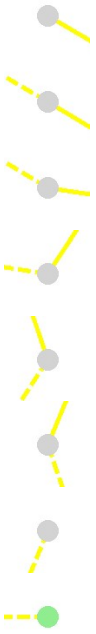
Manhole Schedules for Storm

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)
2	116.800	1.425	Open Manhole	1200	1.000	115.375	225				
3	115.050	2.100	Open Manhole	1200	1.001	112.950	300	1.000	113.025	225	
4	112.250	1.800	Open Manhole	1200	1.002	110.450	300	1.001	110.450	300	
5	111.450	1.550	Open Manhole	1200	1.003	109.900	300	1.002	109.900	300	
6	110.750	1.750	Open Manhole	1200	1.004	109.000	300	1.003	109.000	300	
7	110.800	3.800	Open Manhole	1500	1.005	107.000	600	1.004	108.100	300	800
8	110.200	3.300	Open Manhole	1500	1.006	106.900	150	1.005	106.950	600	500
	111.340	4.580	Open Manhole	0		OUTFALL		1.006	106.760	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	414568.192	415416.673	414568.192	415416.673	Required	
3	414598.629	415398.855	414598.629	415398.855	Required	
4	414631.800	415378.975	414631.800	415378.975	Required	
5	414641.060	415377.562	414641.060	415377.562	Required	
6	414647.124	415386.791	414647.124	415386.791	Required	
7	414644.029	415395.842	414644.029	415395.842	Required	
8	414648.030	415405.507	414648.030	415405.507	Required	
	414658.101	415405.507			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	225	2	116.800	115.375	1.200	Open Manhole	1200
1.001	o	300	3	115.050	112.950	1.800	Open Manhole	1200
1.002	o	300	4	112.250	110.450	1.500	Open Manhole	1200
1.003	o	300	5	111.450	109.900	1.250	Open Manhole	1200
1.004	o	300	6	110.750	109.000	1.450	Open Manhole	1200
1.005	o	600	7	110.800	107.000	3.200	Open Manhole	1500
1.006	o	150	8	110.200	106.900	3.150	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	35.269	15.0	3	115.050	113.025	1.800	Open Manhole	1200
1.001	38.672	15.5	4	112.250	110.450	1.500	Open Manhole	1200
1.002	9.367	17.0	5	111.450	109.900	1.250	Open Manhole	1200
1.003	11.044	12.3	6	110.750	109.000	1.450	Open Manhole	1200
1.004	9.566	10.6	7	110.800	108.100	2.400	Open Manhole	1500
1.005	10.580	211.6	8	110.200	106.950	2.650	Open Manhole	1500
1.006	10.071	71.9		111.340	106.760	4.430	Open Manhole	0

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
1.000	2	225	1.200	1.800	Unclassified	1200	0	1.200	Unclassified
1.001	3	300	1.500	1.800	Unclassified	1200	0	1.800	Unclassified
1.002	4	300	1.250	1.500	Unclassified	1200	0	1.500	Unclassified
1.003	5	300	1.250	1.450	Unclassified	1200	0	1.250	Unclassified
1.004	6	300	1.450	2.400	Unclassified	1200	0	1.450	Unclassified
1.005	7	600	2.650	3.200	Unclassified	1500	0	3.200	Unclassified
1.006	8	150	3.150	4.430	Unclassified	1500	0	3.150	Unclassified

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)
1.006		111.340	106.760	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)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.317		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 8, DS/PN: 1.006, Volume (m³): 8.4

Unit Reference	MD-SHE-0081-5000-3300-5000
Design Head (m)	3.300
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	81
Invert Level (m)	106.900
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)	3.300	5.0	Kick-Flo®	0.723	2.5
Flush-Flo™	0.349	3.1	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	7.1
0.200	3.0	1.000	2.9	2.200	4.1	4.500	5.8	7.500	7.4
0.300	3.1	1.200	3.1	2.400	4.3	5.000	6.1	8.000	7.6
0.400	3.1	1.400	3.4	2.600	4.5	5.500	6.4	8.500	7.8
0.500	3.0	1.600	3.6	3.000	4.8	6.000	6.6	9.000	8.0
0.600	2.9	1.800	3.8	3.500	5.1	6.500	6.9	9.500	8.2

Storage Structures for Storm

Tank or Pond Manhole: 7, DS/PN: 1.005

Invert Level (m) 107.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	170.0	2.500	170.0	2.501	0.0

Manhole Headloss for Storm

PN	US/MH Name	US/MH Headloss
1.000	2	0.500
1.001	3	0.500
1.002	4	0.500
1.003	5	0.500
1.004	6	0.500
1.005	7	0.500
1.006	8	0.500

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) 19.000	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.317	Cv (Winter) 0.850

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, 4320, 5760
Return Period(s) (years)	1, 30, 100
Climate Change (%)	30, 30, 30

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	2	15 Winter	1	+30%					115.424	-0.176
1.001	3	15 Winter	1	+30%					113.031	-0.219
1.002	4	15 Winter	1	+30%	30/15 Summer				110.573	-0.177
1.003	5	15 Winter	1	+30%	100/15 Summer				110.011	-0.189
1.004	6	15 Winter	1	+30%	100/15 Summer				109.111	-0.189
1.005	7	360 Winter	1	+30%	30/30 Winter				107.416	-0.184
1.006	8	360 Winter	1	+30%	1/15 Summer				107.455	0.405

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	2	0.000	0.11			13.7	OK	
1.001	3	0.000	0.16			42.2	OK	
1.002	4	0.000	0.35			64.5	OK	
1.003	5	0.000	0.29			69.1	OK	
1.004	6	0.000	0.29			69.5	OK	
1.005	7	0.000	0.06			16.8	OK	
1.006	8	0.000	0.17			3.1	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 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) 19.000	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.317	Cv (Winter) 0.850

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, 4320, 5760
Return Period(s) (years)	1, 30, 100
Climate Change (%)	30, 30, 30

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	2	15 Winter	30	+30%					115.454	-0.146
1.001	3	15 Winter	30	+30%					113.094	-0.156
1.002	4	15 Winter	30	+30%	30/15 Summer				110.775	0.025
1.003	5	15 Winter	30	+30%	100/15 Summer				110.115	-0.085
1.004	6	15 Winter	30	+30%	100/15 Summer				109.215	-0.085
1.005	7	480 Winter	30	+30%	30/30 Winter				108.258	0.658
1.006	8	480 Winter	30	+30%	1/15 Summer				108.389	1.339

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	2	0.000	0.26			33.5	OK	
1.001	3	0.000	0.46			121.6	OK	
1.002	4	0.000	1.02			189.0	SURCHARGED	
1.003	5	0.000	0.85			200.9	OK	
1.004	6	0.000	0.84			200.5	OK	
1.005	7	0.000	0.03			9.2	SURCHARGED	
1.006	8	0.000	0.17			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 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) 19.000	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.317	Cv (Winter) 0.850

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, 4320, 5760
Return Period(s) (years)	1, 30, 100
Climate Change (%)	30, 30, 30

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	2	15 Winter	100	+30%					115.466	-0.134
1.001	3	15 Winter	100	+30%					113.118	-0.132
1.002	4	15 Winter	100	+30%	30/15 Summer				111.264	0.514
1.003	5	15 Winter	100	+30%	100/15 Summer				110.359	0.159
1.004	6	15 Winter	100	+30%	100/15 Summer				109.369	0.069
1.005	7	600 Winter	100	+30%	30/30 Winter				108.714	1.114
1.006	8	360 Winter	100	+30%	1/15 Summer				108.841	1.791

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	2	0.000	0.34			43.2	OK	
1.001	3	0.000	0.60			157.1	OK	
1.002	4	0.000	1.27			235.7	SURCHARGED	
1.003	5	0.000	1.05			249.0	SURCHARGED	
1.004	6	0.000	1.05			248.5	SURCHARGED	
1.005	7	0.000	0.03			10.0	SURCHARGED	
1.006	8	0.000	0.19			3.6	SURCHARGED	