



THIS DRAWING SHOWS THE PROPOSED DETENTION BASINS, MAIN STORM SEWERS SERVING AND FOUL DRAINAGE

GREENFIELD RUN-OFF RATE ARE DETERMINED FROM THE HR WALLINGFORD GREENFIELD RUN-OFF RATE ESTIMATOR FOR SITES

SUDS EARTHWORK PROFILE

PROPOSED SW DRAINAGE

PROPOSED FW DRAINAGE

RISING MAIN

ANCIENT WOODLAND

ANCIENT WOODLAND STANDOFF

REFER TO DRAWINGS:
 QD2088-00-100
 QD2088-00-101
 QD2088-00-102
 FOR PRE-DEVELOPMENT RUN-OFF RATES AND ALLOCATION OF POST DEVELOPMENT RATES

Rev	Date	Revision Details	Drawn	Checked
1	05.06.2023	FIRST ISSUE		

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Client: STRATA STERLING BARNSELY WEST LTD

Project: BARNSELY WEST MASTERPLAN

Title: MAIN INFRASTRUCTURE DRAINAGE STRATEGY SHEET 3

Drawn	ND	Checked	AL	Date	05.06.2023
Drawing Number	QD2088-00-402		Scale	1:1000 - A0	

Queensberry Design Ltd		Page 1
Suite 24, Metro House Metro Centre, Gateshead Tyne & Wear, NE11 9NH	STRATA STERLING BARNSELY WEST BASIN 1	
Date 03/10/2023 File QD2088_BASIN 1_SW 03 10...	Designed by nick.dunwoodie Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for QD2088 BASIN 1 SW 03 10 23.sws

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for QD2088 BASIN 1 SW 03 10 23.sws

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	30.000#	1.300	23.1	2.900	10.00	0.0	0.600	o	750	Pipe/Conduit	
2.000	21.000#	0.800	26.3	1.133	6.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	8.633	0.100	86.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	21.278	1.125	18.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	35.08	10.09	85.850	2.900	0.0	0.0	0.0	5.84	2580.1	367.3
2.000	45.09	6.09	85.450	1.133	0.0	0.0	0.0	3.98	633.1	184.5
1.001	34.92	10.17	84.425	4.033	0.0	0.0	0.0	1.69	119.7«	508.5
1.002	34.74	10.27	84.325	4.033	0.0	0.0	0.0	3.63	256.7«	508.5

Manhole Schedules for QD2088 BASIN 1 SW 03 10 23.sws

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out		Pipes In		Backdrop (mm)		
					PN	Invert Level (m)	Diameter (mm)	PN		Invert Level (m)	Diameter (mm)
S100	87.824	1.974	Open Manhole	1800	1.000	85.850	750				
S101	87.199	1.749	Open Manhole	1350	2.000	85.450	450				
BASIN_1	85.700	1.275	Open Manhole	10	1.001	84.425	300	1.000	84.550	750	575
S102_FC	85.700	1.375	Open Manhole	2700	1.002	84.325	300	2.000	84.650	450	375
S103	83.500	0.300	Open Manhole	0		OUTFALL		1.001	84.325	300	
								1.002	83.200	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S100	431523.480	407877.253	431523.480	407877.253	Required	
S101	431643.020	407829.502	431643.020	407829.502	Required	
BASIN_1	431639.566	407877.713	431639.566	407877.713	Required	
S102_FC	431645.034	407884.394	431645.034	407884.394	Required	
S103	431660.967	407898.498			No Entry	

Free Flowing Outfall Details for QD2088 BASIN 1 SW 03 10 23.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.002	S103	83.500	83.200	1.900	0	0

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Innovyze	Network 2020.1.3	

Simulation Criteria for QD2088 BASIN 1 SW 03 10 23.sws

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs 0		Number of Storage Structures 1	
Number of Online Controls 1		Number of Time/Area Diagrams 0	
Number of Offline Controls 0		Number of Real Time Controls 0	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for QD2088 BASIN 1 SW 03 10 23.sws

Hydro-Brake® Optimum Manhole: S102 FC, DS/PN: 1.002, Volume (m³): 8.4

Unit Reference	MD-SHE-0237-3130-1375-3130
Design Head (m)	1.375
Design Flow (l/s)	31.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	237
Invert Level (m)	84.325
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.375	31.3
Flush-Flo™	0.442	31.3
Kick-Flo®	0.961	26.4
Mean Flow over Head Range	-	26.7

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)						
0.100	7.8	1.200	29.3	3.000	45.5	7.000	68.6
0.200	23.9	1.400	31.6	3.500	49.0	7.500	71.0
0.300	30.5	1.600	33.6	4.000	52.3	8.000	73.2
0.400	31.2	1.800	35.6	4.500	55.4	8.500	75.4
0.500	31.2	2.000	37.4	5.000	58.3	9.000	77.6
0.600	30.9	2.200	39.2	5.500	61.0	9.500	79.6
0.800	29.5	2.400	40.9	6.000	63.7		
1.000	26.9	2.600	42.5	6.500	66.2		

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Storage Structures for QD2088 BASIN 1 SW 03 10 23.sws

Tank or Pond Manhole: BASIN 1, DS/PN: 1.001

Invert Level (m) 84.425

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2928.0	1.200	3880.0	1.275	4743.0

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 1 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S100	30	Summer	100	+40%				86.354
2.000	S101	15	Summer	100	+40%	100/15	Summer		86.750
1.001	BASIN_1	480	Summer	100	+40%	30/60	Summer		85.369
1.002	S102_FC	480	Summer	100	+40%	30/15	Summer		85.353

PN	US/MH Name	Surcharged		Flooded		Half Drain		Pipe	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Overflow (l/s)	Time (mins)	Pipe Flow (l/s)	Status	
1.000	S100	-0.246	0.000	0.79			1404.6		OK
2.000	S101	0.850	0.000	1.44			728.1		SURCHARGED
1.001	BASIN_1	0.644	0.000	0.40			31.9		SURCHARGED
1.002	S102_FC	0.728	0.000	0.14			31.3		SURCHARGED

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Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for QD2088 BASIN 2 SW 03 10 23.sws

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.365	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for QD2088 BASIN 2 SW 03 10 23.sws

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	129.657	6.000	21.6	2.500	10.00	28.6	0.600	o	750	Pipe/Conduit	
1.001	38.817#	1.000	38.8	1.230	0.00	0.0	0.600	o	750	Pipe/Conduit	
2.000	74.376#	0.150	495.8	4.462	10.00	0.0	0.600	o	1050	Pipe/Conduit	
1.002	12.799	0.030	426.6	0.660	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.003	13.069	0.035	373.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	53.565	0.135	396.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	99.808	0.250	399.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	51.451	0.130	395.8	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)
1.000	34.87	10.36	94.000	2.500	28.6	0.0	0.0	6.04	2666.4	264.7
1.001	34.60	10.50	88.000	3.730	28.6	0.0	0.0	4.50	1988.0	378.2
2.000	34.08	10.80	87.100	4.462	0.0	0.0	0.0	1.54	1334.1	411.8
1.002	33.82	10.96	86.750	8.852	28.6	0.0	0.0	1.35	595.7«	839.4
1.003	33.49	11.17	86.720	8.852	28.6	0.0	0.0	1.05	166.4«	839.4
1.004	32.16	12.05	86.685	8.852	28.6	0.0	0.0	1.01	161.3«	839.4
1.005	29.99	13.70	86.550	8.852	28.6	0.0	0.0	1.01	160.8«	839.4
1.006	29.01	14.54	86.300	8.852	28.6	0.0	0.0	1.02	161.6«	839.4

Manhole Schedules for QD2088 BASIN 2 SW 03 10 23.sws

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S200	96.876	2.876	Open Manhole	1800	1.000	94.000	750				
S201	90.052	2.052	Open Manhole	1800	1.001	88.000	750	1.000	88.000	750	
S202	89.000	1.900	Open Manhole	1950	2.000	87.100	1050				
BASIN2	88.500	1.750	Open Manhole	10	1.002	86.750	750	1.001	87.000	750	250
								2.000	86.950	1050	500
S203_FC	88.500	1.780	Open Manhole	2700	1.003	86.720	450	1.002	86.720	750	
S204	88.852	2.167	Open Manhole	1350	1.004	86.685	450	1.003	86.685	450	
S205	92.916	6.366	Open Manhole	1350	1.005	86.550	450	1.004	86.550	450	
S206	91.069	4.769	Open Manhole	1350	1.006	86.300	450	1.005	86.300	450	
S8	90.000	3.830	Open Manhole	0		OUTFALL		1.006	86.170	450	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S200	431701.882	407564.405	431701.882	407564.405	Required	
S201	431811.539	407633.587	431811.539	407633.587	Required	
S202	431753.398	407706.183	431753.398	407706.183	Required	
BASIN2	431987.474	407576.963	431987.474	407576.963	Required	
S203_FC	431995.935	407567.360	431995.935	407567.360	Required	
S204	431995.994	407554.291	431995.994	407554.291	Required	
S205	431965.269	407510.414	431965.269	407510.414	Required	
S206	432045.958	407451.671	432045.958	407451.671	Required	
S8	432049.595	407400.348			No Entry	

PIPELINE SCHEDULES for QD2088 BASIN 2 SW 03 10 23.sws

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	750	S200	96.876	94.000	2.126	Open Manhole	1800
1.001	o	750	S201	90.052	88.000	1.302	Open Manhole	1800
2.000	o	1050	S202	89.000	87.100	0.850	Open Manhole	1950
1.002	o	750	BASIN2	88.500	86.750	1.000	Open Manhole	10
1.003	o	450	S203_FC	88.500	86.720	1.330	Open Manhole	2700
1.004	o	450	S204	88.852	86.685	1.717	Open Manhole	1350
1.005	o	450	S205	92.916	86.550	5.916	Open Manhole	1350
1.006	o	450	S206	91.069	86.300	4.319	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	129.657	21.6	S201	90.052	88.000	1.302	Open Manhole	1800
1.001	38.817#	38.8	BASIN2	88.500	87.000	0.750	Open Manhole	10
2.000	74.376#	495.8	BASIN2	88.500	86.950	0.500	Open Manhole	10
1.002	12.799	426.6	S203_FC	88.500	86.720	1.030	Open Manhole	2700
1.003	13.069	373.4	S204	88.852	86.685	1.717	Open Manhole	1350
1.004	53.565	396.8	S205	92.916	86.550	5.916	Open Manhole	1350
1.005	99.808	399.2	S206	91.069	86.300	4.319	Open Manhole	1350
1.006	51.451	395.8	S8	90.000	86.170	3.380	Open Manhole	0

Free Flowing Outfall Details for QD2088 BASIN 2 SW 03 10 23.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.006	S8	90.000	86.170	1.900	0	0

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Innovyze	Network 2020.1.3	

Simulation Criteria for QD2088 BASIN 2 SW 03 10 23.sws

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.365		

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Online Controls for QD2088 BASIN 2 SW 03 10 23.sws

Hydro-Brake® Optimum Manhole: S203 FC, DS/PN: 1.003, Volume (m³): 15.2

Unit Reference	MD-SHE-0335-7250-1780-7250
Design Head (m)	1.780
Design Flow (l/s)	72.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	335
Invert Level (m)	86.720
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.780	72.5
Flush-Flo™	0.587	72.4
Kick-Flo®	1.253	61.2
Mean Flow over Head Range	-	61.3

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)						
0.100	9.9	1.200	63.8	3.000	93.4	7.000	141.1
0.200	34.1	1.400	64.5	3.500	100.6	7.500	146.0
0.300	61.4	1.600	68.8	4.000	107.4	8.000	150.6
0.400	70.6	1.800	72.9	4.500	113.7	8.500	155.2
0.500	72.1	2.000	76.7	5.000	119.7	9.000	159.6
0.600	72.4	2.200	80.3	5.500	125.4	9.500	163.9
0.800	71.3	2.400	83.8	6.000	130.9		
1.000	69.1	2.600	87.1	6.500	136.1		

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Storage Structures for QD2088 BASIN 2 SW 03 10 23.sws

Tank or Pond Manhole: BASIN2, DS/PN: 1.002

Invert Level (m) 86.750

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	5334.8	1.250	7762.0

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

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.365
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S200	30	Summer	1	+0%			
1.001	S201	30	Summer	1	+0%	100/15	Summer	
2.000	S202	30	Summer	1	+0%	100/15	Summer	
1.002	BASIN2	1440	Summer	1	+0%	30/1440	Summer	
1.003	S203_FC	1440	Summer	1	+0%	1/960	Summer	
1.004	S204	1440	Summer	1	+0%			
1.005	S205	1440	Summer	1	+0%			
1.006	S206	1440	Summer	1	+0%			

PN	US/MH Name	Water Surcharged			Flooded		Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
1.000	S200	94.172	-0.578	0.000	0.12			298.4	OK
1.001	S201	88.272	-0.478	0.000	0.29			446.7	OK
2.000	S202	87.580	-0.570	0.000	0.43			483.3	OK
1.002	BASIN2	87.202	-0.298	0.000	0.25			76.7	OK
1.003	S203_FC	87.215	0.045	0.000	0.56			61.7	SURCHARGED

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 2 SW 03 10 23.sws

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.004	S204	86.888	-0.247	0.000	0.42		61.7	OK
1.005	S205	86.748	-0.252	0.000	0.40		61.7	OK
1.006	S206	86.503	-0.247	0.000	0.42		61.7	OK

PN	US/MH Name	Level Exceeded
1.000	S200	
1.001	S201	
2.000	S202	
1.002	BASIN2	
1.003	S203_FC	
1.004	S204	
1.005	S205	
1.006	S206	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 2 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.365
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S200	30	Summer	30	+0%			
1.001	S201	15	Summer	30	+0%	100/15	Summer	
2.000	S202	30	Summer	30	+0%	100/15	Summer	
1.002	BASIN2	1440	Summer	30	+0%	30/1440	Summer	
1.003	S203_FC	1440	Summer	30	+0%	1/960	Summer	
1.004	S204	1440	Summer	30	+0%			
1.005	S205	1440	Summer	30	+0%			
1.006	S206	1440	Summer	30	+0%			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S200	94.269	-0.481	0.000	0.28		691.7	OK
1.001	S201	88.454	-0.296	0.000	0.67		1048.5	OK
2.000	S202	88.150	0.000	0.000	1.06		1188.4	OK
1.002	BASIN2	87.510	0.010	0.000	0.27		83.2	SURCHARGED
1.003	S203_FC	87.513	0.343	0.000	0.65		72.3	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 2 SW 03 10 23.sws

PN	US/MH Name	Water		Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)				
1.004	S204	86.907	-0.228	0.000	0.49			72.3		OK
1.005	S205	86.767	-0.233	0.000	0.47			72.3		OK
1.006	S206	86.523	-0.227	0.000	0.49			72.3		OK

PN	US/MH Name	Level Exceeded
1.000	S200	
1.001	S201	
2.000	S202	
1.002	BASIN2	
1.003	S203_FC	
1.004	S204	
1.005	S205	
1.006	S206	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 2 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.365
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S200	30 Summer	100	+40%				
1.001	S201	30 Summer	100	+40%	100/15 Summer			
2.000	S202	30 Summer	100	+40%	100/15 Summer			
1.002	BASIN2	1440 Summer	100	+40%	30/1440 Summer			
1.003	S203_FC	1440 Summer	100	+40%	1/960 Summer			
1.004	S204	360 Winter	100	+40%				
1.005	S205	360 Winter	100	+40%				
1.006	S206	360 Winter	100	+40%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S200	94.376	-0.374	0.000	0.50		1241.3	OK
1.001	S201	89.209	0.459	0.000	1.21		1897.4	SURCHARGED
2.000	S202	88.508	0.358	0.000	1.92		2162.3	SURCHARGED
1.002	BASIN2	88.034	0.534	0.000	0.34		106.5	SURCHARGED
1.003	S203_FC	88.051	0.881	0.000	0.65		72.3	SURCHARGED

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 2 SW 03 10 23.sws

PN	US/MH Name	Water Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)			
1.004	S204	86.907	-0.228	0.000	0.49		72.3	OK
1.005	S205	86.767	-0.233	0.000	0.47		72.3	OK
1.006	S206	86.523	-0.227	0.000	0.49		72.3	OK

PN	US/MH Name	Level Exceeded
1.000	S200	
1.001	S201	
2.000	S202	
1.002	BASIN2	
1.003	S203_FC	
1.004	S204	
1.005	S205	
1.006	S206	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for QD2088 BASIN 6 SW 03 10 23.sws

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for QD2088 BASIN 6 SW 03 10 23.sws

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	19.459#	1.000	19.5	6.050	10.00	0.0	0.600	o	750	Pipe/Conduit	
1.001	6.620	0.020	331.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	22.000#	2.000	11.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	35.14	10.05	91.400	6.050	0.0	0.0	0.0	6.36	2810.2	767.7
1.001	34.96	10.15	90.050	6.050	0.0	0.0	0.0	1.11	176.8«	767.7
1.002	34.81	10.23	90.030	6.050	0.0	0.0	0.0	4.77	336.9«	767.7

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Manhole Schedules for QD2088 BASIN 6 SW 03 10 23.sws

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S600	94.757	3.357	Open Manhole	1800	1.000	91.400	750				
BASIN_6	91.250	1.200	Open Manhole	1800	1.001	90.050	450	1.000	90.400	750	650
S601_FC	91.307	1.277	Open Manhole	1350	1.002	90.030	300	1.001	90.030	450	
S4	91.000	2.970	Open Manhole	0		OUTFALL		1.002	88.030	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S600	431953.393	407446.178	431953.393	407446.178	Required	
BASIN_6	432027.056	407389.205	432027.056	407389.205	Required	
S601_FC	432032.890	407386.075	432032.890	407386.075	Required	
S4	432038.723	407382.946			No Entry	

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PIPELINE SCHEDULES for QD2088 BASIN 6 SW 03 10 23.sws

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	750	S600	94.757	91.400	2.607	Open Manhole	1800
1.001	o	450	BASIN_6	91.250	90.050	0.750	Open Manhole	1800
1.002	o	300	S601_FC	91.307	90.030	0.977	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	19.459#	19.5	BASIN_6	91.250	90.400	0.100	Open Manhole	1800
1.001	6.620	331.0	S601_FC	91.307	90.030	0.827	Open Manhole	1350
1.002	22.000#	11.0	S4	91.000	88.030	2.670	Open Manhole	0

Free Flowing Outfall Details for QD2088 BASIN 6 SW 03 10 23.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	S4	91.000	88.030	1.900	0	0

Simulation Criteria for QD2088 BASIN 6 SW 03 10 23.sws

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for QD2088 BASIN 6 SW 03 10 23.sws

Hydro-Brake® Optimum Manhole: S601 FC, DS/PN: 1.002, Volume (m³): 2.6

Unit Reference	MD-SHE-0298-5280-1270-5280
Design Head (m)	1.270
Design Flow (l/s)	52.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	298
Invert Level (m)	90.030
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.270	52.7
Flush-Flo™	0.481	52.7
Kick-Flo®	0.944	45.7
Mean Flow over Head Range	-	43.7

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)						
0.100	9.1	1.200	51.3	3.000	79.9	7.000	120.8
0.200	30.7	1.400	55.3	3.500	86.1	7.500	124.9
0.300	50.7	1.600	59.0	4.000	91.9	8.000	128.9
0.400	52.4	1.800	62.4	4.500	97.4	8.500	132.8
0.500	52.7	2.000	65.7	5.000	102.5	9.000	136.6
0.600	52.2	2.200	68.8	5.500	107.4	9.500	140.2
0.800	50.0	2.400	71.7	6.000	112.0		
1.000	47.0	2.600	74.6	6.500	116.5		

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Storage Structures for QD2088 BASIN 6 SW 03 10 23.sws

Tank or Pond Manhole: BASIN 6, DS/PN: 1.001

Invert Level (m) 90.050

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	4285.0	1.200	6085.7

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

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S600	30	Summer	1	+0%	30/30	Summer	
1.001	BASIN_6	960	Summer	1	+0%	30/240	Summer	
1.002	S601_FC	1440	Summer	1	+0%	30/30	Summer 100/120	Summer

PN	US/MH Name	Water		Surcharged		Flooded		Half Drain		Pipe	
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
1.000	S600	91.737	-0.413	0.000	0.42			652.0	OK		
1.001	BASIN_6	90.285	-0.215	0.000	0.41			43.1	OK		
1.002	S601_FC	90.281	-0.049	0.000	0.14			40.3	OK		5

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 6 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S600	30	Summer	+0%	30/30	Summer		
1.001	BASIN_6	480	Summer	+0%	30/240	Summer		
1.002	S601_FC	480	Summer	+0%	30/30	Summer	100/120	Summer

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S600	92.170	0.020	0.000	1.02		1595.7	SURCHARGED
1.001	BASIN_6	90.543	0.043	0.000	0.57		59.8	SURCHARGED
1.002	S601_FC	90.589	0.259	0.000	0.18		52.7	SURCHARGED

US/MH Level
PN Name Exceeded
1.000 S600

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Level Exceeded
1.001	BASIN_6	
1.002	S601_FC	5

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 6 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S600	30	Summer	100	+40%	30/30	Summer	
1.001	BASIN_6	960	Summer	100	+40%	30/240	Summer	
1.002	S601_FC	480	Summer	100	+40%	30/30	Summer	100/120

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S600	94.632	2.482	0.000	1.87		2923.4	FLOOD RISK
1.001	BASIN_6	90.987	0.487	0.000	0.78		80.9	FLOOD RISK
1.002	S601_FC	91.307	0.977	0.556	0.18		52.7	FLOOD

PN	US/MH Name	Level Exceeded
1.000	S600	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 6 SW 03 10 23.sws

PN	US/MH Name	Level Exceeded
1.001	BASIN_6	
1.002	S601_FC	5

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for QD2088 BASIN 7 SW 03 10 23.sws

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for QD2088 BASIN 7 SW 03 10 23.sws

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	52.935	0.600	88.2	4.600	10.00	0.0	0.600	o	900	Pipe/Conduit	
1.001	6.986	0.600	11.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	5.388	0.500	10.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	9.417	0.900	10.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	34.74	10.26	99.400	4.600	0.0	0.0	0.0	3.34	2122.9	577.1
1.001	34.70	10.29	98.725	4.600	0.0	0.0	0.0	4.63	327.5«	577.1
1.002	34.66	10.31	98.125	4.600	0.0	0.0	0.0	4.82	340.4«	577.1
1.003	34.61	10.34	96.000	4.600	0.0	0.0	0.0	4.89	345.5«	577.1

Manhole Schedules for QD2088 BASIN 7 SW 03 10 23.sws

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)
S700	101.598	2.198	Open Manhole	1800	1.000	99.400	900				
BASIN_7	100.000	1.275	Open Manhole	1800	1.001	98.725	300	1.000	98.800	900	675
S701_FC	100.000	1.875	Open Manhole	1200	1.002	98.125	300	1.001	98.125	300	
S702	99.000	3.000	Open Manhole	1200	1.003	96.000	300	1.002	97.625	300	1625
S5	95.500	0.400	Open Manhole	0		OUTFALL		1.003	95.100	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S700	431977.292	407183.927	431977.292	407183.927	Required	
BASIN_7	432001.106	407231.203	432001.106	407231.203	Required	
S701_FC	432004.371	407237.379	432004.371	407237.379	Required	
S702	432006.198	407242.448	432006.198	407242.448	Required	
S5	432009.392	407251.307			No Entry	

PIPELINE SCHEDULES for QD2088 BASIN 7 SW 03 10 23.sws

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	900	S700	101.598	99.400	1.298	Open Manhole	1800
1.001	o	300	BASIN_7	100.000	98.725	0.975	Open Manhole	1800
1.002	o	300	S701_FC	100.000	98.125	1.575	Open Manhole	1200
1.003	o	300	S702	99.000	96.000	2.700	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	52.935	88.2	BASIN_7	100.000	98.800	0.300	Open Manhole	1800
1.001	6.986	11.6	S701_FC	100.000	98.125	1.575	Open Manhole	1200
1.002	5.388	10.8	S702	99.000	97.625	1.075	Open Manhole	1200
1.003	9.417	10.5	S5	95.500	95.100	0.100	Open Manhole	0

Free Flowing Outfall Details for QD2088 BASIN 7 SW 03 10 23.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.003	S5	95.500	95.100	1.900	0	0

Simulation Criteria for QD2088 BASIN 7 SW 03 10 23.sws

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for QD2088 BASIN 7 SW 03 10 23.sws

Hydro-Brake® Optimum Manhole: S701 FC, DS/PN: 1.002, Volume (m³): 2.5

Unit Reference	MD-SHE-0261-4160-1875-4160
Design Head (m)	1.875
Design Flow (l/s)	41.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	261
Invert Level (m)	98.125
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.875	41.6
Flush-Flo™	0.566	41.6
Kick-Flo®	1.241	34.1
Mean Flow over Head Range	-	35.8

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)						
0.100	8.4	1.200	35.5	3.000	52.2	7.000	78.7
0.200	26.8	1.400	36.1	3.500	56.2	7.500	81.3
0.300	38.9	1.600	38.5	4.000	59.9	8.000	83.9
0.400	40.7	1.800	40.8	4.500	63.5	8.500	86.5
0.500	41.5	2.000	42.9	5.000	66.8	9.000	88.9
0.600	41.5	2.200	44.9	5.500	70.0	9.500	91.3
0.800	40.8	2.400	46.8	6.000	73.0		
1.000	39.3	2.600	48.7	6.500	75.9		

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Storage Structures for QD2088 BASIN 7 SW 03 10 23.sws

Tank or Pond Manhole: BASIN 7, DS/PN: 1.001

Invert Level (m) 98.725

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2535.0	1.200	4272.0	1.275	5226.0

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 7 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Water Level (m)
1.000	S700	30	Summer	1 +0%	100/15	Summer		99.726
1.001	BASIN_7	360	Summer	1 +0%	30/30	Summer		98.945
1.002	S701_FC	360	Summer	1 +0%	1/15	Summer		98.941
1.003	S702	480	Winter	1 +0%				96.083

PN	US/MH Name	Surcharged		Flooded		Half Drain		Pipe		Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Overflow (l/s)	Time (mins)	Flow (l/s)	Status		
1.000	S700	-0.574	0.000	0.28			494.7		OK	
1.001	BASIN_7	-0.080	0.000	0.23			44.5		OK	
1.002	S701_FC	0.516	0.000	0.23			41.0	SURCHARGED		
1.003	S702	-0.217	0.000	0.17			41.1		OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 7 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S700	30 Summer	30	+0%	100/15 Summer			
1.001	BASIN_7	360 Summer	30	+0%	30/30 Summer			
1.002	S701_FC	360 Summer	30	+0%	1/15 Summer			
1.003	S702	1440 Winter	30	+0%				

PN	US/MH Name	Water			Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Overflow (l/s)					
1.000	S700	99.956	-0.344	0.000	0.70			1216.1		OK	
1.001	BASIN_7	99.266	0.241	0.000	0.23			43.9		SURCHARGED	
1.002	S701_FC	99.241	0.816	0.000	0.23			41.0		SURCHARGED	
1.003	S702	96.083	-0.217	0.000	0.17			41.2		OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 7 SW 03 10 23.sws

PN	US/MH Name	Level Exceeded
1.000	S700	
1.001	BASIN_7	
1.002	S701_FC	
1.003	S702	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 7 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S700	30 Summer	100	+40%	100/15 Summer			
1.001	BASIN_7	480 Summer	100	+40%	30/30 Summer			
1.002	S701_FC	360 Summer	100	+40%	1/15 Summer			
1.003	S702	1440 Summer	100	+40%				

PN	US/MH Name	Water Level	Surcharged Depth	Flooded Volume	Flow / Overflow Cap.	Half Drain Time	Pipe Flow	Status
		(m)	(m)	(m ³)	(l/s)	(mins)	(l/s)	
1.000	S700	100.635	0.335	0.000	1.27		2219.8	SURCHARGED
1.001	BASIN_7	99.751	0.726	0.000	0.22		43.5	FLOOD RISK
1.002	S701_FC	99.715	1.290	0.000	0.23		41.0	FLOOD RISK
1.003	S702	96.083	-0.217	0.000	0.19		45.9	OK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 7 SW 03 10 23.sws

PN	US/MH Name	Level Exceeded
1.000	S700	
1.001	BASIN_7	
1.002	S701_FC	
1.003	S702	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for QD2088 BASIN 8 SW 03 10 23.sws

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for QD2088 BASIN 8 SW 03 10 23.sws

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	53.000#	5.300	10.0	2.820	8.00	0.0	0.600	o	525	Pipe/Conduit	
1.001	5.004	0.500	10.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	1.700#	0.302	5.6	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)
1.000	39.26	8.12	124.350	2.820	0.0	0.0	0.0	7.11	1539.5	399.8
1.001	39.23	8.14	118.550	2.820	0.0	0.0	0.0	6.45	1026.6	399.8
1.002	39.22	8.14	118.050	2.820	0.0	0.0	0.0	8.61	1369.5	399.8

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Manhole Schedules for QD2088 BASIN 8 SW 03 10 23.sws

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S800	130.122	5.772	Open Manhole	1500	1.000	124.350	525				
BASIN_8	120.050	1.500	Open Manhole	10	1.001	118.550	450	1.000	119.050	525	575
S801	120.082	2.032	Open Manhole	2700	1.002	118.050	450	1.001	118.050	450	
S4	118.500	0.752	Open Manhole	0		OUTFALL		1.002	117.748	450	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S800	432285.605	406908.759	432285.605	406908.759	Required	
BASIN_8	432174.663	406966.706	432174.663	406966.706	Required	
S801	432171.405	406970.505	432171.405	406970.505	Required	
S4	432161.401	406985.081			No Entry	

PIPELINE SCHEDULES for QD2088 BASIN 8 SW 03 10 23.sws

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	525	S800	130.122	124.350	5.247	Open Manhole	1500
1.001	o	450	BASIN_8	120.050	118.550	1.050	Open Manhole	10
1.002	o	450	S801	120.082	118.050	1.582	Open Manhole	2700

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	53.000#	10.0	BASIN_8	120.050	119.050	0.475	Open Manhole	10
1.001	5.004	10.0	S801	120.082	118.050	1.582	Open Manhole	2700
1.002	1.700#	5.6	S4	118.500	117.748	0.302	Open Manhole	0

Free Flowing Outfall Details for QD2088 BASIN 8 SW 03 10 23.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	S4	118.500	117.748	1.900	0	0

Simulation Criteria for QD2088 BASIN 8 SW 03 10 23.sws

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for QD2088 BASIN 8 SW 03 10 23.sws

Hydro-Brake® Optimum Manhole: S801, DS/PN: 1.002, Volume (m³): 12.2

Unit Reference	MD-SHE-0225-3080-2030-3080
Design Head (m)	2.030
Design Flow (l/s)	30.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	225
Invert Level (m)	118.050
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.030	30.7
Flush-Flo™	0.597	30.7
Kick-Flo®	1.285	24.7
Mean Flow over Head Range	-	26.6

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)						
0.100	7.5	1.200	26.6	3.000	37.1	7.000	55.8
0.200	22.3	1.400	25.7	3.500	39.9	7.500	57.7
0.300	28.3	1.600	27.4	4.000	42.6	8.000	59.6
0.400	29.8	1.800	29.0	4.500	45.1	8.500	61.4
0.500	30.5	2.000	30.5	5.000	47.4	9.000	63.1
0.600	30.7	2.200	32.0	5.500	49.7	9.500	64.8
0.800	30.2	2.400	33.3	6.000	51.8		
1.000	29.1	2.600	34.6	6.500	53.9		

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Storage Structures for QD2088 BASIN 8 SW 03 10 23.sws

Tank or Pond Manhole: BASIN 8, DS/PN: 1.001

Invert Level (m) 118.550

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1108.0	1.500	1916.0

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 8 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
 Region England and Wales Cv (Summer) 1.000
 M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S800	30	Summer	1	+0%	100/15	Summer	
1.001	BASIN_8	240	Summer	1	+0%	30/30	Summer	
1.002	S801	240	Summer	1	+0%	1/15	Summer	

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S800	124.527	-0.348	0.000	0.25		344.4	OK
1.001	BASIN_8	118.806	-0.194	0.000	0.10		38.7	OK
1.002	S801	118.807	0.307	0.000	0.10		30.6	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S800	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Level Exceeded
1.001	BASIN_8	
1.002	S801	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for QD2088 BASIN 8 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
 Region England and Wales Cv (Summer) 1.000
 M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S800	30	Summer	30	+0%	100/15	Summer	
1.001	BASIN_8	240	Summer	30	+0%	30/30	Summer	
1.002	S801	240	Summer	30	+0%	1/15	Summer	

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S800	124.648	-0.227	0.000	0.61		846.5	OK
1.001	BASIN_8	119.240	0.240	0.000	0.09		36.3	SURCHARGED
1.002	S801	119.240	0.740	0.000	0.10		30.6	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S800	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Level Exceeded
1.001	BASIN_8	
1.002	s801	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 8 SW 03 10 23.sws

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.357
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S800	30	Summer	100	+40%	100/15	Summer	
1.001	BASIN_8	360	Summer	100	+40%	30/30	Summer	
1.002	S801	360	Summer	100	+40%	1/15	Summer	

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S800	126.214	1.339	0.000	1.11		1537.7	SURCHARGED
1.001	BASIN_8	119.860	0.860	0.000	0.09		35.8	FLOOD RISK
1.002	S801	119.858	1.358	0.000	0.10		30.6	FLOOD RISK

US/MH Level Exceeded
PN Name

1.000 S800

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for QD2088 BASIN 8 SW 03 10 23.sws

PN	US/MH Name	Level Exceeded
1.001	BASIN_8	
1.002	s801	