

Davidsons Developments Ltd		Page 0
Leicester Road Ibstock Leicestershire LE67 6HP		
Date 07/05/2025 16:56 File Desford 2025-05-07 (For...	Designed by jacob.clifford Checked by	
XP Solutions	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	20.200	Add Flow / Climate Change (%)	0
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

Network Design Table for Surface Network 1

« - 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	40.910	0.136	300.8	0.117	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	33.144	0.110	301.3	0.069	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	22.420	0.075	298.9	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	33.214	0.111	299.2	0.067	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	24.245	0.081	299.3	0.077	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.005	18.728	0.062	302.1	0.037	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	8.695	0.029	299.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	21.728	0.109	199.3	0.078	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.001	5.121	0.026	197.0	0.148	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.002	51.046	0.102	500.0	0.024	0.00	0.0	0.600	\/	38	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	5.76	130.457	0.117	0.0	0.0	0.0	0.90	63.7	15.8
1.001	49.43	6.37	130.320	0.185	0.0	0.0	0.0	0.90	63.7	24.8
1.002	47.93	6.78	130.210	0.205	0.0	0.0	0.0	0.90	63.9	26.6
1.003	46.16	7.31	130.060	0.272	0.0	0.0	0.0	1.04	115.1	34.0
1.004	44.95	7.70	129.949	0.349	0.0	0.0	0.0	1.04	115.1	42.5
1.005	44.07	8.00	129.868	0.386	0.0	0.0	0.0	1.04	114.6	46.1
1.006	43.67	8.14	129.806	0.386	0.0	0.0	0.0	1.04	115.0	46.1
2.000	50.00	5.33	130.164	0.078	0.0	0.0	0.0	1.11	78.5	10.5
2.001	50.00	5.40	130.055	0.226	0.0	0.0	0.0	1.12	78.9	30.6
2.002	50.00	5.83	130.030	0.250	0.0	0.0	0.0	1.98	3035.3	33.8

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Network Design Table for Surface Network 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
4.002	87.215	0.428	204.0	0.079	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	15.495	0.067	229.6	0.096	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.014	23.159	0.000	0.0	0.044	0.00	0.0	0.600	\/	38	Pipe/Conduit	
1.015	44.782	0.175	255.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
6.000	51.812	0.259	200.0	0.081	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	31.790	0.159	200.0	0.147	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.002	18.066	0.090	200.0	0.068	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.016	15.116	0.050	300.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.017	24.000	0.100	240.0	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)
4.002	47.30	6.97	129.970	0.338	0.0	0.0	0.0	1.10	77.5	43.2
4.003	46.58	7.18	129.467	0.434	0.0	0.0	0.0	1.19	131.6	54.7
1.014	34.15	12.90	129.400	1.906	0.0	0.0	0.0	0.44	668.4	176.2
1.015	33.43	13.39	129.400	1.906	0.0	0.0	0.0	1.52	429.1	176.2
6.000	50.00	5.94	130.173	0.081	0.0	0.0	0.0	0.92	36.6	11.0
6.001	49.25	6.42	129.839	0.228	0.0	0.0	0.0	1.11	78.3	30.4
6.002	48.27	6.69	129.680	0.296	0.0	0.0	0.0	1.11	78.3	38.7
1.016	33.18	13.57	129.225	2.202	0.0	0.0	0.0	1.40	396.0	197.8
1.017	32.53	14.05	129.175	2.202	0.0	0.0	0.0	0.84	33.4«	197.8

Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.017	S49	131.000	129.075	0.000	1200	0

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Simulation Criteria for Surface Network 1

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 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 Storage Structures	1
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)	20.200	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S48, DS/PN: 1.017, Volume (m³): 18.3

Unit Reference	MD-SHE-0211-2350-1125-2350
Design Head (m)	1.125
Design Flow (l/s)	23.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	211
Invert Level (m)	129.175
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.125	23.5
Flush-Flo™	0.375	23.4
Kick-Flo®	0.801	20.0
Mean Flow over Head Range	-	19.8

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	7.2	1.200	24.2	3.000	37.6	7.000	56.6
0.200	20.5	1.400	26.1	3.500	40.5	7.500	58.5
0.300	23.2	1.600	27.8	4.000	43.2	8.000	60.4
0.400	23.4	1.800	29.4	4.500	45.7	8.500	62.2
0.500	23.1	2.000	30.9	5.000	48.1	9.000	64.0
0.600	22.7	2.200	32.4	5.500	50.4	9.500	65.7
0.800	20.0	2.400	33.7	6.000	52.5		
1.000	22.2	2.600	35.1	6.500	54.6		

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Storage Structures for Surface Network 1

Tank or Pond Manhole: S20, DS/PN: 1.015

Invert Level (m) 129.400

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1255.2	0.400	1475.6	0.800	1705.4	1.200	1943.5
0.100	1308.7	0.500	1532.3	0.900	1764.1		
0.200	1363.8	0.600	1589.5	1.000	1823.4		
0.300	1419.5	0.700	1647.2	1.100	1883.2		

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

for Surface Network 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 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 1

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

Ratio R 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.200 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status ON

Analysis Timestep Fine

Inertia Status ON

DTS Status OFF

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

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
									(m)
1.000	S38	15 Winter	1	+0%	100/15 Summer				130.565
1.001	S5	15 Winter	1	+0%	100/15 Summer				130.453
1.002	S6	15 Winter	1	+0%	100/15 Summer				130.350
1.003	S36	15 Winter	1	+0%	100/15 Summer				130.201
1.004	S35	15 Winter	1	+0%	30/15 Winter				130.114
1.005	S7	15 Winter	1	+0%	30/15 Winter				130.045
1.006	S27	15 Winter	1	+0%	100/15 Summer				129.991
2.000	S30	15 Winter	1	+0%	30/15 Summer				130.253
2.001	S31	15 Winter	1	+0%	30/15 Summer				130.211
2.002	S32	15 Winter	1	+0%					130.127
2.003	S33	15 Winter	1	+0%					130.036
2.004	S44	15 Winter	1	+0%					130.018
2.005	S45	15 Winter	1	+0%					129.947
1.007	S9	15 Winter	1	+0%					129.929
1.008	S46	15 Winter	1	+0%					129.874
1.009	S47	15 Winter	1	+0%					129.817
3.000	S10	15 Winter	1	+0%	100/15 Summer				130.306
3.001	S11	15 Winter	1	+0%	30/15 Winter				129.961
3.002	S12	15 Winter	1	+0%	30/15 Winter				129.850
1.010	S13	15 Winter	1	+0%					129.769
1.011	S23	15 Winter	1	+0%					129.712

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

PN	US/MH Name	Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)				
1.000	S38	-0.192	0.000	0.27			15.9	OK	
1.001	S5	-0.167	0.000	0.40			23.2	OK	
1.002	S6	-0.160	0.000	0.44			24.7	OK	
1.003	S36	-0.234	0.000	0.30			30.9	OK	
1.004	S35	-0.210	0.000	0.38			37.3	OK	
1.005	S7	-0.198	0.000	0.42			40.0	OK	
1.006	S27	-0.190	0.000	0.49			39.9	OK	
2.000	S30	-0.211	0.000	0.15			10.7	OK	
2.001	S31	-0.144	0.000	0.53			28.1	OK	
2.002	S32	-0.696	0.000	0.01			30.3	OK	
2.003	S33	-0.686	0.000	0.03			29.9	OK	
2.004	S44	-0.683	0.000	0.02			36.6	OK	
2.005	S45	-0.664	0.000	0.02			33.8	OK	
1.007	S9	-0.642	0.000	0.02			72.7	OK	
1.008	S46	-0.629	0.000	0.04			71.7	OK	
1.009	S47	-0.617	0.000	0.04			78.7	OK	
3.000	S10	-0.191	0.000	0.28			20.8	OK	
3.001	S11	-0.210	0.000	0.40			48.5	OK	
3.002	S12	-0.205	0.000	0.42			51.6	OK	
1.010	S13	-0.575	0.000	0.04			108.8	OK	
1.011	S23	-0.567	0.000	0.06			110.8	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.012	S22	30 Winter	1	+0%				
1.013	S21	30 Winter	1	+0%				
4.000	S40	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
4.001	S39	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
5.000	S29	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
4.002	S14	15 Winter	1	+0%	30/15 Summer	100/15 Summer		
4.003	S15	15 Winter	1	+0%	100/15 Summer			
1.014	S16	30 Winter	1	+0%				
1.015	S20	120 Winter	1	+0%	100/240 Winter			
6.000	S17	15 Winter	1	+0%	100/15 Summer			
6.001	S41	15 Winter	1	+0%	30/15 Summer			
6.002	S18	15 Winter	1	+0%	30/15 Summer			
1.016	S19	240 Winter	1	+0%	100/15 Winter			
1.017	S48	240 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.012	S22	129.672	-0.557	0.000	0.09			112.7	OK
1.013	S21	129.641	-0.553	0.000	0.07			111.5	OK
4.000	S40	130.362	-0.197	0.000	0.25			16.8	OK
4.001	S39	130.224	-0.173	0.000	0.37			26.0	OK
5.000	S29	130.204	-0.148	0.000	0.25			8.4	OK
4.002	S14	130.134	-0.136	0.000	0.54			40.3	OK
4.003	S15	129.650	-0.192	0.000	0.47			50.1	OK
1.014	S16	129.562	-0.632	0.000	0.18			142.9	OK
1.015	S20	129.537	-0.463	0.000	0.05			22.1	OK*
6.000	S17	130.262	-0.137	0.000	0.31			11.0	OK
6.001	S41	129.970	-0.169	0.000	0.39			27.8	OK
6.002	S18	129.836	-0.145	0.000	0.53			35.5	OK
1.016	S19	129.515	-0.311	0.000	0.08			23.5	OK
1.017	S48	129.503	0.103	0.000	0.76			23.3	SURCHARGED

**US/MH Level
PN Name Exceeded**

1.012	S22	
1.013	S21	
4.000	S40	2
4.001	S39	2
5.000	S29	1
4.002	S14	2
4.003	S15	
1.014	S16	

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	US/MH Level PN Name Exceeded	
	1.015 S20	
	6.000 S17	
	6.001 S41	
	6.002 S18	
	1.016 S19	
	1.017 S48	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 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 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 1

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

Ratio R 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.200 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status ON

Analysis Timestep Fine

Inertia Status ON

DTS Status OFF

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

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
									(m)
1.000	S38 15	Winter	30	+0%	100/15	Summer			130.644
1.001	S5 15	Winter	30	+0%	100/15	Summer			130.589
1.002	S6 15	Winter	30	+0%	100/15	Summer			130.508
1.003	S36 15	Winter	30	+0%	100/15	Summer			130.427
1.004	S35 15	Winter	30	+0%	30/15	Winter			130.346
1.005	S7 15	Winter	30	+0%	30/15	Winter			130.262
1.006	S27 15	Winter	30	+0%	100/15	Summer			130.171
2.000	S30 15	Winter	30	+0%	30/15	Summer			130.507
2.001	S31 15	Winter	30	+0%	30/15	Summer			130.418
2.002	S32 15	Winter	30	+0%					130.199
2.003	S33 15	Winter	30	+0%					130.126
2.004	S44 15	Winter	30	+0%					130.109
2.005	S45 15	Winter	30	+0%					130.052
1.007	S9 15	Winter	30	+0%					130.033
1.008	S46 15	Winter	30	+0%					129.984
1.009	S47 15	Winter	30	+0%					129.932
3.000	S10 15	Winter	30	+0%	100/15	Summer			130.382
3.001	S11 15	Winter	30	+0%	30/15	Winter			130.181
3.002	S12 15	Winter	30	+0%	30/15	Winter			130.060
1.010	S13 15	Winter	30	+0%					129.890
1.011	S23 15	Winter	30	+0%					129.837

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

PN	US/MH Name	Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)				
1.000	S38	-0.113	0.000	0.65			38.8	OK	
1.001	S5	-0.031	0.000	0.97			56.5	OK	
1.002	S6	-0.002	0.000	1.00			56.4	OK	
1.003	S36	-0.008	0.000	0.70			71.6	OK	
1.004	S35	0.022	0.000	0.86			85.7	SURCHARGED	
1.005	S7	0.019	0.000	0.93			88.1	SURCHARGED	
1.006	S27	-0.010	0.000	1.00			82.0	OK	
2.000	S30	0.043	0.000	0.38			26.6	SURCHARGED	
2.001	S31	0.063	0.000	1.45			76.5	SURCHARGED	
2.002	S32	-0.624	0.000	0.03			84.9	OK	
2.003	S33	-0.596	0.000	0.08			77.8	OK	
2.004	S44	-0.592	0.000	0.05			94.7	OK	
2.005	S45	-0.559	0.000	0.06			86.8	OK	
1.007	S9	-0.538	0.000	0.05			166.4	OK	
1.008	S46	-0.519	0.000	0.08			164.0	OK	
1.009	S47	-0.502	0.000	0.08			178.5	OK	
3.000	S10	-0.115	0.000	0.67			49.5	OK	
3.001	S11	0.010	0.000	1.02			122.7	SURCHARGED	
3.002	S12	0.005	0.000	1.05			129.3	SURCHARGED	
1.010	S13	-0.454	0.000	0.10			274.8	OK	
1.011	S23	-0.442	0.000	0.16			276.4	OK	

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Surface Network 1</u>																										
	<table><thead><tr><th></th><th>US/MH</th><th>Level</th></tr><tr><th>PN</th><th>Name</th><th>Exceeded</th></tr></thead><tbody><tr><td>1.015</td><td>S20</td><td></td></tr><tr><td>6.000</td><td>S17</td><td></td></tr><tr><td>6.001</td><td>S41</td><td></td></tr><tr><td>6.002</td><td>S18</td><td></td></tr><tr><td>1.016</td><td>S19</td><td></td></tr><tr><td>1.017</td><td>S48</td><td></td></tr></tbody></table>		US/MH	Level	PN	Name	Exceeded	1.015	S20		6.000	S17		6.001	S41		6.002	S18		1.016	S19		1.017	S48		
	US/MH	Level																								
PN	Name	Exceeded																								
1.015	S20																									
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 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 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 1
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 Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.200 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

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 Level (m)
1.000	S38	15 Winter	100	+40%	100/15 Summer				131.550
1.001	S5	15 Winter	100	+40%	100/15 Summer				131.408
1.002	S6	15 Winter	100	+40%	100/15 Summer				131.139
1.003	S36	15 Winter	100	+40%	100/15 Summer				130.922
1.004	S35	15 Winter	100	+40%	30/15 Winter				130.752
1.005	S7	15 Winter	100	+40%	30/15 Winter				130.537
1.006	S27	15 Winter	100	+40%	100/15 Summer				130.335
2.000	S30	15 Winter	100	+40%	30/15 Summer				130.749
2.001	S31	15 Winter	100	+40%	30/15 Summer				130.657
2.002	S32	15 Winter	100	+40%					130.279
2.003	S33	240 Winter	100	+40%					130.267
2.004	S44	240 Winter	100	+40%					130.267
2.005	S45	240 Winter	100	+40%					130.264
1.007	S9	240 Winter	100	+40%					130.262
1.008	S46	240 Winter	100	+40%					130.256
1.009	S47	240 Winter	100	+40%					130.247
3.000	S10	15 Winter	100	+40%	100/15 Summer				131.133
3.001	S11	15 Winter	100	+40%	30/15 Winter				130.794
3.002	S12	15 Winter	100	+40%	30/15 Winter				130.427
1.010	S13	240 Winter	100	+40%					130.232
1.011	S23	240 Winter	100	+40%					130.195

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

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)						
1.000	S38	0.793	0.000	1.01			59.7	SURCHARGED	
1.001	S5	0.788	0.000	1.53			89.4	SURCHARGED	
1.002	S6	0.629	0.000	1.72			97.3	SURCHARGED	
1.003	S36	0.487	0.000	1.20			123.8	SURCHARGED	
1.004	S35	0.428	0.000	1.58			156.8	SURCHARGED	
1.005	S7	0.294	0.000	1.80			171.7	SURCHARGED	
1.006	S27	0.154	0.000	2.08			170.7	SURCHARGED	
2.000	S30	0.285	0.000	0.71			49.1	SURCHARGED	
2.001	S31	0.302	0.000	2.69			141.7	SURCHARGED	
2.002	S32	-0.544	0.000	0.05			156.6	FLOOD RISK*	
2.003	S33	-0.454	0.000	0.03			28.9	FLOOD RISK	
2.004	S44	-0.434	0.000	0.02			37.1	FLOOD RISK	
2.005	S45	-0.346	0.000	0.02			35.2	FLOOD RISK	
1.007	S9	-0.309	0.000	0.03			78.4	FLOOD RISK*	
1.008	S46	-0.248	0.000	0.04			75.0	FLOOD RISK	
1.009	S47	-0.187	0.000	0.04			85.9	FLOOD RISK	
3.000	S10	0.636	0.000	1.14			84.3	SURCHARGED	
3.001	S11	0.624	0.000	1.77			214.5	SURCHARGED	
3.002	S12	0.373	0.000	1.87			229.6	SURCHARGED	
1.010	S13	-0.112	0.000	0.05			126.7	FLOOD RISK*	
1.011	S23	-0.083	0.000	0.07			129.3	OK	

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Micro Drainage

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.012	S22	240 Winter	100	+40%				
1.013	S21	360 Winter	100	+40%				
4.000	S40	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
4.001	S39	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
5.000	S29	15 Winter	100	+40%	30/15 Summer	100/15 Winter		
4.002	S14	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
4.003	S15	480 Winter	100	+40%	100/15 Summer			
1.014	S16	480 Winter	100	+40%				
1.015	S20	480 Winter	100	+40%	100/240 Winter			
6.000	S17	15 Winter	100	+40%	100/15 Summer			
6.001	S41	15 Winter	100	+40%	30/15 Summer			
6.002	S18	15 Winter	100	+40%	30/15 Summer			
1.016	S19	360 Winter	100	+40%	100/15 Winter			
1.017	S48	360 Winter	100	+40%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.012	S22	130.152	-0.077	0.000	0.10			136.1	OK
1.013	S21	130.119	-0.075	0.000	0.06			95.3	OK
4.000	S40	131.898	1.339	1.418	0.86			57.4	FLOOD
4.001	S39	131.828	1.431	0.955	1.23			86.1	FLOOD
5.000	S29	131.726	1.374	0.084	0.93			31.7	FLOOD
4.002	S14	131.643	1.373	0.658	1.92			143.8	FLOOD
4.003	S15	130.056	0.213	0.000	0.27			28.9	SURCHARGED
1.014	S16	130.054	-0.140	0.000	0.12			102.0	OK
1.015	S20	130.042	0.042	0.000	0.05			22.5	SURCHARGED*
6.000	S17	131.337	0.939	0.000	1.32			46.2	SURCHARGED
6.001	S41	130.896	0.756	0.000	1.72			122.8	SURCHARGED
6.002	S18	130.404	0.423	0.000	2.39			160.9	SURCHARGED
1.016	S19	130.055	0.230	0.000	0.09			24.7	SURCHARGED
1.017	S48	130.081	0.681	0.000	0.76			23.4	SURCHARGED

PN	US/MH Name	Level Exceeded
1.012	S22	
1.013	S21	
4.000	S40	2
4.001	S39	2
5.000	S29	1
4.002	S14	2
4.003	S15	
1.014	S16	

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

US/MH Level		
PN	Name	Exceeded
1.015	S20	
6.000	S17	
6.001	S41	
6.002	S18	
1.016	S19	
1.017	S48	