


Curtins		Page 1
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm 1

Pipe Sizes BR Manhole Sizes STANDARD










FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.434	Minimum Backdrop Height (m)	19.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	20.000
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.	0.750	Min Slope for Optimisation (1:X)	250

Designed with Level Soffits

Network Design Table for Storm 1

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

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	21.282	0.142	149.9	0.055	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	39.398	0.145	271.7	0.042	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	44.851	0.345	130.0	0.047	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	10.623	0.071	150.0	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	19.943	0.130	153.4	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	29.723	0.200	148.6	0.066	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	6.505	0.055	118.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	24.251	0.160	151.6	0.054	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	47.066	0.320	147.1	0.038	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	5.43	84.350	0.055	0.0	0.0	0.0	0.82	14.5	7.5
1.001	50.00	6.13	83.700	0.098	0.0	0.0	0.0	0.95	67.1	13.2
2.000	50.00	5.65	83.900	0.047	0.0	0.0	0.0	1.15	45.5	6.4
1.002	50.00	6.26	83.480	0.157	0.0	0.0	0.0	1.28	90.6	21.2
1.003	50.00	6.53	83.400	0.194	0.0	0.0	0.0	1.27	89.6	26.3
3.000	50.00	5.46	83.600	0.066	0.0	0.0	0.0	1.07	42.6	8.9
3.001	50.00	5.55	83.400	0.066	0.0	0.0	0.0	1.20	47.8	8.9
1.004	50.00	6.84	83.270	0.314	0.0	0.0	0.0	1.27	90.1	42.5
1.005	50.00	7.45	83.110	0.352	0.0	0.0	0.0	1.29	91.5	47.6

Curtins		Page 2
40 Compton Street London EC1V 0BD		066571 - Shredded Wheat
Date 22/02/2019 File SW Network for tender.MDX		Designed by JW Checked by
Innovyze		Network 2018.1.1



Network Design Table for Storm 1

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
4.000	17.414	0.095	183.3	0.011	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
5.000	13.251	0.095	139.5	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
4.001	21.334	0.140	152.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
1.006	24.745	0.170	145.6	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
1.007	6.401	0.028	225.0	0.008	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
6.000	32.240	0.215	150.0	0.057	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
6.001	43.000#	0.213	201.5	0.167	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
1.008	31.447	0.210	149.7	0.042	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
1.009	7.873	0.930	8.5	0.000	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)
4.000	50.00	5.39	84.350	0.011	0.0	0.0	0.0	0.74	13.1	1.5
5.000	50.00	5.26	84.350	0.012	0.0	0.0	0.0	0.85	15.0	1.7
4.001	50.00	5.73	84.180	0.024	0.0	0.0	0.0	1.06	42.0	3.2
1.006	50.00	7.77	82.170	0.405	0.0	0.0	0.0	1.30	92.0	54.9
1.007	50.00	7.87	82.000	0.413	0.0	0.0	0.0	1.04	73.8	55.9
6.000	50.00	5.66	83.410	0.057	0.0	0.0	0.0	0.82	14.5	7.7
6.001	50.00	6.44	82.260	0.224	0.0	0.0	0.0	0.92	36.5	30.3
1.008	50.00	8.28	81.960	0.678	0.0	0.0	0.0	1.28	90.7«	91.8
1.009	50.00	8.31	81.750	0.678	0.0	0.0	0.0	3.48	61.6«	91.8

Curtins		Page 3
40 Compton Street London EC1V 0BD		066571 - Shredded Wheat
Date 22/02/2019 File SW Network for tender.MDX		Designed by JW Checked by
Innovyze		Network 2018.1.1



Manhole Schedules for Storm 1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)	
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)		Diameter (mm)
RE	85.000	0.650	Junction		1.000	84.350	150				
SW01	84.800	1.100	Open Manhole	1200	1.001	83.700	300	1.000	84.208	150	358
RE	85.000	1.100	Junction		2.000	83.900	225				
SW02	84.800	1.320	Open Manhole	1200	1.002	83.480	300	1.001	83.555	300	75
					2.000	83.555	225				
SW03	84.800	1.400	Open Manhole	1200	1.003	83.400	300	1.002	83.409	300	9
RE	84.800	1.200	Junction		3.000	83.600	225				
SW39	85.000	1.600	Open Manhole	1200	3.001	83.400	225	3.000	83.400	225	
Junction	84.800	1.530	Junction		1.004	83.270	300	1.003	83.270	300	
					3.001	83.345	225				
SW04	84.800	1.690	Open Manhole	1200	1.005	83.110	300	1.004	83.110	300	
RE	85.000	0.650	Junction		4.000	84.350	150				
RE	85.000	0.650	Junction		5.000	84.350	150				
SW10	84.800	0.620	Open Manhole	1200	4.001	84.180	225	4.000	84.255	150	
					5.000	84.255	150				
SW05	84.800	2.630	Open Manhole	1200	1.006	82.170	300	1.005	82.790	300	620
					4.001	84.040	225				1795
SW06	84.800	2.800	Open Manhole	1200	1.007	82.000	300	1.006	82.000	300	
RE	84.760	1.350	Junction		6.000	83.410	150				
SW09	84.800	2.540	Open Manhole	1200	6.001	82.260	225	6.000	83.195	150	860
SW07	84.800	2.840	Open Manhole	1200	1.008	81.960	300	1.007	81.972	300	12
					6.001	82.047	225				12
SW08	84.400	2.650	Open Manhole	1200	1.009	81.750	150	1.008	81.750	300	
Outfall 1	84.290	3.470	Open Manhole	0		OUTFALL		1.009	80.820	150	

Curtins		Page 4
40 Compton Street London EC1V 0BD		
Date 22/02/2019 File SW Network for tender.MDX		
		066571 - Shredded Wheat
		Designed by JW Checked by
Innovyze		Network 2018.1.1

PIPELINE SCHEDULES for Storm 1


Upstream Manhole

- Indicates pipe length does not match coordinates

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	RE	85.000	84.350	0.500	Junction	
1.001	o	300	SW01	84.800	83.700	0.800	Open Manhole	1200
2.000	o	225	RE	85.000	83.900	0.875	Junction	
1.002	o	300	SW02	84.800	83.480	1.020	Open Manhole	1200
1.003	o	300	SW03	84.800	83.400	1.100	Open Manhole	1200
3.000	o	225	RE	84.800	83.600	0.975	Junction	
3.001	o	225	SW39	85.000	83.400	1.375	Open Manhole	1200
1.004	o	300	Junction	84.800	83.270	1.230	Junction	
1.005	o	300	SW04	84.800	83.110	1.390	Open Manhole	1200
4.000	o	150	RE	85.000	84.350	0.500	Junction	
5.000	o	150	RE	85.000	84.350	0.500	Junction	
4.001	o	225	SW10	84.800	84.180	0.395	Open Manhole	1200
1.006	o	300	SW05	84.800	82.170	2.330	Open Manhole	1200
1.007	o	300	SW06	84.800	82.000	2.500	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	21.282	149.9	SW01	84.800	84.208	0.442	Open Manhole	1200
1.001	39.398	271.7	SW02	84.800	83.555	0.945	Open Manhole	1200
2.000	44.851	130.0	SW02	84.800	83.555	1.020	Open Manhole	1200
1.002	10.623	150.0	SW03	84.800	83.409	1.091	Open Manhole	1200
1.003	19.943	153.4	Junction	84.800	83.270	1.230	Junction	
3.000	29.723	148.6	SW39	85.000	83.400	1.375	Open Manhole	1200
3.001	6.505	118.3	Junction	84.800	83.345	1.230	Junction	
1.004	24.251	151.6	SW04	84.800	83.110	1.390	Open Manhole	1200
1.005	47.066	147.1	SW05	84.800	82.790	1.710	Open Manhole	1200
4.000	17.414	183.3	SW10	84.800	84.255	0.395	Open Manhole	1200
5.000	13.251	139.5	SW10	84.800	84.255	0.395	Open Manhole	1200
4.001	21.334	152.4	SW05	84.800	84.040	0.535	Open Manhole	1200
1.006	24.745	145.6	SW06	84.800	82.000	2.500	Open Manhole	1200
1.007	6.401	225.0	SW07	84.800	81.972	2.528	Open Manhole	1200

Curtins		Page 5
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

PIPELINE SCHEDULES for Storm 1

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)
6.000	o	150	RE	84.760	83.410	1.200	Junction	
6.001	o	225	SW09	84.800	82.260	2.315	Open Manhole	1200
1.008	o	300	SW07	84.800	81.960	2.540	Open Manhole	1200
1.009	o	150	SW08	84.400	81.750	2.500	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)
6.000	32.240	150.0	SW09	84.800	83.195	1.455	Open Manhole	1200
6.001	43.000#	201.5	SW07	84.800	82.047	2.528	Open Manhole	1200
1.008	31.447	149.7	SW08	84.400	81.750	2.350	Open Manhole	1200
1.009	7.873	8.5	Outfall 1	84.290	80.820	3.320	Open Manhole	0

Area Summary for Storm 1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	Classification	Default	100	0.038	0.038	0.038
	Classification	Default	100	0.017	0.017	0.055
1.001	Classification	Default	100	0.029	0.029	0.029
	Classification	Default	100	0.013	0.013	0.042
2.000	Classification	Default	100	0.047	0.047	0.047
1.002	Classification	Default	100	0.012	0.012	0.012
1.003	Classification	Default	100	0.020	0.020	0.020
	Classification	Default	100	0.017	0.017	0.037
3.000	Classification	Default	100	0.066	0.066	0.066
3.001	-	-	100	0.000	0.000	0.000
1.004	Classification	Default	100	0.022	0.022	0.022
	Classification	Default	100	0.032	0.032	0.054
1.005	Classification	Default	100	0.038	0.038	0.038
4.000	Classification	Default	100	0.011	0.011	0.011
5.000	Classification	Default	100	0.012	0.012	0.012
4.001	-	-	100	0.000	0.000	0.000
1.006	Classification	Default	100	0.030	0.030	0.030
1.007	Classification	Default	100	0.008	0.008	0.008
6.000	Classification	Default	100	0.057	0.057	0.057
6.001	Classification	Default	100	0.167	0.167	0.167
1.008	Classification	Default	100	0.042	0.042	0.042
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.678	0.678	0.678

Free Flowing Outfall Details for Storm 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	Outfall 1	84.290	80.820	80.820	0	0


Simulation Criteria for Storm 1

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	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 11 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)	20.000	Storm Duration (mins)	30
Ratio R	0.434		

Curtins		Page 7
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

Online Controls for Storm 1


Hydro-Brake® Optimum Manhole: SW08, DS/PN: 1.009, Volume (m³): 5.1

Unit Reference	MD-SHE-0108-6900-2000-6900
Design Head (m)	2.000
Design Flow (l/s)	6.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	108
Invert Level (m)	81.750
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	6.9	Kick-Flo®	0.966	4.9
Flush-Flo™	0.471	6.2	Mean Flow over Head Range	-	5.7

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	3.7	1.200	5.4	3.000	8.3	7.000	12.5
0.200	5.5	1.400	5.8	3.500	9.0	7.500	12.9
0.300	6.0	1.600	6.2	4.000	9.6	8.000	13.3
0.400	6.2	1.800	6.6	4.500	10.1	8.500	13.7
0.500	6.2	2.000	6.9	5.000	10.6	9.000	14.1
0.600	6.1	2.200	7.2	5.500	11.1	9.500	14.4
0.800	5.8	2.400	7.5	6.000	11.6		
1.000	5.0	2.600	7.8	6.500	12.0		

Curtins		Page 8
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

Storage Structures for Storm 1

Porous Car Park Manhole: RE, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	46.0
Max Percolation (l/s)	63.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	84.350	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: SW01, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	42.0
Max Percolation (l/s)	58.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	83.700	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: RE, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	40.0
Max Percolation (l/s)	55.6	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	83.900	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: SW03, DS/PN: 1.003


Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	26.0
Max Percolation (l/s)	36.1	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	83.400	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: SW04, DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	45.0
Max Percolation (l/s)	62.5	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	83.110	Cap Volume Depth (m)	0.450

Porous Car Park Manhole: RE, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	6.0
Max Percolation (l/s)	8.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	84.350	Cap Volume Depth (m)	0.450

Curtins		Page 9
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019	Designed by JW	
File SW Network for tender.MDX	Checked by	
Innovyze	Network 2018.1.1	

Cellular Storage Manhole: SW05, DS/PN: 1.006

Invert Level (m) 82.170 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	88.0	0.0	1.601	0.0	0.0
1.600	88.0	0.0			

Porous Car Park Manhole: SW06, DS/PN: 1.007

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 3.7
 Membrane Percolation (mm/hr) 1000 Length (m) 30.0
 Max Percolation (l/s) 30.8 Slope (1:X) 0.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 82.000 Cap Volume Depth (m) 0.450

Porous Car Park Manhole: RE, DS/PN: 6.000

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 5.0
 Membrane Percolation (mm/hr) 1000 Length (m) 15.0
 Max Percolation (l/s) 20.8 Slope (1:X) 0.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 83.410 Cap Volume Depth (m) 0.450

Complex Manhole: SW07, DS/PN: 1.008

Cellular Storage

Invert Level (m) 81.960 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	136.0	0.0	1.601	0.0	0.0
1.600	136.0	0.0			


Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 7.0
 Membrane Percolation (mm/hr) 1000 Length (m) 37.5
 Max Percolation (l/s) 72.9 Slope (1:X) 0.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 81.960 Cap Volume Depth (m) 0.450

Tank or Pond Manhole: SW08, DS/PN: 1.009

Invert Level (m) 83.775

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	75.0	0.625	75.0

Curtins		Page 10
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

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

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 Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 11 Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.434 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, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	RE	60 Winter	1	+0%					84.387	-0.113
1.001	SW01	60 Winter	1	+0%					83.741	-0.259
2.000	RE	60 Winter	1	+0%					83.931	-0.194
1.002	SW02	60 Winter	1	+0%					83.535	-0.245
1.003	SW03	60 Winter	1	+0%					83.456	-0.244
3.000	RE	15 Winter	1	+0%					83.672	-0.153
3.001	SW39	15 Winter	1	+0%	100/15 Summer				83.482	-0.143
1.004	Junction	15 Winter	1	+0%					83.357	-0.213
1.005	SW04	30 Winter	1	+0%	100/30 Winter				83.192	-0.218
4.000	RE	15 Winter	1	+0%					84.378	-0.122
5.000	RE	15 Winter	1	+0%					84.384	-0.116
4.001	SW10	15 Winter	1	+0%					84.217	-0.188
1.006	SW05	60 Winter	1	+0%	30/120 Winter				82.254	-0.216
1.007	SW06	240 Winter	1	+0%	30/30 Winter				82.140	-0.160
6.000	RE	15 Winter	1	+0%	100/15 Summer				83.475	-0.085
6.001	SW09	15 Winter	1	+0%	30/15 Summer				82.399	-0.086
1.008	SW07	240 Winter	1	+0%	30/30 Summer				82.137	-0.123
1.009	SW08	240 Winter	1	+0%	1/15 Summer				82.130	0.230

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	Flow (l/s)		
1.000	RE	0.000	0.14		2.0	OK*	
1.001	SW01	0.000	0.05		2.9	OK	
2.000	RE	0.000	0.05		2.1	OK*	
1.002	SW02	0.000	0.08		5.1	OK	
1.003	SW03	0.000	0.08		6.2	OK	

Curtins		Page 11
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

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

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	RE	0.000	0.22	9.2	OK*	
3.001	SW39	0.000	0.28	9.3	OK	
1.004	Junction	0.000	0.19	16.7	OK*	
1.005	SW04	0.000	0.17	14.5	OK	
4.000	RE	0.000	0.08	1.0	OK*	
5.000	RE	0.000	0.12	1.7	OK*	
4.001	SW10	0.000	0.07	2.5	OK	
1.006	SW05	0.000	0.17	14.2	OK	
1.007	SW06	0.000	0.17	8.9	OK	
6.000	RE	0.000	0.39	5.6	OK*	
6.001	SW09	0.000	0.68	23.8	OK	
1.008	SW07	0.000	0.09	7.2	OK	
1.009	SW08	0.000	0.11	5.9	SURCHARGED	

Curtins		Page 12
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

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

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 Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 11 Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.434 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, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	RE	30 Winter	30	+0%					84.430	-0.070
1.001	SW01	30 Winter	30	+0%					83.787	-0.213
2.000	RE	30 Winter	30	+0%					83.966	-0.159
1.002	SW02	30 Winter	30	+0%					83.595	-0.185
1.003	SW03	30 Winter	30	+0%					83.516	-0.184
3.000	RE	15 Winter	30	+0%					83.719	-0.106
3.001	SW39	15 Winter	30	+0%	100/15 Summer				83.538	-0.087
1.004	Junction	15 Winter	30	+0%					83.439	-0.131
1.005	SW04	15 Winter	30	+0%	100/30 Winter				83.277	-0.133
4.000	RE	15 Winter	30	+0%					84.403	-0.097
5.000	RE	15 Winter	30	+0%					84.405	-0.095
4.001	SW10	15 Winter	30	+0%					84.248	-0.157
1.006	SW05	240 Winter	30	+0%	30/120 Winter				82.551	0.081
1.007	SW06	240 Winter	30	+0%	30/30 Winter				82.549	0.249
6.000	RE	15 Winter	30	+0%	100/15 Summer				83.544	-0.016
6.001	SW09	15 Winter	30	+0%	30/15 Summer				83.128	0.643
1.008	SW07	240 Winter	30	+0%	30/30 Summer				82.549	0.289
1.009	SW08	240 Winter	30	+0%	1/15 Summer				82.737	0.837

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Cap. (l/s)	Flow (l/s)	Overflow (l/s)		
1.000	RE	0.000	0.55	8.0		OK*	
1.001	SW01	0.000	0.19	11.6		OK	
2.000	RE	0.000	0.19	8.5		OK*	
1.002	SW02	0.000	0.31	20.9		OK	
1.003	SW03	0.000	0.32	24.7		OK	

Curtins		Page 13
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

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

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	RE	0.000	0.53	22.7	OK*	
3.001	SW39	0.000	0.69	22.9	OK	
1.004	Junction	0.000	0.59	53.3	OK*	
1.005	SW04	0.000	0.60	51.2	OK	
4.000	RE	0.000	0.27	3.5	OK*	
5.000	RE	0.000	0.29	4.3	OK*	
4.001	SW10	0.000	0.19	7.4	OK	
1.006	SW05	0.000	0.27	21.8	SURCHARGED	
1.007	SW06	0.000	0.33	17.1	SURCHARGED	
6.000	RE	0.000	1.00	14.5	OK*	
6.001	SW09	0.000	1.97	68.6	SURCHARGED	
1.008	SW07	0.000	0.14	11.7	SURCHARGED	
1.009	SW08	0.000	0.11	6.1	SURCHARGED	

Curtins		Page 14
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

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

1

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 Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 11 Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.434 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, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	RE	30 Winter	100	+40%					84.488	-0.012
1.001	SW01	30 Winter	100	+40%					83.836	-0.164
2.000	RE	15 Winter	100	+40%					84.004	-0.121
1.002	SW02	30 Winter	100	+40%					83.669	-0.111
1.003	SW03	30 Winter	100	+40%					83.636	-0.064
3.000	RE	15 Winter	100	+40%					83.825	0.000
3.001	SW39	15 Winter	100	+40%	100/15 Summer				83.650	0.025
1.004	Junction	30 Winter	100	+40%					83.570	0.000
1.005	SW04	30 Winter	100	+40%	100/30 Winter				83.418	0.008
4.000	RE	15 Winter	100	+40%					84.427	-0.073
5.000	RE	15 Winter	100	+40%					84.428	-0.072
4.001	SW10	15 Winter	100	+40%					84.275	-0.130
1.006	SW05	360 Winter	100	+40%	30/120 Winter				83.350	0.880
1.007	SW06	360 Winter	100	+40%	30/30 Winter				83.350	1.050
6.000	RE	15 Winter	100	+40%	100/15 Summer				83.860	0.300
6.001	SW09	15 Winter	100	+40%	30/15 Summer				84.014	1.529
1.008	SW07	360 Winter	100	+40%	30/30 Summer				83.348	1.088
1.009	SW08	360 Winter	100	+40%	1/15 Summer				83.518	1.618

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	RE	0.000	1.00	14.5	OK*	
1.001	SW01	0.000	0.42	26.2	OK	
2.000	RE	0.000	0.43	19.4	OK*	
1.002	SW02	0.000	0.71	47.7	OK	

Curtins		Page 15
40 Compton Street London EC1V 0BD	066571 - Shredded Wheat	
Date 22/02/2019 File SW Network for tender.MDX	Designed by JW Checked by	
Innovyze	Network 2018.1.1	

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

1

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.003	SW03	0.000	0.74	57.3	OK	
3.000	RE	0.000	0.96	40.7	SURCHARGED*	
3.001	SW39	0.000	1.23	40.5	SURCHARGED	
1.004	Junction	0.000	1.02	91.7	SURCHARGED*	
1.005	SW04	0.000	1.03	88.8	SURCHARGED	
4.000	RE	0.000	0.51	6.6	OK*	
5.000	RE	0.000	0.52	7.8	OK*	
4.001	SW10	0.000	0.37	14.2	OK	
1.006	SW05	0.000	0.24	19.9	SURCHARGED	
1.007	SW06	0.000	0.33	17.5	SURCHARGED	
6.000	RE	0.000	1.75	25.4	SURCHARGED*	
6.001	SW09	0.000	2.83	98.2	SURCHARGED	
1.008	SW07	0.000	0.15	12.2	SURCHARGED	
1.009	SW08	0.000	0.11	6.1	SURCHARGED	