



Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Spine Road and Western Gateway Phase 1 (SRWG1)

MicroDrainage Results

WMHP-TG-SRWG1-RP-DD-0505

Revision: P04 Date: 22/01/2024

Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Spine Road and Western Gateway Phase 1 (SRWG1)

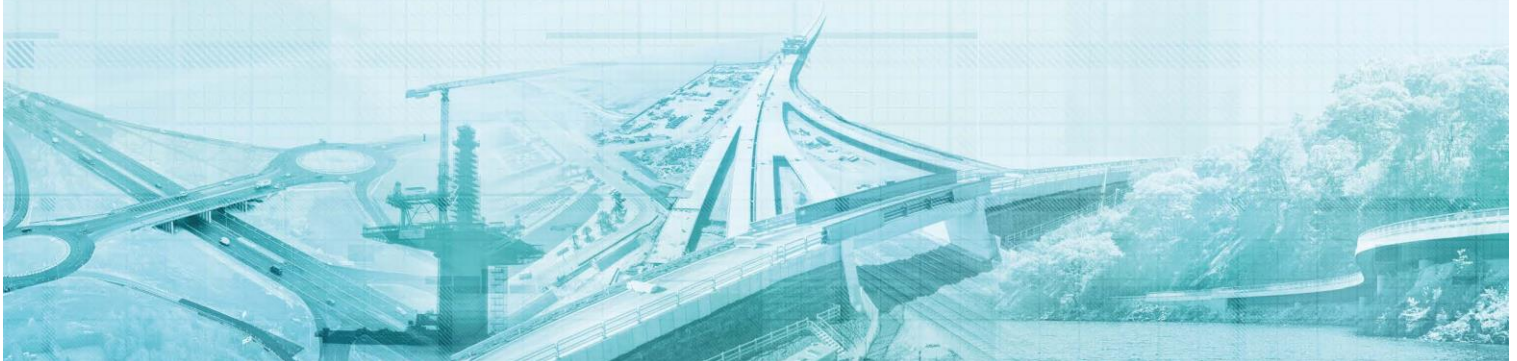
MicroDrainage Results

Wokingham Borough Council

Document no: WMHP-TG-SRWG1-RP-DD-0505

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Document Issue Record

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P01	19/04/21	First Issue	MH	DJF	JC
P02	02/09/21	Updated following SCO Comments	MH	BH	JC
P03	29/09/21	For Planning Discharge	DJF	JC	JC
P04	22/01/24	VE Roundabout Update	JB	DJF	JC

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1 Introduction

The results presented in this report are generated using WinDes Microdrainage. The models have been created to support the hydraulic design of the proposed drainage networks for the Spine Road scheme.

This report should be read in conjunction with layout drawings WMHP-TG-SRWG1-DR-DD-0501 to WMHP-TG-SRWG1-DR-DD-0507, construction detail drawings WMHP-TG-SRWG1-DR-DD-0521 to WMHP-TG-SRWG1-DR-DD-0521 to WMHP-TG-SRWG1-DR-DD-0524, drainage specification WMHP-TG-SRWG1-SP-HI-0501 and drainage schedule WMHP-TG-SRWG1-SH-HI-0501.

2 Results

Tony Gee & Partners LLP		Page 1
Hardy House, 140 High Street Esher Surrey, KT10 9QJ	Spine Road Distributor Road Wokingham Tony Gee and Partners LLP	
Date 22/01/2024	Designed by JB	
File CATCHMENT 1.MDX	Checked by DJF	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales					
Return Period (years)	1	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	18.700	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	0.980
Ratio R	0.400	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	50	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.200		

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.050	4-8	0.050	8-12	0.000

Total Area Contributing (ha) = 0.100

Total Pipe Volume (m³) = 2.369

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow	k (l/s)	HYD SECT	DIA (mm)	Section Type	Auto Design
2.000	18.275	0.309	59.1	0.003	6.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	12.138	0.243	50.0	0.023	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	18.289	0.313	58.4	0.002	6.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	27.426	0.549	50.0	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.003	13.966	0.279	50.0	0.039	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.004	27.809	0.056	500.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.005	3.481	0.007	500.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.006	12.671	0.025	500.0	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	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.000	46.33	6.23	50.612	0.003	0.0	0.0	0.0	1.31	23.2	0.4
2.001	45.84	6.37	50.303	0.026	0.0	0.0	0.0	1.43	25.2	3.2
3.000	46.34	6.23	50.600	0.002	0.0	0.0	0.0	1.32	23.3	0.3
2.002	44.76	6.69	50.060	0.048	0.0	0.0	0.0	1.43	25.2	5.8
2.003	44.23	6.86	49.512	0.087	0.0	0.0	0.0	1.43	25.2	10.4
2.004	41.16	7.90	49.049	0.100	0.0	0.0	0.0	0.44	7.8«	11.2
2.005	40.81	8.04	48.918	0.100	0.0	0.0	0.0	0.44	7.8«	11.2
2.006	39.58	8.51	48.836	0.100	0.0	0.0	0.0	0.44	7.8«	11.2

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., I*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 2-2.000	51.552	0.940	Open Manhole	1200	2.000	50.612	150				
CP 1-1.000	51.379	1.076	Open Manhole	1200	2.001	50.303	150	2.000	50.303	150	
CP 2-1.000	51.540	0.940	Open Manhole	1200	3.000	50.600	150				
CP 1-1.001	51.383	1.323	Open Manhole	1200	2.002	50.060	150	2.001	50.060	150	
								3.000	50.287	150	227
CP 1-1.002	50.922	1.410	Open Manhole	1200	2.003	49.512	150	2.002	49.512	150	
CP 1-1.003	50.870	1.821	Open Manhole	1200	2.004	49.049	150	2.003	49.232	150	183
1-1.004	51.408	2.490	Open Manhole	1200	2.005	48.918	150	2.004	48.993	150	75
CP 1-1.005	51.458	2.622	Open Manhole	1200	2.006	48.836	150	2.005	48.911	150	75
	49.180	0.369	Open Manhole	0		OUTFALL		2.006	48.811	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 2-2.000	480993.292	167851.296	480993.292	167851.296	Required	
CP 1-1.000	480978.877	167862.528	480978.877	167862.528	Required	
CP 2-1.000	480985.034	167841.474	480985.034	167841.474	Required	
CP 1-1.001	480971.045	167853.255	480971.045	167853.255	Required	
CP 1-1.002	480950.092	167870.950	480950.092	167870.950	Required	
CP 1-1.003	480956.260	167883.480	480956.260	167883.480	Required	
1-1.004	480979.132	167867.662	480979.132	167867.662	Required	
CP 1-1.005	480981.989	167865.674	480981.989	167865.674	Required	
	480990.071	167875.433			No Entry	

PIPELINE SCHEDULES for Storm

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)
2.000	o	150	CP 2-2.000	51.552	50.612	0.790	Open Manhole	1200
2.001	o	150	CP 1-1.000	51.379	50.303	0.926	Open Manhole	1200
3.000	o	150	CP 2-1.000	51.540	50.600	0.790	Open Manhole	1200
2.002	o	150	CP 1-1.001	51.383	50.060	1.173	Open Manhole	1200
2.003	o	150	CP 1-1.002	50.922	49.512	1.260	Open Manhole	1200
2.004	o	150	CP 1-1.003	50.870	49.049	1.671	Open Manhole	1200
2.005	o	150	1-1.004	51.408	48.918	2.340	Open Manhole	1200
2.006	o	150	CP 1-1.005	51.458	48.836	2.472	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)
2.000	18.275	59.1	CP 1-1.000	51.379	50.303	0.926	Open Manhole	1200
2.001	12.138	50.0	CP 1-1.001	51.383	50.060	1.173	Open Manhole	1200
3.000	18.289	58.4	CP 1-1.001	51.383	50.287	0.946	Open Manhole	1200
2.002	27.426	50.0	CP 1-1.002	50.922	49.512	1.260	Open Manhole	1200
2.003	13.966	50.0	CP 1-1.003	50.870	49.232	1.487	Open Manhole	1200
2.004	27.809	500.0	1-1.004	51.408	48.993	2.264	Open Manhole	1200
2.005	3.481	500.0	CP 1-1.005	51.458	48.911	2.397	Open Manhole	1200
2.006	12.671	500.0		49.180	48.811	0.219	Open Manhole	0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
2.000	User	-	100	0.003	0.003	0.003
2.001	User	-	100	0.023	0.023	0.023
3.000	User	-	100	0.002	0.002	0.002
2.002	User	-	100	0.020	0.020	0.020
2.003	User	-	100	0.039	0.039	0.039
2.004	User	-	100	0.013	0.013	0.013
2.005	-	-	100	0.000	0.000	0.000
2.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.100	0.100	0.100

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2.006		49.180	48.811	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coefficient 0.800
Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Additional Flow - % of Total Flow 0.000 Run Time (mins) 60
Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 2.000 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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
Return Period (years) 1 Ratio R 0.400 Cv (Winter) 0.840
Region England and Wales Profile Type Summer Storm Duration (mins) 30

Online Controls for Storm

Complex Manhole: 1-1.004, DS/PN: 2.005, Volume (m³): 3.3

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0034-4000-0500-4000	Sump Available	Yes
Design Head (m)	0.500	Diameter (mm)	34
Design Flow (l/s)	0.4	Invert Level (m)	48.918
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	75
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.500	0.4	Kick-Flo®	0.300	0.3
Flush-Flo™	0.149	0.4	Mean Flow over Head Range	-	0.3

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.4	0.600	0.4	1.600	0.7	2.600	0.8	5.000	1.1	7.500	1.4
0.200	0.4	0.800	0.5	1.800	0.7	3.000	0.9	5.500	1.2	8.000	1.4
0.300	0.3	1.000	0.5	2.000	0.7	3.500	0.9	6.000	1.2	8.500	1.4
0.400	0.4	1.200	0.6	2.200	0.8	4.000	1.0	6.500	1.3	9.000	1.5
0.500	0.4	1.400	0.6	2.400	0.8	4.500	1.1	7.000	1.3	9.500	1.5

Orifice

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 49.569

Storage Structures for Storm

Tank or Pond Manhole: CP 1-1.003, DS/PN: 2.004

Invert Level (m) 49.049

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	75.6	0.750	75.6	0.751	0.0	2.011	0.0

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

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700 Cv (Summer)	0.750
Region	England and Wales	Ratio R	0.400 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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 Flooded			Flow / Overflow (l/s)	Half Drain Pipe		Status
									Level (m)	Depth (m)	Volume (m³)		Time (mins)	Flow (l/s)	
2.000	CP 2-2.000	15 Winter	1	+0%					50.624	-0.138	0.000	0.02		0.4	OK
2.001	CP 1-1.000	15 Winter	1	+0%	100/15 Summer				50.338	-0.115	0.000	0.12		2.8	OK
3.000	CP 2-1.000	15 Winter	1	+0%					50.608	-0.142	0.000	0.01		0.3	OK
2.002	CP 1-1.001	15 Winter	1	+0%	100/15 Summer				50.108	-0.102	0.000	0.22		5.3	OK
2.003	CP 1-1.002	15 Winter	1	+0%	30/15 Summer				49.579	-0.083	0.000	0.41		9.6	OK
2.004	CP 1-1.003	360 Winter	1	+0%	1/360 Winter				49.200	0.001	0.000	0.12		0.9	SURCHARGED
2.005	1-1.004	360 Winter	1	+0%	1/15 Summer				49.346	0.278	0.000	0.04		0.4	SURCHARGED
2.006	CP 1-1.005	2880 Winter	1	+0%					48.859	-0.127	0.000	0.06		0.4	OK

PN	US/MH Name	Level Exceeded
2.000	CP 2-2.000	
2.001	CP 1-1.000	
3.000	CP 2-1.000	
2.002	CP 1-1.001	
2.003	CP 1-1.002	
2.004	CP 1-1.003	
2.005	1-1.004	
2.006	CP 1-1.005	

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

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

									Water	Surcharged	Flooded	Half Drain			Pipe		
PN	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow	
	Name	Storm	Period	Change		Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status
2.000	CP 2-2.000	15 Winter	30	+0%						50.631	-0.131	0.000	0.04			0.9	OK
2.001	CP 1-1.000	15 Winter	30	+0%	100/15 Summer					50.367	-0.086	0.000	0.38			8.6	OK
3.000	CP 2-1.000	15 Winter	30	+0%						50.617	-0.133	0.000	0.03			0.6	OK
2.002	CP 1-1.001	15 Winter	30	+0%	100/15 Summer					50.150	-0.060	0.000	0.66			16.0	OK
2.003	CP 1-1.002	15 Winter	30	+0%	30/15 Summer					49.781	0.120	0.000	1.20			27.7	SURCHARGED
2.004	CP 1-1.003	480 Winter	30	+0%	1/360 Winter					49.447	0.248	0.000	0.07			0.5	SURCHARGED
2.005	1-1.004	480 Winter	30	+0%	1/15 Summer					49.507	0.439	0.000	0.04			0.4	SURCHARGED
2.006	CP 1-1.005	600 Winter	30	+0%						48.860	-0.126	0.000	0.06			0.4	OK

		US/MH	Level
PN	Name		Exceeded
2.000	CP 2-2.000		
2.001	CP 1-1.000		
3.000	CP 2-1.000		
2.002	CP 1-1.001		
2.003	CP 1-1.002		
2.004	CP 1-1.003		
2.005	1-1.004		
2.006	CP 1-1.005		

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

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

			Water				Flooded				Half Drain				Pipe	Status
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
2.000	CP 2-2.000	15 Winter	100	+40%					50.680	-0.082	0.000	0.09			1.9	OK
2.001	CP 1-1.000	15 Winter	100	+40%	100/15 Summer				50.677	0.224	0.000	0.53			12.1	SURCHARGED
3.000	CP 2-1.000	15 Winter	100	+40%					50.628	-0.122	0.000	0.05			1.1	OK
2.002	CP 1-1.001	15 Winter	100	+40%	100/15 Summer				50.624	0.413	0.000	0.92			22.1	SURCHARGED
2.003	CP 1-1.002	15 Winter	100	+40%	30/15 Summer				50.227	0.565	0.000	1.74			40.2	SURCHARGED
2.004	CP 1-1.003	360 Winter	100	+40%	1/360 Winter				49.700	0.501	0.000	0.28			2.1	SURCHARGED
2.005	1-1.004	720 Winter	100	+40%	1/15 Summer				49.735	0.667	0.000	0.20			2.0	SURCHARGED
2.006	CP 1-1.005	480 Winter	100	+40%					48.896	-0.090	0.000	0.32			2.1	OK

		US/MH	Level
PN	Name		Exceeded
2.000	CP 2-2.000		
2.001	CP 1-1.000		
3.000	CP 2-1.000		
2.002	CP 1-1.001		
2.003	CP 1-1.002		
2.004	CP 1-1.003		
2.005	1-1.004		
2.006	CP 1-1.005		

Time Area Diagram for Catchment 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.185	4-8	0.364	8-12	0.032

Total Area Contributing (ha) = 0.582

Total Pipe Volume (m³) = 28.042

Existing Network Details for Catchment 2

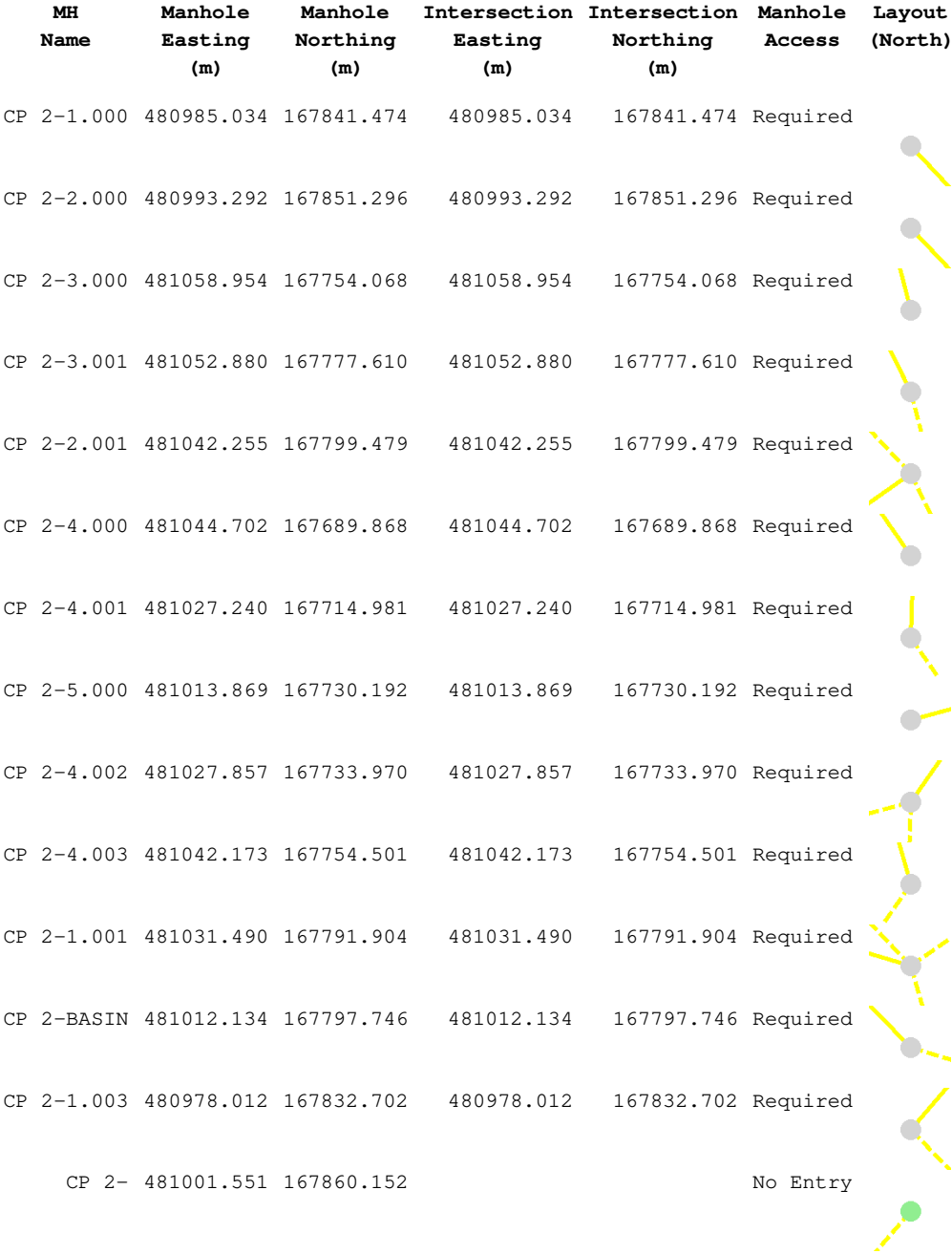
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
PN 2-1.000	68.405	0.601	113.8	0.046	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 2-2.000	71.320	0.676	105.5	0.064	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 2-3.000	24.313	0.928	26.2	0.064	5.00	0.0	0.600	o	225	Pipe/Conduit
PN 2-3.001	24.314	0.732	33.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
PN 2-2.001	13.163	0.046	286.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 2-4.000	31.178	0.312	99.9	0.038	6.00	0.0	0.600	o	150	Pipe/Conduit
PN 2-4.001	18.999	0.132	143.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
PN 2-5.000	14.489	0.059	245.6	0.030	6.00	0.0	0.600	o	300	Pipe/Conduit
PN 2-4.002	25.029	0.103	243.0	0.172	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 2-4.003	40.313	0.599	67.3	0.048	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 2-1.001	20.218	0.208	97.2	0.120	0.00	0.0	0.600	o	400	Pipe/Conduit
PN 2-1.002	48.850	0.070	697.9	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit
PN 2-1.003	36.160	0.113	319.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	E I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
PN 2-1.000	50.552	0.046	0.0	1.22	48.7
PN 2-2.000	50.664	0.064	0.0	1.27	50.6
PN 2-3.000	51.453	0.064	0.0	2.57	102.0
PN 2-3.001	50.525	0.064	0.0	2.28	90.6
PN 2-2.001	49.913	0.128	0.0	0.92	65.3
PN 2-4.000	51.222	0.038	0.0	1.01	17.8
PN 2-4.001	50.835	0.038	0.0	1.09	43.2
PN 2-5.000	50.628	0.030	0.0	1.00	70.6
PN 2-4.002	50.569	0.240	0.0	1.00	71.0
PN 2-4.003	50.466	0.288	0.0	1.92	135.7
PN 2-1.001	49.767	0.582	0.0	1.91	240.6
PN 2-1.002	49.059	0.582	0.0	0.71	88.8
PN 2-1.003	48.989	0.582	0.0	1.01	111.4

Manhole Schedules for Catchment 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 2-1.000	51.425	0.873	Open Manhole	1200	PN 2-1.000	50.552	225				
CP 2-2.000	51.547	0.883	Open Manhole	1200	PN 2-2.000	50.664	225				
CP 2-3.000	52.302	0.849	Open Manhole	600	PN 2-3.000	51.453	225				
CP 2-3.001	51.392	0.867	Open Manhole	600	PN 2-3.001	50.525	225	PN 2-3.000	50.525	225	
CP 2-2.001	50.995	1.202	Open Manhole	1200	PN 2-2.001	49.913	300	PN 2-2.000	49.988	225	
								PN 2-3.001	49.793	225	
CP 2-4.000	52.189	0.967	Open Manhole	600	PN 2-4.000	51.222	150				
CP 2-4.001	52.187	1.352	Open Manhole	1200	PN 2-4.001	50.835	225	PN 2-4.000	50.910	150	
CP 2-5.000	51.716	1.088	Open Manhole	1050	PN 2-5.000	50.628	300				
CP 2-4.002	52.264	1.695	Open Manhole	1200	PN 2-4.002	50.569	300	PN 2-4.001	50.703	225	59
								PN 2-5.000	50.569	300	
CP 2-4.003	52.086	1.620	Open Manhole	1200	PN 2-4.003	50.466	300	PN 2-4.002	50.466	300	
CP 2-1.001	50.991	1.224	Open Manhole	1350	PN 2-1.001	49.767	400	PN 2-1.000	49.951	225	9
								PN 2-2.001	49.867	300	
								PN 2-4.003	49.867	300	
CP 2-BASIN	50.444	1.385	Open Manhole	100	PN 2-1.002	49.059	400	PN 2-1.001	49.559	400	500
CP 2-1.003	51.161	2.172	Open Manhole	2100	PN 2-1.003	48.989	375	PN 2-1.002	48.989	400	
CP 2-	49.458	0.582	Open Manhole	0		OUTFALL		PN 2-1.003	48.876	375	



PIPELINE SCHEDULES for Catchment 2

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)
PN 2-1.000	o	225	CP 2-1.000	51.425	50.552	0.648	Open Manhole	1200
PN 2-2.000	o	225	CP 2-2.000	51.547	50.664	0.658	Open Manhole	1200
PN 2-3.000	o	225	CP 2-3.000	52.302	51.453	0.624	Open Manhole	600
PN 2-3.001	o	225	CP 2-3.001	51.392	50.525	0.642	Open Manhole	600
PN 2-2.001	o	300	CP 2-2.001	50.995	49.913	0.782	Open Manhole	1200
PN 2-4.000	o	150	CP 2-4.000	52.189	51.222	0.817	Open Manhole	600
PN 2-4.001	o	225	CP 2-4.001	52.187	50.835	1.127	Open Manhole	1200
PN 2-5.000	o	300	CP 2-5.000	51.716	50.628	0.788	Open Manhole	1050
PN 2-4.002	o	300	CP 2-4.002	52.264	50.569	1.395	Open Manhole	1200
PN 2-4.003	o	300	CP 2-4.003	52.086	50.466	1.320	Open Manhole	1200
PN 2-1.001	o	400	CP 2-1.001	50.991	49.767	0.824	Open Manhole	1350
PN 2-1.002	o	400	CP 2-BASIN	50.444	49.059	0.985	Open Manhole	100
PN 2-1.003	o	375	CP 2-1.003	51.161	48.989	1.797	Open Manhole	2100

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)
PN 2-1.000	68.405	113.8	CP 2-1.001	50.991	49.951	0.815	Open Manhole	1350
PN 2-2.000	71.320	105.5	CP 2-2.001	50.995	49.988	0.782	Open Manhole	1200
PN 2-3.000	24.313	26.2	CP 2-3.001	51.392	50.525	0.642	Open Manhole	600
PN 2-3.001	24.314	33.2	CP 2-2.001	50.995	49.793	0.977	Open Manhole	1200
PN 2-2.001	13.163	286.2	CP 2-1.001	50.991	49.867	0.824	Open Manhole	1350
PN 2-4.000	31.178	99.9	CP 2-4.001	52.187	50.910	1.127	Open Manhole	1200
PN 2-4.001	18.999	143.9	CP 2-4.002	52.264	50.703	1.336	Open Manhole	1200
PN 2-5.000	14.489	245.6	CP 2-4.002	52.264	50.569	1.395	Open Manhole	1200
PN 2-4.002	25.029	243.0	CP 2-4.003	52.086	50.466	1.320	Open Manhole	1200
PN 2-4.003	40.313	67.3	CP 2-1.001	50.991	49.867	0.824	Open Manhole	1350
PN 2-1.001	20.218	97.2	CP 2-BASIN	50.444	49.559	0.485	Open Manhole	100
PN 2-1.002	48.850	697.9	CP 2-1.003	51.161	48.989	1.772	Open Manhole	2100
PN 2-1.003	36.160	319.1	CP 2-	49.458	48.876	0.207	Open Manhole	0

Area Summary for Catchment 2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.046	0.046	0.046
2.000	User	-	100	0.064	0.064	0.064
3.000	User	-	100	0.064	0.064	0.064
3.001	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.038	0.038	0.038
4.001	-	-	100	0.000	0.000	0.000
5.000	User	-	100	0.030	0.030	0.030
4.002	User	-	100	0.172	0.172	0.172
4.003	User	-	100	0.048	0.048	0.048
1.001	User	-	37	0.324	0.120	0.120
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.786	0.582	0.582

Free Flowing Outfall Details for Catchment 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
PN 2-1.003	CP 2-	49.458	48.876	0.000	0	0

Simulation Criteria for Catchment 2

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.700	Cv (Summer)	0.750
Return Period (years)	100	Ratio R	0.400	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Summer Storm	Duration (mins)	30

Online Controls for Catchment 2

Complex Manhole: CP 2-BASIN, DS/PN: PN 2-1.002, Volume (m³): 2.5

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0072-2200-0870-2200	Sump Available	Yes
Design Head (m)	0.870	Diameter (mm)	72
Design Flow (l/s)	2.2	Invert Level (m)	49.059
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.870	2.2	Kick-Flo®	0.553	1.8
Flush-Flo™	0.266	2.2	Mean Flow over Head Range	-	1.9

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9	0.600	1.9	1.600	2.9	2.600	3.6	5.000	4.9	7.500	6.0
0.200	2.2	0.800	2.1	1.800	3.1	3.000	3.9	5.500	5.2	8.000	6.2
0.300	2.2	1.000	2.3	2.000	3.2	3.500	4.2	6.000	5.4	8.500	6.3
0.400	2.1	1.200	2.5	2.200	3.4	4.000	4.4	6.500	5.6	9.000	6.5
0.500	2.0	1.400	2.7	2.400	3.5	4.500	4.7	7.000	5.8	9.500	6.7

Orifice

Diameter (m) 0.090 Discharge Coefficient 0.600 Invert Level (m) 49.935

Weir

Discharge Coef 0.544 Width (m) 2.100 Invert Level (m) 49.935

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Storage Structures for Catchment 2

Tank or Pond Manhole: CP 2-BASIN, DS/PN: PN 2-1.002

Invert Level (m) 49.059

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	167.3	0.670	417.2	0.675	553.3	1.385	866.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700 Cv (Summer)	0.750
Region	England and Wales	Ratio R	0.400 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

										Water	Surcharged	Flooded	Half Drain		Pipe		
PN	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow		Level	Depth	Volume	Flow /	Overflow	Time	Flow	Status
	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.		(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	
PN 2-1.000	CP 2-1.000	15	Winter	1	+0%					50.603	-0.174	0.000	0.12			5.5	OK
PN 2-2.000	CP 2-2.000	15	Winter	1	+0%					50.723	-0.166	0.000	0.15			7.4	OK
PN 2-3.000	CP 2-3.000	15	Winter	1	+0%					51.498	-0.180	0.000	0.09			8.3	OK
PN 2-3.001	CP 2-3.001	15	Winter	1	+0%					50.573	-0.177	0.000	0.10			8.3	OK
PN 2-2.001	CP 2-2.001	15	Winter	1	+0%	100/15	Summer			50.022	-0.191	0.000	0.29			15.5	OK
PN 2-4.000	CP 2-4.000	15	Winter	1	+0%	100/15	Summer			51.274	-0.098	0.000	0.27			4.6	OK
PN 2-4.001	CP 2-4.001	15	Winter	1	+0%	100/15	Summer			50.886	-0.174	0.000	0.12			4.5	OK
PN 2-5.000	CP 2-5.000	15	Winter	1	+0%	100/15	Summer			50.711	-0.217	0.000	0.06			3.6	OK
PN 2-4.002	CP 2-4.002	15	Winter	1	+0%	30/15	Summer			50.704	-0.165	0.000	0.41			26.3	OK
PN 2-4.003	CP 2-4.003	15	Winter	1	+0%	100/15	Summer			50.568	-0.198	0.000	0.25			31.3	OK
PN 2-1.001	CP 2-1.001	15	Winter	1	+0%	100/15	Summer			49.924	-0.243	0.000	0.32			64.3	OK
PN 2-1.002	CP 2-BASIN	360	Winter	1	+0%	30/30	Summer			49.368	-0.091	0.000	0.03			2.2	OK
PN 2-1.003	CP 2-1.003	960	Summer	1	+0%					49.027	-0.337	0.000	0.02			2.2	OK

PN	US/MH Name	Level Exceeded
PN 2-1.000	CP 2-1.000	
PN 2-2.000	CP 2-2.000	
PN 2-3.000	CP 2-3.000	
PN 2-3.001	CP 2-3.001	
PN 2-2.001	CP 2-2.001	
PN 2-4.000	CP 2-4.000	
PN 2-4.001	CP 2-4.001	
PN 2-5.000	CP 2-5.000	
PN 2-4.002	CP 2-4.002	
PN 2-4.003	CP 2-4.003	
PN 2-1.001	CP 2-1.001	
PN 2-1.002	CP 2-BASIN	
PN 2-1.003	CP 2-1.003	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

									Water	Surcharged	Flooded			Half Drain	Pipe	
PN	US/MH		Storm	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow
	Name			Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)
PN 2-1.000	CP 2-1.000	15	Winter	30	+0%					50.634	-0.143	0.000	0.27			12.9
PN 2-2.000	CP 2-2.000	15	Winter	30	+0%					50.760	-0.129	0.000	0.37			18.0
PN 2-3.000	CP 2-3.000	15	Winter	30	+0%					51.524	-0.154	0.000	0.22			20.5
PN 2-3.001	CP 2-3.001	15	Winter	30	+0%					50.601	-0.149	0.000	0.24			20.3
PN 2-2.001	CP 2-2.001	15	Winter	30	+0%	100/15	Summer			50.099	-0.114	0.000	0.70			37.7
PN 2-4.000	CP 2-4.000	15	Winter	30	+0%	100/15	Summer			51.311	-0.061	0.000	0.65			11.2
PN 2-4.001	CP 2-4.001	15	Winter	30	+0%	100/15	Summer			50.926	-0.134	0.000	0.29			11.1
PN 2-5.000	CP 2-5.000	15	Winter	30	+0%	100/15	Summer			50.910	-0.018	0.000	0.16			9.4
PN 2-4.002	CP 2-4.002	15	Winter	30	+0%	30/15	Summer			50.895	0.026	0.000	1.14			72.4
PN 2-4.003	CP 2-4.003	15	Winter	30	+0%	100/15	Summer			50.649	-0.117	0.000	0.68			85.6
PN 2-1.001	CP 2-1.001	15	Winter	30	+0%	100/15	Summer			50.054	-0.113	0.000	0.85			170.6
PN 2-1.002	CP 2-BASIN	600	Winter	30	+0%	30/30	Summer			49.725	0.266	0.000	0.03			2.2
PN 2-1.003	CP 2-1.003	5760	Winter	30	+0%					49.027	-0.337	0.000	0.02			2.2

PN	US/MH Name	Status	Level Exceeded
PN 2-1.000	CP 2-1.000	OK	
PN 2-2.000	CP 2-2.000	OK	
PN 2-3.000	CP 2-3.000	OK	
PN 2-3.001	CP 2-3.001	OK	
PN 2-2.001	CP 2-2.001	OK	
PN 2-4.000	CP 2-4.000	OK	
PN 2-4.001	CP 2-4.001	OK	
PN 2-5.000	CP 2-5.000	OK	
PN 2-4.002	CP 2-4.002	SURCHARGED	
PN 2-4.003	CP 2-4.003	OK	
PN 2-1.001	CP 2-1.001	OK	
PN 2-1.002	CP 2-BASIN	SURCHARGED	
PN 2-1.003	CP 2-1.003	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s) Summer and Winter

Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

									Water	Surcharged	Flooded			Half Drain	Pipe	
PN	US/MH		Storm	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow
	Name			Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)
PN 2-1.000	CP 2-1.000	15	Winter	100	+40%					50.667	-0.110	0.000	0.50			23.4
PN 2-2.000	CP 2-2.000	15	Winter	100	+40%					50.802	-0.087	0.000	0.66			32.6
PN 2-3.000	CP 2-3.000	15	Winter	100	+40%					51.552	-0.126	0.000	0.40			37.1
PN 2-3.001	CP 2-3.001	15	Winter	100	+40%					50.631	-0.119	0.000	0.44			36.8
PN 2-2.001	CP 2-2.001	15	Winter	100	+40%	100/15	Summer			50.437	0.224	0.000	1.24			66.8
PN 2-4.000	CP 2-4.000	15	Winter	100	+40%	100/15	Summer			51.824	0.452	0.000	1.15			19.6
PN 2-4.001	CP 2-4.001	15	Winter	100	+40%	100/15	Summer			51.475	0.415	0.000	0.72			28.2
PN 2-5.000	CP 2-5.000	15	Winter	100	+40%	100/15	Summer			51.456	0.528	0.000	0.31			18.5
PN 2-4.002	CP 2-4.002	15	Winter	100	+40%	30/15	Summer			51.443	0.574	0.000	1.80			113.9
PN 2-4.003	CP 2-4.003	15	Winter	100	+40%	100/15	Summer			51.097	0.331	0.000	1.09			137.2
PN 2-1.001	CP 2-1.001	15	Winter	100	+40%	100/15	Summer			50.367	0.200	0.000	1.41			282.0
PN 2-1.002	CP 2-BASIN	600	Winter	100	+40%	30/30	Summer			49.959	0.500	0.000	0.12			9.7
PN 2-1.003	CP 2-1.003	600	Winter	100	+40%					49.067	-0.297	0.000	0.10			9.7

PN	US/MH Name	Status	Level Exceeded
PN 2-1.000	CP 2-1.000	OK	
PN 2-2.000	CP 2-2.000	OK	
PN 2-3.000	CP 2-3.000	OK	
PN 2-3.001	CP 2-3.001	OK	
PN 2-2.001	CP 2-2.001	SURCHARGED	
PN 2-4.000	CP 2-4.000	SURCHARGED	
PN 2-4.001	CP 2-4.001	SURCHARGED	
PN 2-5.000	CP 2-5.000	FLOOD RISK	
PN 2-4.002	CP 2-4.002	SURCHARGED	
PN 2-4.003	CP 2-4.003	SURCHARGED	
PN 2-1.001	CP 2-1.001	SURCHARGED	
PN 2-1.002	CP 2-BASIN	SURCHARGED	
PN 2-1.003	CP 2-1.003	OK	

Time Area Diagram for Catchment 3

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.196	4-8	0.344	8-12	0.036
Total Area Contributing (ha) = 0.576					
Total Pipe Volume (m³) = 20.391					

Existing Network Details for Catchment 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
PN 3-1.000	73.221	0.422	173.5	0.083	6.00	0.0	0.600	o	300	Pipe/Conduit
PN 3-2.000	47.445	0.852	55.7	0.153	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 3-2.001	27.222	0.224	121.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
PN 3-1.001	12.300	0.146	84.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 3-3.000	70.562	0.421	167.6	0.079	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 3-4.000	44.034	0.809	54.4	0.130	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 3-4.001	26.688	0.370	72.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
PN 3-1.002	18.893	0.852	22.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 3-1.003	27.910	0.128	218.0	0.131	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 3-1.004	20.722	0.036	575.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 3-1.005	24.800	0.117	212.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
PN 3-1.000	51.498	0.083	0.0	1.19	84.2
PN 3-2.000	52.152	0.153	0.0	1.76	69.8
PN 3-2.001	51.300	0.153	0.0	1.18	47.1
PN 3-1.001	51.076	0.236	0.0	1.71	121.2
PN 3-3.000	51.426	0.079	0.0	1.01	40.0
PN 3-4.000	52.109	0.130	0.0	1.78	70.6
PN 3-4.001	51.300	0.130	0.0	1.54	61.3
PN 3-1.002	50.930	0.445	0.0	3.35	237.0
PN 3-1.003	50.078	0.576	0.0	1.06	75.0
PN 3-1.004	49.507	0.576	0.0	0.65	45.8
PN 3-1.005	49.471	0.576	0.0	0.89	35.6

Manhole Schedules for Catchment 3

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 3-1.000	52.778	1.280	Open Manhole	1200	PN 3-1.000	51.498	300				
CP 3-2.000	53.357	1.205	Open Manhole	1200	PN 3-2.000	52.152	225				
CP 3-2.001	52.428	1.128	Open Manhole	1200	PN 3-2.001	51.300	225	PN 3-2.000	51.300	225	
CP 3-1.001	52.428	1.352	Open Manhole	1200	PN 3-1.001	51.076	300	PN 3-1.000	51.076	300	
								PN 3-2.001	51.076	225	
CP 3-3.000	52.759	1.333	Open Manhole	1200	PN 3-3.000	51.426	225				
CP 3-4.000	53.314	1.205	Open Manhole	1200	PN 3-4.000	52.109	225				
CP 3-4.001	52.428	1.128	Open Manhole	1200	PN 3-4.001	51.300	225	PN 3-4.000	51.300	225	
CP 3-1.002	52.457	1.527	Open Manhole	1200	PN 3-1.002	50.930	300	PN 3-1.001	50.930	300	
								PN 3-3.000	51.005	225	
								PN 3-4.001	50.930	225	
CP 3-1.003	51.358	1.280	Open Manhole	1200	PN 3-1.003	50.078	300	PN 3-1.002	50.078	300	
CP 3-BASIN	50.850	1.343	Open Manhole	100	PN 3-1.004	49.507	300	PN 3-1.003	49.950	300	443
CP 3-1.005	50.928	1.457	Open Manhole	2100	PN 3-1.005	49.471	225	PN 3-1.004	49.471	300	
CP 3-	50.497	1.143	Open Manhole	0		OUTFALL		PN 3-1.005	49.354	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 3-1.000	481080.877	167708.952	481080.877	167708.952	Required	
CP 3-2.000	481227.777	167713.158	481227.777	167713.158	Required	
CP 3-2.001	481181.088	167704.864	481181.088	167704.864	Required	
CP 3-1.001	481153.888	167704.620	481153.888	167704.620	Required	
CP 3-3.000	481084.395	167725.298	481084.395	167725.298	Required	
CP 3-4.000	481224.249	167722.638	481224.249	167722.638	Required	
CP 3-4.001	481180.631	167717.156	481180.631	167717.156	Required	
CP 3-1.002	481153.964	167716.920	481153.964	167716.920	Required	
CP 3-1.003	481153.965	167735.813	481153.965	167735.813	Required	
CP 3-BASIN	481126.402	167740.196	481126.402	167740.196	Required	
CP 3-1.005	481105.702	167739.230	481105.702	167739.230	Required	
CP 3-	481085.584	167753.731			No Entry	

PIPELINE SCHEDULES for Catchment 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)
PN 3-1.000	o	300	CP 3-1.000	52.778	51.498	0.980	Open Manhole	1200
PN 3-2.000	o	225	CP 3-2.000	53.357	52.152	0.980	Open Manhole	1200
PN 3-2.001	o	225	CP 3-2.001	52.428	51.300	0.903	Open Manhole	1200
PN 3-1.001	o	300	CP 3-1.001	52.428	51.076	1.052	Open Manhole	1200
PN 3-3.000	o	225	CP 3-3.000	52.759	51.426	1.108	Open Manhole	1200
PN 3-4.000	o	225	CP 3-4.000	53.314	52.109	0.980	Open Manhole	1200
PN 3-4.001	o	225	CP 3-4.001	52.428	51.300	0.903	Open Manhole	1200
PN 3-1.002	o	300	CP 3-1.002	52.457	50.930	1.227	Open Manhole	1200
PN 3-1.003	o	300	CP 3-1.003	51.358	50.078	0.980	Open Manhole	1200
PN 3-1.004	o	300	CP 3-BASIN	50.850	49.507	1.043	Open Manhole	100
PN 3-1.005	o	225	CP 3-1.005	50.928	49.471	1.232	Open Manhole	2100

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)
PN 3-1.000	73.221	173.5	CP 3-1.001	52.428	51.076	1.052	Open Manhole	1200
PN 3-2.000	47.445	55.7	CP 3-2.001	52.428	51.300	0.903	Open Manhole	1200
PN 3-2.001	27.222	121.5	CP 3-1.001	52.428	51.076	1.127	Open Manhole	1200
PN 3-1.001	12.300	84.2	CP 3-1.002	52.457	50.930	1.227	Open Manhole	1200
PN 3-3.000	70.562	167.6	CP 3-1.002	52.457	51.005	1.227	Open Manhole	1200
PN 3-4.000	44.034	54.4	CP 3-4.001	52.428	51.300	0.903	Open Manhole	1200
PN 3-4.001	26.688	72.1	CP 3-1.002	52.457	50.930	1.302	Open Manhole	1200
PN 3-1.002	18.893	22.2	CP 3-1.003	51.358	50.078	0.980	Open Manhole	1200
PN 3-1.003	27.910	218.0	CP 3-BASIN	50.850	49.950	0.600	Open Manhole	100
PN 3-1.004	20.722	575.6	CP 3-1.005	50.928	49.471	1.157	Open Manhole	2100
PN 3-1.005	24.800	212.0	CP 3-	50.497	49.354	0.918	Open Manhole	0

Area Summary for Catchment 3

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.083	0.083	0.083
2.000	User	-	100	0.153	0.153	0.153
2.001	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.079	0.079	0.079
4.000	User	-	100	0.130	0.130	0.130
4.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.131	0.131	0.131
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.576	0.576	0.576

Free Flowing Outfall Details for Catchment 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	-----------	--------

PN 3-1.005 CP 3- 50.497 49.354 0.000 0 0

Simulation Criteria for Catchment 3

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha	Storage 2.000	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.600	Cv (Summer)	0.750
Return Period (years)	100	Ratio R	0.400	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Summer Storm	Duration (mins)	30

Online Controls for Catchment 3

Complex Manhole: CP 3-1.005, DS/PN: PN 3-1.005, Volume (m³): 6.4

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0080-2200-0300-2200	Sump Available	Yes
Design Head (m)	0.300	Diameter (mm)	80
Design Flow (l/s)	2.2	Invert Level (m)	49.471
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.300	2.2	Kick-Flo®	0.230	2.0
Flush-Flo™	0.117	2.2	Mean Flow over Head Range	-	1.8

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.2	0.600	3.0	1.600	4.8	2.600	6.0	5.000	8.2	7.500	10.1
0.200	2.1	0.800	3.4	1.800	5.0	3.000	6.4	5.500	8.6	8.000	10.4
0.300	2.2	1.000	3.8	2.000	5.3	3.500	6.9	6.000	9.0	8.500	10.7
0.400	2.5	1.200	4.2	2.200	5.5	4.000	7.3	6.500	9.4	9.000	11.0
0.500	2.8	1.400	4.5	2.400	5.7	4.500	7.8	7.000	9.7	9.500	11.3

Orifice

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 50.141

Weir

Discharge Coef 0.544 Width (m) 2.100 Invert Level (m) 50.378

Tony Gee & Partners LLP		Page 7
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Storage Structures for Catchment 3

Tank or Pond Manhole: CP 3-BASIN, DS/PN: PN 3-1.004

Invert Level (m) 49.507

Depth (m) Area (m²)		Depth (m) Area (m²)	
0.000	256.0	1.350	606.0

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

Simulation Criteria
Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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 1 Number of Real Time Controls 0

Synthetic Rainfall Details
Rainfall Model FSR M5-60 (mm) 18.600 Cv (Summer) 0.750
Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

										Water	Surcharged	Flooded			Half Drain	Pipe
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)		Time (mins)	Flow (l/s)
PN 3-1.000	CP 3-1.000	15 Winter	1	+0%	100/15 Summer				51.567	-0.231	0.000	0.12				9.4
PN 3-2.000	CP 3-2.000	15 Winter	1	+0%	100/15 Summer				52.232	-0.145	0.000	0.27				18.2
PN 3-2.001	CP 3-2.001	15 Winter	1	+0%	100/15 Summer	100/15 Winter			51.401	-0.124	0.000	0.41				18.0
PN 3-1.001	CP 3-1.001	15 Winter	1	+0%	100/15 Summer				51.185	-0.191	0.000	0.29				27.5
PN 3-3.000	CP 3-3.000	15 Winter	1	+0%	100/15 Summer				51.501	-0.150	0.000	0.24				9.2
PN 3-4.000	CP 3-4.000	15 Winter	1	+0%	100/15 Summer				52.182	-0.152	0.000	0.23				15.4
PN 3-4.001	CP 3-4.001	15 Winter	1	+0%	100/15 Summer				51.380	-0.145	0.000	0.27				15.3
PN 3-1.002	CP 3-1.002	15 Winter	1	+0%	100/15 Summer				51.032	-0.198	0.000	0.25				52.0
PN 3-1.003	CP 3-1.003	15 Winter	1	+0%	30/15 Summer	100/15 Winter			50.312	-0.066	0.000	0.96				64.8
PN 3-1.004	CP 3-BASIN	360 Winter	1	+0%	30/30 Summer				49.737	-0.070	0.000	0.10				3.4
PN 3-1.005	CP 3-1.005	480 Winter	1	+0%	1/120 Summer				49.746	0.050	0.000	0.06				2.1

PN	US/MH Name	Status	Level Exceeded
PN 3-1.000	CP 3-1.000	OK	
PN 3-2.000	CP 3-2.000	OK	
PN 3-2.001	CP 3-2.001	OK	1
PN 3-1.001	CP 3-1.001	OK	
PN 3-3.000	CP 3-3.000	OK	
PN 3-4.000	CP 3-4.000	OK	
PN 3-4.001	CP 3-4.001	OK	
PN 3-1.002	CP 3-1.002	OK	
PN 3-1.003	CP 3-1.003	OK	1
PN 3-1.004	CP 3-BASIN	OK	
PN 3-1.005	CP 3-1.005	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.600 Cv (Summer)	0.750
Region	England and Wales	Ratio R	0.400 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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			Flooded		Half Drain Time (mins)	Pipe Flow (l/s)
									Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)		
PN 3-1.000	CP 3-1.000	15 Winter	30	+0%	100/15 Summer				51.610	-0.188	0.000	0.29			23.1
PN 3-2.000	CP 3-2.000	15 Winter	30	+0%	100/15 Summer				52.287	-0.090	0.000	0.67			44.6
PN 3-2.001	CP 3-2.001	15 Winter	30	+0%	100/15 Summer	100/15 Winter			51.500	-0.025	0.000	1.00			43.7
PN 3-1.001	CP 3-1.001	15 Winter	30	+0%	100/15 Summer				51.261	-0.115	0.000	0.70			66.8
PN 3-3.000	CP 3-3.000	15 Winter	30	+0%	100/15 Summer				51.551	-0.100	0.000	0.57			22.1
PN 3-4.000	CP 3-4.000	15 Winter	30	+0%	100/15 Summer				52.230	-0.104	0.000	0.56			37.9
PN 3-4.001	CP 3-4.001	15 Winter	30	+0%	100/15 Summer				51.435	-0.090	0.000	0.66			37.4
PN 3-1.002	CP 3-1.002	15 Winter	30	+0%	100/15 Summer				51.174	-0.056	0.000	0.61			125.9
PN 3-1.003	CP 3-1.003	15 Winter	30	+0%	30/15 Summer	100/15 Winter			50.872	0.494	0.000	2.21			149.6
PN 3-1.004	CP 3-BASIN	600 Winter	30	+0%	30/30 Summer				50.046	0.239	0.000	0.09			3.1
PN 3-1.005	CP 3-1.005	1440 Winter	30	+0%	1/120 Summer				50.325	0.629	0.000	0.14			4.7

PN	US/MH Name	Status	Level Exceeded
PN 3-1.000	CP 3-1.000	OK	
PN 3-2.000	CP 3-2.000	OK	
PN 3-2.001	CP 3-2.001	OK	1
PN 3-1.001	CP 3-1.001	OK	
PN 3-3.000	CP 3-3.000	OK	
PN 3-4.000	CP 3-4.000	OK	
PN 3-4.001	CP 3-4.001	OK	
PN 3-1.002	CP 3-1.002	OK	
PN 3-1.003	CP 3-1.003	SURCHARGED	1
PN 3-1.004	CP 3-BASIN	SURCHARGED	
PN 3-1.005	CP 3-1.005	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.600 Cv (Summer)	0.750
Region	England and Wales	Ratio R	0.400 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

									Water	Surcharged	Flooded			Half Drain	Pipe
PN	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow
	Name	Storm	Period	Change	Surcharge		Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)
PN 3-1.000	CP 3-1.000	15 Winter	100	+40%	100/15 Summer				52.143	0.345	0.000	0.47			38.2
PN 3-2.000	CP 3-2.000	15 Winter	100	+40%	100/15 Summer				53.130	0.753	0.000	0.98			65.3
PN 3-2.001	CP 3-2.001	15 Winter	100	+40%	100/15 Summer	100/15 Winter			52.428	0.903	0.465	1.37			59.8
PN 3-1.001	CP 3-1.001	15 Winter	100	+40%	100/15 Summer				52.071	0.695	0.000	0.94			89.5
PN 3-3.000	CP 3-3.000	15 Winter	100	+40%	100/15 Summer				52.221	0.570	0.000	0.86			33.3
PN 3-4.000	CP 3-4.000	15 Winter	100	+40%	100/15 Summer				52.717	0.383	0.000	0.90			60.3
PN 3-4.001	CP 3-4.001	15 Winter	100	+40%	100/15 Summer				52.256	0.731	0.000	0.91			51.5
PN 3-1.002	CP 3-1.002	15 Winter	100	+40%	100/15 Summer				51.949	0.719	0.000	0.83			170.8
PN 3-1.003	CP 3-1.003	15 Winter	100	+40%	30/15 Summer	100/15 Winter			51.358	0.980	0.122	2.96			200.4
PN 3-1.004	CP 3-BASIN	600 Winter	100	+40%	30/30 Summer				50.328	0.521	0.000	0.32			11.0
PN 3-1.005	CP 3-1.005	2160 Winter	100	+40%	1/120 Summer				50.415	0.719	0.000	0.32			10.4

PN	US/MH Name	Status	Level Exceeded
PN 3-1.000	CP 3-1.000	SURCHARGED	
PN 3-2.000	CP 3-2.000	FLOOD RISK	
PN 3-2.001	CP 3-2.001	FLOOD	1
PN 3-1.001	CP 3-1.001	SURCHARGED	
PN 3-3.000	CP 3-3.000	SURCHARGED	
PN 3-4.000	CP 3-4.000	SURCHARGED	
PN 3-4.001	CP 3-4.001	FLOOD RISK	
PN 3-1.002	CP 3-1.002	SURCHARGED	
PN 3-1.003	CP 3-1.003	FLOOD	1
PN 3-1.004	CP 3-BASIN	SURCHARGED	
PN 3-1.005	CP 3-1.005	SURCHARGED	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Catchment 4

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales					
Return Period (years)	1	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	18.700	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	0.980
Ratio R	0.400	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	50	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.200		

Designed with Level Soffits

Network Design Table for Catchment 4

« - 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
PN 4-1.000	74.821	0.586	127.7	0.062	6.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-1.001	74.139	0.800	92.7	0.088	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-1.002	89.969	0.853	105.5	0.099	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-1.003	76.207	2.873	26.5	0.079	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-1.004	58.134	1.980	29.4	0.102	0.00	0.0	0.600	o	300	Pipe/Conduit	
PN 4-1.005	35.014	0.869	40.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
PN 4-2.000	43.452	1.267	34.3	0.078	6.00	0.0	0.600	o	150	Pipe/Conduit	
PN 4-1.006	14.890	0.062	240.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
PN 4-3.000	40.298	1.126	35.8	0.063	6.00	0.0	0.600	o	150	Pipe/Conduit	
PN 4-4.000	73.213	0.719	101.8	0.070	6.00	0.0	0.600	o	150	Pipe/Conduit	
PN 4-4.001	81.097	0.692	117.2	0.097	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-4.002	76.843	0.647	118.8	0.076	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-4.003	74.951	2.462	30.4	0.076	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-4.004	69.153	2.702	25.6	0.078	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-4.005	35.725	0.801	44.6	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	
PN 4-1.007	15.424	1.132	13.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
PN 4-1.008	48.445	0.109	444.4	0.074	0.00	0.0	0.600	o	375	Pipe/Conduit	
PN 4-1.009	8.870	0.875	10.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 4-1.010	5.874	0.035	167.8	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)
PN 4-1.000	43.54	7.08	59.874	0.062	0.0	0.0	0.0	1.16	45.9	7.3
PN 4-1.001	40.93	7.99	59.288	0.149	0.0	0.0	0.0	1.36	54.0	16.6
PN 4-1.002	38.04	9.17	58.488	0.248	0.0	0.0	0.0	1.27	50.6	25.6
PN 4-1.003	36.95	9.66	57.635	0.327	0.0	0.0	0.0	2.55	101.4	32.7
PN 4-1.004	36.26	10.00	54.687	0.429	0.0	0.0	0.0	2.91	205.9	42.1
PN 4-1.005	35.79	10.23	52.707	0.429	0.0	0.0	0.0	2.48	175.6	42.1
PN 4-2.000	45.68	6.42	53.248	0.078	0.0	0.0	0.0	1.72	30.5	9.6
PN 4-1.006	35.34	10.48	51.831	0.506	0.0	0.0	0.0	1.01	71.4	48.5
PN 4-3.000	45.75	6.40	53.460	0.063	0.0	0.0	0.0	1.69	29.8	7.8
PN 4-4.000	43.09	7.23	59.950	0.070	0.0	0.0	0.0	1.00	17.6	8.1
PN 4-4.001	40.00	8.35	59.156	0.167	0.0	0.0	0.0	1.21	48.0	18.0
PN 4-4.002	37.49	9.41	58.464	0.243	0.0	0.0	0.0	1.20	47.7	24.7
PN 4-4.003	36.38	9.94	57.817	0.319	0.0	0.0	0.0	2.38	94.6	31.4
PN 4-4.004	35.52	10.38	55.355	0.396	0.0	0.0	0.0	2.60	103.3	38.1
PN 4-4.005	35.06	10.63	52.578	0.430	0.0	0.0	0.0	2.36	166.9	40.8
PN 4-1.007	34.97	10.69	51.701	0.999	0.0	0.0	0.0	4.93	544.6	94.7
PN 4-1.008	33.39	11.63	50.569	1.073	0.0	0.0	0.0	0.85	94.2«	97.1
PN 4-1.009	33.33	11.67	50.460	1.073	0.0	0.0	0.0	4.13	164.4	97.1
PN 4-1.010	33.18	11.77	49.585	1.073	0.0	0.0	0.0	1.01	40.0«	97.1

Manhole Schedules for Catchment 4

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 4-1.000	61.079	1.205	Open Manhole	1200	PN 4-1.000	59.874	225				
CP 4-1.001	60.614	1.326	Open Manhole	1200	PN 4-1.001	59.288	225	PN 4-1.000	59.288	225	
CP 4-1.002	59.693	1.205	Open Manhole	1200	PN 4-1.002	58.488	225	PN 4-1.001	58.488	225	
CP 4-1.003	58.840	1.205	Open Manhole	1200	PN 4-1.003	57.635	225	PN 4-1.002	57.635	225	
CP 4-1.004	55.967	1.280	Open Manhole	1200	PN 4-1.004	54.687	300	PN 4-1.003	54.762	225	
CP 4-1.005	54.591	1.884	Open Manhole	1200	PN 4-1.005	52.707	300	PN 4-1.004	52.707	300	
CP 4-2.000	54.526	1.278	Open Manhole	1200	PN 4-2.000	53.248	150				
CP 4-1.006	53.215	1.384	Open Manhole	1200	PN 4-1.006	51.831	300	PN 4-1.005	51.838	300	7
								PN 4-2.000	51.981	150	
CP 4-3.000	54.590	1.130	Open Manhole	1200	PN 4-3.000	53.460	150				
CP 4-4.000	61.080	1.130	Open Manhole	1200	PN 4-4.000	59.950	150				
CP 4-4.001	60.549	1.393	Open Manhole	1200	PN 4-4.001	59.156	225	PN 4-4.000	59.231	150	
CP 4-4.002	59.669	1.205	Open Manhole	1200	PN 4-4.002	58.464	225	PN 4-4.001	58.464	225	
CP 4-4.003	59.022	1.205	Open Manhole	1200	PN 4-4.003	57.817	225	PN 4-4.002	57.817	225	
CP 4-4.004	56.560	1.205	Open Manhole	1200	PN 4-4.004	55.355	225	PN 4-4.003	55.355	225	
CP 4-4.005	53.858	1.280	Open Manhole	1200	PN 4-4.005	52.578	300	PN 4-4.004	52.653	225	
CP 4-1.007	53.290	1.589	Open Manhole	1350	PN 4-1.007	51.701	375	PN 4-1.006	51.769	300	
								PN 4-3.000	52.334	150	408
								PN 4-4.005	51.777	300	1
CP 4-1.008	52.033	1.464	Open Manhole	1350	PN 4-1.008	50.569	375	PN 4-1.007	50.569	375	
CP 4-1.009	52.000	1.540	Open Manhole	2100	PN 4-1.009	50.460	225	PN 4-1.008	50.460	375	
CP 4-Outfall Headwall Junc	50.200	0.615	Junction		PN 4-1.010	49.585	225	PN 4-1.009	49.585	225	
CP 4-	50.183	0.633	Open Manhole	0		OUTFALL		PN 4-1.010	49.550	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 4-1.000	481776.865	167732.873	481776.865	167732.873	Required	
CP 4-1.001	481704.834	167712.633	481704.834	167712.633	Required	
CP 4-1.002	481631.285	167705.405	481631.285	167705.405	Required	
CP 4-1.003	481542.475	167717.160	481542.475	167717.160	Required	
CP 4-1.004	481468.898	167736.947	481468.898	167736.947	Required	
CP 4-1.005	481412.087	167749.280	481412.087	167749.280	Required	
CP 4-2.000	481335.584	167749.565	481335.584	167749.565	Required	
CP 4-1.006	481377.872	167756.716	481377.872	167756.716	Required	
CP 4-3.000	481337.242	167740.375	481337.242	167740.375	Required	
CP 4-4.000	481779.949	167718.783	481779.949	167718.783	Required	
CP 4-4.001	481708.908	167701.082	481708.908	167701.082	Required	
CP 4-4.002	481628.595	167690.957	481628.595	167690.957	Required	
CP 4-4.003	481552.649	167701.999	481552.649	167701.999	Required	
CP 4-4.004	481479.669	167719.074	481479.669	167719.074	Required	
CP 4-4.005	481412.743	167736.483	481412.743	167736.483	Required	

Manhole Schedules for Catchment 4

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 4-1.007	481377.488	167741.831	481377.488	167741.831	Required	
CP 4-1.008	481383.248	167727.524	481383.248	167727.524	Required	
CP 4-1.009	481338.893	167708.043	481338.893	167708.043	Required	
CP 4-Outfall Headwall Junc	481334.479	167700.350			No Entry	
CP 4-	481331.592	167695.234			No Entry	

PIPELINE SCHEDULES for Catchment 4

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)
PN 4-1.000	o	225	CP 4-1.000	61.079	59.874	0.980	Open Manhole	1200
PN 4-1.001	o	225	CP 4-1.001	60.614	59.288	1.101	Open Manhole	1200
PN 4-1.002	o	225	CP 4-1.002	59.693	58.488	0.980	Open Manhole	1200
PN 4-1.003	o	225	CP 4-1.003	58.840	57.635	0.980	Open Manhole	1200
PN 4-1.004	o	300	CP 4-1.004	55.967	54.687	0.980	Open Manhole	1200
PN 4-1.005	o	300	CP 4-1.005	54.591	52.707	1.584	Open Manhole	1200
PN 4-2.000	o	150	CP 4-2.000	54.526	53.248	1.128	Open Manhole	1200
PN 4-1.006	o	300	CP 4-1.006	53.215	51.831	1.084	Open Manhole	1200
PN 4-3.000	o	150	CP 4-3.000	54.590	53.460	0.980	Open Manhole	1200
PN 4-4.000	o	150	CP 4-4.000	61.080	59.950	0.980	Open Manhole	1200
PN 4-4.001	o	225	CP 4-4.001	60.549	59.156	1.168	Open Manhole	1200
PN 4-4.002	o	225	CP 4-4.002	59.669	58.464	0.980	Open Manhole	1200
PN 4-4.003	o	225	CP 4-4.003	59.022	57.817	0.980	Open Manhole	1200
PN 4-4.004	o	225	CP 4-4.004	56.560	55.355	0.980	Open Manhole	1200
PN 4-4.005	o	300	CP 4-4.005	53.858	52.578	0.980	Open Manhole	1200
PN 4-1.007	o	375	CP 4-1.007	53.290	51.701	1.214	Open Manhole	1350
PN 4-1.008	o	375	CP 4-1.008	52.033	50.569	1.089	Open Manhole	1350
PN 4-1.009	o	225	CP 4-1.009	52.000	50.460	1.315	Open Manhole	2100
PN 4-1.010	o	225	CP 4-Outfall Headwall Junc	50.200	49.585	0.390	Junction	

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)
PN 4-1.000	74.821	127.7	CP 4-1.001	60.614	59.288	1.101	Open Manhole	1200
PN 4-1.001	74.139	92.7	CP 4-1.002	59.693	58.488	0.980	Open Manhole	1200
PN 4-1.002	89.969	105.5	CP 4-1.003	58.840	57.635	0.980	Open Manhole	1200
PN 4-1.003	76.207	26.5	CP 4-1.004	55.967	54.762	0.980	Open Manhole	1200
PN 4-1.004	58.134	29.4	CP 4-1.005	54.591	52.707	1.584	Open Manhole	1200
PN 4-1.005	35.014	40.3	CP 4-1.006	53.215	51.838	1.077	Open Manhole	1200
PN 4-2.000	43.452	34.3	CP 4-1.006	53.215	51.981	1.084	Open Manhole	1200
PN 4-1.006	14.890	240.2	CP 4-1.007	53.290	51.769	1.221	Open Manhole	1350
PN 4-3.000	40.298	35.8	CP 4-1.007	53.290	52.334	0.806	Open Manhole	1350
PN 4-4.000	73.213	101.8	CP 4-4.001	60.549	59.231	1.168	Open Manhole	1200
PN 4-4.001	81.097	117.2	CP 4-4.002	59.669	58.464	0.980	Open Manhole	1200
PN 4-4.002	76.843	118.8	CP 4-4.003	59.022	57.817	0.980	Open Manhole	1200
PN 4-4.003	74.951	30.4	CP 4-4.004	56.560	55.355	0.980	Open Manhole	1200
PN 4-4.004	69.153	25.6	CP 4-4.005	53.858	52.653	0.980	Open Manhole	1200
PN 4-4.005	35.725	44.6	CP 4-1.007	53.290	51.777	1.213	Open Manhole	1350
PN 4-1.007	15.424	13.6	CP 4-1.008	52.033	50.569	1.089	Open Manhole	1350
PN 4-1.008	48.445	444.4	CP 4-1.009	52.000	50.460	1.165	Open Manhole	2100
PN 4-1.009	8.870	10.1	CP 4-Outfall Headwall Junc	50.200	49.585	0.390	Junction	
PN 4-1.010	5.874	167.8	CP 4-	50.183	49.550	0.408	Open Manhole	0

Area Summary for Catchment 4

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.062	0.062	0.062
1.001	User	-	100	0.088	0.088	0.088
1.002	User	-	100	0.099	0.099	0.099
1.003	User	-	100	0.079	0.079	0.079
1.004	User	-	100	0.102	0.102	0.102
1.005	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.078	0.078	0.078
1.006	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.063	0.063	0.063
4.000	User	-	100	0.070	0.070	0.070
4.001	User	-	100	0.097	0.097	0.097
4.002	User	-	100	0.076	0.076	0.076
4.003	User	-	100	0.076	0.076	0.076
4.004	User	-	100	0.078	0.078	0.078
4.005	User	-	100	0.034	0.034	0.034
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.074	0.074	0.074
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.073	1.073	1.073

Free Flowing Outfall Details for Catchment 4

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
PN 4-1.010	CP 4-	50.183	49.550	0.000	0	0

Simulation Criteria for Catchment 4

Volumetric Runoff Coeff 0.750Manhole Headloss Coeff (Global) 0.500Inlet Coeffiecient 0.800

Areal Reduction Factor 1.000Foul Sewage per hectare (l/s) 0.000Flow per Person per Day (l/per/day) 0.000

Hot Start (mins) 0Additional Flow - % of Total Flow 0.000Run Time (mins) 60

Hot Start Level (mm) 0MADD Factor * 10m³/ha Storage 2.000Output Interval (mins) 1

Number of Input Hydrographs 0Number of Offline Controls 1Number of Time/Area Diagrams 0

Number of Online Controls 1Number of Storage Structures 1Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall ModelFSR M5-60 (mm) 18.700Cv (Summer) 0.750

Return Period (years) 1Ratio R 0.400Cv (Winter) 0.840

Region England and WalesProfile Type SummerStorm Duration (mins) 30

Online Controls for Catchment 4

Complex Manhole: CP 4-1.009, DS/PN: PN 4-1.009, Volume (m³): 10.5

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0096-4400-1200-4400	Sump Available	Yes
Design Head (m)	1.200	Diameter (mm)	96
Design Flow (l/s)	4.4	Invert Level (m)	50.460
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	4.4	Kick-Flo®	0.744	3.5
Flush-Flo™	0.357	4.4	Mean Flow over Head Range	-	3.9

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	0.600	4.1	1.600	5.0	2.600	6.3	5.000	8.6	7.500	10.4
0.200	4.2	0.800	3.6	1.800	5.3	3.000	6.7	5.500	9.0	8.000	10.7
0.300	4.4	1.000	4.0	2.000	5.6	3.500	7.3	6.000	9.4	8.500	11.0
0.400	4.4	1.200	4.4	2.200	5.8	4.000	7.7	6.500	9.7	9.000	11.4
0.500	4.3	1.400	4.7	2.400	6.1	4.500	8.2	7.000	10.1	9.500	11.7

Orifice

Diameter (m) 0.112 Discharge Coefficient 0.600 Invert Level (m) 51.115

Tony Gee & Partners LLP		Page 7
Hardy House, 140 High Street Esher Surrey, KT10 9QJ	Spine Road Distributor Road Wokingham Tony Gee and Partners LLP	
Date 02/09/2021	Designed by DJF & MH	
File NETWORK 4.MDX	Checked by JC	
Innovyze	Network 2020.1	

Offline Controls for Catchment 4

Weir Manhole: CP 4-1.009, DS/PN: PN 4-1.009, Loop to PN: None

Discharge Coef 0.544 Width (m) 2.100 Invert Level (m) 51.450

Storage Structures for Catchment 4

Tank or Pond Manhole: CP 4-1.009, DS/PN: PN 4-1.009

Invert Level (m) 50.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	373.3	0.554	544.8	0.564	656.4	1.483	1003.4

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 4

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
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	Surcharged Depth	Flooded Volume	Flow / Cap.
									(m)	(m)	(m³)	
PN 4-1.000	CP 4-1.000	15 Winter	1	+0%	100/15 Summer				59.935	-0.164	0.000	0.16
PN 4-1.001	CP 4-1.001	15 Winter	1	+0%	100/15 Summer	100/15 Winter			59.374	-0.139	0.000	0.30
PN 4-1.002	CP 4-1.002	15 Winter	1	+0%	30/15 Summer	100/15 Summer			58.605	-0.108	0.000	0.50
PN 4-1.003	CP 4-1.003	15 Winter	1	+0%	100/15 Summer				57.724	-0.136	0.000	0.33
PN 4-1.004	CP 4-1.004	15 Winter	1	+0%	100/15 Winter				54.781	-0.206	0.000	0.21
PN 4-1.005	CP 4-1.005	15 Winter	1	+0%	100/15 Summer				52.810	-0.197	0.000	0.26
PN 4-2.000	CP 4-2.000	15 Winter	1	+0%	100/15 Summer	100/15 Winter			53.305	-0.093	0.000	0.31
PN 4-1.006	CP 4-1.006	15 Winter	1	+0%	30/15 Summer	100/15 Winter			52.043	-0.089	0.000	0.84
PN 4-3.000	CP 4-3.000	15 Winter	1	+0%	100/15 Summer				53.512	-0.098	0.000	0.26
PN 4-4.000	CP 4-4.000	15 Winter	1	+0%	30/15 Summer	100/15 Summer			60.024	-0.076	0.000	0.46
PN 4-4.001	CP 4-4.001	15 Winter	1	+0%	30/15 Summer	100/15 Summer			59.254	-0.127	0.000	0.37
PN 4-4.002	CP 4-4.002	15 Winter	1	+0%	30/15 Summer	100/15 Summer			58.582	-0.107	0.000	0.52
PN 4-4.003	CP 4-4.003	15 Winter	1	+0%	100/15 Summer				57.908	-0.134	0.000	0.34
PN 4-4.004	CP 4-4.004	15 Winter	1	+0%	100/15 Summer	100/15 Winter			55.451	-0.129	0.000	0.38
PN 4-4.005	CP 4-4.005	15 Winter	1	+0%	100/15 Summer				52.683	-0.195	0.000	0.26
PN 4-1.007	CP 4-1.007	15 Winter	1	+0%	30/15 Winter				51.824	-0.252	0.000	0.23
PN 4-1.008	CP 4-1.008	15 Winter	1	+0%	1/15 Summer	100/15 Summer			50.973	0.029	0.000	1.17
PN 4-1.009	CP 4-1.009	240 Winter	1	+0%	1/30 Winter		100/240 Winter	3	50.769	0.084	0.000	0.03
PN 4-1.010	CP 4-Outfall Headwall Junc	240 Winter	1	+0%					49.642	-0.168	0.000	0.15

PN	US/MH Name	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
PN 4-1.000	CP 4-1.000			7.1	OK	
PN 4-1.001	CP 4-1.001			15.9	OK	1
PN 4-1.002	CP 4-1.002			24.9	OK	4
PN 4-1.003	CP 4-1.003			32.2	OK	
PN 4-1.004	CP 4-1.004			41.5	OK	
PN 4-1.005	CP 4-1.005			41.6	OK	
PN 4-2.000	CP 4-2.000			9.3	OK	1
PN 4-1.006	CP 4-1.006			50.0	OK	1
PN 4-3.000	CP 4-3.000			7.6	OK	
PN 4-4.000	CP 4-4.000			8.0	OK	4
PN 4-4.001	CP 4-4.001			17.5	OK	2
PN 4-4.002	CP 4-4.002			24.3	OK	4
PN 4-4.003	CP 4-4.003			30.9	OK	
PN 4-4.004	CP 4-4.004			37.8	OK	1
PN 4-4.005	CP 4-4.005			40.7	OK	
PN 4-1.007	CP 4-1.007			97.5	OK	
PN 4-1.008	CP 4-1.008			101.5	SURCHARGED	6
PN 4-1.009	CP 4-1.009	0.0		4.4	SURCHARGED	
PN 4-1.010	CP 4-Outfall Headwall Junc			4.4	OK*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 4

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
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	Surcharged Depth	Flooded Volume	Flow /
									(m)	(m)	(m³)	Cap.
PN 4-1.000	CP 4-1.000	15 Winter	30	+0%	100/15 Summer				59.973	-0.126	0.000	0.39
PN 4-1.001	CP 4-1.001	15 Winter	30	+0%	100/15 Summer	100/15 Winter			59.504	-0.009	0.000	0.77
PN 4-1.002	CP 4-1.002	15 Winter	30	+0%	30/15 Summer	100/15 Summer			59.093	0.380	0.000	1.18
PN 4-1.003	CP 4-1.003	15 Winter	30	+0%	100/15 Summer				57.787	-0.073	0.000	0.77
PN 4-1.004	CP 4-1.004	15 Winter	30	+0%	100/15 Winter				54.848	-0.139	0.000	0.54
PN 4-1.005	CP 4-1.005	15 Winter	30	+0%	100/15 Summer				52.886	-0.121	0.000	0.66
PN 4-2.000	CP 4-2.000	15 Winter	30	+0%	100/15 Summer	100/15 Winter			53.347	-0.051	0.000	0.77
PN 4-1.006	CP 4-1.006	15 Winter	30	+0%	30/15 Summer	100/15 Winter			52.389	0.258	0.000	2.10
PN 4-3.000	CP 4-3.000	15 Winter	30	+0%	100/15 Summer				53.548	-0.062	0.000	0.64
PN 4-4.000	CP 4-4.000	15 Winter	30	+0%	30/15 Summer	100/15 Summer			60.254	0.154	0.000	1.04
PN 4-4.001	CP 4-4.001	15 Winter	30	+0%	30/15 Summer	100/15 Summer			59.491	0.110	0.000	0.88
PN 4-4.002	CP 4-4.002	15 Winter	30	+0%	30/15 Summer	100/15 Summer			58.972	0.283	0.000	1.18
PN 4-4.003	CP 4-4.003	15 Winter	30	+0%	100/15 Summer				57.970	-0.072	0.000	0.78
PN 4-4.004	CP 4-4.004	15 Winter	30	+0%	100/15 Summer	100/15 Winter			55.531	-0.049	0.000	0.94
PN 4-4.005	CP 4-4.005	15 Winter	30	+0%	100/15 Summer				52.761	-0.117	0.000	0.68
PN 4-1.007	CP 4-1.007	15 Winter	30	+0%	30/15 Winter				52.130	0.054	0.000	0.58
PN 4-1.008	CP 4-1.008	15 Winter	30	+0%	1/15 Summer	100/15 Summer			51.761	0.817	0.000	2.87
PN 4-1.009	CP 4-1.009	480 Winter	30	+0%	1/30 Winter		100/240 Winter	3	51.158	0.473	0.000	0.04
PN 4-1.010	CP 4-Outfall Headwall Junc	480 Winter	30	+0%					49.644	-0.166	0.000	0.16

PN	US/MH Name	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level
						Exceeded
PN 4-1.000	CP 4-1.000			17.3	OK	
PN 4-1.001	CP 4-1.001			40.2	OK	1
PN 4-1.002	CP 4-1.002			58.4	SURCHARGED	4
PN 4-1.003	CP 4-1.003			76.0	OK	
PN 4-1.004	CP 4-1.004			106.4	OK	
PN 4-1.005	CP 4-1.005			106.5	OK	
PN 4-2.000	CP 4-2.000			22.7	OK	1
PN 4-1.006	CP 4-1.006			125.3	SURCHARGED	1
PN 4-3.000	CP 4-3.000			18.6	OK	
PN 4-4.000	CP 4-4.000			18.0	SURCHARGED	4
PN 4-4.001	CP 4-4.001			41.0	SURCHARGED	2
PN 4-4.002	CP 4-4.002			54.9	SURCHARGED	4
PN 4-4.003	CP 4-4.003			71.8	OK	
PN 4-4.004	CP 4-4.004			94.5	OK	1
PN 4-4.005	CP 4-4.005			104.3	OK	
PN 4-1.007	CP 4-1.007			240.5	SURCHARGED	
PN 4-1.008	CP 4-1.008			250.1	FLOOD RISK	6
PN 4-1.009	CP 4-1.009	0.0		4.7	SURCHARGED	
PN 4-1.010	CP 4-Outfall Headwall Junc			4.7	OK*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 4

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
PN 4-1.000	CP 4-1.000	15 Winter	100	+40%	100/15 Summer				60.871	0.772	0.000	0.61
PN 4-1.001	CP 4-1.001	15 Winter	100	+40%	100/15 Summer	100/15 Winter			60.614	1.101	0.226	1.05
PN 4-1.002	CP 4-1.002	15 Winter	100	+40%	30/15 Summer	100/15 Summer			59.698	0.985	5.043	1.47
PN 4-1.003	CP 4-1.003	15 Winter	100	+40%	100/15 Summer				58.038	0.178	0.000	1.03
PN 4-1.004	CP 4-1.004	15 Winter	100	+40%	100/15 Winter				55.028	0.041	0.000	0.81
PN 4-1.005	CP 4-1.005	15 Winter	100	+40%	100/15 Summer				53.917	0.910	0.000	0.90
PN 4-2.000	CP 4-2.000	15 Winter	100	+40%	100/15 Summer	100/15 Winter			54.526	1.128	0.178	1.01
PN 4-1.006	CP 4-1.006	15 Winter	100	+40%	30/15 Summer	100/15 Winter			53.215	1.084	0.497	2.86
PN 4-3.000	CP 4-3.000	15 Winter	100	+40%	100/15 Summer				53.884	0.274	0.000	1.01
PN 4-4.000	CP 4-4.000	15 Winter	100	+40%	30/15 Summer	100/15 Summer			61.084	0.984	3.898	1.35
PN 4-4.001	CP 4-4.001	15 Winter	100	+40%	30/15 Summer	100/15 Summer			60.550	1.169	0.939	1.12
PN 4-4.002	CP 4-4.002	15 Winter	100	+40%	30/15 Summer	100/15 Summer			59.673	0.984	3.962	1.50
PN 4-4.003	CP 4-4.003	15 Winter	100	+40%	100/15 Summer				58.590	0.548	0.000	0.96
PN 4-4.004	CP 4-4.004	15 Winter	100	+40%	100/15 Summer	100/15 Winter			56.560	0.980	0.184	1.11
PN 4-4.005	CP 4-4.005	15 Winter	100	+40%	100/15 Summer				53.245	0.367	0.000	0.81
PN 4-1.007	CP 4-1.007	15 Winter	100	+40%	30/15 Winter				52.717	0.641	0.000	0.77
PN 4-1.008	CP 4-1.008	15 Winter	100	+40%	1/15 Summer	100/15 Summer			52.048	1.104	15.140	3.35
PN 4-1.009	CP 4-1.009	360 Winter	100	+40%	1/30 Winter		100/240 Winter	3	51.453	0.768	0.000	0.14
PN 4-1.010	CP 4-Outfall Headwall Junc	360 Winter	100	+40%					49.711	-0.099	0.000	0.60

PN	US/MH Name	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
PN 4-1.000	CP 4-1.000			27.3	FLOOD RISK	
PN 4-1.001	CP 4-1.001			55.2	FLOOD	1
PN 4-1.002	CP 4-1.002			72.6	FLOOD	4
PN 4-1.003	CP 4-1.003			101.1	SURCHARGED	
PN 4-1.004	CP 4-1.004			158.2	SURCHARGED	
PN 4-1.005	CP 4-1.005			144.9	SURCHARGED	
PN 4-2.000	CP 4-2.000			30.0	FLOOD	1
PN 4-1.006	CP 4-1.006			171.1	FLOOD	1
PN 4-3.000	CP 4-3.000			29.1	SURCHARGED	
PN 4-4.000	CP 4-4.000			23.3	FLOOD	4
PN 4-4.001	CP 4-4.001			52.2	FLOOD	2
PN 4-4.002	CP 4-4.002			69.5	FLOOD	4
PN 4-4.003	CP 4-4.003			88.2	SURCHARGED	
PN 4-4.004	CP 4-4.004			111.1	FLOOD	1
PN 4-4.005	CP 4-4.005			124.2	SURCHARGED	
PN 4-1.007	CP 4-1.007			321.7	SURCHARGED	
PN 4-1.008	CP 4-1.008			291.8	FLOOD	6
PN 4-1.009	CP 4-1.009	0.0		17.9	SURCHARGED	
PN 4-1.010	CP 4-Outfall Headwall Junc			17.9	OK*	

Time Area Diagram for Catchment 5

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.326	4-8	0.740	8-12	0.224	12-16	0.006

Total Area Contributing (ha) = 1.297

Total Pipe Volume (m³) = 119.743

Existing Network Details for Catchment 5

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
PN 5-1.000	97.513	2.408	40.5	0.091	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 5-1.001	30.533	1.030	29.6	0.106	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 5-1.002	58.952	0.488	120.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 5-1.003	82.085	0.430	190.9	0.086	0.00	0.0	0.600	o	375	Pipe/Conduit
PN 5-1.004	89.976	0.449	200.4	0.105	0.00	0.0	0.600	o	375	Pipe/Conduit
PN 5-1.005	90.252	0.431	209.4	0.104	0.00	0.0	0.600	o	400	Pipe/Conduit
PN 5-1.006	59.327	0.317	187.2	0.068	0.00	0.0	0.600	o	450	Pipe/Conduit
PN 5-2.000	96.012	2.270	42.3	0.102	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 5-2.001	90.153	1.512	59.6	0.090	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 5-2.002	89.141	0.478	186.5	0.090	0.00	0.0	0.600	o	375	Pipe/Conduit
PN 5-2.003	75.051	0.360	208.5	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit
PN 5-2.004	85.652	0.464	184.6	0.102	0.00	0.0	0.600	o	400	Pipe/Conduit
PN 5-2.005	67.781	0.367	184.7	0.120	0.00	0.0	0.600	o	450	Pipe/Conduit
PN 5-2.006	17.487	0.038	460.2	0.000	0.00	0.0	0.600	o	500	Pipe/Conduit
PN 5-1.007	25.181	0.336	74.9	0.000	0.00	0.0	0.600	o	500	Pipe/Conduit
PN 5-3.000	54.851	0.314	174.7	0.098	6.00	0.0	0.600	o	300	Pipe/Conduit
PN 5-1.008	27.890	0.300	93.0	0.047	0.00	0.0	0.600	o	500	Pipe/Conduit
PN 5-1.009	11.004	0.060	183.4	0.010	0.00	0.0	0.600	o	500	Pipe/Conduit

Network Results Table

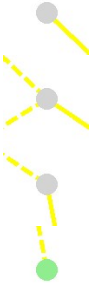
PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
PN 5-1.000	60.330	0.091	0.0	2.06	82.0
PN 5-1.001	57.606	0.197	0.0	2.90	204.9
PN 5-1.002	56.576	0.197	0.0	1.43	101.0
PN 5-1.003	56.088	0.282	0.0	1.31	144.5
PN 5-1.004	55.658	0.387	0.0	1.28	141.0
PN 5-1.005	55.184	0.491	0.0	1.30	163.4
PN 5-1.006	54.703	0.559	0.0	1.48	235.8
PN 5-2.000	60.254	0.102	0.0	2.02	80.2
PN 5-2.001	57.705	0.191	0.0	2.04	144.2
PN 5-2.002	56.118	0.281	0.0	1.32	146.2
PN 5-2.003	55.640	0.360	0.0	1.25	138.2
PN 5-2.004	55.255	0.461	0.0	1.39	174.2
PN 5-2.005	54.741	0.582	0.0	1.49	237.4
PN 5-2.006	54.374	0.582	0.0	1.01	197.5
PN 5-1.007	54.336	1.141	0.0	2.51	493.1
PN 5-3.000	54.800	0.098	0.0	1.19	83.9
PN 5-1.008	54.000	1.287	0.0	2.25	442.5
PN 5-1.009	53.700	1.297	0.0	1.60	314.3

Manhole Schedules for Catchment 5

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 5-1.000	61.079	0.749	Open Manhole	1200	PN 5-1.000	60.330	225				
CP 5-1.001	58.886	1.280	Open Manhole	1200	PN 5-1.001	57.606	300	PN 5-1.000	57.922	225	241
CP 5-1.002	57.800	1.224	Open Manhole	1200	PN 5-1.002	56.576	300	PN 5-1.001	56.576	300	
CP 5-1.003	57.443	1.355	Open Manhole	1200	PN 5-1.003	56.088	375	PN 5-1.002	56.088	300	
CP 5-1.004	57.013	1.355	Open Manhole	1350	PN 5-1.004	55.658	375	PN 5-1.003	55.658	375	
CP 5-1.005	56.564	1.380	Open Manhole	1350	PN 5-1.005	55.184	400	PN 5-1.004	55.209	375	
CP 5-1.006	56.133	1.430	Open Manhole	1350	PN 5-1.006	54.703	450	PN 5-1.005	54.753	400	
CP 5-2.000	61.080	0.826	Open Manhole	1200	PN 5-2.000	60.254	225				
CP 5-2.001	58.985	1.280	Open Manhole	1200	PN 5-2.001	57.705	300	PN 5-2.000	57.984	225	204
CP 5-2.002	57.473	1.355	Open Manhole	1200	PN 5-2.002	56.118	375	PN 5-2.001	56.193	300	
CP 5-2.003	56.995	1.355	Open Manhole	1350	PN 5-2.003	55.640	375	PN 5-2.002	55.640	375	
CP 5-2.004	56.635	1.380	Open Manhole	1350	PN 5-2.004	55.255	400	PN 5-2.003	55.280	375	
CP 5-2.005	56.171	1.430	Open Manhole	1350	PN 5-2.005	54.741	450	PN 5-2.004	54.791	400	
CP 5-2.006	55.813	1.439	Open Manhole	1350	PN 5-2.006	54.374	500	PN 5-2.005	54.374	450	
CP 5-1.007	55.911	1.575	Open Manhole	1350	PN 5-1.007	54.336	500	PN 5-1.006	54.386	450	
								PN 5-2.006	54.336	500	
CP 5-3.000	56.080	1.280	Open Manhole	1200	PN 5-3.000	54.800	300				
CP 5-1.008	55.985	1.985	Open Manhole	1350	PN 5-1.008	54.000	500	PN 5-1.007	54.000	500	
								PN 5-3.000	54.486	300	286
CP 5-1.009	55.400	1.700	Open Manhole	1350	PN 5-1.009	53.700	500	PN 5-1.008	53.700	500	
CP 5-55.040	56.000	2.360	Open Manhole	0		OUTFALL		PN 5-1.009	53.640	500	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 5-1.000	481779.949	167718.783	481779.949	167718.783	Required	
CP 5-1.001	481874.776	167740.019	481874.776	167740.019	Required	
CP 5-1.002	481905.243	167741.863	481905.243	167741.863	Required	
CP 5-1.003	481963.822	167736.653	481963.822	167736.653	Required	
CP 5-1.004	482044.665	167724.405	482044.665	167724.405	Required	
CP 5-1.005	482133.080	167738.725	482133.080	167738.725	Required	
CP 5-1.006	482214.207	167777.490	482214.207	167777.490	Required	
CP 5-2.000	481776.865	167732.873	481776.865	167732.873	Required	
CP 5-2.001	481870.445	167754.246	481870.445	167754.246	Required	
CP 5-2.002	481960.217	167749.888	481960.217	167749.888	Required	
CP 5-2.003	482048.353	167738.958	482048.353	167738.958	Required	
CP 5-2.004	482122.310	167750.259	482122.310	167750.259	Required	
CP 5-2.005	482199.947	167785.635	482199.947	167785.635	Required	
CP 5-2.006	482256.247	167823.378	482256.247	167823.378	Required	
CP 5-1.007	482264.946	167808.208	482264.946	167808.208	Required	

Manhole Schedules for Catchment 5

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 5-3.000	482246.694	167859.048	482246.694	167859.048	Required	
CP 5-1.008	482286.336	167821.496	482286.336	167821.496	Required	
CP 5-1.009	482309.436	167805.868	482309.436	167805.868	Required	
CP 5-55.040	482311.500	167795.059			No Entry	

PIPELINE SCHEDULES for Catchment 5

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)
PN 5-1.000	o	225	CP 5-1.000	61.079	60.330	0.524	Open Manhole	1200
PN 5-1.001	o	300	CP 5-1.001	58.886	57.606	0.980	Open Manhole	1200
PN 5-1.002	o	300	CP 5-1.002	57.800	56.576	0.924	Open Manhole	1200
PN 5-1.003	o	375	CP 5-1.003	57.443	56.088	0.980	Open Manhole	1200
PN 5-1.004	o	375	CP 5-1.004	57.013	55.658	0.980	Open Manhole	1350
PN 5-1.005	o	400	CP 5-1.005	56.564	55.184	0.980	Open Manhole	1350
PN 5-1.006	o	450	CP 5-1.006	56.133	54.703	0.980	Open Manhole	1350
PN 5-2.000	o	225	CP 5-2.000	61.080	60.254	0.601	Open Manhole	1200
PN 5-2.001	o	300	CP 5-2.001	58.985	57.705	0.980	Open Manhole	1200
PN 5-2.002	o	375	CP 5-2.002	57.473	56.118	0.980	Open Manhole	1200
PN 5-2.003	o	375	CP 5-2.003	56.995	55.640	0.980	Open Manhole	1350
PN 5-2.004	o	400	CP 5-2.004	56.635	55.255	0.980	Open Manhole	1350
PN 5-2.005	o	450	CP 5-2.005	56.171	54.741	0.980	Open Manhole	1350
PN 5-2.006	o	500	CP 5-2.006	55.813	54.374	0.939	Open Manhole	1350
PN 5-1.007	o	500	CP 5-1.007	55.911	54.336	1.075	Open Manhole	1350
PN 5-3.000	o	300	CP 5-3.000	56.080	54.800	0.980	Open Manhole	1200
PN 5-1.008	o	500	CP 5-1.008	55.985	54.000	1.485	Open Manhole	1350
PN 5-1.009	o	500	CP 5-1.009	55.400	53.700	1.200	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)
PN 5-1.000	97.513	40.5	CP 5-1.001	58.886	57.922	0.738	Open Manhole	1200
PN 5-1.001	30.533	29.6	CP 5-1.002	57.800	56.576	0.924	Open Manhole	1200
PN 5-1.002	58.952	120.8	CP 5-1.003	57.443	56.088	1.055	Open Manhole	1200
PN 5-1.003	82.085	190.9	CP 5-1.004	57.013	55.658	0.980	Open Manhole	1350
PN 5-1.004	89.976	200.4	CP 5-1.005	56.564	55.209	0.980	Open Manhole	1350
PN 5-1.005	90.252	209.4	CP 5-1.006	56.133	54.753	0.980	Open Manhole	1350
PN 5-1.006	59.327	187.2	CP 5-1.007	55.911	54.386	1.075	Open Manhole	1350
PN 5-2.000	96.012	42.3	CP 5-2.001	58.985	57.984	0.776	Open Manhole	1200
PN 5-2.001	90.153	59.6	CP 5-2.002	57.473	56.193	0.980	Open Manhole	1200
PN 5-2.002	89.141	186.5	CP 5-2.003	56.995	55.640	0.980	Open Manhole	1350
PN 5-2.003	75.051	208.5	CP 5-2.004	56.635	55.280	0.980	Open Manhole	1350
PN 5-2.004	85.652	184.6	CP 5-2.005	56.171	54.791	0.980	Open Manhole	1350
PN 5-2.005	67.781	184.7	CP 5-2.006	55.813	54.374	0.989	Open Manhole	1350
PN 5-2.006	17.487	460.2	CP 5-1.007	55.911	54.336	1.075	Open Manhole	1350
PN 5-1.007	25.181	74.9	CP 5-1.008	55.985	54.000	1.485	Open Manhole	1350
PN 5-3.000	54.851	174.7	CP 5-1.008	55.985	54.486	1.199	Open Manhole	1350
PN 5-1.008	27.890	93.0	CP 5-1.009	55.400	53.700	1.200	Open Manhole	1350
PN 5-1.009	11.004	183.4	CP 5-55.040	56.000	53.640	1.860	Open Manhole	0

Area Summary for Catchment 5

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.091	0.091	0.091
1.001	User	-	100	0.106	0.106	0.106
1.002	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.086	0.086	0.086
1.004	User	-	100	0.105	0.105	0.105
1.005	User	-	100	0.104	0.104	0.104
1.006	User	-	100	0.068	0.068	0.068
2.000	User	-	100	0.102	0.102	0.102
2.001	User	-	100	0.090	0.090	0.090
2.002	User	-	100	0.090	0.090	0.090
2.003	User	-	100	0.078	0.078	0.078
2.004	User	-	100	0.102	0.102	0.102
2.005	User	-	100	0.120	0.120	0.120
2.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.098	0.098	0.098
1.008	User	-	100	0.047	0.047	0.047
1.009	-	-	100	0.010	0.010	0.010
				Total	Total	Total
				1.297	1.297	1.297

Free Flowing Outfall Details for Catchment 5

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,I (mm)	W (mm)
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PN 5-1.009 CP 5-55.040 56.000 53.640 0.000 0 0

Simulation Criteria for Catchment 5

Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coeffiecient 0.800
Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Additional Flow - % of Total Flow 0.000 Run Time (mins) 60
Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 2.000 Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
Return Period (years) 100 Ratio R 0.400 Cv (Winter) 0.840
Region England and Wales Profile Type Summer Storm Duration (mins) 30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 5

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700 Cv (Summer)	0.750
Region England and Wales	Ratio R	0.400 Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

										Water	Surcharged	Flooded			Half Drain	Pipe		
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status		
PN 5-1.000	CP 5-1.000	15 Winter	1	+0%					60.385	-0.170	0.000	0.14			10.9	OK		
PN 5-1.001	CP 5-1.001	15 Winter	1	+0%					57.675	-0.231	0.000	0.12			22.2	OK		
PN 5-1.002	CP 5-1.002	15 Winter	1	+0%	100/15 Summer				56.674	-0.202	0.000	0.23			21.8	OK		
PN 5-1.003	CP 5-1.003	15 Winter	1	+0%	100/15 Summer				56.208	-0.255	0.000	0.21			29.4	OK		
PN 5-1.004	CP 5-1.004	15 Winter	1	+0%	100/15 Summer				55.796	-0.237	0.000	0.28			37.6	OK		
PN 5-1.005	CP 5-1.005	15 Winter	1	+0%	100/15 Summer				55.333	-0.251	0.000	0.29			44.5	OK		
PN 5-1.006	CP 5-1.006	15 Winter	1	+0%	100/15 Winter				54.848	-0.305	0.000	0.23			49.0	OK		
PN 5-2.000	CP 5-2.000	15 Winter	1	+0%					60.313	-0.166	0.000	0.15			12.1	OK		
PN 5-2.001	CP 5-2.001	15 Winter	1	+0%					57.784	-0.221	0.000	0.15			21.3	OK		
PN 5-2.002	CP 5-2.002	15 Winter	1	+0%	100/15 Summer				56.237	-0.256	0.000	0.21			29.2	OK		
PN 5-2.003	CP 5-2.003	15 Winter	1	+0%	100/15 Summer				55.775	-0.240	0.000	0.27			35.5	OK		
PN 5-2.004	CP 5-2.004	15 Winter	1	+0%	100/15 Winter				55.395	-0.260	0.000	0.26			43.0	OK		
PN 5-2.005	CP 5-2.005	15 Winter	1	+0%	100/15 Summer				54.889	-0.302	0.000	0.23			51.1	OK		
PN 5-2.006	CP 5-2.006	15 Winter	1	+0%	100/15 Summer				54.588	-0.286	0.000	0.38			50.7	OK		
PN 5-1.007	CP 5-1.007	15 Winter	1	+0%	100/15 Summer				54.504	-0.332	0.000	0.25			99.3	OK		
PN 5-3.000	CP 5-3.000	15 Winter	1	+0%					54.877	-0.223	0.000	0.15			11.8	OK		
PN 5-1.008	CP 5-1.008	15 Winter	1	+0%	100/15 Summer				54.185	-0.315	0.000	0.29			108.8	OK		
PN 5-1.009	CP 5-1.009	15 Winter	1	+0%	30/15 Summer				53.952	-0.248	0.000	0.50			109.1	OK		

PN	US/MH Name	Level Exceeded
PN 5-1.000	CP 5-1.000	
PN 5-1.001	CP 5-1.001	
PN 5-1.002	CP 5-1.002	
PN 5-1.003	CP 5-1.003	
PN 5-1.004	CP 5-1.004	
PN 5-1.005	CP 5-1.005	
PN 5-1.006	CP 5-1.006	
PN 5-2.000	CP 5-2.000	
PN 5-2.001	CP 5-2.001	
PN 5-2.002	CP 5-2.002	
PN 5-2.003	CP 5-2.003	
PN 5-2.004	CP 5-2.004	
PN 5-2.005	CP 5-2.005	
PN 5-2.006	CP 5-2.006	
PN 5-1.007	CP 5-1.007	
PN 5-3.000	CP 5-3.000	
PN 5-1.008	CP 5-1.008	
PN 5-1.009	CP 5-1.009	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 5

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700 Cv (Summer)	0.750
Region England and Wales	Ratio R	0.400 Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

									Water	Surcharged	Flooded				Half Drain	Pipe
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
PN 5-1.000	CP 5-1.000	15 Winter	30	+0%					60.419	-0.136	0.000	0.33			26.8	
PN 5-1.001	CP 5-1.001	15 Winter	30	+0%					57.725	-0.181	0.000	0.32			59.9	
PN 5-1.002	CP 5-1.002	15 Winter	30	+0%	100/15 Summer				56.749	-0.127	0.000	0.61			58.7	
PN 5-1.003	CP 5-1.003	15 Winter	30	+0%	100/15 Summer				56.303	-0.160	0.000	0.58			80.1	
PN 5-1.004	CP 5-1.004	15 Winter	30	+0%	100/15 Summer				55.915	-0.118	0.000	0.75			101.0	
PN 5-1.005	CP 5-1.005	15 Winter	30	+0%	100/15 Summer				55.454	-0.130	0.000	0.76			118.1	
PN 5-1.006	CP 5-1.006	15 Winter	30	+0%	100/15 Winter				54.953	-0.200	0.000	0.58			126.4	
PN 5-2.000	CP 5-2.000	15 Winter	30	+0%					60.350	-0.129	0.000	0.38			29.8	
PN 5-2.001	CP 5-2.001	15 Winter	30	+0%					57.842	-0.163	0.000	0.40			56.2	
PN 5-2.002	CP 5-2.002	15 Winter	30	+0%	100/15 Summer				56.330	-0.163	0.000	0.56			78.2	
PN 5-2.003	CP 5-2.003	15 Winter	30	+0%	100/15 Summer				55.887	-0.128	0.000	0.72			95.0	
PN 5-2.004	CP 5-2.004	15 Winter	30	+0%	100/15 Winter				55.506	-0.149	0.000	0.68			113.3	
PN 5-2.005	CP 5-2.005	15 Winter	30	+0%	100/15 Summer				54.999	-0.192	0.000	0.61			133.6	
PN 5-2.006	CP 5-2.006	15 Winter	30	+0%	100/15 Summer				54.770	-0.104	0.000	0.98			130.3	
PN 5-1.007	CP 5-1.007	15 Winter	30	+0%	100/15 Summer				54.626	-0.210	0.000	0.63			255.9	
PN 5-3.000	CP 5-3.000	15 Winter	30	+0%					54.925	-0.175	0.000	0.36			28.9	
PN 5-1.008	CP 5-1.008	15 Winter	30	+0%	100/15 Summer				54.454	-0.046	0.000	0.76			278.9	
PN 5-1.009	CP 5-1.009	15 Winter	30	+0%	30/15 Summer				54.280	0.080	0.000	1.30			280.8	

PN	US/MH Name	Status	Level Exceeded
PN 5-1.000	CP 5-1.000	OK	
PN 5-1.001	CP 5-1.001	OK	
PN 5-1.002	CP 5-1.002	OK	
PN 5-1.003	CP 5-1.003	OK	
PN 5-1.004	CP 5-1.004	OK	
PN 5-1.005	CP 5-1.005	OK	
PN 5-1.006	CP 5-1.006	OK	
PN 5-2.000	CP 5-2.000	OK	
PN 5-2.001	CP 5-2.001	OK	
PN 5-2.002	CP 5-2.002	OK	
PN 5-2.003	CP 5-2.003	OK	
PN 5-2.004	CP 5-2.004	OK	
PN 5-2.005	CP 5-2.005	OK	
PN 5-2.006	CP 5-2.006	OK	
PN 5-1.007	CP 5-1.007	OK	
PN 5-3.000	CP 5-3.000	OK	
PN 5-1.008	CP 5-1.008	OK	
PN 5-1.009	CP 5-1.009	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 5

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000

Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800

Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0

Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750

Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON

Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF

DTS Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

					Water				Surcharged		Flooded		Flow /		Overflow		Half Drain	Pipe
PN	US/MH	Storm	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow			
	Name		Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)			
PN 5-1.000	CP 5-1.000	15 Winter	100	+40%					60.456	-0.099	0.000	0.61						48.5
PN 5-1.001	CP 5-1.001	15 Winter	100	+40%					57.775	-0.131	0.000	0.58						108.9
PN 5-1.002	CP 5-1.002	15 Winter	100	+40%	100/15 Summer				57.129	0.253	0.000	1.05						100.7
PN 5-1.003	CP 5-1.003	15 Winter	100	+40%	100/15 Summer				56.627	0.164	0.000	0.92						127.0
PN 5-1.004	CP 5-1.004	15 Winter	100	+40%	100/15 Summer				56.270	0.237	0.000	1.12						151.5
PN 5-1.005	CP 5-1.005	15 Winter	100	+40%	100/15 Summer				55.684	0.100	0.000	1.11						172.1
PN 5-1.006	CP 5-1.006	30 Winter	100	+40%	100/15 Winter				55.196	0.043	0.000	0.80						174.0
PN 5-2.000	CP 5-2.000	15 Winter	100	+40%					60.392	-0.087	0.000	0.69						54.1
PN 5-2.001	CP 5-2.001	15 Winter	100	+40%					57.904	-0.101	0.000	0.73						101.9
PN 5-2.002	CP 5-2.002	15 Winter	100	+40%	100/15 Summer				56.624	0.131	0.000	0.98						136.3
PN 5-2.003	CP 5-2.003	15 Winter	100	+40%	100/15 Summer				56.188	0.173	0.000	1.13						148.4
PN 5-2.004	CP 5-2.004	15 Winter	100	+40%	100/15 Winter				55.728	0.073	0.000	1.01						167.2
PN 5-2.005	CP 5-2.005	30 Winter	100	+40%	100/15 Summer				55.285	0.094	0.000	0.85						188.6
PN 5-2.006	CP 5-2.006	30 Winter	100	+40%	100/15 Summer				55.048	0.174	0.000	1.34						178.1
PN 5-1.007	CP 5-1.007	30 Winter	100	+40%	100/15 Summer				54.995	0.159	0.000	0.87						352.1
PN 5-3.000	CP 5-3.000	15 Winter	100	+40%					54.978	-0.122	0.000	0.66						52.1
PN 5-1.008	CP 5-1.008	30 Winter	100	+40%	100/15 Summer				54.744	0.244	0.000	1.04						383.1
PN 5-1.009	CP 5-1.009	30 Winter	100	+40%	30/15 Summer				54.421	0.221	0.000	1.78						384.8

PN	US/MH	Status	Level Exceeded
PN 5-1.000	CP 5-1.000	OK	
PN 5-1.001	CP 5-1.001	OK	
PN 5-1.002	CP 5-1.002	SURCHARGED	
PN 5-1.003	CP 5-1.003	SURCHARGED	
PN 5-1.004	CP 5-1.004	SURCHARGED	
PN 5-1.005	CP 5-1.005	SURCHARGED	
PN 5-1.006	CP 5-1.006	SURCHARGED	
PN 5-2.000	CP 5-2.000	OK	
PN 5-2.001	CP 5-2.001	OK	
PN 5-2.002	CP 5-2.002	SURCHARGED	
PN 5-2.003	CP 5-2.003	SURCHARGED	
PN 5-2.004	CP 5-2.004	SURCHARGED	
PN 5-2.005	CP 5-2.005	SURCHARGED	
PN 5-2.006	CP 5-2.006	SURCHARGED	
PN 5-1.007	CP 5-1.007	SURCHARGED	
PN 5-3.000	CP 5-3.000	OK	
PN 5-1.008	CP 5-1.008	SURCHARGED	
PN 5-1.009	CP 5-1.009	SURCHARGED	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Catchment 6

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales					
Return Period (years)	1	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	18.800	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	0.980
Ratio R	0.400	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	50	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.200		

Designed with Level Soffits

Network Design Table for Catchment 6

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
PN 6-1.000	51.213	0.507	101.0	0.056	6.00	0.0	0.600	o	150	Pipe/Conduit		
PN 6-1.001	78.494	1.167	67.3	0.097	0.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-1.002	18.149	0.475	38.2	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-2.000	38.393	0.380	101.0	0.049	6.00	0.0	0.600	o	150	Pipe/Conduit		
PN 6-2.001	75.453	0.985	76.6	0.081	0.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-2.002	18.471	0.322	57.4	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-3.000	37.632	0.404	93.1	0.042	6.00	0.0	0.600	o	150	Pipe/Conduit		
PN 6-3.001	89.869	0.891	100.9	0.118	0.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-3.002	20.257	0.120	168.8	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit		
PN 6-2.003	34.173	0.141	242.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
PN 6-1.003	38.856	0.161	241.3	0.089	0.00	0.0	0.600	o	375	Pipe/Conduit		
PN 6-1.004	90.063	0.960	93.8	0.090	0.00	0.0	0.600	o	375	Pipe/Conduit		
PN 6-1.005	89.993	0.920	97.8	0.085	0.00	0.0	0.600	o	375	Pipe/Conduit		
PN 6-1.006	90.009	0.898	100.2	0.094	0.00	0.0	0.600	o	400	Pipe/Conduit		
PN 6-1.007	30.000	0.275	109.1	0.030	0.00	0.0	0.600	o	400	Pipe/Conduit		
PN 6-1.008	59.974	0.744	80.6	0.069	0.00	0.0	0.600	o	400	Pipe/Conduit		
PN 6-1.009	56.716	0.645	87.9	0.082	0.00	0.0	0.600	o	400	Pipe/Conduit		
PN 6-1.010	58.157	0.442	131.6	0.103	0.00	0.0	0.600	o	400	Pipe/Conduit		
PN 6-4.000	86.268	0.891	96.8	0.085	6.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-4.001	90.022	0.790	114.0	0.127	0.00	0.0	0.600	o	225	Pipe/Conduit		
PN 6-4.002	30.650	0.252	121.6	0.046	0.00	0.0	0.600	o	300	Pipe/Conduit		
PN 6-4.003	89.941	0.866	103.9	0.118	0.00	0.0	0.600	o	300	Pipe/Conduit		
PN 6-4.004	90.078	0.786	114.6	0.102	0.00	0.0	0.600	o	300	Pipe/Conduit		
PN 6-4.005	89.999	0.918	98.0	0.089	0.00	0.0	0.600	o	375	Pipe/Conduit		
PN 6-4.006	27.364	0.286	95.7	0.027	0.00	0.0	0.600	o	375	Pipe/Conduit		
PN 6-4.007	89.954	0.849	106.0	0.088	0.00	0.0	0.600	o	375	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)
PN 6-1.000	44.47	6.85	62.058	0.056	0.0	0.0	0.0	1.00	17.7	6.8
PN 6-1.001	42.01	7.67	61.476	0.154	0.0	0.0	0.0	1.60	63.5	17.5
PN 6-1.002	41.61	7.82	60.309	0.174	0.0	0.0	0.0	2.12	84.4	19.6
PN 6-2.000	45.17	6.64	62.021	0.049	0.0	0.0	0.0	1.00	17.7	6.0
PN 6-2.001	42.56	7.48	61.566	0.130	0.0	0.0	0.0	1.50	59.5	15.0
PN 6-2.002	42.05	7.66	60.581	0.161	0.0	0.0	0.0	1.73	68.8	18.3
PN 6-3.000	45.30	6.60	61.465	0.042	0.0	0.0	0.0	1.04	18.4	5.1
PN 6-3.001	41.79	7.75	60.986	0.160	0.0	0.0	0.0	1.30	51.8	18.1
PN 6-3.002	41.03	8.03	60.020	0.186	0.0	0.0	0.0	1.21	85.3	20.6
PN 6-2.003	39.58	8.60	59.900	0.347	0.0	0.0	0.0	1.01	71.1	37.1
PN 6-1.003	38.26	9.16	59.684	0.609	0.0	0.0	0.0	1.16	128.3	63.1
PN 6-1.004	36.53	9.96	59.523	0.699	0.0	0.0	0.0	1.87	206.7	69.2
PN 6-1.005	35.01	10.78	58.563	0.784	0.0	0.0	0.0	1.83	202.4	74.4
PN 6-1.006	33.67	11.57	57.618	0.879	0.0	0.0	0.0	1.89	236.9	80.1
PN 6-1.007	33.24	11.85	56.720	0.908	0.0	0.0	0.0	1.81	227.0	81.7
PN 6-1.008	32.52	12.32	56.445	0.977	0.0	0.0	0.0	2.10	264.4	86.0
PN 6-1.009	31.84	12.79	55.701	1.059	0.0	0.0	0.0	2.01	253.0	91.3
PN 6-1.010	31.04	13.38	55.056	1.161	0.0	0.0	0.0	1.64	206.6	97.6
PN 6-4.000	43.75	7.08	61.395	0.085	0.0	0.0	0.0	1.33	52.8	10.0
PN 6-4.001	40.31	8.31	60.504	0.211	0.0	0.0	0.0	1.22	48.7	23.1
PN 6-4.002	39.41	8.67	59.639	0.257	0.0	0.0	0.0	1.42	100.7	27.4
PN 6-4.003	37.20	9.64	59.387	0.375	0.0	0.0	0.0	1.54	109.0	37.8
PN 6-4.004	35.21	10.66	58.521	0.477	0.0	0.0	0.0	1.47	103.8	45.5
PN 6-4.005	33.82	11.48	57.660	0.566	0.0	0.0	0.0	1.83	202.1	51.9
PN 6-4.006	33.43	11.73	56.742	0.593	0.0	0.0	0.0	1.85	204.6	53.7
PN 6-4.007	32.15	12.58	56.456	0.681	0.0	0.0	0.0	1.76	194.4	59.3

Network Design Table for Catchment 6

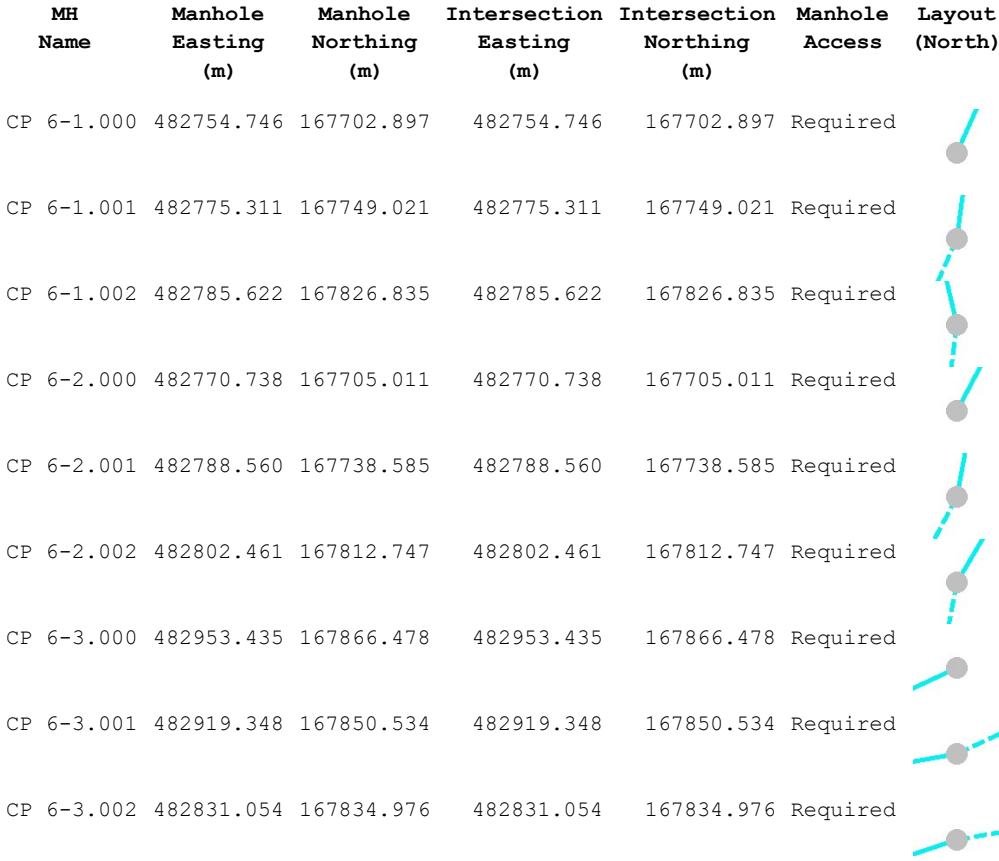
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
PN 6-4.008	39.813	0.373	106.7	0.040	0.00	0.0	0.600	o	375	Pipe/Conduit	
PN 6-4.009	54.740	0.578	94.7	0.053	0.00	0.0	0.600	o	375	Pipe/Conduit	
PN 6-5.000	39.662	0.466	85.1	0.113	6.00	0.0	0.600	o	225	Pipe/Conduit	
PN 6-5.001	11.599	0.207	56.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
PN 6-4.010	20.662	0.088	234.8	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
PN 6-1.011	11.938	0.035	341.1	0.000	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)
PN 6-4.008	31.62	12.96	55.607	0.721	0.0	0.0	0.0	1.75	193.7	61.7
PN 6-4.009	30.96	13.45	55.234	0.774	0.0	0.0	0.0	1.86	205.7	64.8
PN 6-5.000	45.76	6.47	54.720	0.113	0.0	0.0	0.0	1.42	56.4	14.0
PN 6-5.001	45.38	6.58	54.254	0.113	0.0	0.0	0.0	1.75	69.6	14.0
PN 6-4.010	30.62	13.71	53.822	0.916	0.0	0.0	0.0	1.32	210.3	76.0
PN 6-1.011	30.39	13.89	53.734	2.078	0.0	0.0	0.0	1.10	174.2	171.0

Manhole Schedules for Catchment 6

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 6-1.000	63.188	1.130	Open Manhole	1200	PN 6-1.000	62.058	150				
CP 6-1.001	62.801	1.325	Open Manhole	1200	PN 6-1.001	61.476	225	PN 6-1.000	61.551	150	
CP 6-1.002	61.513	1.204	Open Manhole	1200	PN 6-1.002	60.309	225	PN 6-1.001	60.309	225	
CP 6-2.000	63.151	1.130	Open Manhole	1200	PN 6-2.000	62.021	150				
CP 6-2.001	62.934	1.368	Open Manhole	1200	PN 6-2.001	61.566	225	PN 6-2.000	61.641	150	
CP 6-2.002	61.785	1.204	Open Manhole	1200	PN 6-2.002	60.581	225	PN 6-2.001	60.581	225	
CP 6-3.000	62.960	1.495	Open Manhole	1200	PN 6-3.000	61.465	150				
CP 6-3.001	62.560	1.574	Open Manhole	1200	PN 6-3.001	60.986	225	PN 6-3.000	61.061	150	
CP 6-3.002	61.593	1.573	Open Manhole	1200	PN 6-3.002	60.020	300	PN 6-3.001	60.095	225	
CP 6-2.003	61.555	1.655	Open Manhole	1200	PN 6-2.003	59.900	300	PN 6-2.002	60.259	225	284
								PN 6-3.002	59.900	300	
CP 6-1.003	61.179	1.495	Open Manhole	1350	PN 6-1.003	59.684	375	PN 6-1.002	59.834	225	
								PN 6-2.003	59.759	300	
CP 6-1.004	60.831	1.308	Open Manhole	1350	PN 6-1.004	59.523	375	PN 6-1.003	59.523	375	
CP 6-1.005	59.919	1.356	Open Manhole	1350	PN 6-1.005	58.563	375	PN 6-1.004	58.563	375	
CP 6-1.006	58.998	1.380	Open Manhole	1350	PN 6-1.006	57.618	400	PN 6-1.005	57.643	375	
CP 6-1.007	58.100	1.380	Open Manhole	1350	PN 6-1.007	56.720	400	PN 6-1.006	56.720	400	
CP 6-1.008	57.826	1.381	Open Manhole	1350	PN 6-1.008	56.445	400	PN 6-1.007	56.445	400	
CP 6-1.009	57.082	1.381	Open Manhole	1350	PN 6-1.009	55.701	400	PN 6-1.008	55.701	400	
CP 6-1.010	56.437	1.381	Open Manhole	1350	PN 6-1.010	55.056	400	PN 6-1.009	55.056	400	
CP 6-4.000	62.780	1.385	Open Manhole	1200	PN 6-4.000	61.395	225				
CP 6-4.001	62.039	1.535	Open Manhole	1200	PN 6-4.001	60.504	225	PN 6-4.000	60.504	225	
CP 6-4.002	60.919	1.280	Open Manhole	1200	PN 6-4.002	59.639	300	PN 6-4.001	59.714	225	
CP 6-4.003	60.668	1.281	Open Manhole	1200	PN 6-4.003	59.387	300	PN 6-4.002	59.387	300	
CP 6-4.004	59.801	1.280	Open Manhole	1200	PN 6-4.004	58.521	300	PN 6-4.003	58.521	300	
CP 6-4.005	59.015	1.355	Open Manhole	1350	PN 6-4.005	57.660	375	PN 6-4.004	57.735	300	
CP 6-4.006	58.098	1.356	Open Manhole	1350	PN 6-4.006	56.742	375	PN 6-4.005	56.742	375	
CP 6-4.007	57.811	1.355	Open Manhole	1350	PN 6-4.007	56.456	375	PN 6-4.006	56.456	375	
CP 6-4.008	56.962	1.355	Open Manhole	1350	PN 6-4.008	55.607	375	PN 6-4.007	55.607	375	
CP 6-4.009	56.589	1.355	Open Manhole	1350	PN 6-4.009	55.234	375	PN 6-4.008	55.234	375	
CP 6-5.000	55.925	1.205	Open Manhole	1200	PN 6-5.000	54.720	225				
CP 6-5.001	55.740	1.486	Open Manhole	1200	PN 6-5.001	54.254	225	PN 6-5.000	54.254	225	
CP 6-4.010	56.011	2.189	Open Manhole	1350	PN 6-4.010	53.822	450	PN 6-4.009	54.656	375	759
								PN 6-5.001	54.047	225	
CP 6-4.011	55.995	2.261	Open Manhole	1350	PN 6-1.011	53.734	450	PN 6-1.010	54.614	400	830
								PN 6-4.010	53.734	450	
CP 6-55.040	55.700	2.001	Open Manhole	0		OUTFALL		PN 6-1.011	53.699	450	



Manhole Schedules for Catchment 6

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 6-2.003	482811.800	167828.683	482811.800	167828.683	Required	
CP 6-1.003	482781.515	167844.513	482781.515	167844.513	Required	
CP 6-1.004	482749.137	167865.981	482749.137	167865.981	Required	
CP 6-1.005	482667.273	167902.176	482667.273	167902.176	Required	
CP 6-1.006	482577.869	167907.034	482577.869	167907.034	Required	
CP 6-1.007	482488.517	167905.416	482488.517	167905.416	Required	
CP 6-1.008	482459.300	167912.211	482459.300	167912.211	Required	
CP 6-1.009	482400.650	167908.084	482400.650	167908.084	Required	
CP 6-1.010	482357.017	167873.293	482357.017	167873.293	Required	
CP 6-4.000	482948.079	167877.867	482948.079	167877.867	Required	
CP 6-4.001	482865.224	167854.648	482865.224	167854.648	Required	
CP 6-4.002	482777.643	167870.093	482777.643	167870.093	Required	
CP 6-4.003	482750.679	167884.535	482750.679	167884.535	Required	
CP 6-4.004	482667.806	167918.411	482667.806	167918.411	Required	
CP 6-4.005	482577.906	167919.422	482577.906	167919.422	Required	
CP 6-4.006	482488.298	167918.425	482488.298	167918.425	Required	
CP 6-4.007	482461.673	167924.629	482461.673	167924.629	Required	
CP 6-4.008	482375.136	167914.011	482375.136	167914.011	Required	
CP 6-4.009	482346.094	167887.136	482346.094	167887.136	Required	
CP 6-5.000	482258.397	167867.248	482258.397	167867.248	Required	
CP 6-5.001	482293.301	167848.413	482293.301	167848.413	Required	
CP 6-4.010	482303.572	167853.802	482303.572	167853.802	Required	
CP 6-4.011	482313.562	167835.715	482313.562	167835.715	Required	
CP 6-55.040	482320.731	167826.169			No Entry	

PIPELINE SCHEDULES for Catchment 6

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)
PN 6-1.000	o	150	CP 6-1.000	63.188	62.058	0.980	Open Manhole	1200
PN 6-1.001	o	225	CP 6-1.001	62.801	61.476	1.100	Open Manhole	1200
PN 6-1.002	o	225	CP 6-1.002	61.513	60.309	0.979	Open Manhole	1200
PN 6-2.000	o	150	CP 6-2.000	63.151	62.021	0.980	Open Manhole	1200
PN 6-2.001	o	225	CP 6-2.001	62.934	61.566	1.143	Open Manhole	1200
PN 6-2.002	o	225	CP 6-2.002	61.785	60.581	0.979	Open Manhole	1200
PN 6-3.000	o	150	CP 6-3.000	62.960	61.465	1.345	Open Manhole	1200
PN 6-3.001	o	225	CP 6-3.001	62.560	60.986	1.349	Open Manhole	1200
PN 6-3.002	o	300	CP 6-3.002	61.593	60.020	1.273	Open Manhole	1200
PN 6-2.003	o	300	CP 6-2.003	61.555	59.900	1.355	Open Manhole	1200
PN 6-1.003	o	375	CP 6-1.003	61.179	59.684	1.120	Open Manhole	1350
PN 6-1.004	o	375	CP 6-1.004	60.831	59.523	0.933	Open Manhole	1350
PN 6-1.005	o	375	CP 6-1.005	59.919	58.563	0.981	Open Manhole	1350
PN 6-1.006	o	400	CP 6-1.006	58.998	57.618	0.980	Open Manhole	1350
PN 6-1.007	o	400	CP 6-1.007	58.100	56.720	0.980	Open Manhole	1350
PN 6-1.008	o	400	CP 6-1.008	57.826	56.445	0.981	Open Manhole	1350
PN 6-1.009	o	400	CP 6-1.009	57.082	55.701	0.981	Open Manhole	1350
PN 6-1.010	o	400	CP 6-1.010	56.437	55.056	0.981	Open Manhole	1350
PN 6-4.000	o	225	CP 6-4.000	62.780	61.395	1.160	Open Manhole	1200
PN 6-4.001	o	225	CP 6-4.001	62.039	60.504	1.310	Open Manhole	1200
PN 6-4.002	o	300	CP 6-4.002	60.919	59.639	0.980	Open Manhole	1200
PN 6-4.003	o	300	CP 6-4.003	60.668	59.387	0.981	Open Manhole	1200
PN 6-4.004	o	300	CP 6-4.004	59.801	58.521	0.980	Open Manhole	1200
PN 6-4.005	o	375	CP 6-4.005	59.015	57.660	0.980	Open Manhole	1350
PN 6-4.006	o	375	CP 6-4.006	58.098	56.742	0.981	Open Manhole	1350
PN 6-4.007	o	375	CP 6-4.007	57.811	56.456	0.980	Open Manhole	1350
PN 6-4.008	o	375	CP 6-4.008	56.962	55.607	0.980	Open Manhole	1350
PN 6-4.009	o	375	CP 6-4.009	56.589	55.234	0.980	Open Manhole	1350
PN 6-5.000	o	225	CP 6-5.000	55.925	54.720	0.980	Open Manhole	1200
PN 6-5.001	o	225	CP 6-5.001	55.740	54.254	1.261	Open Manhole	1200
PN 6-4.010	o	450	CP 6-4.010	56.011	53.822	1.739	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)
PN 6-1.000	51.213	101.0	CP 6-1.001	62.801	61.551	1.100	Open Manhole	1200
PN 6-1.001	78.494	67.3	CP 6-1.002	61.513	60.309	0.979	Open Manhole	1200
PN 6-1.002	18.149	38.2	CP 6-1.003	61.179	59.834	1.120	Open Manhole	1350
PN 6-2.000	38.393	101.0	CP 6-2.001	62.934	61.641	1.143	Open Manhole	1200
PN 6-2.001	75.453	76.6	CP 6-2.002	61.785	60.581	0.979	Open Manhole	1200
PN 6-2.002	18.471	57.4	CP 6-2.003	61.555	60.259	1.071	Open Manhole	1200
PN 6-3.000	37.632	93.1	CP 6-3.001	62.560	61.061	1.349	Open Manhole	1200
PN 6-3.001	89.869	100.9	CP 6-3.002	61.593	60.095	1.273	Open Manhole	1200
PN 6-3.002	20.257	168.8	CP 6-2.003	61.555	59.900	1.355	Open Manhole	1200
PN 6-2.003	34.173	242.4	CP 6-1.003	61.179	59.759	1.120	Open Manhole	1350
PN 6-1.003	38.856	241.3	CP 6-1.004	60.831	59.523	0.933	Open Manhole	1350
PN 6-1.004	90.063	93.8	CP 6-1.005	59.919	58.563	0.981	Open Manhole	1350
PN 6-1.005	89.993	97.8	CP 6-1.006	58.998	57.643	0.980	Open Manhole	1350
PN 6-1.006	90.009	100.2	CP 6-1.007	58.100	56.720	0.980	Open Manhole	1350
PN 6-1.007	30.000	109.1	CP 6-1.008	57.826	56.445	0.981	Open Manhole	1350
PN 6-1.008	59.974	80.6	CP 6-1.009	57.082	55.701	0.981	Open Manhole	1350
PN 6-1.009	56.716	87.9	CP 6-1.010	56.437	55.056	0.981	Open Manhole	1350
PN 6-1.010	58.157	131.6	CP 6-4.011	55.995	54.614	0.981	Open Manhole	1350
PN 6-4.000	86.268	96.8	CP 6-4.001	62.039	60.504	1.310	Open Manhole	1200
PN 6-4.001	90.022	114.0	CP 6-4.002	60.919	59.714	0.980	Open Manhole	1200
PN 6-4.002	30.650	121.6	CP 6-4.003	60.668	59.387	0.981	Open Manhole	1200
PN 6-4.003	89.941	103.9	CP 6-4.004	59.801	58.521	0.980	Open Manhole	1200
PN 6-4.004	90.078	114.6	CP 6-4.005	59.015	57.735	0.980	Open Manhole	1350
PN 6-4.005	89.999	98.0	CP 6-4.006	58.098	56.742	0.981	Open Manhole	1350
PN 6-4.006	27.364	95.7	CP 6-4.007	57.811	56.456	0.980	Open Manhole	1350
PN 6-4.007	89.954	106.0	CP 6-4.008	56.962	55.607	0.980	Open Manhole	1350
PN 6-4.008	39.813	106.7	CP 6-4.009	56.589	55.234	0.980	Open Manhole	1350
PN 6-4.009	54.740	94.7	CP 6-4.010	56.011	54.656	0.980	Open Manhole	1350
PN 6-5.000	39.662	85.1	CP 6-5.001	55.740	54.254	1.261	Open Manhole	1200
PN 6-5.001	11.599	56.0	CP 6-4.010	56.011	54.047	1.739	Open Manhole	1350
PN 6-4.010	20.662	234.8	CP 6-4.011	55.995	53.734	1.811	Open Manhole	1350

PIPELINE SCHEDULES for Catchment 6

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)
PN 6-1.011	o	450	CP 6-4.011	55.995	53.734	1.811	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)
PN 6-1.011	11.938	341.1	CP 6-55.040	55.700	53.699	1.551	Open Manhole	0

Area Summary for Catchment 6

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.056	0.056	0.056
1.001	User	-	100	0.097	0.097	0.097
1.002	User	-	100	0.020	0.020	0.020
2.000	User	-	100	0.049	0.049	0.049
2.001	User	-	100	0.081	0.081	0.081
2.002	User	-	100	0.030	0.030	0.030
3.000	User	-	100	0.042	0.042	0.042
3.001	User	-	100	0.118	0.118	0.118
3.002	User	-	100	0.026	0.026	0.026
2.003	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.089	0.089	0.089
1.004	User	-	100	0.090	0.090	0.090
1.005	User	-	100	0.085	0.085	0.085
1.006	User	-	100	0.094	0.094	0.094
1.007	User	-	100	0.030	0.030	0.030
1.008	User	-	100	0.069	0.069	0.069
1.009	User	-	100	0.082	0.082	0.082
1.010	User	-	100	0.103	0.103	0.103
4.000	User	-	100	0.085	0.085	0.085
4.001	User	-	100	0.127	0.127	0.127
4.002	User	-	100	0.046	0.046	0.046
4.003	User	-	100	0.118	0.118	0.118
4.004	User	-	100	0.102	0.102	0.102
4.005	User	-	100	0.089	0.089	0.089
4.006	User	-	100	0.027	0.027	0.027
4.007	User	-	100	0.088	0.088	0.088
4.008	User	-	100	0.040	0.040	0.040
4.009	User	-	100	0.053	0.053	0.053
5.000	User	-	100	0.113	0.113	0.113
5.001	-	-	100	0.000	0.000	0.000
4.010	User	-	100	0.030	0.030	0.030
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.078	2.078	2.078

Simulation Criteria for Catchment 6

Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coeffiecient 0.800
Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Additional Flow - % of Total Flow 0.000 Run Time (mins) 60
Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 2.000 Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Return Period (years) 1 Ratio R 0.400 Cv (Winter) 0.840
Region England and Wales Profile Type Summer Storm Duration (mins) 30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 6

Simulation Criteria
Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details
Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

										Water Level	Surcharged Depth	Flooded Volume	Flow / Overflow	Half Drain Time	Pipe Flow
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)
PN 6-1.000	CP 6-1.000	15 Winter	1	+0%	100/15 Summer	100/15 Winter			62.123	-0.085	0.000	0.39			6.8
PN 6-1.001	CP 6-1.001	15 Winter	1	+0%	100/15 Summer				61.557	-0.144	0.000	0.27			16.8
PN 6-1.002	CP 6-1.002	15 Winter	1	+0%	100/15 Summer				60.385	-0.149	0.000	0.25			18.9
PN 6-2.000	CP 6-2.000	15 Winter	1	+0%	100/15 Summer				62.082	-0.089	0.000	0.35			5.9
PN 6-2.001	CP 6-2.001	15 Winter	1	+0%	100/15 Summer				61.643	-0.148	0.000	0.25			14.3
PN 6-2.002	CP 6-2.002	15 Winter	1	+0%	100/15 Summer				60.663	-0.143	0.000	0.28			17.4
PN 6-3.000	CP 6-3.000	15 Winter	1	+0%	100/15 Summer	100/15 Winter			61.519	-0.096	0.000	0.28			5.0
PN 6-3.001	CP 6-3.001	15 Winter	1	+0%	30/15 Winter	100/15 Winter			61.079	-0.132	0.000	0.34			17.4
PN 6-3.002	CP 6-3.002	15 Winter	1	+0%	30/15 Summer	100/15 Winter			60.126	-0.194	0.000	0.27			20.1
PN 6-2.003	CP 6-2.003	15 Winter	1	+0%	30/15 Summer				60.063	-0.137	0.000	0.57			37.0
PN 6-1.003	CP 6-1.003	15 Winter	1	+0%	30/15 Summer				59.884	-0.175	0.000	0.55			63.7
PN 6-1.004	CP 6-1.004	15 Winter	1	+0%	100/15 Summer				59.679	-0.219	0.000	0.36			70.2
PN 6-1.005	CP 6-1.005	15 Winter	1	+0%	100/15 Summer				58.727	-0.211	0.000	0.39			75.1
PN 6-1.006	CP 6-1.006	15 Winter	1	+0%	100/15 Summer				57.785	-0.233	0.000	0.36			80.8
PN 6-1.007	CP 6-1.007	15 Winter	1	+0%	100/15 Summer				56.899	-0.221	0.000	0.41			82.0
PN 6-1.008	CP 6-1.008	15 Winter	1	+0%	100/15 Summer				56.608	-0.237	0.000	0.35			85.6
PN 6-1.009	CP 6-1.009	15 Winter	1	+0%	100/15 Summer				55.873	-0.228	0.000	0.38			89.3
PN 6-1.010	CP 6-1.010	15 Winter	1	+0%	30/15 Winter				55.254	-0.202	0.000	0.49			93.5
PN 6-4.000	CP 6-4.000	15 Winter	1	+0%	100/15 Summer				61.463	-0.157	0.000	0.19			9.8
PN 6-4.001	CP 6-4.001	15 Winter	1	+0%	30/15 Summer	100/15 Summer			60.616	-0.113	0.000	0.47			22.5
PN 6-4.002	CP 6-4.002	15 Winter	1	+0%	100/15 Summer				59.750	-0.189	0.000	0.29			26.9
PN 6-4.003	CP 6-4.003	15 Winter	1	+0%	100/15 Summer	100/15 Winter			59.513	-0.174	0.000	0.36			37.6
PN 6-4.004	CP 6-4.004	15 Winter	1	+0%	30/15 Summer				58.666	-0.155	0.000	0.45			45.5
PN 6-4.005	CP 6-4.005	15 Winter	1	+0%					57.794	-0.241	0.000	0.27			52.3
PN 6-4.006	CP 6-4.006	15 Winter	1	+0%	100/15 Summer				56.883	-0.234	0.000	0.30			54.1
PN 6-4.007	CP 6-4.007	15 Winter	1	+0%	100/15 Summer				56.603	-0.228	0.000	0.32			59.8
PN 6-4.008	CP 6-4.008	15 Winter	1	+0%	100/15 Summer				55.761	-0.221	0.000	0.35			62.1
PN 6-4.009	CP 6-4.009	15 Winter	1	+0%	100/15 Summer				55.385	-0.224	0.000	0.34			64.9
PN 6-5.000	CP 6-5.000	15 Winter	1	+0%	100/15 Summer				54.797	-0.148	0.000	0.25			13.5
PN 6-5.001	CP 6-5.001	15 Winter	1	+0%	30/15 Summer				54.327	-0.152	0.000	0.23			13.5
PN 6-4.010	CP 6-4.010	15 Winter	1	+0%	30/15 Summer				54.215	-0.057	0.000	0.44			74.3
PN 6-1.011	CP 6-4.011	15 Winter	1	+0%	1/15 Winter				54.186	0.002	0.000	1.40			166.0

PN	US/MH Name	Status	Level Exceeded
PN 6-1.000	CP 6-1.000	OK	1
PN 6-1.001	CP 6-1.001	OK	
PN 6-1.002	CP 6-1.002	OK	
PN 6-2.000	CP 6-2.000	OK	
PN 6-2.001	CP 6-2.001	OK	
PN 6-2.002	CP 6-2.002	OK	
PN 6-3.000	CP 6-3.000	OK	1
PN 6-3.001	CP 6-3.001	OK	1
PN 6-3.002	CP 6-3.002	OK	1
PN 6-2.003	CP 6-2.003	OK	
PN 6-1.003	CP 6-1.003	OK	
PN 6-1.004	CP 6-1.004	OK	
PN 6-1.005	CP 6-1.005	OK	
PN 6-1.006	CP 6-1.006	OK	
PN 6-1.007	CP 6-1.007	OK	
PN 6-1.008	CP 6-1.008	OK	
PN 6-1.009	CP 6-1.009	OK	
PN 6-1.010	CP 6-1.010	OK	
PN 6-4.000	CP 6-4.000	OK	
PN 6-4.001	CP 6-4.001	OK	4
PN 6-4.002	CP 6-4.002	OK	
PN 6-4.003	CP 6-4.003	OK	1
PN 6-4.004	CP 6-4.004	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 6

PN	US/MH Name	Status	Level Exceeded
PN 6-4.005	CP 6-4.005	OK	
PN 6-4.006	CP 6-4.006	OK	
PN 6-4.007	CP 6-4.007	OK	
PN 6-4.008	CP 6-4.008	OK	
PN 6-4.009	CP 6-4.009	OK	
PN 6-5.000	CP 6-5.000	OK	
PN 6-5.001	CP 6-5.001	OK	
PN 6-4.010	CP 6-4.010	OK	
PN 6-1.011	CP 6-4.011	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 6

Simulation Criteria
Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details
Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

										Water	Surcharged	Flooded			Half Drain	Pipe
PN	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time	Flow	
	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	
PN 6-1.000	CP 6-1.000	15	Winter	30	+0%	100/15	Summer	100/15	Winter	62.175	-0.033	0.000	0.93		16.1	
PN 6-1.001	CP 6-1.001	15	Winter	30	+0%	100/15	Summer			61.627	-0.074	0.000	0.74		46.0	
PN 6-1.002	CP 6-1.002	15	Winter	30	+0%	100/15	Summer			60.448	-0.086	0.000	0.69		52.2	
PN 6-2.000	CP 6-2.000	15	Winter	30	+0%	100/15	Summer			62.128	-0.043	0.000	0.84		14.3	
PN 6-2.001	CP 6-2.001	15	Winter	30	+0%	100/15	Summer			61.708	-0.083	0.000	0.68		39.2	
PN 6-2.002	CP 6-2.002	15	Winter	30	+0%	100/15	Summer			60.734	-0.072	0.000	0.79		48.6	
PN 6-3.000	CP 6-3.000	15	Winter	30	+0%	100/15	Summer	100/15	Winter	61.557	-0.058	0.000	0.69		12.2	
PN 6-3.001	CP 6-3.001	15	Winter	30	+0%	30/15	Winter	100/15	Winter	61.233	0.022	0.000	0.91		46.0	
PN 6-3.002	CP 6-3.002	15	Winter	30	+0%	30/15	Summer	100/15	Winter	60.534	0.214	0.000	0.70		51.9	
PN 6-2.003	CP 6-2.003	15	Winter	30	+0%	30/15	Summer			60.483	0.283	0.000	1.44		93.9	
PN 6-1.003	CP 6-1.003	15	Winter	30	+0%	30/15	Summer			60.200	0.141	0.000	1.37		159.8	
PN 6-1.004	CP 6-1.004	15	Winter	30	+0%	100/15	Summer			59.802	-0.096	0.000	0.89		175.0	
PN 6-1.005	CP 6-1.005	15	Winter	30	+0%	100/15	Summer			58.860	-0.078	0.000	0.95		184.3	
PN 6-1.006	CP 6-1.006	15	Winter	30	+0%	100/15	Summer			57.910	-0.108	0.000	0.87		195.4	
PN 6-1.007	CP 6-1.007	15	Winter	30	+0%	100/15	Summer			57.039	-0.081	0.000	0.99		197.3	
PN 6-1.008	CP 6-1.008	15	Winter	30	+0%	100/15	Summer			56.725	-0.120	0.000	0.83		203.3	
PN 6-1.009	CP 6-1.009	15	Winter	30	+0%	100/15	Summer			56.041	-0.060	0.000	0.88		206.9	
PN 6-1.010	CP 6-1.010	30	Winter	30	+0%	30/15	Winter			55.538	0.082	0.000	1.11		212.6	
PN 6-4.000	CP 6-4.000	15	Winter	30	+0%	100/15	Summer			61.506	-0.114	0.000	0.46		23.9	
PN 6-4.001	CP 6-4.001	15	Winter	30	+0%	30/15	Summer	100/15	Summer	60.981	0.252	0.000	1.12		53.3	
PN 6-4.002	CP 6-4.002	15	Winter	30	+0%	100/15	Summer			59.826	-0.113	0.000	0.69		63.1	
PN 6-4.003	CP 6-4.003	15	Winter	30	+0%	100/15	Summer	100/15	Winter	59.643	-0.044	0.000	0.88		92.7	
PN 6-4.004	CP 6-4.004	15	Winter	30	+0%	30/15	Summer			58.996	0.175	0.000	1.09		109.5	
PN 6-4.005	CP 6-4.005	15	Winter	30	+0%					57.884	-0.151	0.000	0.64		124.4	
PN 6-4.006	CP 6-4.006	15	Winter	30	+0%	100/15	Summer			56.980	-0.137	0.000	0.72		129.2	
PN 6-4.007	CP 6-4.007	15	Winter	30	+0%	100/15	Summer			56.713	-0.118	0.000	0.78		145.0	
PN 6-4.008	CP 6-4.008	15	Winter	30	+0%	100/15	Summer			55.877	-0.105	0.000	0.86		151.4	
PN 6-4.009	CP 6-4.009	15	Winter	30	+0%	100/15	Summer			55.497	-0.112	0.000	0.83		158.9	
PN 6-5.000	CP 6-5.000	15	Winter	30	+0%	100/15	Summer			54.858	-0.087	0.000	0.62		33.2	
PN 6-5.001	CP 6-5.001	15	Winter	30	+0%	30/15	Summer			54.754	0.275	0.000	0.45		26.4	
PN 6-4.010	CP 6-4.010	15	Winter	30	+0%	30/15	Summer			54.718	0.446	0.000	1.11		187.4	
PN 6-1.011	CP 6-4.011	15	Winter	30	+0%	1/15	Winter			54.615	0.431	0.000	3.30		392.5	

PN	US/MH Name	Status	Level Exceeded
PN 6-1.000	CP 6-1.000	OK	1
PN 6-1.001	CP 6-1.001	OK	
PN 6-1.002	CP 6-1.002	OK	
PN 6-2.000	CP 6-2.000	OK	
PN 6-2.001	CP 6-2.001	OK	
PN 6-2.002	CP 6-2.002	OK	
PN 6-3.000	CP 6-3.000	OK	1
PN 6-3.001	CP 6-3.001	SURCHARGED	1
PN 6-3.002	CP 6-3.002	SURCHARGED	1
PN 6-2.003	CP 6-2.003	SURCHARGED	
PN 6-1.003	CP 6-1.003	SURCHARGED	
PN 6-1.004	CP 6-1.004	OK	
PN 6-1.005	CP 6-1.005	OK	
PN 6-1.006	CP 6-1.006	OK	
PN 6-1.007	CP 6-1.007	OK	
PN 6-1.008	CP 6-1.008	OK	
PN 6-1.009	CP 6-1.009	OK	
PN 6-1.010	CP 6-1.010	SURCHARGED	
PN 6-4.000	CP 6-4.000	OK	
PN 6-4.001	CP 6-4.001	SURCHARGED	4
PN 6-4.002	CP 6-4.002	OK	
PN 6-4.003	CP 6-4.003	OK	1
PN 6-4.004	CP 6-4.004	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 6

PN	US/MH Name	Status	Level Exceeded
PN 6-4.005	CP 6-4.005	OK	
PN 6-4.006	CP 6-4.006	OK	
PN 6-4.007	CP 6-4.007	OK	
PN 6-4.008	CP 6-4.008	OK	
PN 6-4.009	CP 6-4.009	OK	
PN 6-5.000	CP 6-5.000	OK	
PN 6-5.001	CP 6-5.001	SURCHARGED	
PN 6-4.010	CP 6-4.010	SURCHARGED	
PN 6-1.011	CP 6-4.011	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 6

PN	US/MH Name	Status	Level Exceeded
PN 6-4.005	CP 6-4.005	OK	
PN 6-4.006	CP 6-4.006	SURCHARGED	
PN 6-4.007	CP 6-4.007	SURCHARGED	
PN 6-4.008	CP 6-4.008	SURCHARGED	
PN 6-4.009	CP 6-4.009	SURCHARGED	
PN 6-5.000	CP 6-5.000	FLOOD RISK	
PN 6-5.001	CP 6-5.001	SURCHARGED	
PN 6-4.010	CP 6-4.010	SURCHARGED	
PN 6-1.011	CP 6-4.011	SURCHARGED	

Existing Network Details for Catchment 7

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
PN 7-1.000	65.391	0.887	73.7	0.070	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 7-1.001	35.962	0.543	66.2	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit
PN 7-1.002	58.183	0.863	67.4	0.065	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-1.003	49.117	0.432	113.7	0.047	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-1.004	14.942	0.065	229.9	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-2.000	49.857	0.714	69.8	0.075	6.00	0.0	0.600	o	225	Pipe/Conduit
PN 7-2.001	90.127	1.408	64.0	0.053	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-2.002	64.428	0.662	97.3	0.044	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-1.005	12.002	0.294	40.8	0.059	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-1.006	11.586	0.000	0.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
PN 7-1.007	3.924	0.016	245.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
PN 7-1.000	61.983	0.070	0.0	1.52	60.6
PN 7-1.001	61.096	0.097	0.0	1.61	64.0
PN 7-1.002	60.478	0.161	0.0	1.92	135.5
PN 7-1.003	59.615	0.208	0.0	1.47	104.2
PN 7-1.004	59.183	0.227	0.0	1.03	73.0
PN 7-2.000	61.977	0.075	0.0	1.57	62.3
PN 7-2.001	61.188	0.128	0.0	1.97	139.1
PN 7-2.002	59.780	0.172	0.0	1.59	112.7
PN 7-1.005	59.118	0.458	0.0	2.47	174.5
PN 7-1.006	58.824	0.458	0.0	0.00	0.0
PN 7-1.007	58.824	0.458	0.0	1.00	70.6

Manhole Schedules for Catchment 7

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CP 7-1.000	63.188	1.205	Open Manhole	1200	PN 7-1.000	61.983	225				
CP 7-1.001	62.301	1.205	Open Manhole	1200	PN 7-1.001	61.096	225	PN 7-1.000	61.096	225	
CP 7-1.002	61.758	1.280	Open Manhole	1200	PN 7-1.002	60.478	300	PN 7-1.001	60.553	225	
CP 7-1.003	60.895	1.280	Open Manhole	1200	PN 7-1.003	59.615	300	PN 7-1.002	59.615	300	
CP 7-1.004	60.083	0.900	Open Manhole	1200	PN 7-1.004	59.183	300	PN 7-1.003	59.183	300	
CP 7-2.000	63.182	1.205	Open Manhole	1200	PN 7-2.000	61.977	225				
CP 7-2.001	62.468	1.280	Open Manhole	1200	PN 7-2.001	61.188	300	PN 7-2.000	61.263	225	
CP 7-2.002	61.060	1.280	Open Manhole	1200	PN 7-2.002	59.780	300	PN 7-2.001	59.780	300	
CP 7-1.005	60.018	0.900	Open Manhole	1200	PN 7-1.005	59.118	300	PN 7-1.004	59.118	300	
								PN 7-2.002	59.118	300	
CP 7-BASIN	59.763	0.939	Open Manhole	100	PN 7-1.006	58.824	300	PN 7-1.005	58.824	300	
CP 7-OUTFALL	59.763	0.939	Open Manhole	1200	PN 7-1.007	58.824	300	PN 7-1.006	58.824	300	
CP 7-	59.262	0.454	Open Manhole	0		OUTFALL		PN 7-1.007	58.808	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CP 7-1.000	482754.596	167702.829	482754.596	167702.829	Required	
CP 7-1.001	482706.687	167658.325	482706.687	167658.325	Required	
CP 7-1.002	482677.550	167637.245	482677.550	167637.245	Required	
CP 7-1.003	482628.756	167605.553	482628.756	167605.553	Required	
CP 7-1.004	482584.064	167585.179	482584.064	167585.179	Required	
CP 7-2.000	482757.821	167687.661	482757.821	167687.661	Required	
CP 7-2.001	482720.776	167654.293	482720.776	167654.293	Required	
CP 7-2.002	482645.585	167604.604	482645.585	167604.604	Required	
CP 7-1.005	482590.262	167571.583	482590.262	167571.583	Required	
CP 7-BASIN	482595.239	167560.661	482595.239	167560.661	Required	
CP 7-OUTFALL	482583.687	167559.781	482583.687	167559.781	Required	
CP 7-	482580.035	167561.217			No Entry	

PIPELINE SCHEDULES for Catchment 7

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)
PN 7-1.000	o	225	CP 7-1.000	63.188	61.983	0.980	Open Manhole	1200
PN 7-1.001	o	225	CP 7-1.001	62.301	61.096	0.980	Open Manhole	1200
PN 7-1.002	o	300	CP 7-1.002	61.758	60.478	0.980	Open Manhole	1200
PN 7-1.003	o	300	CP 7-1.003	60.895	59.615	0.980	Open Manhole	1200
PN 7-1.004	o	300	CP 7-1.004	60.083	59.183	0.600	Open Manhole	1200
PN 7-2.000	o	225	CP 7-2.000	63.182	61.977	0.980	Open Manhole	1200
PN 7-2.001	o	300	CP 7-2.001	62.468	61.188	0.980	Open Manhole	1200
PN 7-2.002	o	300	CP 7-2.002	61.060	59.780	0.980	Open Manhole	1200
PN 7-1.005	o	300	CP 7-1.005	60.018	59.118	0.600	Open Manhole	1200
PN 7-1.006	o	300	CP 7-BASIN	59.763	58.824	0.639	Open Manhole	100
PN 7-1.007	o	300	CP 7-OUTFALL	59.763	58.824	0.639	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)
PN 7-1.000	65.391	73.7	CP 7-1.001	62.301	61.096	0.980	Open Manhole	1200
PN 7-1.001	35.962	66.2	CP 7-1.002	61.758	60.553	0.980	Open Manhole	1200
PN 7-1.002	58.183	67.4	CP 7-1.003	60.895	59.615	0.980	Open Manhole	1200
PN 7-1.003	49.117	113.7	CP 7-1.004	60.083	59.183	0.600	Open Manhole	1200
PN 7-1.004	14.942	229.9	CP 7-1.005	60.018	59.118	0.600	Open Manhole	1200
PN 7-2.000	49.857	69.8	CP 7-2.001	62.468	61.263	0.980	Open Manhole	1200
PN 7-2.001	90.127	64.0	CP 7-2.002	61.060	59.780	0.980	Open Manhole	1200
PN 7-2.002	64.428	97.3	CP 7-1.005	60.018	59.118	0.600	Open Manhole	1200
PN 7-1.005	12.002	40.8	CP 7-BASIN	59.763	58.824	0.639	Open Manhole	100
PN 7-1.006	11.586	0.0	CP 7-OUTFALL	59.763	58.824	0.639	Open Manhole	1200
PN 7-1.007	3.924	245.3	CP 7-	59.262	58.808	0.154	Open Manhole	0

Area Summary for Catchment 7

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.070	0.070	0.070
1.001	User	-	100	0.027	0.027	0.027
1.002	User	-	100	0.065	0.065	0.065
1.003	User	-	100	0.047	0.047	0.047
1.004	User	-	100	0.019	0.019	0.019
2.000	User	-	100	0.075	0.075	0.075
2.001	User	-	100	0.053	0.053	0.053
2.002	User	-	100	0.044	0.044	0.044
1.005	User	-	100	0.059	0.059	0.059
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.458	0.458	0.458

Simulation Criteria for Catchment 7

Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coeffiecient 0.800
Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0 Additional Flow - % of Total Flow 0.000 Run Time (mins) 60
Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 2.000 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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
Return Period (years) 100 Ratio R 0.400 Cv (Winter) 0.840
Region England and Wales Profile Type Summer Storm Duration (mins) 30

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Online Controls for Catchment 7

Orifice Manhole: CP 7-OUTFALL, DS/PN: PN 7-1.007, Volume (m³): 1.8

Diameter (m) 0.120 Discharge Coefficient 0.600 Invert Level (m) 58.824

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Storage Structures for Catchment 7

Tank or Pond Manhole: CP 7-BASIN, DS/PN: PN 7-1.006

Invert Level (m) 58.824

Depth (m) Area (m ²)		Depth (m) Area (m ²)	
0.000	128.8	0.939	359.6

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 7

Simulation Criteria

Areal Reduction Factor 1.000

Manhole Headloss Coeff (Global) 0.500

MADD Factor * 10m³/ha Storage 2.000

Hot Start (mins) 0

Foul Sewage per hectare (l/s) 0.000

Inlet Coeffiecient 0.800

Hot Start Level (mm) 0

Additional Flow - % of Total Flow 0.000

Flow per Person per Day (l/per/day) 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 1

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model

FSR M5-60 (mm) 18.700

Cv (Summer) 0.750

Region England and Wales

Ratio R 0.400

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DTS Status ON

Inertia Status ON

Analysis Timestep Fine

DVD Status OFF

Profile(s)

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Summer and Winter

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
PN 7-1.000	CP 7-1.000	15 Winter	1	+0%					62.039	-0.169	0.000	0.14			8.2
PN 7-1.001	CP 7-1.001	15 Winter	1	+0%					61.161	-0.160	0.000	0.18			11.0
PN 7-1.002	CP 7-1.002	15 Winter	1	+0%					60.552	-0.226	0.000	0.14			17.6
PN 7-1.003	CP 7-1.003	15 Winter	1	+0%	100/15 Summer				59.713	-0.202	0.000	0.23			22.3
PN 7-1.004	CP 7-1.004	15 Winter	1	+0%	100/15 Summer				59.313	-0.170	0.000	0.39			23.9
PN 7-2.000	CP 7-2.000	15 Winter	1	+0%					62.035	-0.167	0.000	0.15			9.0
PN 7-2.001	CP 7-2.001	15 Winter	1	+0%					61.254	-0.234	0.000	0.11			14.4
PN 7-2.002	CP 7-2.002	15 Winter	1	+0%	100/15 Summer				59.865	-0.215	0.000	0.17			18.7
PN 7-1.005	CP 7-1.005	15 Winter	1	+0%	100/15 Summer				59.242	-0.176	0.000	0.35			48.0
PN 7-1.006	CP 7-BASIN	180 Winter	1	+0%	30/15 Summer				59.077	-0.047	0.000	0.26			7.0
PN 7-1.007	CP 7-OUTFALL	180 Winter	1	+0%	30/15 Summer	30/480 Winter			59.094	-0.030	0.000	0.13			6.2

PN	US/MH Name	Level Status	Exceeded
PN 7-1.000	CP 7-1.000	OK	
PN 7-1.001	CP 7-1.001	OK	
PN 7-1.002	CP 7-1.002	OK	
PN 7-1.003	CP 7-1.003	OK	
PN 7-1.004	CP 7-1.004	OK	
PN 7-2.000	CP 7-2.000	OK	
PN 7-2.001	CP 7-2.001	OK	
PN 7-2.002	CP 7-2.002	OK	
PN 7-1.005	CP 7-1.005	OK	
PN 7-1.006	CP 7-BASIN	OK	
PN 7-1.007	CP 7-OUTFALL	OK	5

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 7

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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 Surcharged Flooded				Half Drain Time (mins)	Pipe Flow (l/s)
									Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)		
PN 7-1.000	CP 7-1.000	15 Winter	30	+0%					62.075	-0.133	0.000	0.34		20.1
PN 7-1.001	CP 7-1.001	15 Winter	30	+0%					61.205	-0.116	0.000	0.46		28.0
PN 7-1.002	CP 7-1.002	15 Winter	30	+0%					60.607	-0.171	0.000	0.37		47.7
PN 7-1.003	CP 7-1.003	15 Winter	30	+0%	100/15 Summer				59.791	-0.124	0.000	0.63		61.5
PN 7-1.004	CP 7-1.004	15 Winter	30	+0%	100/15 Summer				59.481	-0.002	0.000	1.02		62.2
PN 7-2.000	CP 7-2.000	15 Winter	30	+0%					62.072	-0.130	0.000	0.37		22.0
PN 7-2.001	CP 7-2.001	15 Winter	30	+0%					61.299	-0.189	0.000	0.28		37.7
PN 7-2.002	CP 7-2.002	15 Winter	30	+0%	100/15 Summer				59.927	-0.153	0.000	0.46		49.9
PN 7-1.005	CP 7-1.005	15 Winter	30	+0%	100/15 Summer				59.348	-0.070	0.000	0.94		127.6
PN 7-1.006	CP 7-BASIN	1440 Summer	30	+0%	30/15 Summer				59.333	0.209	0.000	0.20		5.2
PN 7-1.007	CP 7-OUTFALL	1440 Summer	30	+0%	30/15 Summer	30/480 Winter			59.759	0.635	1.931	0.24		11.5

PN	US/MH Name	Status	Level Exceeded
PN 7-1.000	CP 7-1.000	OK	
PN 7-1.001	CP 7-1.001	OK	
PN 7-1.002	CP 7-1.002	OK	
PN 7-1.003	CP 7-1.003	OK	
PN 7-1.004	CP 7-1.004	OK	
PN 7-2.000	CP 7-2.000	OK	
PN 7-2.001	CP 7-2.001	OK	
PN 7-2.002	CP 7-2.002	OK	
PN 7-1.005	CP 7-1.005	OK	
PN 7-1.006	CP 7-BASIN	SURCHARGED	
PN 7-1.007	CP 7-OUTFALL	FLOOD	5

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 7

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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	Surcharged	Flooded	Flow / Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
									Level (m)	Depth (m)	Volume (m³)			
PN 7-1.000	CP 7-1.000	15 Winter	100	+40%					62.113	-0.095	0.000	0.62		36.4
PN 7-1.001	CP 7-1.001	15 Winter	100	+40%					61.257	-0.064	0.000	0.84		50.8
PN 7-1.002	CP 7-1.002	15 Winter	100	+40%					60.670	-0.108	0.000	0.67		86.3
PN 7-1.003	CP 7-1.003	15 Winter	100	+40%	100/15 Summer				60.363	0.448	0.000	0.96		94.3
PN 7-1.004	CP 7-1.004	15 Winter	100	+40%	100/15 Summer				59.974	0.491	0.000	1.63		99.6
PN 7-2.000	CP 7-2.000	15 Winter	100	+40%					62.112	-0.090	0.000	0.67		39.8
PN 7-2.001	CP 7-2.001	15 Winter	100	+40%					61.344	-0.144	0.000	0.51		68.2
PN 7-2.002	CP 7-2.002	15 Winter	100	+40%	100/15 Summer				60.150	0.070	0.000	0.77		82.8
PN 7-1.005	CP 7-1.005	15 Winter	100	+40%	100/15 Summer				59.798	0.380	0.000	1.45		197.1
PN 7-1.006	CP 7-BASIN	120 Winter	100	+40%	30/15 Summer				59.616	0.492	0.000	0.57		15.1
PN 7-1.007	CP 7-OUTFALL	1440 Summer	100	+40%	30/15 Summer	30/480 Winter			59.765	0.641	3.623	0.31		15.1

PN	US/MH Name	Status	Level
			Exceeded
PN 7-1.000	CP 7-1.000	OK	
PN 7-1.001	CP 7-1.001	OK	
PN 7-1.002	CP 7-1.002	OK	
PN 7-1.003	CP 7-1.003	SURCHARGED	
PN 7-1.004	CP 7-1.004	FLOOD RISK	
PN 7-2.000	CP 7-2.000	OK	
PN 7-2.001	CP 7-2.001	OK	
PN 7-2.002	CP 7-2.002	SURCHARGED	
PN 7-1.005	CP 7-1.005	FLOOD RISK	
PN 7-1.006	CP 7-BASIN	FLOOD RISK	
PN 7-1.007	CP 7-OUTFALL	FLOOD	5