

Scott White and Hookins		Page 2
St Nicholas House St Nicholas Road Sutton SM1 1EL		
Date 16/11/2022 11:07 File SW - NORTHERN NETWORK -...	Designed by tkillingback Checked by	
Micro Drainage Network 2020.1.3		

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
S1.002	31.960	0.630	50.7	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	25.520	0.865	29.5	0.082	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	27.470	0.930	29.5	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.000	45.082	1.503	30.0	0.082	5.00	0.0	0.600	o	300	Pipe/Conduit	
S5.001	45.082	1.503	30.0	0.082	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.002	10.547	0.352	30.0	0.082	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.003	37.648	1.642	22.9	0.082	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	26.661	0.846	31.5	0.082	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	27.104	1.000	27.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	31.062	0.100	310.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	79.870	4.750	16.8	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)
S1.002	50.00	6.68	35.425	0.512	0.0	0.0	0.0	2.21	156.4	69.3
S1.003	50.00	6.83	34.795	0.594	0.0	0.0	0.0	2.91	205.4	80.4
S1.004	50.00	6.99	33.930	0.656	0.0	0.0	0.0	2.90	205.3	88.8
S5.000	50.00	5.26	38.000	0.082	0.0	0.0	0.0	2.88	203.7	11.1
S5.001	50.00	5.52	36.497	0.164	0.0	0.0	0.0	2.88	203.7	22.2
S5.002	50.00	5.58	34.994	0.246	0.0	0.0	0.0	2.88	203.8	33.3
S5.003	50.00	5.77	34.642	0.328	0.0	0.0	0.0	3.30	233.1	44.4
S6.000	50.00	5.16	33.846	0.082	0.0	0.0	0.0	2.81	198.7	11.1
S1.005	50.00	7.13	33.000	1.066	0.0	0.0	0.0	3.03	214.3	144.3
S1.006	50.00	7.72	28.350	1.066	0.0	0.0	0.0	0.89	62.7«	144.3
S1.007	50.00	8.26	28.250	1.066	0.0	0.0	0.0	2.47	43.6«	144.3

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)
S1.007	S	24.000	23.500	23.500	0	0

Scott White and Hookins		Page 3
St Nicholas House St Nicholas Road Sutton SM1 1EL		
Date 16/11/2022 11:07 File SW - NORTHERN NETWORK -...	Designed by tkillingback Checked by	
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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 * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	3	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)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Storm Duration (mins)	30
Ratio R	0.350		

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Scott White and Hookins		Page 4
St Nicholas House St Nicholas Road Sutton SM1 1EL		
Date 16/11/2022 11:07	Designed by tkillingback	
File SW - NORTHERN NETWORK -...	Checked by	
Micro Drainage	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S2hb, DS/PN: S2.001, Volume (m³): 2.8

Unit Reference	MD-SHE-0147-1000-0900-1000
Design Head (m)	0.900
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	147
Invert Level (m)	37.900
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	10.0
Flush-Flo™	0.283	10.0
Kick-Flo®	0.625	8.4
Mean Flow over Head Range	-	8.5

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	5.3	1.200	11.4	3.000	17.7	7.000	26.5
0.200	9.8	1.400	12.3	3.500	19.0	7.500	27.4
0.300	10.0	1.600	13.1	4.000	20.3	8.000	28.3
0.400	9.8	1.800	13.9	4.500	21.5	8.500	29.1
0.500	9.5	2.000	14.6	5.000	22.6	9.000	30.0
0.600	8.8	2.200	15.2	5.500	23.6	9.500	30.7
0.800	9.5	2.400	15.9	6.000	24.6		
1.000	10.5	2.600	16.5	6.500	25.6		

Hydro-Brake® Optimum Manhole: S6hb, DS/PN: S4.001, Volume (m³): 2.5

Unit Reference	MD-SHE-0055-1300-0900-1300
Design Head (m)	0.900
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	55
Invert Level (m)	38.275
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Scott White and Hookins

St Nicholas House
St Nicholas Road
Sutton SM1 1EL

Date 16/11/2022 11:07
File SW - NORTHERN NETWORK -...

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Network 2020.1.3

Page 5



Hydro-Brake® Optimum Manhole: S6hb, DS/PN: S4.001, Volume (m³): 2.5

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)

0.900

1.3

Flush-Flo™

0.241

1.2

Kick-Flo®

0.489

1.0

Mean Flow over Head Range

-

1.1

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

1.1

1.200

1.5

3.000

2.2

7.000

3.3

0.200

1.2

1.400

1.6

3.500

2.4

7.500

3.4

0.300

1.2

1.600

1.7

4.000

2.6

8.000

3.5

0.400

1.1

1.800

1.8

4.500

2.7

8.500

3.6

0.500

1.0

2.000

1.9

5.000

2.8

9.000

3.7

0.600

1.1

2.200

1.9

5.500

3.0

9.500

3.8

0.800

1.2

2.400

2.0

6.000

3.1

1.000

1.4

2.600

2.1

6.500

3.2

Hydro-Brake® Optimum Manhole: S14hb, DS/PN: S1.007, Volume (m³): 7.4

Unit Reference

MD-SHE-0101-5300-1500-5300

Design Head (m)

1.500

Design Flow (l/s)

5.3

Flush-Flo™

Calculated

Objective

Minimise upstream storage

Application

Surface

Sump Available

Yes

Diameter (mm)

101

Invert Level (m)

28.250

Minimum Outlet Pipe Diameter (mm)

150

Suggested Manhole Diameter (mm)

1200

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)

1.500

5.3

Flush-Flo™

0.442

5.3

Kick-Flo®

0.903

4.2

Mean Flow over Head Range

-

4.6

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)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

0.100

3.4

0.300

5.1

0.500

5.2

0.800

4.7

0.200

4.7

0.400

5.2

0.600

5.2

1.000

4.4

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Scott White and Hookins		Page 6					
St Nicholas House St Nicholas Road Sutton SM1 1EL							
Date 16/11/2022 11:07	Designed by tkillingback						
File SW - NORTHERN NETWORK -...	Checked by						
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<u>Hydro-Brake® Optimum Manhole: S14hb, DS/PN: S1.007, Volume (m³): 7.4</u>							
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	4.8	2.400	6.6	5.000	9.3	8.000	11.7
1.400	5.1	2.600	6.8	5.500	9.8	8.500	12.0
1.600	5.5	3.000	7.3	6.000	10.2	9.000	12.3
1.800	5.8	3.500	7.9	6.500	10.6	9.500	12.7
2.000	6.1	4.000	8.4	7.000	10.9		
2.200	6.3	4.500	8.9	7.500	11.3		
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Scott White and Hookins

Page 7

St Nicholas House
St Nicholas Road
Sutton SM1 1EL

Date 16/11/2022 11:07
File SW - NORTHERN NETWORK -...

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Network 2020.1.3

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 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 3
Number of Online Controls 3 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 0.350
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	1	+0%				
S2.000	SAT2	60 Winter	1	+0%	100/15 Winter			
S2.001	S2hb	15 Winter	1	+0%	1/15 Summer			
S3.000	S3	15 Winter	1	+0%				
S4.000	SAT 1	30 Winter	1	+0%				
S4.001	S6hb	30 Winter	1	+0%	30/15 Summer			
S1.001	S4	15 Winter	1	+0%				
S1.002	S5	15 Winter	1	+0%	100/15 Summer			
S1.003	S6	15 Winter	1	+0%	100/15 Summer			
S1.004	S7	15 Winter	1	+0%	100/15 Summer			
S5.000	S8	15 Winter	1	+0%				
S5.001	S9	15 Winter	1	+0%				
S5.002	S10	15 Winter	1	+0%	100/15 Summer			
S5.003	S11	15 Winter	1	+0%	100/15 Summer			
S6.000	S12	15 Winter	1	+0%	100/15 Summer			
S1.005	S13	15 Winter	1	+0%	30/15 Summer			
S1.006	SPOND1	360 Winter	1	+0%	1/15 Summer			
S1.007	S14hb	360 Winter	1	+0%	1/15 Summer	30/720 Winter		

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Scott White and Hookins		Page 8
St Nicholas House St Nicholas Road Sutton SM1 1EL		
Date 16/11/2022 11:07 File SW - NORTHERN NETWORK -...	Designed by tkillingback Checked by	
Micro Drainage Network 2020.1.3		

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

		Water	Surcharged	Flooded			Half Drain	Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Time	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status
S1.000	S1	37.561	-0.239	0.000	0.09			7.5	OK
S2.000	SAT2	38.059	-0.241	0.000	0.07			5.7	OK
S2.001	S2hb	38.107	0.057	0.000	0.47			9.8	SURCHARGED
S3.000	S3	37.558	-0.242	0.000	0.08			15.4	OK
S4.000	SAT 1	38.397	-0.278	0.000	0.02			1.2	OK
S4.001	S6hb	38.380	-0.045	0.000	0.02			1.1	OK
S1.001	S4	37.101	-0.199	0.000	0.25			32.8	OK
S1.002	S5	35.525	-0.200	0.000	0.24			34.7	OK
S1.003	S6	34.894	-0.201	0.000	0.23			42.8	OK
S1.004	S7	34.036	-0.194	0.000	0.27			49.1	OK
S5.000	S8	38.045	-0.255	0.000	0.05			10.3	OK
S5.001	S9	36.561	-0.236	0.000	0.10			19.0	OK
S5.002	S10	35.082	-0.212	0.000	0.19			27.7	OK
S5.003	S11	34.725	-0.217	0.000	0.17			36.5	OK
S6.000	S12	33.893	-0.253	0.000	0.06			10.4	OK
S1.005	S13	33.149	-0.151	0.000	0.49			95.2	OK
S1.006	SPOND1	28.967	0.317	0.000	0.29			16.5	SURCHARGED
S1.007	S14hb	29.972	1.572	0.000	0.12			5.2	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	S1	
S2.000	SAT2	
S2.001	S2hb	
S3.000	S3	
S4.000	SAT 1	
S4.001	S6hb	
S1.001	S4	
S1.002	S5	
S1.003	S6	
S1.004	S7	
S5.000	S8	
S5.001	S9	
S5.002	S10	
S5.003	S11	
S6.000	S12	
S1.005	S13	
S1.006	SPOND1	
S1.007	S14hb	7

Scott White and Hookins

Page 9

St Nicholas House

St Nicholas Road

Sutton SM1 1EL

Date 16/11/2022 11:07

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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 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 3

Number of Online Controls 3

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 0.350

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep Fine

Inertia Status OFF

DTS 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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	30	+0%				
S2.000	SAT2	60 Winter	30	+0%	100/15 Winter			
S2.001	S2hb	15 Winter	30	+0%	1/15 Summer			
S3.000	S3	15 Winter	30	+0%				
S4.000	SAT 1	30 Winter	30	+0%				
S4.001	S6hb	30 Winter	30	+0%	30/15 Summer			
S1.001	S4	15 Winter	30	+0%				
S1.002	S5	15 Winter	30	+0%	100/15 Summer			
S1.003	S6	15 Winter	30	+0%	100/15 Summer			
S1.004	S7	15 Winter	30	+0%	100/15 Summer			
S5.000	S8	15 Winter	30	+0%				
S5.001	S9	15 Winter	30	+0%				
S5.002	S10	15 Winter	30	+0%	100/15 Summer			
S5.003	S11	15 Winter	30	+0%	100/15 Summer			
S6.000	S12	15 Winter	30	+0%	100/15 Summer			
S1.005	S13	15 Winter	30	+0%	30/15 Summer			
S1.006	SPOND1	1440 Winter	30	+0%	1/15 Summer			
S1.007	S14hb	360 Winter	30	+0%	1/15 Summer	30/720 Winter		

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Scott White and Hookins		Page 10
St Nicholas House St Nicholas Road Sutton SM1 1EL		
Date 16/11/2022 11:07 File SW - NORTHERN NETWORK -...	Designed by tkillingback Checked by	
Micro Drainage Network 2020.1.3		

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow Cap. (l/s)		Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
S1.000	S1	37.596	-0.204	0.000	0.21			18.3	OK
S2.000	SAT2	38.207	-0.093	0.000	0.13			10.1	OK
S2.001	S2hb	38.325	0.275	0.000	0.48			10.0	SURCHARGED
S3.000	S3	37.592	-0.208	0.000	0.21			37.8	OK
S4.000	SAT 1	38.446	-0.229	0.000	0.02			1.9	OK
S4.001	S6hb	38.446	0.021	0.000	0.02			1.2	SURCHARGED
S1.001	S4	37.151	-0.149	0.000	0.50			66.5	OK
S1.002	S5	35.577	-0.148	0.000	0.51			72.5	OK
S1.003	S6	34.951	-0.144	0.000	0.52			96.0	OK
S1.004	S7	34.104	-0.126	0.000	0.62			114.2	OK
S5.000	S8	38.073	-0.227	0.000	0.13			25.2	OK
S5.001	S9	36.604	-0.193	0.000	0.27			52.1	OK
S5.002	S10	35.151	-0.143	0.000	0.53			78.9	OK
S5.003	S11	34.792	-0.150	0.000	0.49			105.7	OK
S6.000	S12	33.921	-0.225	0.000	0.14			25.4	OK
S1.005	S13	33.733	0.433	0.000	1.19			229.3	SURCHARGED
S1.006	SPOND1	29.513	0.863	0.000	0.10			5.6	SURCHARGED
S1.007	S14hb	30.893	2.493	0.000	0.13			5.5	SURCHARGED

PN	US/MH		Level Exceeded
	Name		
S1.000	S1		
S2.000	SAT2		
S2.001	S2hb		
S3.000	S3		
S4.000	SAT 1		
S4.001	S6hb		
S1.001	S4		
S1.002	S5		
S1.003	S6		
S1.004	S7		
S5.000	S8		
S5.001	S9		
S5.002	S10		
S5.003	S11		
S6.000	S12		
S1.005	S13		
S1.006	SPOND1		
S1.007	S14hb		

7

Scott White and Hookins

Page 11

St Nicholas House

St Nicholas Road

Sutton SM1 1EL

Date 16/11/2022 11:07

File SW - NORTHERN NETWORK -...

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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 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 3

Number of Online Controls 3

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 0.350

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep Fine

Inertia Status OFF

DTS 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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	100	+40%				
S2.000	SAT2	360 Winter	100	+40%	100/15 Winter			
S2.001	S2hb	480 Winter	100	+40%	1/15 Summer			
S3.000	S3	15 Winter	100	+40%				
S4.000	SAT 1	60 Winter	100	+40%				
S4.001	S6hb	120 Winter	100	+40%	30/15 Summer			
S1.001	S4	15 Winter	100	+40%				
S1.002	S5	15 Winter	100	+40%	100/15 Summer			
S1.003	S6	15 Winter	100	+40%	100/15 Summer			
S1.004	S7	15 Winter	100	+40%	100/15 Summer			
S5.000	S8	15 Winter	100	+40%				
S5.001	S9	15 Winter	100	+40%				
S5.002	S10	15 Winter	100	+40%	100/15 Summer			
S5.003	S11	15 Winter	100	+40%	100/15 Summer			
S6.000	S12	15 Winter	100	+40%	100/15 Summer			
S1.005	S13	15 Winter	100	+40%	30/15 Summer			
S1.006	SPOND1	1440 Winter	100	+40%	1/15 Summer			
S1.007	S14hb	720 Winter	100	+40%	1/15 Summer	30/720 Winter		

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Scott White and Hookins		Page 12
St Nicholas House St Nicholas Road Sutton SM1 1EL		
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Micro Drainage Network 2020.1.3		

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

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe	Status	
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)		Flow (l/s)
S1.000	S1	37.633	-0.167	0.000	0.38			33.2	OK
S2.000	SAT2	38.508	0.208	0.000	0.13			9.9	SURCHARGED
S2.001	S2hb	38.951	0.901	0.000	0.48			9.9	SURCHARGED
S3.000	S3	37.627	-0.173	0.000	0.37			68.4	OK
S4.000	SAT 1	38.542	-0.133	0.000	0.02			1.5	OK
S4.001	S6hb	38.673	0.248	0.000	0.02			1.2	SURCHARGED
S1.001	S4	37.212	-0.088	0.000	0.84			110.8	OK
S1.002	S5	36.757	1.032	0.000	0.79			112.8	SURCHARGED
S1.003	S6	36.421	1.326	0.000	0.75			137.5	SURCHARGED
S1.004	S7	35.959	1.729	0.000	0.85			156.9	SURCHARGED
S5.000	S8	38.100	-0.200	0.000	0.24			45.6	OK
S5.001	S9	36.647	-0.150	0.000	0.49			94.3	OK
S5.002	S10	36.293	0.999	0.000	0.80			119.1	SURCHARGED
S5.003	S11	36.088	1.146	0.000	0.70			150.2	SURCHARGED
S6.000	S12	35.349	1.203	0.000	0.21			36.8	SURCHARGED
S1.005	S13	35.304	2.004	0.000	1.74			334.8	SURCHARGED
S1.006	SPOND1	30.149	1.499	0.000	0.09			5.1	SURCHARGED
S1.007	S14hb	31.251	2.851	2.158	0.14			6.0	FLOOD

PN	US/MH		Level Exceeded
	Name		
S1.000	S1		
S2.000	SAT2		
S2.001	S2hb		
S3.000	S3		
S4.000	SAT 1		
S4.001	S6hb		
S1.001	S4		
S1.002	S5		
S1.003	S6		
S1.004	S7		
S5.000	S8		
S5.001	S9		
S5.002	S10		
S5.003	S11		
S6.000	S12		
S1.005	S13		
S1.006	SPOND1		
S1.007	S14hb		

7