.004	30 minute 1 year Winter I+0%	16.500	14.479	0.000	0.38	27.019	21.4	OK
1.005	30 minute 1 year Winter I+0%	16.500	14.458	0.000	0.39	27.007	21.4	OK
1.006	30 minute 1 year Winter I+0%	16.500	14.288	0.000	0.25	26.995	21.5	OK
1.007	30 minute 1 year Winter I+0%	16.500	14.122	0.000	0.27	26.979	21.5	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 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	M5-60 (mm) 26.250	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	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 20, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 30 year Winter I+20%	17.300	16.483	0.000	0.86	3.572	7.8	SURCHARGED
1.001	15 minute 30 year Winter I+20%	17.100	16.317	0.000	1.20	12.246	25.5	SURCHARGED
2.000	15 minute 30 year Winter I+20%	16.850	16.106	0.000	0.35	4.082	8.7	OK
1.002	15 minute 30 year Winter I+20%	16.900	15.943	0.000	0.68	23.982	50.9	OK
3.000	15 minute 30 year Winter I+20%	16.850	16.317	0.000	0.41	3.572	7.6	OK
3.001	15 minute 30 year Winter I+20%	16.700	16.193	0.000	0.87	7.654	15.5	SURCHARGED
3.002	15 minute 30 year Winter I+20%	16.700	16.100	0.000	0.92	7.654	15.3	SURCHARGED
3.003	15 minute 30 year Winter I+20%	16.700	16.040	0.000	1.11	10.460	20.2	SURCHARGED
3.004	15 minute 30 year Winter I+20%	16.700	15.838	0.000	0.83	13.266	25.9	SURCHARGED
4.000	15 minute 30 year Winter I+20%	16.600	15.708	0.000	0.81	15.052	31.5	SURCHARGED
1.003	15 minute 30 year Winter I+20%	16.600	15.605	0.000	1.86	55.872	114.4	SURCHARGED
5.000	15 minute 30 year Winter I+20%	16.500	15.276	0.000	0.36	6.633	14.2	OK
1.004	30 minute 30 year Winter I+20%	16.500	15.112	0.000	0.75	77.710	41.6	SURCHARGED
1.005	15 minute 30 year Winter I+20%	16.500	15.086	0.000	0.72	61.167	39.7	SURCHARGED
1.006	60 minute 30 year Summer I+20%	16.500	14.329	0.000	0.46	88.136	39.7	OK
1.007	15 minute 30 year Winter I+20%	16.500	14.166	0.000	0.51	61.105	39.7	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 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	M5-60 (mm) 26.250	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	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 20, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 100 year Winter I+20%	17.300	16.815	0.000	1.10	4.678	10.0	SURCHARGED
1.001	15 minute 100 year Winter I+20%	17.100	16.566	0.000	1.41	16.038	29.8	SURCHARGED
2.000	15 minute 100 year Winter I+20%	16.850	16.119	0.000	0.46	5.346	11.4	OK
1.002	15 minute 100 year Winter I+20%	16.900	16.079	0.000	0.81	31.409	60.8	SURCHARGED
3.000	15 minute 100 year Winter I+20%	16.850	16.468	0.000	0.49	4.678	9.1	SURCHARGED
3.001	15 minute 100 year Winter I+20%	16.700	16.428	0.000	0.93	10.024	16.6	FLOOD RISK
3.002	15 minute 100 year Winter I+20%	16.700	16.309	0.000	1.07	10.024	17.9	SURCHARGED
3.003	15 minute 100 year Winter I+20%	16.700	16.240	0.000	1.25	13.700	22.8	SURCHARGED
3.004	15 minute 100 year Winter I+20%	16.700	16.001	0.000	0.93	17.375	28.8	SURCHARGED
4.000	30 minute 100 year Winter I+20%	16.600	15.945	0.000	0.83	25.609	32.1	SURCHARGED
1.003	30 minute 100 year Winter I+20%	16.600	15.921	0.000	1.89	95.048	115.9	SURCHARGED
5.000	30 minute 100 year Winter I+20%	16.500	15.845	0.000	0.37	11.279	14.4	SURCHARGED
1.004	30 minute 100 year Winter I+20%	16.500	15.841	0.000	0.76	99.604	42.5	SURCHARGED
1.005	30 minute 100 year Winter I+20%	16.500	15.766	0.000	0.72	99.349	39.9	SURCHARGED
1.006	30 minute 100 year Winter I+20%	16.500	14.330	0.000	0.46	99.193	40.0	OK
1.007	30 minute 100 year Winter I+20%	16.500	14.167	0.000	0.51	99.030	40.0	OK