STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Water Network

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.600	Add Flow / Climate Change (%)	40
Ratio R	0.402	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	75	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

Network Design Table for Surface Water Network

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	50.092	1.200	41.7	0.107	5.00	0.0	0.600		o	225	Pipe/Conduit	
1.001	19.423	0.730	26.6	0.013	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.002	21.485	0.126	170.5	0.032	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.003	11.758	0.565	20.8	0.127	0.00	0.0	0.600		o	375	Pipe/Conduit	
2.000	43.463	0.660	65.9	0.472	5.00	0.0	0.600		o	375	Pipe/Conduit	
2.001	40.489	1.110	36.5	0.140	0.00	0.0	0.600		o	375	Pipe/Conduit	
2.002	13.983	0.455	30.7	0.087	0.00	0.0	0.600		o	450	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	75.00	5.41	113.850	0.107	0.0	0.0	8.7	2.03	80.7	30.4
1.001	75.00	5.54	112.650	0.120	0.0	0.0	9.7	2.55	101.3	34.1
1.002	75.00	5.90	111.920	0.152	0.0	0.0	12.3	1.00	39.7«	43.2
1.003	75.00	5.95	111.640	0.279	0.0	0.0	22.7	3.99	440.4	79.3
2.000	75.00	5.32	113.300	0.472	0.0	0.0	38.3	2.24	246.9	134.2
2.001	75.00	5.55	112.640	0.612	0.0	0.0	49.7	3.01	332.3	174.0
2.002	75.00	5.61	111.455	0.699	0.0	0.0	56.8	3.68	584.9	198.8

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Network Design Table for Surface Water Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.004	28.004	0.141	198.6	0.102	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.005	26.776	0.690	38.8	0.068	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.006	21.930	1.319	16.6	0.026	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.007	52.729	1.750	30.1	0.259	0.00	0.0	0.600		o	600	Pipe/Conduit	
1.008	16.134	0.236	68.4	0.149	0.00	0.0	0.600		o	600	Pipe/Conduit	
3.000	30.855	1.060	29.1	0.055	5.00	0.0	0.600		o	225	Pipe/Conduit	
3.001	21.906	0.705	31.1	0.132	0.00	0.0	0.600		o	300	Pipe/Conduit	
3.002	29.084	1.746	16.7	0.056	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.009	32.017	0.071	450.9	0.058	0.00	0.0	0.600		o	600	Pipe/Conduit	
1.010	11.920	0.025	476.8	0.024	0.00	0.0	0.600		o	675	Pipe/Conduit	
1.011	21.125	0.044	476.0	0.000	0.00	0.0	0.600		o	675	Pipe/Conduit	
4.000	24.119	0.450	53.6	0.186	5.00	0.0		0.050	v	-1	Pipe/Conduit	
4.001	3.063	0.030	102.1	0.000	0.00	0.0		0.050	v	-1	Pipe/Conduit	
4.002	18.973	0.290	65.4	0.000	0.00	0.0		0.050	v	-1	Pipe/Conduit	
4.003	30.004	1.700	17.6	0.025	0.00	0.0		0.050	v	-1	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)
1.004	75.00	6.27	111.000	1.080	0.0	0.0	87.7	1.44	228.9«	307.1
1.005	75.00	6.41	110.859	1.148	0.0	0.0	93.3	3.27	520.3	326.5
1.006	75.00	6.48	110.169	1.174	0.0	0.0	95.4	5.00	796.0	333.8
1.007	75.00	6.68	108.700	1.433	0.0	0.0	116.4	4.45	1257.5	407.5
1.008	75.00	6.77	106.950	1.582	0.0	0.0	128.5	2.95	833.6	449.9
3.000	75.00	5.21	110.600	0.055	0.0	0.0	4.5	2.43	96.8	15.6
3.001	75.00	5.34	109.465	0.187	0.0	0.0	15.2	2.83	200.1	53.2
3.002	75.00	5.47	108.760	0.243	0.0	0.0	19.7	3.87	273.6	69.1
1.009	75.00	7.24	106.714	1.883	0.0	0.0	153.0	1.14	322.4«	535.5
1.010	75.00	7.40	106.568	1.907	0.0	0.0	154.9	1.19	427.1«	542.3
1.011	75.00	7.70	106.543	1.907	0.0	0.0	154.9	1.19	427.5«	542.3
4.000	75.00	5.27	111.610	0.186	0.0	0.0	15.1	1.48	3217.5	52.9
4.001	75.00	5.32	111.160	0.186	0.0	0.0	15.1	1.07	2331.2	52.9
4.002	75.00	5.55	111.130	0.186	0.0	0.0	15.1	1.34	2912.2	52.9
4.003	75.00	5.75	110.840	0.211	0.0	0.0	17.1	2.58	5606.9	60.0

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Network Design Table for Surface Water Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
4.004	51.681	1.190	43.4	0.072	0.00	0.0		0.050	v	-1	Pipe/Conduit	
4.005	10.410	1.451	7.2	0.000	0.00	0.0		0.050	v	-1	Pipe/Conduit	
1.012	17.926	0.195	91.9	0.114	0.00	0.0	0.600		o	675	Pipe/Conduit	
5.000	43.052	0.760	56.6	0.126	5.00	0.0	0.600		o	225	Pipe/Conduit	
5.001	8.941	0.065	137.6	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
6.000	26.870	0.458	58.7	0.138	5.00	0.0	0.600		o	225	Pipe/Conduit	
6.001	11.136	0.067	166.2	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
5.002	7.586	0.155	48.9	0.133	0.00	0.0	0.600		o	300	Pipe/Conduit	
5.003	32.882	1.190	27.6	0.035	0.00	0.0	0.600		o	375	Pipe/Conduit	
5.004	38.620	2.705	14.3	0.117	0.00	0.0	0.600		o	375	Pipe/Conduit	
5.005	9.484	0.058	163.5	0.089	0.00	0.0	0.600		o	375	Pipe/Conduit	
5.006	13.782	0.043	320.5	0.036	0.00	0.0	0.600		o	375	Pipe/Conduit	
5.007	22.332	0.055	406.0	0.025	0.00	0.0	0.600		o	450	Pipe/Conduit	
5.008	32.676	0.081	403.4	0.051	0.00	0.0	0.600		o	450	Pipe/Conduit	
5.009	53.372	0.132	404.3	0.048	0.00	0.0	0.600		o	450	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)
4.004	75.00	6.27	109.140	0.283	0.0	0.0	23.0	1.65	3574.3	80.5
4.005	75.00	6.31	107.950	0.283	0.0	0.0	23.0	4.05	8794.2	80.5
1.012	75.00	7.81	106.499	2.304	0.0	0.0	187.2	2.73	978.5	655.2
5.000	75.00	5.41	111.770	0.126	0.0	0.0	10.2	1.74	69.2	35.8
5.001	75.00	5.55	111.010	0.126	0.0	0.0	10.2	1.11	44.3	35.8
6.000	75.00	5.26	111.470	0.138	0.0	0.0	11.2	1.71	68.0	39.2
6.001	75.00	5.45	111.012	0.138	0.0	0.0	11.2	1.01	40.2	39.2
5.002	75.00	5.60	110.870	0.397	0.0	0.0	32.3	2.25	159.2	112.9
5.003	75.00	5.76	110.640	0.432	0.0	0.0	35.1	3.46	382.0	122.8
5.004	75.00	5.89	109.450	0.549	0.0	0.0	44.6	4.82	532.0	156.1
5.005	75.00	6.01	106.745	0.638	0.0	0.0	51.8	1.41	156.2«	181.4
5.006	75.00	6.23	106.687	0.674	0.0	0.0	54.8	1.01	111.2«	191.7
5.007	75.00	6.61	106.569	0.699	0.0	0.0	56.8	1.00	159.5«	198.8
5.008	75.00	7.15	106.514	0.750	0.0	0.0	60.9	1.01	160.0«	213.3
5.009	75.00	8.03	106.433	0.798	0.0	0.0	64.8	1.00	159.8«	226.9

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Network Design Table for Surface Water Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.013	19.480	0.050	389.6	0.025	0.00	0.0	0.600		o	675	Pipe/Conduit	
1.014	19.984	0.079	253.0	0.000	0.00	0.0	0.600		o	675	Pipe/Conduit	
1.015	8.849	0.050	177.0	0.000	0.00	0.0	0.600		o	675	Pipe/Conduit	
1.016	7.222	0.050	144.4	0.000	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)
1.013	75.00	8.28	106.304	3.127	0.0	0.0	254.1	1.32	473.0«	889.2
1.014	75.00	8.48	106.254	3.127	0.0	0.0	254.1	1.64	588.0«	889.2
1.015	75.00	8.56	106.100	3.127	0.0	0.0	254.1	1.97	703.9«	889.2
1.016	75.00	8.67	106.050	3.127	0.0	0.0	254.1	1.09	43.2«	889.2

Free Flowing Outfall Details for Surface Water Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.016	S37	107.300	106.000	0.000	0	0

Simulation Criteria for Surface Water Network

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
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	5	Number of Time/Area Diagrams	0
Number of Online Controls	3	Number of Storage Structures	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	19.600
Return Period (years)	100	Ratio R	0.402
Region	England and Wales	Profile Type	Summer

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Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30
Cv (Winter) 0.840

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Online Controls for Surface Water Network

Orifice Manhole: S41, DS/PN: 4.003, Volume (m³): 39.2

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 110.840

Orifice Manhole: S43, DS/PN: 4.005, Volume (m³): 110.2

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 107.950

Hydro-Brake® Optimum Manhole: S35, DS/PN: 1.015, Volume (m³): 9.6

Unit Reference	MD-SHE-0201-2190-1400-2190
Design Head (m)	1.400
Design Flow (l/s)	21.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	201
Invert Level (m)	106.100
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	21.9	Kick-Flo®	0.936	18.1
Flush-Flo™	0.425	21.9	Mean Flow over Head Range	-	18.8

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	6.9	1.200	20.4	3.000	31.5	7.000	47.5
0.200	19.0	1.400	21.9	3.500	34.0	7.500	49.1
0.300	21.5	1.600	23.3	4.000	36.2	8.000	50.7
0.400	21.9	1.800	24.7	4.500	38.3	8.500	52.2
0.500	21.8	2.000	26.0	5.000	40.3	9.000	53.6
0.600	21.5	2.200	27.2	5.500	42.2	9.500	55.1
0.800	20.3	2.400	28.3	6.000	44.1		
1.000	18.7	2.600	29.4	6.500	45.8		

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Offline Controls for Surface Water Network

Orifice Manhole: S39, DS/PN: 4.001, Loop to PN: None

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 111.160

Orifice Manhole: S40, DS/PN: 4.002, Loop to PN: None

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 111.130

Orifice Manhole: S41, DS/PN: 4.003, Loop to PN: None

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 110.840

Orifice Manhole: S42, DS/PN: 4.004, Loop to PN: None

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 109.140

Orifice Manhole: S43, DS/PN: 4.005, Loop to PN: None

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 107.950

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Storage Structures for Surface Water Network

Tank or Pond Manhole: S33, DS/PN: 1.013

Invert Level (m) 106.400

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	175.0	1.200	638.0

Tank or Pond Manhole: S35, DS/PN: 1.015

Invert Level (m) 106.100

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	791.8	0.500	992.5	1.000	1206.7	1.500	1434.5
0.100	830.9	0.600	1034.2	1.100	1251.2	1.600	1481.7
0.200	870.4	0.700	1076.5	1.200	1296.2	1.700	1529.3
0.300	910.6	0.800	1119.4	1.300	1341.7		
0.400	951.3	0.900	1162.8	1.400	1387.8		

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water Network

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
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 5 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.401
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.600	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 450.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	40

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	S4	15 Winter	100	+40%	100/15 Summer				114.363
1.001	S5	15 Winter	100	+40%	100/15 Summer				113.716
1.002	S6	15 Winter	100	+40%	100/15 Summer	100/15 Winter			113.401
1.003	S7	15 Winter	100	+40%	100/15 Summer	100/15 Winter			113.057
2.000	S1	15 Winter	100	+40%	100/15 Summer	100/15 Summer			115.057
2.001	S2	15 Winter	100	+40%	100/15 Summer	100/15 Summer			114.268
2.002	S3	15 Winter	100	+40%	100/15 Summer	100/15 Winter			113.304
1.004	S8	15 Winter	100	+40%	100/15 Summer	100/15 Winter			112.955
1.005	S9	15 Winter	100	+40%	100/15 Summer				112.068
1.006	S10	15 Winter	100	+40%	100/15 Summer				111.090
1.007	S11	15 Winter	100	+40%	100/15 Summer				110.211
1.008	S12	15 Winter	100	+40%	100/15 Summer				109.640
3.000	S13	15 Winter	100	+40%					110.695
3.001	S14	15 Winter	100	+40%					109.738
3.002	S15	15 Winter	100	+40%	100/15 Summer				109.516
1.009	S16	15 Winter	100	+40%	100/15 Summer				109.162

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water Network

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S4	0.288	0.000	0.81		62.4	SURCHARGED	
1.001	S5	0.841	0.000	0.66		60.0	FLOOD RISK	
1.002	S6	1.256	1.003	2.18		78.9	FLOOD	1
1.003	S7	1.042	0.132	0.45		133.1	FLOOD	1
2.000	S1	1.382	1.957	1.09		247.2	FLOOD	2
2.001	S2	1.253	3.129	1.00		301.1	FLOOD	2
2.002	S3	1.399	0.011	0.90		341.4	FLOOD	1
1.004	S8	1.505	0.386	2.62		511.4	FLOOD	1
1.005	S9	0.759	0.000	1.22		536.0	FLOOD RISK	
1.006	S10	0.471	0.000	0.83		535.3	FLOOD RISK	
1.007	S11	0.911	0.000	0.57		635.2	FLOOD RISK	
1.008	S12	2.090	0.000	1.44		698.7	FLOOD RISK	
3.000	S13	-0.130	0.000	0.37		33.5	OK	
3.001	S14	-0.027	0.000	0.68		119.0	OK	
3.002	S15	0.456	0.000	0.58		143.2	SURCHARGED	
1.009	S16	1.848	0.000	3.17		841.1	FLOOD RISK	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water Network

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.010	S17	15 Winter	100	+40%	100/15 Summer			
1.011	S18	15 Winter	100	+40%	100/15 Summer			
4.000	S38	15 Winter	100	+40%				
4.001	S39	15 Winter	100	+40%			100/15 Summer	18
4.002	S40	15 Winter	100	+40%			100/15 Summer	18
4.003	S41	15 Winter	100	+40%			100/15 Summer	18
4.004	S42	15 Winter	100	+40%			100/15 Summer	18
4.005	S43	15 Winter	100	+40%			100/15 Summer	18
1.012	S32	30 Winter	100	+40%	100/15 Summer			
5.000	S22	15 Winter	100	+40%	100/15 Summer			
5.001	S23	15 Winter	100	+40%	100/15 Summer			
6.000	28	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
6.001	29	15 Winter	100	+40%	100/15 Summer			
5.002	S24	15 Winter	100	+40%	100/15 Summer			
5.003	S25	15 Winter	100	+40%				
5.004	S26	15 Winter	100	+40%	100/15 Summer			
5.005	S27	15 Winter	100	+40%	100/15 Summer	100/15 Winter		
5.006	S28	15 Winter	100	+40%	100/15 Summer			
5.007	S29	15 Winter	100	+40%	100/15 Summer			
5.008	S30	15 Winter	100	+40%	100/15 Summer			
5.009	S31	15 Winter	100	+40%	100/15 Summer			
1.013	S33	30 Winter	100	+40%	100/15 Summer			
1.014	S34	480 Winter	100	+40%	100/15 Summer			
1.015	S35	480 Winter	100	+40%	100/15 Winter			
1.016	S36	1440 Winter	100	+40%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.010	S17	108.479	1.236	0.000	3.95		848.9	SURCHARGED	
1.011	S18	108.074	0.856	0.000	2.82		838.9	SURCHARGED	
4.000	S38	111.737	-0.573	0.000	0.04		112.3	OK	
4.001	S39	111.346	-0.514	0.000	0.06	14.1	99.9	OK	
4.002	S40	111.343	-0.487	0.000	0.03	17.3	87.4	OK	
4.003	S41	111.340	-0.200	0.000	0.01	30.6	30.6	FLOOD RISK	
4.004	S42	109.232	-0.608	0.000	0.02	4.8	66.5	OK	
4.005	S43	108.337	-0.313	0.000	0.00	26.2	26.2	FLOOD RISK	
1.012	S32	107.743	0.569	0.000	1.45		809.7	FLOOD RISK	
5.000	S22	112.855	0.860	0.000	1.05		69.2	SURCHARGED	
5.001	S23	111.980	0.745	0.000	1.99		71.6	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Water Network

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
6.000	28	112.654	0.959	0.831	1.18		74.5	FLOOD	2
6.001	29	112.053	0.816	0.000	2.23		75.8	SURCHARGED	
5.002	S24	111.749	0.579	0.000	2.17		213.7	SURCHARGED	
5.003	S25	111.010	-0.005	0.000	0.67		226.9	OK	
5.004	S26	110.507	0.682	0.000	0.57		272.8	SURCHARGED	
5.005	S27	109.625	2.505	2.676	2.74		293.7	FLOOD	1
5.006	S28	109.128	2.066	0.000	3.58		303.7	FLOOD RISK	
5.007	S29	108.572	1.553	0.000	2.36		310.3	SURCHARGED	
5.008	S30	108.281	1.317	0.000	2.35		326.3	SURCHARGED	
5.009	S31	107.913	1.030	0.000	2.29		333.9	SURCHARGED	
1.013	S33	107.468	0.489	0.000	2.11		723.1	FLOOD RISK	
1.014	S34	107.384	0.455	0.000	0.34		147.2	FLOOD RISK	
1.015	S35	107.381	0.606	0.000	0.05		21.9	FLOOD RISK	
1.016	S36	106.188	-0.087	0.000	0.69		21.9	OK	

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