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26-29 Saint Cross St London EC1N 8UH	066571 - Shredded Wheat	
Date 22/02/2019 File FROM 1104.MDX	Designed by JW Checked by	
Micro Drainage	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm 3

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 3

« - 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	45.477	0.440	103.4	0.062	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	12.989	0.070	185.6	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	36.956	0.175	211.2	0.085	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	17.315	0.115	150.6	0.063	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	31.183	0.225	138.6	0.063	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	21.502	0.070	307.2	0.055	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	18.919	0.150	126.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	23.230	0.230	101.0	0.073	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.000	37.044	0.255	145.3	0.015	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	14.846	0.150	99.0	0.005	0.00	0.0	0.600	o	225	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	5.59	83.810	0.062	0.0	0.0	0.0	1.29	51.1	8.4
1.001	50.00	5.82	83.370	0.070	0.0	0.0	0.0	0.96	38.0	9.5
1.002	50.00	6.50	83.300	0.155	0.0	0.0	0.0	0.90	35.6	21.0
2.000	50.00	5.35	83.540	0.063	0.0	0.0	0.0	0.82	14.4	8.5
2.001	50.00	5.82	83.350	0.126	0.0	0.0	0.0	1.11	44.1	17.1
1.003	50.00	6.91	83.050	0.336	0.0	0.0	0.0	0.89	63.0	45.6
1.004	50.00	7.13	82.980	0.336	0.0	0.0	0.0	1.40	98.9	45.6
3.000	50.00	5.30	84.350	0.073	0.0	0.0	0.0	1.30	51.7	9.9
4.000	50.00	5.74	84.450	0.015	0.0	0.0	0.0	0.83	14.7	2.0
3.001	50.00	5.93	84.120	0.094	0.0	0.0	0.0	1.31	52.3	12.7

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Network Design Table for Storm 3

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
3.002	31.712	0.260	122.0	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	6.580	0.020	329.0	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.000	43.849	0.292	150.0	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	22.867	0.152	150.4	0.032	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	24.063	0.578	41.6	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.000	24.371	0.085	286.7	0.052	5.00	0.0	0.600	o	150	Pipe/Conduit	
7.000	17.151	0.035	490.0	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	
6.001	8.548	0.050	171.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
6.002	43.806	0.205	213.7	0.185	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	32.045	0.160	200.3	0.122	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	4.757	0.024	200.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	4.284	1.560	2.7	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)
3.002	50.00	6.38	83.970	0.134	0.0	0.0	0.0	1.18	47.0	18.1
1.005	50.00	7.26	82.830	0.491	0.0	0.0	0.0	0.86	60.9«	66.5
5.000	50.00	5.89	84.550	0.047	0.0	0.0	0.0	0.82	14.5	6.4
1.006	50.00	7.56	82.810	0.571	0.0	0.0	0.0	1.28	90.4	77.3
1.007	50.00	7.72	82.658	0.621	0.0	0.0	0.0	2.44	172.7	84.0
6.000	50.00	5.69	82.570	0.052	0.0	0.0	0.0	0.59	10.4	7.1
7.000	50.00	5.64	82.520	0.046	0.0	0.0	0.0	0.45	7.9	6.3
6.001	50.00	5.83	82.410	0.099	0.0	0.0	0.0	1.00	39.6	13.4
6.002	50.00	6.51	82.285	0.284	0.0	0.0	0.0	1.07	75.7	38.4
1.008	50.00	8.20	82.080	1.026	0.0	0.0	0.0	1.11	78.3«	139.0
1.009	50.00	8.27	81.850	1.026	0.0	0.0	0.0	1.11	78.3«	139.0
1.010	50.00	8.29	81.810	1.026	0.0	0.0	0.0	6.13	108.3«	139.0

Manhole Schedules for Storm 3

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)
RE	85.280	1.470	Junction		1.000	83.810	225			
SW24	84.800	1.430	Open Manhole	1200	1.001	83.370	225	1.000	83.370	225
SW25	84.800	1.500	Open Manhole	1200	1.002	83.300	225	1.001	83.300	225
RE	85.050	1.510	Junction		2.000	83.540	150			
SW26A	85.050	1.700	Open Manhole	1200	2.001	83.350	225	2.000	83.425	150
SW26	84.800	1.750	Open Manhole	1200	1.003	83.050	300	1.002	83.125	225
								2.001	83.125	225
SW29	84.800	1.820	Open Manhole	1200	1.004	82.980	300	1.003	82.980	300
RE	85.000	0.650	Junction		3.000	84.350	225			
RE	85.000	0.550	Junction		4.000	84.450	150			
Junction	85.000	0.880	Junction		3.001	84.120	225	3.000	84.120	225
								4.000	84.195	150
SW31	85.000	1.030	Open Manhole	1200	3.002	83.970	225	3.001	83.970	225
SW30	85.000	2.170	Open Manhole	1200	1.005	82.830	300	1.004	82.830	300
								3.002	83.710	225
RE	85.000	0.450	Junction		5.000	84.550	150			
SW32	85.000	2.190	Open Manhole	1200	1.006	82.810	300	1.005	82.810	300
								5.000	84.258	150
SW33	84.800	2.142	Open Manhole	1200	1.007	82.658	300	1.006	82.658	300
RE	84.800	2.230	Junction		6.000	82.570	150			
RE	84.800	2.280	Junction		7.000	82.520	150			
SW35	85.250	2.840	Open Manhole	1200	6.001	82.410	225	6.000	82.485	150
								7.000	82.485	150
SW36	85.250	2.965	Open Manhole	1200	6.002	82.285	300	6.001	82.360	225
SW34	84.800	2.720	Open Manhole	1200	1.008	82.080	300	1.007	82.080	300
								6.002	82.080	300
SW37	84.800	2.950	Open Manhole	1200	1.009	81.850	300	1.008	81.920	300
SW38	84.800	2.990	Open Manhole	1200	1.010	81.810	150	1.009	81.826	300
Outfall 3	85.030	4.780	Open Manhole	0		OUTFALL		1.010	80.250	150

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
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RE	524084.423	212844.482			No Entry	
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SW24	524071.898	212800.764	524071.898	212800.764	Required	
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SW25	524068.427	212788.248	524068.427	212788.248	Required	
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RE	524117.333	212824.681			No Entry	
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Manhole Schedules for Storm 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW26A	524112.557	212808.038	524112.557	212808.038	Required	
SW26	524103.953	212778.066	524103.953	212778.066	Required	
SW29	524124.638	212772.195	524124.638	212772.195	Required	
RE	524151.782	212853.639			No Entry	
RE	524109.869	212842.156			No Entry	
Junction	524145.297	212831.332			No Entry	
SW31	524140.964	212817.133	524140.964	212817.133	Required	
SW30	524138.032	212785.557	524138.032	212785.557	Required	
RE	524146.901	212741.933			No Entry	
SW32	524144.611	212785.723	524144.611	212785.723	Required	
SW33	524167.393	212787.695	524167.393	212787.695	Required	
RE	524234.191	212813.929			No Entry	
RE	524215.489	212837.275			No Entry	
SW35	524210.802	212820.777	524210.802	212820.777	Required	
SW36	524202.599	212823.179	524202.599	212823.179	Required	
SW34	524190.526	212781.070	524190.526	212781.070	Required	
SW37	524221.327	212772.227	524221.327	212772.227	Required	
SW38	524225.899	212770.913	524225.899	212770.913	Required	

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Manhole Schedules for Storm 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Outfall 3	524230.009	212769.707			No Entry	

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PIPELINE SCHEDULES for Storm 3

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	RE	85.280	83.810	1.245	Junction	
1.001	o	225	SW24	84.800	83.370	1.205	Open Manhole	1200
1.002	o	225	SW25	84.800	83.300	1.275	Open Manhole	1200
2.000	o	150	RE	85.050	83.540	1.360	Junction	
2.001	o	225	SW26A	85.050	83.350	1.475	Open Manhole	1200
1.003	o	300	SW26	84.800	83.050	1.450	Open Manhole	1200
1.004	o	300	SW29	84.800	82.980	1.520	Open Manhole	1200
3.000	o	225	RE	85.000	84.350	0.425	Junction	
4.000	o	150	RE	85.000	84.450	0.400	Junction	
3.001	o	225	Junction	85.000	84.120	0.655	Junction	
3.002	o	225	SW31	85.000	83.970	0.805	Open Manhole	1200
1.005	o	300	SW30	85.000	82.830	1.870	Open Manhole	1200
5.000	o	150	RE	85.000	84.550	0.300	Junction	
1.006	o	300	SW32	85.000	82.810	1.890	Open Manhole	1200
1.007	o	300	SW33	84.800	82.658	1.842	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	45.477	103.4	SW24	84.800	83.370	1.205	Open Manhole	1200
1.001	12.989	185.6	SW25	84.800	83.300	1.275	Open Manhole	1200
1.002	36.956	211.2	SW26	84.800	83.125	1.450	Open Manhole	1200
2.000	17.315	150.6	SW26A	85.050	83.425	1.475	Open Manhole	1200
2.001	31.183	138.6	SW26	84.800	83.125	1.450	Open Manhole	1200
1.003	21.502	307.2	SW29	84.800	82.980	1.520	Open Manhole	1200
1.004	18.919	126.1	SW30	85.000	82.830	1.870	Open Manhole	1200
3.000	23.230	101.0	Junction	85.000	84.120	0.655	Junction	
4.000	37.044	145.3	Junction	85.000	84.195	0.655	Junction	
3.001	14.846	99.0	SW31	85.000	83.970	0.805	Open Manhole	1200
3.002	31.712	122.0	SW30	85.000	83.710	1.065	Open Manhole	1200
1.005	6.580	329.0	SW32	85.000	82.810	1.890	Open Manhole	1200
5.000	43.849	150.0	SW32	85.000	84.258	0.592	Open Manhole	1200
1.006	22.867	150.4	SW33	84.800	82.658	1.842	Open Manhole	1200
1.007	24.063	41.6	SW34	84.800	82.080	2.420	Open Manhole	1200

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PIPELINE SCHEDULES for Storm 3

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	84.800	82.570	2.080	Junction	
7.000	o	150	RE	84.800	82.520	2.130	Junction	
6.001	o	225	SW35	85.250	82.410	2.615	Open Manhole	1200
6.002	o	300	SW36	85.250	82.285	2.665	Open Manhole	1200
1.008	o	300	SW34	84.800	82.080	2.420	Open Manhole	1200
1.009	o	300	SW37	84.800	81.850	2.650	Open Manhole	1200
1.010	o	150	SW38	84.800	81.810	2.840	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	24.371	286.7	SW35	85.250	82.485	2.615	Open Manhole	1200
7.000	17.151	490.0	SW35	85.250	82.485	2.615	Open Manhole	1200
6.001	8.548	171.0	SW36	85.250	82.360	2.665	Open Manhole	1200
6.002	43.806	213.7	SW34	84.800	82.080	2.420	Open Manhole	1200
1.008	32.045	200.3	SW37	84.800	81.920	2.580	Open Manhole	1200
1.009	4.757	200.0	SW38	84.800	81.826	2.674	Open Manhole	1200
1.010	4.284	2.7	Outfall 3	85.030	80.250	4.630	Open Manhole	0

Free Flowing Outfall Details for Storm 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
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1.010 Outfall 3 85.030 80.250 80.250 0 0


Simulation Criteria for Storm 3

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 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.434
Return Period (years)	100	Profile Type	Summer
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

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Synthetic Rainfall Details

Storm Duration (mins) 30

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Online Controls for Storm 3

Hydro-Brake® Optimum Manhole: SW37, DS/PN: 1.009, Volume (m³): 5.5

Unit Reference	MD-SHE-0103-6300-2000-6300
Design Head (m)	2.000
Design Flow (l/s)	6.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	81.850
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	6.3	Kick-Flo®	0.920	4.4
Flush-Flo™	0.448	5.5	Mean Flow over Head Range	-	5.1

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	3.5	1.200	5.0	3.000	7.6	7.000	11.4
0.200	5.0	1.400	5.3	3.500	8.2	7.500	11.8
0.300	5.4	1.600	5.7	4.000	8.7	8.000	12.1
0.400	5.5	1.800	6.0	4.500	9.2	8.500	12.5
0.500	5.5	2.000	6.3	5.000	9.7	9.000	12.8
0.600	5.4	2.200	6.6	5.500	10.1	9.500	13.2
0.800	5.0	2.400	6.9	6.000	10.6		
1.000	4.6	2.600	7.1	6.500	11.0		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 3

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 9 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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged	
									Level (m)	Depth (m)
1.000	RE	30 Winter	1	+0%					83.849	-0.186
1.001	SW24	30 Winter	1	+0%	100/15 Winter				83.423	-0.172
1.002	SW25	60 Winter	1	+0%	100/15 Winter				83.364	-0.161
2.000	RE	15 Winter	1	+0%					83.626	-0.064
2.001	SW26A	15 Winter	1	+0%	30/15 Winter				83.449	-0.126
1.003	SW26	30 Winter	1	+0%	100/15 Summer				83.152	-0.198
1.004	SW29	30 Winter	1	+0%	100/15 Summer				83.061	-0.219
3.000	RE	15 Winter	1	+0%					84.419	-0.156
4.000	RE	15 Winter	1	+0%					84.488	-0.112
3.001	Junction	15 Winter	1	+0%					84.197	-0.148
3.002	SW31	30 Winter	1	+0%	100/15 Summer				84.039	-0.156
1.005	SW30	60 Winter	1	+0%	30/30 Winter				82.961	-0.169
5.000	RE	15 Winter	1	+0%					84.622	-0.078
1.006	SW32	60 Winter	1	+0%	100/15 Winter				82.906	-0.204
1.007	SW33	1440 Winter	1	+0%	100/60 Summer				82.673	-0.285
6.000	RE	15 Winter	1	+0%	30/15 Summer				82.659	-0.061
7.000	RE	120 Winter	1	+0%	30/240 Winter				82.552	-0.118
6.001	SW35	15 Winter	1	+0%	30/120 Winter				82.480	-0.155
6.002	SW36	15 Winter	1	+0%	30/15 Summer				82.417	-0.168
1.008	SW34	120 Winter	1	+0%	30/60 Winter				82.193	-0.187
1.009	SW37	120 Winter	1	+0%	1/30 Summer				82.186	0.036
1.010	SW38	120 Winter	1	+0%					81.836	-0.124

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	0.07	3.6		OK*	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 3

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Cap. (l/s)	Flow (l/s)	Overflow (l/s)		
1.001	SW24	0.000	0.13	4.1		OK	
1.002	SW25	0.000	0.18	6.1		OK	
2.000	RE	0.000	0.61	8.8		OK*	
2.001	SW26A	0.000	0.40	16.6		OK	
1.003	SW26	0.000	0.25	14.0		OK	
1.004	SW29	0.000	0.16	13.9		OK	
3.000	RE	0.000	0.20	10.3		OK*	
4.000	RE	0.000	0.15	2.1		OK*	
3.001	Junction	0.000	0.25	13.2		OK*	
3.002	SW31	0.000	0.21	9.1		OK	
1.005	SW30	0.000	0.40	16.5		OK	
5.000	RE	0.000	0.46	6.7		OK*	
1.006	SW32	0.000	0.23	18.0		OK	
1.007	SW33	0.000	0.01	1.6		OK	
6.000	RE	0.000	0.65	6.7		OK*	
7.000	RE	0.000	0.10	0.8		OK*	
6.001	SW35	0.000	0.22	6.8		OK	
6.002	SW36	0.000	0.39	27.8		OK	
1.008	SW34	0.000	0.11	7.9		OK	
1.009	SW37	0.000	0.11	5.4		SURCHARGED	
1.010	SW38	0.000	0.07	5.4		OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 3

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 9 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	15 Winter	30	+0%					83.889	-0.146
1.001	SW24	15 Winter	30	+0%	100/15 Winter				83.475	-0.120
1.002	SW25	30 Winter	30	+0%	100/15 Winter				83.435	-0.090
2.000	RE	15 Winter	30	+0%					83.690	0.000
2.001	SW26A	15 Winter	30	+0%	30/15 Winter				83.583	0.008
1.003	SW26	30 Winter	30	+0%	100/15 Summer				83.269	-0.081
1.004	SW29	30 Winter	30	+0%	100/15 Summer				83.182	-0.098
3.000	RE	15 Winter	30	+0%					84.463	-0.112
4.000	RE	15 Winter	30	+0%					84.512	-0.088
3.001	Junction	15 Winter	30	+0%					84.250	-0.095
3.002	SW31	15 Winter	30	+0%	100/15 Summer				84.108	-0.087
1.005	SW30	30 Winter	30	+0%	30/30 Winter				83.134	0.004
5.000	RE	15 Winter	30	+0%					84.700	0.000
1.006	SW32	60 Winter	30	+0%	100/15 Winter				83.017	-0.093
1.007	SW33	360 Winter	30	+0%	100/60 Summer				82.792	-0.166
6.000	RE	15 Winter	30	+0%	30/15 Summer				82.791	0.071
7.000	RE	480 Winter	30	+0%	30/240 Winter				82.786	0.116
6.001	SW35	480 Winter	30	+0%	30/120 Winter				82.793	0.158
6.002	SW36	480 Winter	30	+0%	30/15 Summer				82.793	0.208
1.008	SW34	360 Winter	30	+0%	30/60 Winter				82.791	0.411
1.009	SW37	360 Winter	30	+0%	1/30 Summer				82.975	0.825
1.010	SW38	240 Winter	30	+0%					81.836	-0.124

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	0.26	13.3	OK*	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 3

PN	US/MH Name	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	SW24	0.000	0.44	14.4	OK	
1.002	SW25	0.000	0.66	22.4	OK	
2.000	RE	0.000	1.47	21.2	SURCHARGED*	
2.001	SW26A	0.000	1.02	42.0	SURCHARGED	
1.003	SW26	0.000	0.88	48.9	OK	
1.004	SW29	0.000	0.57	48.7	OK	
3.000	RE	0.000	0.49	25.4	OK*	
4.000	RE	0.000	0.35	5.1	OK*	
3.001	Junction	0.000	0.62	32.6	OK*	
3.002	SW31	0.000	0.69	30.4	OK	
1.005	SW30	0.000	1.42	58.7	SURCHARGED	
5.000	RE	0.000	1.05	15.2	FLOOD RISK*	
1.006	SW32	0.000	0.81	64.9	OK	
1.007	SW33	0.000	0.16	23.9	OK	
6.000	RE	0.000	1.37	14.2	SURCHARGED*	
7.000	RE	0.000	0.26	2.1	SURCHARGED*	
6.001	SW35	0.000	0.11	3.4	SURCHARGED	
6.002	SW36	0.000	0.14	10.1	SURCHARGED	
1.008	SW34	0.000	0.20	14.2	SURCHARGED	
1.009	SW37	0.000	0.11	5.5	SURCHARGED	
1.010	SW38	0.000	0.07	5.5	OK	

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

3

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 9 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	15 Winter	100	+40%					83.933	-0.102
1.001	SW24	30 Winter	100	+40%	100/15 Winter				83.639	0.044
1.002	SW25	30 Winter	100	+40%	100/15 Winter				83.584	0.059
2.000	RE	60 Winter	100	+40%					83.690	0.000
2.001	SW26A	15 Winter	100	+40%	30/15 Winter				84.042	0.467
1.003	SW26	480 Winter	100	+40%	100/15 Summer				83.581	0.231
1.004	SW29	480 Winter	100	+40%	100/15 Summer				83.579	0.299
3.000	RE	15 Winter	100	+40%					84.538	-0.037
4.000	RE	15 Winter	100	+40%					84.539	-0.061
3.001	Junction	15 Winter	100	+40%					84.345	0.000
3.002	SW31	15 Winter	100	+40%	100/15 Summer				84.218	0.023
1.005	SW30	480 Winter	100	+40%	30/30 Winter				83.577	0.447
5.000	RE	15 Winter	100	+40%					84.700	0.000
1.006	SW32	480 Winter	100	+40%	100/15 Winter				83.575	0.465
1.007	SW33	480 Winter	100	+40%	100/60 Summer				83.572	0.614
6.000	RE	60 Winter	100	+40%	30/15 Summer				83.020	0.300
7.000	RE	120 Winter	100	+40%	30/240 Winter				82.970	0.300
6.001	SW35	480 Winter	100	+40%	30/120 Winter				83.573	0.938
6.002	SW36	480 Winter	100	+40%	30/15 Summer				83.573	0.988
1.008	SW34	480 Winter	100	+40%	30/60 Winter				83.572	1.192
1.009	SW37	480 Winter	100	+40%	1/30 Summer				83.711	1.561
1.010	SW38	960 Winter	100	+40%					81.837	-0.123

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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	0.57	29.0	OK*	
1.001	SW24	0.000	0.81	26.6	SURCHARGED	
1.002	SW25	0.000	0.88	29.5	SURCHARGED	
2.000	RE	0.000	1.40	20.2	SURCHARGED*	
2.001	SW26A	0.000	1.73	71.3	SURCHARGED	
1.003	SW26	0.000	0.39	21.9	SURCHARGED	
1.004	SW29	0.000	0.26	21.9	SURCHARGED	
3.000	RE	0.000	0.88	45.5	OK*	
4.000	RE	0.000	0.63	9.3	OK*	
3.001	Junction	0.000	1.08	56.4	SURCHARGED*	
3.002	SW31	0.000	1.06	46.8	SURCHARGED	
1.005	SW30	0.000	0.76	31.7	SURCHARGED	
5.000	RE	0.000	1.67	24.1	FLOOD RISK*	
1.006	SW32	0.000	0.46	36.5	SURCHARGED	
1.007	SW33	0.000	0.25	37.7	SURCHARGED	
6.000	RE	0.000	1.41	14.7	SURCHARGED*	
7.000	RE	0.000	0.67	5.3	SURCHARGED*	
6.001	SW35	0.000	0.18	5.6	SURCHARGED	
6.002	SW36	0.000	0.23	16.4	SURCHARGED	
1.008	SW34	0.000	0.31	22.0	SURCHARGED	
1.009	SW37	0.000	0.11	5.8	SURCHARGED	
1.010	SW38	0.000	0.07	5.8	OK	