STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	45
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
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)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 3

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.588	4-8	2.093

Total Area Contributing (ha) = 2.681

Total Pipe Volume (m³) = 18.859

Network Design Table for Surface Network 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	21.976	0.120	183.1	2.609	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	15.806	0.450	35.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	31.958	0.730	43.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	33.324	0.470	70.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	14.198	0.120	118.3	0.000	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	5.50	117.120	2.609	0.0	0.0	159.0	0.74	13.1«	512.3
1.001	50.00	5.59	117.000	2.609	0.0	0.0	159.0	2.66	188.1«	512.3
1.002	50.00	5.82	116.550	2.609	0.0	0.0	159.0	2.38	168.4«	512.3
1.003	50.00	6.11	115.820	2.609	0.0	0.0	159.0	1.87	132.2«	512.3
1.004	50.00	6.28	115.350	2.609	0.0	0.0	159.0	1.44	102.1«	512.3

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Network Design Table for Surface Network 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
1.005	23.948	0.095	252.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	28.701	0.115	249.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	11.270	0.190	59.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	14.698	0.120	122.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	19.010	0.140	135.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	10.363	0.118	87.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	15.904	0.050	318.1	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	18.304	0.050	366.1	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	14.927	0.050	298.5	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.003	15.346	0.050	306.9	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.004	11.279	0.150	75.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.005	64.811	4.123	15.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.011	22.892	0.452	50.6	0.000	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)
1.005	50.00	6.68	115.230	2.609	0.0	0.0	159.0	0.99	69.7«	512.3
1.006	50.00	7.17	115.135	2.609	0.0	0.0	159.0	0.99	70.0«	512.3
1.007	50.00	7.26	115.020	2.609	0.0	0.0	159.0	2.05	144.6«	512.3
1.008	50.00	7.43	114.830	2.609	0.0	0.0	159.0	1.42	100.3«	512.3
1.009	50.00	7.67	114.710	2.609	0.0	0.0	159.0	1.35	95.2«	512.3
1.010	50.00	7.77	114.570	2.609	0.0	0.0	159.0	1.68	118.7«	512.3
2.000	50.00	5.47	119.000	0.018	0.0	0.0	1.1	0.56	9.9	3.5
2.001	50.00	6.06	118.950	0.036	0.0	0.0	2.2	0.52	9.2	7.1
2.002	50.00	6.49	118.900	0.054	0.0	0.0	3.3	0.58	10.2«	10.6
2.003	50.00	6.94	118.850	0.072	0.0	0.0	4.4	0.57	10.0«	14.1
2.004	50.00	7.11	118.800	0.072	0.0	0.0	4.4	1.16	20.5	14.1
2.005	50.00	7.53	118.650	0.072	0.0	0.0	4.4	2.55	45.1	14.1
1.011	50.00	7.94	114.452	2.681	0.0	0.0	163.4	2.21	156.5«	526.4

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Manhole Schedules for Surface Network 3

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)
S62	118.520	1.400	Open Manhole	1350	1.000	117.120	150				
S77	118.520	1.520	Open Manhole	1350	1.001	117.000	300	1.000	117.000	150	
S1	120.280	3.730	Open Manhole	1200	1.002	116.550	300	1.001	116.550	300	
S2	119.125	3.305	Open Manhole	1200	1.003	115.820	300	1.002	115.820	300	
S3	117.750	2.400	Open Manhole	1200	1.004	115.350	300	1.003	115.350	300	
S5	117.327	2.097	Open Manhole	1200	1.005	115.230	300	1.004	115.230	300	
S6	117.647	2.512	Open Manhole	1200	1.006	115.135	300	1.005	115.135	300	
S7	117.900	2.880	Open Manhole	1200	1.007	115.020	300	1.006	115.020	300	
S8	117.866	3.036	Open Manhole	1350	1.008	114.830	300	1.007	114.830	300	
S9	117.694	2.984	Open Manhole	1200	1.009	114.710	300	1.008	114.710	300	
S10	117.239	2.669	Open Manhole	1200	1.010	114.570	300	1.009	114.570	300	
S63	119.300	0.300	Open Manhole	1350	2.000	119.000	150				
S64	119.250	0.300	Open Manhole	1350	2.001	118.950	150	2.000	118.950	150	
S65	119.200	0.300	Open Manhole	1350	2.002	118.900	150	2.001	118.900	150	
S66	119.150	0.300	Open Manhole	1350	2.003	118.850	150	2.002	118.850	150	
S67	119.100	0.300	Open Manhole	1350	2.004	118.800	150	2.003	118.800	150	
S68	120.822	2.172	Open Manhole	1200	2.005	118.650	150	2.004	118.650	150	
S11	115.756	1.304	Open Manhole	1350	1.011	114.452	300	1.010	114.452	300	
								2.005	114.527	150	
S12	115.425	1.425	Open Manhole	0		OUTFALL		1.011	114.000	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S62	537361.640	132889.389	537361.640	132889.389	Required	
S77	537349.379	132907.627	537349.379	132907.627	Required	
S1	537345.322	132922.903	537345.322	132922.903	Required	
S2	537351.496	132954.259	537351.496	132954.259	Required	
S3	537320.572	132966.676	537320.572	132966.676	Required	

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Manhole Schedules for Surface Network 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S5	537309.388	132975.423	537309.388	132975.423	Required	
S6	537321.435	132996.120	537321.435	132996.120	Required	
S7	537333.688	133022.074	537333.688	133022.074	Required	
S8	537335.497	133033.198	537335.497	133033.198	Required	
S9	537345.638	133043.838	537345.638	133043.838	Required	
S10	537356.523	133059.423	537356.523	133059.423	Required	
S63	537372.247	132962.866	537372.247	132962.866	Required	
S64	537377.346	132977.930	537377.346	132977.930	Required	
S65	537386.179	132993.962	537386.179	132993.962	Required	
S66	537395.036	133005.977	537395.036	133005.977	Required	
S67	537405.382	133017.311	537405.382	133017.311	Required	
S68	537408.235	133028.223	537408.235	133028.223	Required	
S11	537358.368	133069.620	537358.368	133069.620	Required	
S12	537343.891	133087.353			No Entry	

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PIPELINE SCHEDULES for Surface Network 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	150	S62	118.520	117.120	1.250	Open Manhole	1350
1.001	o	300	S77	118.520	117.000	1.220	Open Manhole	1350
1.002	o	300	S1	120.280	116.550	3.430	Open Manhole	1200
1.003	o	300	S2	119.125	115.820	3.005	Open Manhole	1200
1.004	o	300	S3	117.750	115.350	2.100	Open Manhole	1200
1.005	o	300	S5	117.327	115.230	1.797	Open Manhole	1200
1.006	o	300	S6	117.647	115.135	2.212	Open Manhole	1200
1.007	o	300	S7	117.900	115.020	2.580	Open Manhole	1200
1.008	o	300	S8	117.866	114.830	2.736	Open Manhole	1350
1.009	o	300	S9	117.694	114.710	2.684	Open Manhole	1200
1.010	o	300	S10	117.239	114.570	2.369	Open Manhole	1200
2.000	o	150	S63	119.300	119.000	0.150	Open Manhole	1350
2.001	o	150	S64	119.250	118.950	0.150	Open Manhole	1350
2.002	o	150	S65	119.200	118.900	0.150	Open Manhole	1350
2.003	o	150	S66	119.150	118.850	0.150	Open Manhole	1350
2.004	o	150	S67	119.100	118.800	0.150	Open Manhole	1350
2.005	o	150	S68	120.822	118.650	2.022	Open Manhole	1200
1.011	o	300	S11	115.756	114.452	1.004	Open Manhole	1350

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	21.976	183.1	S77	118.520	117.000	1.370	Open Manhole	1350
1.001	15.806	35.1	S1	120.280	116.550	3.430	Open Manhole	1200
1.002	31.958	43.8	S2	119.125	115.820	3.005	Open Manhole	1200
1.003	33.324	70.9	S3	117.750	115.350	2.100	Open Manhole	1200
1.004	14.198	118.3	S5	117.327	115.230	1.797	Open Manhole	1200
1.005	23.948	252.1	S6	117.647	115.135	2.212	Open Manhole	1200
1.006	28.701	249.6	S7	117.900	115.020	2.580	Open Manhole	1200
1.007	11.270	59.3	S8	117.866	114.830	2.736	Open Manhole	1350
1.008	14.698	122.5	S9	117.694	114.710	2.684	Open Manhole	1200
1.009	19.010	135.8	S10	117.239	114.570	2.369	Open Manhole	1200
1.010	10.363	87.8	S11	115.756	114.452	1.004	Open Manhole	1350
2.000	15.904	318.1	S64	119.250	118.950	0.150	Open Manhole	1350
2.001	18.304	366.1	S65	119.200	118.900	0.150	Open Manhole	1350
2.002	14.927	298.5	S66	119.150	118.850	0.150	Open Manhole	1350
2.003	15.346	306.9	S67	119.100	118.800	0.150	Open Manhole	1350
2.004	11.279	75.2	S68	120.822	118.650	2.022	Open Manhole	1200
2.005	64.811	15.7	S11	115.756	114.527	1.079	Open Manhole	1350
1.011	22.892	50.6	S12	115.425	114.000	1.125	Open Manhole	0

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Free Flowing Outfall Details for Surface Network 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.011	S12	115.425	114.000	0.000	0	0

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Storage Structures for Surface Network 3

Tank or Pond Manhole: S62, DS/PN: 1.000

Invert Level (m) 117.120

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	13435.0	0.400	17760.0	0.800	22281.0	1.200	22281.0
0.100	15061.0	0.500	18696.0	0.900	22281.0	1.300	22281.0
0.200	15849.0	0.600	20435.0	1.000	22281.0	1.400	22281.0
0.300	16796.0	0.700	22281.0	1.100	22281.0		

Swale Manhole: S63, DS/PN: 2.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	16.7
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	334.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	119.000	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

Swale Manhole: S64, DS/PN: 2.001

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	17.7
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	355.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	118.950	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

Swale Manhole: S65, DS/PN: 2.002

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	15.2
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	304.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	118.900	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

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Swale Manhole: S66, DS/PN: 2.003

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	15.2
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	304.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	118.900	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 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 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 5
Number of Online Controls 0 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 450.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S62	1440 Winter	1	+0%					117.164
1.001	S77	1440 Winter	1	+0%					117.021
1.002	S1	1440 Winter	1	+0%					116.572
1.003	S2	1440 Winter	1	+0%					115.847
1.004	S3	1440 Winter	1	+0%					115.383
1.005	S5	1440 Winter	1	+0%					115.267
1.006	S6	1440 Winter	1	+0%					115.172
1.007	S7	1440 Winter	1	+0%					115.050
1.008	S8	1440 Winter	1	+0%					114.863
1.009	S9	1440 Winter	1	+0%					114.743
1.010	S10	1440 Winter	1	+0%					114.603
2.000	S63	15 Winter	1	+0%					119.044
2.001	S64	30 Winter	1	+0%	100/15 Winter				119.006
2.002	S65	30 Winter	1	+0%	100/15 Summer				118.963
2.003	S66	30 Winter	1	+0%	30/15 Winter				118.923
2.004	S67	30 Winter	1	+0%					118.849
2.005	S68	30 Winter	1	+0%					118.682
1.011	S11	30 Winter	1	+0%					114.487

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S62	-0.106	0.000	0.19			2.3	OK	
1.001	S77	-0.279	0.000	0.01			2.3	OK	
1.002	S1	-0.278	0.000	0.02			2.3	OK	
1.003	S2	-0.273	0.000	0.02			2.3	OK	
1.004	S3	-0.267	0.000	0.03			2.3	OK	
1.005	S5	-0.263	0.000	0.04			2.3	OK	
1.006	S6	-0.263	0.000	0.04			2.3	OK	
1.007	S7	-0.270	0.000	0.02			2.3	OK	
1.008	S8	-0.267	0.000	0.03			2.3	OK	
1.009	S9	-0.267	0.000	0.03			2.3	OK	
1.010	S10	-0.267	0.000	0.03			2.3	OK	
2.000	S63	-0.106	0.000	0.19		7	1.7	FLOOD RISK	
2.001	S64	-0.094	0.000	0.30		11	2.6	FLOOD RISK	
2.002	S65	-0.087	0.000	0.36		13	3.4	FLOOD RISK	
2.003	S66	-0.077	0.000	0.48		12	4.4	FLOOD RISK	
2.004	S67	-0.101	0.000	0.24			4.4	FLOOD RISK	
2.005	S68	-0.118	0.000	0.10			4.4	OK	
1.011	S11	-0.265	0.000	0.03			4.6	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 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 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 5
Number of Online Controls 0 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 450.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S62	1440 Winter	30	+35%					117.226
1.001	S77	1440 Winter	30	+35%					117.050
1.002	S1	1440 Winter	30	+35%					116.601
1.003	S2	1440 Winter	30	+35%					115.879
1.004	S3	1440 Winter	30	+35%					115.420
1.005	S5	1440 Winter	30	+35%					115.312
1.006	S6	1440 Winter	30	+35%					115.216
1.007	S7	1440 Winter	30	+35%					115.082
1.008	S8	1440 Winter	30	+35%					114.900
1.009	S9	1440 Winter	30	+35%					114.780
1.010	S10	1440 Winter	30	+35%					114.639
2.000	S63	15 Winter	30	+35%					119.091
2.001	S64	30 Winter	30	+35%	100/15 Winter				119.076
2.002	S65	30 Winter	30	+35%	100/15 Summer				119.049
2.003	S66	30 Winter	30	+35%	30/15 Winter				119.011
2.004	S67	30 Winter	30	+35%					118.883
2.005	S68	30 Winter	30	+35%					118.700
1.011	S11	60 Winter	30	+35%					114.515

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S62	-0.044	0.000	0.84			10.4	OK	
1.001	S77	-0.250	0.000	0.07			10.4	OK	
1.002	S1	-0.249	0.000	0.07			10.4	OK	
1.003	S2	-0.241	0.000	0.09			10.4	OK	
1.004	S3	-0.230	0.000	0.12			10.4	OK	
1.005	S5	-0.218	0.000	0.17			10.4	OK	
1.006	S6	-0.219	0.000	0.16			10.4	OK	
1.007	S7	-0.238	0.000	0.10			10.4	OK	
1.008	S8	-0.230	0.000	0.12			10.4	OK	
1.009	S9	-0.230	0.000	0.13			10.4	OK	
1.010	S10	-0.231	0.000	0.12			10.4	OK	
2.000	S63	-0.059	0.000	0.56		9	5.1	FLOOD RISK	
2.001	S64	-0.024	0.000	0.80		14	6.9	FLOOD RISK	
2.002	S65	-0.001	0.000	0.88		16	8.3	FLOOD RISK	
2.003	S66	0.011	0.000	1.17		17	10.9	FLOOD RISK	
2.004	S67	-0.067	0.000	0.59			10.9	FLOOD RISK	
2.005	S68	-0.100	0.000	0.25			10.9	OK	
1.011	S11	-0.237	0.000	0.10			13.5	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 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 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 5
Number of Online Controls 0 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 450.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S62	1440 Winter	100	+45%					117.263
1.001	S77	1440 Winter	100	+45%					117.055
1.002	S1	1440 Winter	100	+45%					116.606
1.003	S2	1440 Winter	100	+45%					115.884
1.004	S3	1440 Winter	100	+45%					115.426
1.005	S5	1440 Winter	100	+45%					115.321
1.006	S6	1440 Winter	100	+45%					115.224
1.007	S7	1440 Winter	100	+45%					115.087
1.008	S8	1440 Winter	100	+45%					114.906
1.009	S9	1440 Winter	100	+45%					114.787
1.010	S10	1440 Winter	100	+45%					114.645
2.000	S63	30 Winter	100	+45%					119.137
2.001	S64	30 Winter	100	+45%	100/15 Winter				119.122
2.002	S65	30 Winter	100	+45%	100/15 Summer				119.092
2.003	S66	30 Winter	100	+45%	30/15 Winter				119.044
2.004	S67	30 Winter	100	+45%					118.894
2.005	S68	30 Winter	100	+45%					118.706
1.011	S11	120 Winter	100	+45%					114.524

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S62	-0.007	0.000	1.00			12.4	OK	
1.001	S77	-0.245	0.000	0.08			12.4	OK	
1.002	S1	-0.244	0.000	0.08			12.4	OK	
1.003	S2	-0.236	0.000	0.10			12.4	OK	
1.004	S3	-0.224	0.000	0.15			12.4	OK	
1.005	S5	-0.209	0.000	0.20			12.4	OK	
1.006	S6	-0.211	0.000	0.19			12.4	OK	
1.007	S7	-0.233	0.000	0.11			12.4	OK	
1.008	S8	-0.224	0.000	0.15			12.4	OK	
1.009	S9	-0.223	0.000	0.15			12.4	OK	
1.010	S10	-0.225	0.000	0.14			12.4	OK	
2.000	S63	-0.013	0.000	0.52		15	4.8	FLOOD RISK	
2.001	S64	0.022	0.000	0.81		17	6.9	FLOOD RISK	
2.002	S65	0.042	0.000	1.02		20	9.6	FLOOD RISK	
2.003	S66	0.044	0.000	1.42		21	13.2	FLOOD RISK	
2.004	S67	-0.056	0.000	0.72			13.2	FLOOD RISK	
2.005	S68	-0.094	0.000	0.30			13.2	OK	
1.011	S11	-0.228	0.000	0.13			18.5	OK	

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