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 Storage Structures	10
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

Online Controls for Storm

Hydro-Brake Optimum® Manhole: SFCC1, DS/PN: S1.009, Volume (m³): 9.4

Unit Reference	MD-SHE-0086-3600-1250-3600
Design Head (m)	1.250
Design Flow (l/s)	3.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	86
Invert Level (m)	121.250
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.250	3.6
Flush-Flo™	0.378	3.6
Kick-Flo®	0.770	2.9
Mean Flow over Head Range	-	3.2

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)
0.100	2.6	1.200	3.5	3.000	5.4	7.000	8.1
0.200	3.4	1.400	3.8	3.500	5.8	7.500	8.3
0.300	3.6	1.600	4.0	4.000	6.2	8.000	8.6
0.400	3.6	1.800	4.3	4.500	6.5	8.500	8.8
0.500	3.5	2.000	4.5	5.000	6.9	9.000	9.1
0.600	3.4	2.200	4.7	5.500	7.2	9.500	9.3
0.800	2.9	2.400	4.9	6.000	7.5		
1.000	3.2	2.600	5.1	6.500	7.8		

Storage Structures for Storm

Porous Car Park Manhole: S5, DS/PN: S1.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	27.8
Max Percolation (l/s)	37.1	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.595	Cap Volume Depth (m)	0.225

Porous Car Park Manhole: S6, DS/PN: S2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	26.7	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.595	Cap Volume Depth (m)	0.225

Porous Car Park Manhole: S8, DS/PN: S1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	22.5
Max Percolation (l/s)	30.0	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.045	Cap Volume Depth (m)	0.225

Tank or Pond Manhole: SHW2, DS/PN: S1.007

Invert Level (m) 121.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	35.4	0.800	147.5	0.801	0.0

Porous Car Park Manhole: S11, DS/PN: S3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	27.5
Max Percolation (l/s)	36.7	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.695	Cap Volume Depth (m)	0.225

Porous Car Park Manhole: S12, DS/PN: S3.001

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1000	Porosity	0.30
Max Percolation (l/s)	30.0	Invert Level (m)	123.195

Porous Car Park Manhole: S12, DS/PN: S3.001

Width (m)	4.8	Depression Storage (mm)	5
Length (m)	22.5	Evaporation (mm/day)	3
Slope (1:X)	60.0	Cap Volume Depth (m)	0.225

Tank or Pond Manhole: S13, DS/PN: S1.008

Invert Level (m) 121.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	65.0	1.200	65.0

Filter Drain Manhole: S16, DS/PN: S4.002

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.300
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.30	Slope (1:X)	150.0
Invert Level (m)	123.340	Cap Volume Depth (m)	1.260
Trench Width (m)	0.6	Cap Infiltration Depth (m)	0.000
Trench Length (m)	18.0		

Porous Car Park Manhole: S22, DS/PN: S5.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	16.8
Max Percolation (l/s)	22.4	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	122.595	Cap Volume Depth (m)	0.225

Tank or Pond Manhole: S23, DS/PN: S4.008

Invert Level (m) 121.265

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	384.0	1.200	384.0	1.201	0.0

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 Storage Structures	10
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	504500 224400 TL 04500 24400
C (1km)	-0.027
D1 (1km)	0.320
D2 (1km)	0.266
D3 (1km)	0.299
E (1km)	0.323
F (1km)	2.434
Cv (Summer)	0.750
Cv (Winter)	0.840

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)	60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Sensitivity flows(s) (%)	0, +40

PN	US/MH Name	Storm	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	60 Summer	+40%	+0%/60 Summer				124.509
S1.001	S2	60 Summer	+40%	+0%/60 Summer				124.221
S1.002	S3	60 Summer	+40%	+40%/60 Summer				123.623
S1.003	S4	60 Summer	+40%					123.289
S1.004	S5	60 Summer	+40%	+40%/60 Summer				123.107
S2.000	S6	60 Summer	+40%	+40%/60 Summer				123.665
S2.001	S7	60 Summer	+40%	+0%/60 Summer				123.103
S1.005	S8	60 Summer	+40%	+0%/60 Summer				122.855
S1.006	SHW1	720 Winter	+40%	+0%/60 Summer				122.498
S1.007	SHW2	720 Winter	+40%	+40%/360 Winter				122.497
S3.000	S11	60 Summer	+40%					123.105
S3.001	S12	60 Summer	+40%					122.585

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.659	0.000	1.51		57.7	FLOOD RISK	
S1.001	S2	0.496	0.000	1.76		70.0	SURCHARGED	
S1.002	S3	0.088	0.000	1.21		100.8	SURCHARGED	
S1.003	S4	-0.036	0.000	0.75		104.4	OK	
S1.004	S5	0.107	0.000	0.62		115.2	SURCHARGED	
S2.000	S6	0.615	0.000	1.06		24.7	SURCHARGED	
S2.001	S7	0.553	0.000	1.58		24.7	SURCHARGED	
S1.005	S8	0.405	0.000	1.35		151.3	SURCHARGED	
S1.006	SHW1	0.248	0.000	0.21		19.9	SURCHARGED	
S1.007	SHW2	0.097	0.000	0.03		19.7	SURCHARGED	
S3.000	S11	-0.045	0.000	0.83		29.0	OK	
S3.001	S12	-0.065	0.000	0.62		29.0	OK	

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

PN	US/MH Name	Storm	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.008	S13	720 Winter	+40%	+0%/60 Winter				122.496
S4.000	S14	60 Summer	+40%	+0%/60 Summer				124.582
S4.001	S15	60 Summer	+40%	+0%/60 Summer				123.964
S4.002	S16	60 Summer	+40%	+0%/60 Summer				123.884
S4.003	S17	60 Summer	+40%	+0%/60 Summer				123.743
S4.004	S18	60 Summer	+40%	+40%/60 Summer				123.631
S4.005	S19	60 Summer	+40%	+40%/60 Summer				123.396
S4.006	S20	60 Summer	+40%					123.183
S4.007	S21	60 Summer	+40%					122.796
S5.000	S22	720 Winter	+40%	+0%/240 Winter				122.497
S4.008	S23	720 Winter	+40%	+0%/60 Winter				122.496
S1.009	SFCC1	720 Winter	+40%	+0%/60 Summer				122.501

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.008	S13	0.596	0.000	0.09		25.0	SURCHARGED	
S4.000	S14	0.732	0.000	1.78		70.6	FLOOD RISK	
S4.001	S15	0.304	0.000	1.35		70.8	SURCHARGED	
S4.002	S16	0.244	0.000	1.08		84.3	SURCHARGED	
S4.003	S17	0.223	0.000	1.58		84.2	SURCHARGED	
S4.004	S18	0.126	0.000	1.20		97.0	SURCHARGED	
S4.005	S19	0.051	0.000	1.33		96.9	SURCHARGED	
S4.006	S20	-0.077	0.000	0.88		122.9	OK	
S4.007	S21	-0.154	0.000	0.47		122.2	OK	
S5.000	S22	0.447	0.000	0.12		2.4	SURCHARGED	
S4.008	S23	0.631	0.000	0.02		4.2	SURCHARGED	
S1.009	SFCC1	1.101	0.000	0.25		3.6	SURCHARGED	