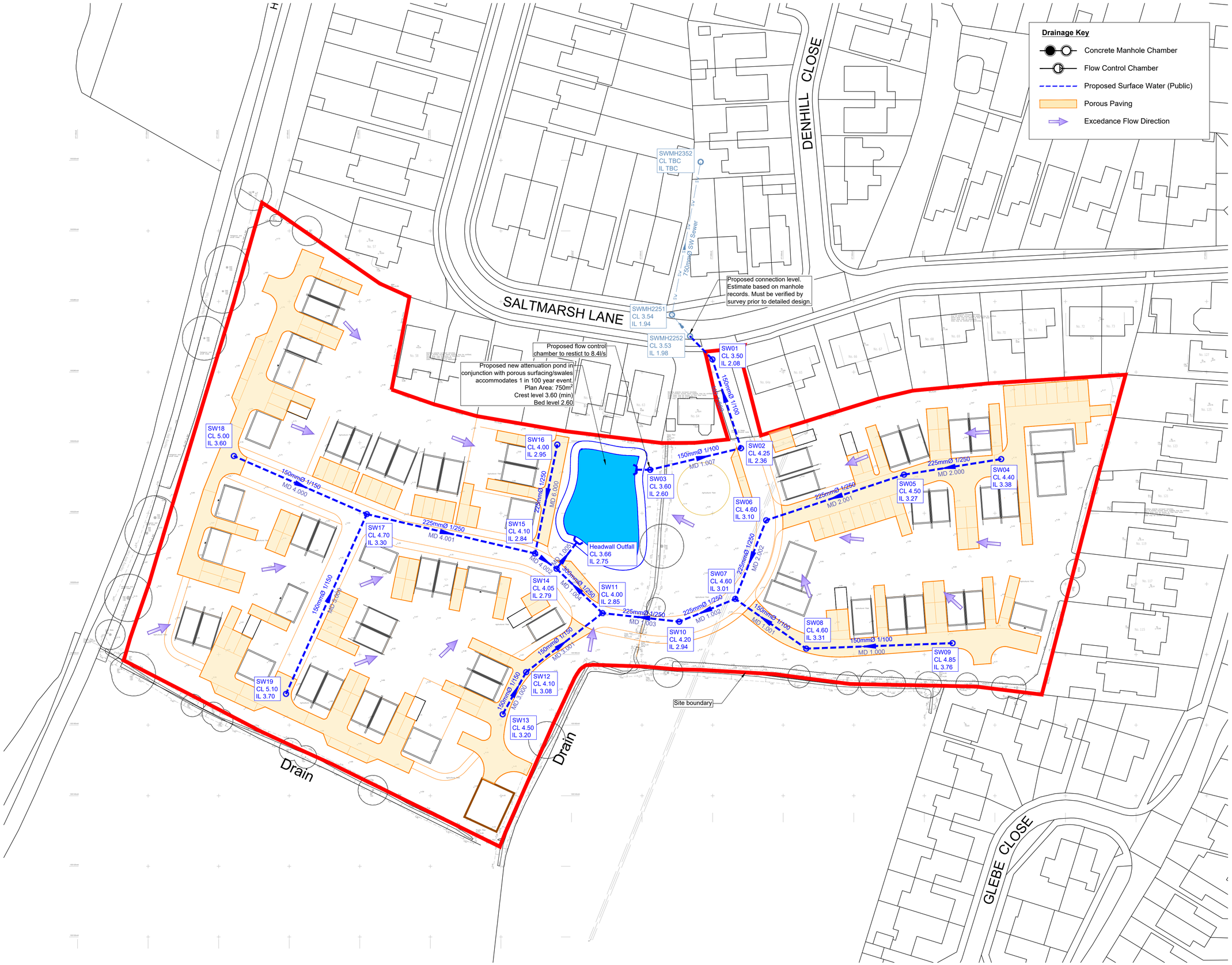

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Drainage Construction Notes

1. All materials and workmanship related to private sewers shall be in accordance with Part H of the Building Regulations and BS EN752 and best practice
2. All materials and workmanship related to adoptable sewers shall be in accordance with the Design and Construction Guidance 2020 as published by the Water Services Association and any subsequent revisions shown by the water authority
3. All sustainable drainage systems to be designed and maintained in accordance with CIRIA C753 The SuDS Manual and best practice guidance.

REV.	REVISION NOTE/COMMENT					
	DRW BY	DATE	CCK BY	DATE	APP BY	DATE
P3	SITE LAYOUT UPDATED					
	HS	18.10.21	DB	18.10.21	DB	18.10.21
P2	DRAINAGE RUN AMENDMENTS					
	HS	01.10.21	DB	01.10.21	DB	01.10.21
P1	INITIAL ISSUE.					
	AJ	29.07.21	DB	29.07.21	DB	29.07.21

Revisions

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Client
Hayling Island Builders

Project
Land South of Saltmarsh Lane

Drawing
Drainage Strategy Plan
Surface Water

Scales 1:500 At original size A1

Drawn AJ
Date July 2021
Checked DB

Status PRELIMINARY

Drawing No. A21079/0201 Rev. P3

Appendix H
MicroDrainage Calculations

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)	2	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	20	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - 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	45.123	0.446	101.2	0.060	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	21.437	0.251	85.5	0.053	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	28.241	0.113	250.0	0.100	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	42.286	0.169	250.0	0.073	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	22.460	0.100	225.0	0.066	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	22.003	0.088	250.0	0.043	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	22.394	0.090	250.0	0.026	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	18.863	0.126	150.0	0.037	5.00	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	20.00	5.75	3.770	0.060	0.0	0.0	0.0	1.00	17.7	3.2
1.001	20.00	6.08	3.324	0.113	0.0	0.0	0.0	1.09	19.2	6.1
2.000	20.00	5.57	3.380	0.100	0.0	0.0	0.0	0.82	32.7	5.4
2.001	20.00	6.43	3.267	0.173	0.0	0.0	0.0	0.82	32.7	9.4
2.002	20.00	6.86	3.098	0.239	0.0	0.0	0.0	0.87	34.5	12.9
1.002	20.00	7.31	2.998	0.396	0.0	0.0	0.0	0.82	32.7	21.4
1.003	20.00	7.76	2.910	0.421	0.0	0.0	0.0	0.82	32.7	22.8
3.000	20.00	5.38	3.200	0.037	0.0	0.0	0.0	0.82	14.5	2.0

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Network Design Table for Storm

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
3.001	23.098	0.179	129.3	0.027	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	12.988	0.203	64.0	0.038	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	40.713	0.353	115.3	0.183	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	57.006	0.453	125.9	0.174	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	50.724	0.348	145.7	0.114	0.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	31.441	0.126	249.3	0.050	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	8.521	0.206	41.4	0.118	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	18.588	0.074	251.2	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	21.602	0.050	432.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	24.883	0.249	99.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.008	26.413	0.264	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	8.829	0.088	100.3	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 (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.001	20.00	5.82	3.074	0.064	0.0	0.0	0.0	0.88	15.6	3.5
1.004	20.00	7.87	2.746	0.523	0.0	0.0	0.0	1.97	139.2	28.3
4.000	20.00	5.73	3.600	0.183	0.0	0.0	0.0	0.93	16.5	9.9
5.000	20.00	6.06	3.700	0.174	0.0	0.0	0.0	0.89	15.8	9.4
4.001	20.00	6.84	3.172	0.471	0.0	0.0	0.0	1.08	43.0	25.5
6.000	20.00	5.64	2.950	0.050	0.0	0.0	0.0	0.82	32.7	2.7
4.002	20.00	6.91	2.824	0.639	0.0	0.0	0.0	2.04	81.1	34.6
1.005	20.00	8.18	2.543	1.189	0.0	0.0	0.0	0.99	69.8	64.4
1.006	20.00	8.66	2.469	1.189	0.0	0.0	0.0	0.75	53.0«	64.4
1.007	20.00	9.08	2.419	1.189	0.0	0.0	0.0	1.01	17.8«	64.4
1.008	20.00	9.52	2.170	1.189	0.0	0.0	0.0	1.00	17.8«	64.4
1.009	20.00	9.66	1.906	1.189	0.0	0.0	0.0	1.00	17.7«	64.4

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Simulation Criteria for Storm

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

Number of Input Hydrographs	0	Number of Storage Structures	10
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)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW03, DS/PN: 1.007, Volume (m³): 2.8

Unit Reference	MD-SHE-0134-8400-1000-8400
Design Head (m)	1.000
Design Flow (l/s)	8.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	134
Invert Level (m)	2.419
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	8.4
Flush-Flo™	0.301	8.3
Kick-Flo®	0.662	6.9
Mean Flow over Head Range	-	7.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.8	1.200	9.1	3.000	14.1	7.000	21.2
0.200	8.1	1.400	9.8	3.500	15.2	7.500	21.9
0.300	8.3	1.600	10.5	4.000	16.2	8.000	22.6
0.400	8.2	1.800	11.1	4.500	17.1	8.500	23.2
0.500	8.0	2.000	11.6	5.000	18.0	9.000	23.9
0.600	7.5	2.200	12.2	5.500	18.8	9.500	24.5
0.800	7.6	2.400	12.7	6.000	19.6		
1.000	8.4	2.600	13.2	6.500	20.4		

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Storage Structures for Storm

Porous Car Park Manhole: SW09, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	18.7
Membrane Percolation (mm/hr)	1000	Length (m)	18.7
Max Percolation (l/s)	97.1	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.420	Membrane Depth (mm)	0

Porous Car Park Manhole: SW08, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	18.7
Membrane Percolation (mm/hr)	1000	Length (m)	18.7
Max Percolation (l/s)	97.1	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.320	Membrane Depth (mm)	0

Porous Car Park Manhole: SW04, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	26.1
Membrane Percolation (mm/hr)	1000	Length (m)	26.1
Max Percolation (l/s)	189.2	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	3.820	Membrane Depth (mm)	0

Porous Car Park Manhole: SW05, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	26.1
Membrane Percolation (mm/hr)	1000	Length (m)	26.1
Max Percolation (l/s)	189.2	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	3.920	Membrane Depth (mm)	0

Porous Car Park Manhole: SW13, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.2
Membrane Percolation (mm/hr)	1000	Length (m)	13.2
Max Percolation (l/s)	48.4	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	3.920	Membrane Depth (mm)	0

Porous Car Park Manhole: SW12, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Max Percolation (l/s)	48.4
Membrane Percolation (mm/hr)	1000	Safety Factor	2.0

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Porous Car Park Manhole: SW12, DS/PN: 3.001

Porosity	0.30	Slope (1:X)	500.0
Invert Level (m)	3.720	Depression Storage (mm)	5
Width (m)	13.2	Evaporation (mm/day)	3
Length (m)	13.2	Membrane Depth (mm)	0

Porous Car Park Manhole: SW18, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	23.4
Membrane Percolation (mm/hr)	1000	Length (m)	23.4
Max Percolation (l/s)	152.1	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.420	Membrane Depth (mm)	0

Porous Car Park Manhole: SW19, DS/PN: 5.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	26.0
Membrane Percolation (mm/hr)	1000	Length (m)	26.0
Max Percolation (l/s)	187.8	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	4.520	Membrane Depth (mm)	0

Porous Car Park Manhole: SW16, DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	14.0
Membrane Percolation (mm/hr)	1000	Length (m)	14.0
Max Percolation (l/s)	54.4	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	3.120	Membrane Depth (mm)	0

Tank or Pond Manhole: Pond, DS/PN: 1.006

Invert Level (m) 2.469

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	450.0	1.200	750.0

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 10
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 0.412
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.900 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, 180, 240, 360, 480, 600, 720, 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	SW09	15 Winter	1	+0%	30/15 Summer			
1.001	SW08	15 Winter	1	+0%	30/15 Summer			
2.000	SW04	15 Winter	1	+0%	30/15 Summer			
2.001	SW05	30 Winter	1	+0%	30/15 Summer			
2.002	SW06	30 Winter	1	+0%	30/15 Summer	100/15 Summer		
1.002	SW07	30 Winter	1	+0%	30/15 Summer			
1.003	SW10	30 Winter	1	+0%	30/15 Summer			
3.000	SW13	15 Winter	1	+0%	30/15 Summer			
3.001	SW12	15 Winter	1	+0%	30/15 Summer			
1.004	SW11	30 Winter	1	+0%	30/15 Summer			
4.000	SW18	15 Winter	1	+0%	1/15 Summer			
5.000	SW19	15 Winter	1	+0%	1/15 Summer			
4.001	SW17	15 Winter	1	+0%	1/15 Summer	100/15 Summer		
6.000	SW16	30 Winter	1	+0%	30/15 Summer	100/15 Summer		
4.002	SW15	30 Winter	1	+0%	1/15 Winter			
1.005	SW14	30 Winter	1	+0%	1/15 Summer			
1.006	Pond	240 Winter	1	+0%	30/15 Winter			
1.007	SW03	240 Winter	1	+0%	1/30 Summer	100/30 Summer		

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW09	3.843	-0.077	0.000	0.44		6	7.5	OK
1.001	SW08	3.421	-0.053	0.000	0.70		7	12.8	OK
2.000	SW04	3.482	-0.123	0.000	0.39		6	11.7	OK
2.001	SW05	3.384	-0.108	0.000	0.49		7	15.1	OK
2.002	SW06	3.246	-0.077	0.000	0.58			18.4	OK
1.002	SW07	3.210	-0.014	0.000	1.00			29.8	OK
1.003	SW10	3.133	-0.002	0.000	1.00			29.9	OK
3.000	SW13	3.264	-0.086	0.000	0.37		6	5.0	OK
3.001	SW12	3.153	-0.071	0.000	0.53		6	7.8	OK
1.004	SW11	2.967	-0.078	0.000	0.33			37.4	OK
4.000	SW18	3.966	0.216	0.000	1.22		4	19.6	SURCHARGED
5.000	SW19	4.056	0.206	0.000	1.13		4	17.5	SURCHARGED
4.001	SW17	3.469	0.072	0.000	1.08			44.5	SURCHARGED
6.000	SW16	3.082	-0.093	0.000	0.16		5	5.1	OK
4.002	SW15	3.075	0.026	0.000	0.82			52.6	SURCHARGED
1.005	SW14	2.924	0.081	0.000	1.51			91.2	SURCHARGED
1.006	Pond	2.695	-0.074	0.000	0.26			12.0	OK
1.007	SW03	2.692	0.123	0.000	0.49			8.3	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	SW09	
1.001	SW08	
2.000	SW04	
2.001	SW05	
2.002	SW06	2
1.002	SW07	
1.003	SW10	
3.000	SW13	
3.001	SW12	
1.004	SW11	
4.000	SW18	
5.000	SW19	
4.001	SW17	4
6.000	SW16	18
4.002	SW15	
1.005	SW14	
1.006	Pond	
1.007	SW03	20

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.008	SW02	240 Winter	1	+0%					2.244
1.009	SW01	240 Winter	1	+0%					1.984

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.008	SW02	-0.076	0.000	0.49			8.3	OK	
1.009	SW01	-0.072	0.000	0.53			8.3	OK	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 10
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 0.412
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.900 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, 180, 240, 360, 480, 600, 720, 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	SW09	15 Winter	30	+0%	30/15 Summer			
1.001	SW08	15 Winter	30	+0%	30/15 Summer			
2.000	SW04	30 Winter	30	+0%	30/15 Summer			
2.001	SW05	15 Winter	30	+0%	30/15 Summer			
2.002	SW06	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.002	SW07	15 Winter	30	+0%	30/15 Summer			
1.003	SW10	15 Winter	30	+0%	30/15 Summer			
3.000	SW13	15 Winter	30	+0%	30/15 Summer			
3.001	SW12	15 Winter	30	+0%	30/15 Summer			
1.004	SW11	15 Winter	30	+0%	30/15 Summer			
4.000	SW18	15 Winter	30	+0%	1/15 Summer			
5.000	SW19	15 Winter	30	+0%	1/15 Summer			
4.001	SW17	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
6.000	SW16	30 Winter	30	+0%	30/15 Summer	100/15 Summer		
4.002	SW15	15 Winter	30	+0%	1/15 Winter			
1.005	SW14	15 Winter	30	+0%	1/15 Summer			
1.006	Pond	240 Winter	30	+0%	30/15 Winter			
1.007	SW03	180 Winter	30	+0%	1/30 Summer	100/30 Summer		

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW09	4.439	0.519	0.000	0.83		3	14.2	SURCHARGED
1.001	SW08	4.319	0.845	0.000	1.24		8	22.5	SURCHARGED
2.000	SW04	3.902	0.297	0.000	0.98		9	29.7	FLOOD RISK
2.001	SW05	3.952	0.460	0.000	1.00		3	31.2	SURCHARGED
2.002	SW06	4.042	0.719	0.000	1.04			32.8	SURCHARGED
1.002	SW07	4.005	0.782	0.000	1.76			52.7	SURCHARGED
1.003	SW10	3.712	0.577	0.000	1.91			57.0	SURCHARGED
3.000	SW13	3.628	0.278	0.000	0.74		4	10.0	SURCHARGED
3.001	SW12	3.563	0.339	0.000	1.05		6	15.5	SURCHARGED
1.004	SW11	3.368	0.322	0.000	0.71			80.3	SURCHARGED
4.000	SW18	4.506	0.756	0.000	1.51		8	24.1	FLOOD RISK
5.000	SW19	4.595	0.745	0.000	1.41		8	21.8	SURCHARGED
4.001	SW17	4.260	0.863	0.000	1.53			63.2	FLOOD RISK
6.000	SW16	3.356	0.181	0.000	0.68		13	21.0	FLOOD RISK
4.002	SW15	3.406	0.357	0.000	1.05			67.2	SURCHARGED
1.005	SW14	3.208	0.365	0.000	2.45			147.6	SURCHARGED
1.006	Pond	3.086	0.317	0.000	0.59			27.5	SURCHARGED
1.007	SW03	3.494	0.925	0.000	0.49			8.3	FLOOD RISK

PN	US/MH Name	Level Exceeded
1.000	SW09	
1.001	SW08	
2.000	SW04	
2.001	SW05	
2.002	SW06	2
1.002	SW07	
1.003	SW10	
3.000	SW13	
3.001	SW12	
1.004	SW11	
4.000	SW18	
5.000	SW19	
4.001	SW17	4
6.000	SW16	18
4.002	SW15	
1.005	SW14	
1.006	Pond	
1.007	SW03	20

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.008	SW02	720 Summer	30	+0%					2.244
1.009	SW01	1440 Summer	30	+0%					1.984

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.008	SW02	-0.076	0.000	0.49			8.3	OK	
1.009	SW01	-0.072	0.000	0.54			8.3	OK	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 10
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 0.412
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.900 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, 180, 240, 360, 480, 600, 720, 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	SW09	30 Winter	100	+40%	30/15 Summer			
1.001	SW08	15 Winter	100	+40%	30/15 Summer			
2.000	SW04	60 Winter	100	+40%	30/15 Summer			
2.001	SW05	30 Winter	100	+40%	30/15 Summer			
2.002	SW06	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
1.002	SW07	15 Winter	100	+40%	30/15 Summer			
1.003	SW10	15 Summer	100	+40%	30/15 Summer			
3.000	SW13	15 Winter	100	+40%	30/15 Summer			
3.001	SW12	15 Winter	100	+40%	30/15 Summer			
1.004	SW11	15 Winter	100	+40%	30/15 Summer			
4.000	SW18	30 Winter	100	+40%	1/15 Summer			
5.000	SW19	30 Winter	100	+40%	1/15 Summer			
4.001	SW17	15 Winter	100	+40%	1/15 Summer	100/15 Summer		
6.000	SW16	480 Winter	100	+40%	30/15 Summer	100/15 Summer		
4.002	SW15	15 Winter	100	+40%	1/15 Winter			
1.005	SW14	480 Winter	100	+40%	1/15 Summer			
1.006	Pond	480 Winter	100	+40%	30/15 Winter			
1.007	SW03	360 Winter	100	+40%	1/30 Summer	100/30 Summer		

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW09	4.514	0.594	0.000	1.03		12	17.7	FLOOD RISK
1.001	SW08	4.401	0.927	0.000	1.47		8	26.6	FLOOD RISK
2.000	SW04	4.025	0.420	0.000	0.95		26	28.9	FLOOD RISK
2.001	SW05	4.029	0.537	0.000	1.04		15	32.5	FLOOD RISK
2.002	SW06	4.400	1.077	0.148	1.07			33.9	FLOOD
1.002	SW07	4.371	1.148	0.000	1.78			53.1	FLOOD RISK
1.003	SW10	4.156	1.020	0.000	2.22			66.3	FLOOD RISK
3.000	SW13	3.952	0.602	0.000	1.16		5	15.8	SURCHARGED
3.001	SW12	3.805	0.581	0.000	1.53		6	22.6	FLOOD RISK
1.004	SW11	3.697	0.651	0.000	0.89			100.7	FLOOD RISK
4.000	SW18	4.684	0.934	0.000	1.50		20	24.0	FLOOD RISK
5.000	SW19	4.730	0.880	0.000	1.37		22	21.2	FLOOD RISK
4.001	SW17	4.505	1.108	4.942	1.64			67.7	FLOOD
6.000	SW16	3.535	0.360	34.915	0.16		121	4.9	FLOOD
4.002	SW15	3.795	0.746	0.000	1.24			79.3	FLOOD RISK
1.005	SW14	3.537	0.694	0.000	1.13			68.2	FLOOD RISK
1.006	Pond	3.527	0.758	0.000	0.57			26.7	FLOOD RISK
1.007	SW03	3.601	1.032	0.552	0.51			8.6	FLOOD

PN	US/MH Name	Level Exceeded
1.000	SW09	
1.001	SW08	
2.000	SW04	
2.001	SW05	
2.002	SW06	2
1.002	SW07	
1.003	SW10	
3.000	SW13	
3.001	SW12	
1.004	SW11	
4.000	SW18	
5.000	SW19	
4.001	SW17	4
6.000	SW16	18
4.002	SW15	
1.005	SW14	
1.006	Pond	
1.007	SW03	20

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.008	SW02	120 Winter	100	+40%					2.247
1.009	SW01	480 Winter	100	+40%					1.986

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.008	SW02	-0.073	0.000	0.50			8.5	OK	
1.009	SW01	-0.070	0.000	0.55			8.6	OK	

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