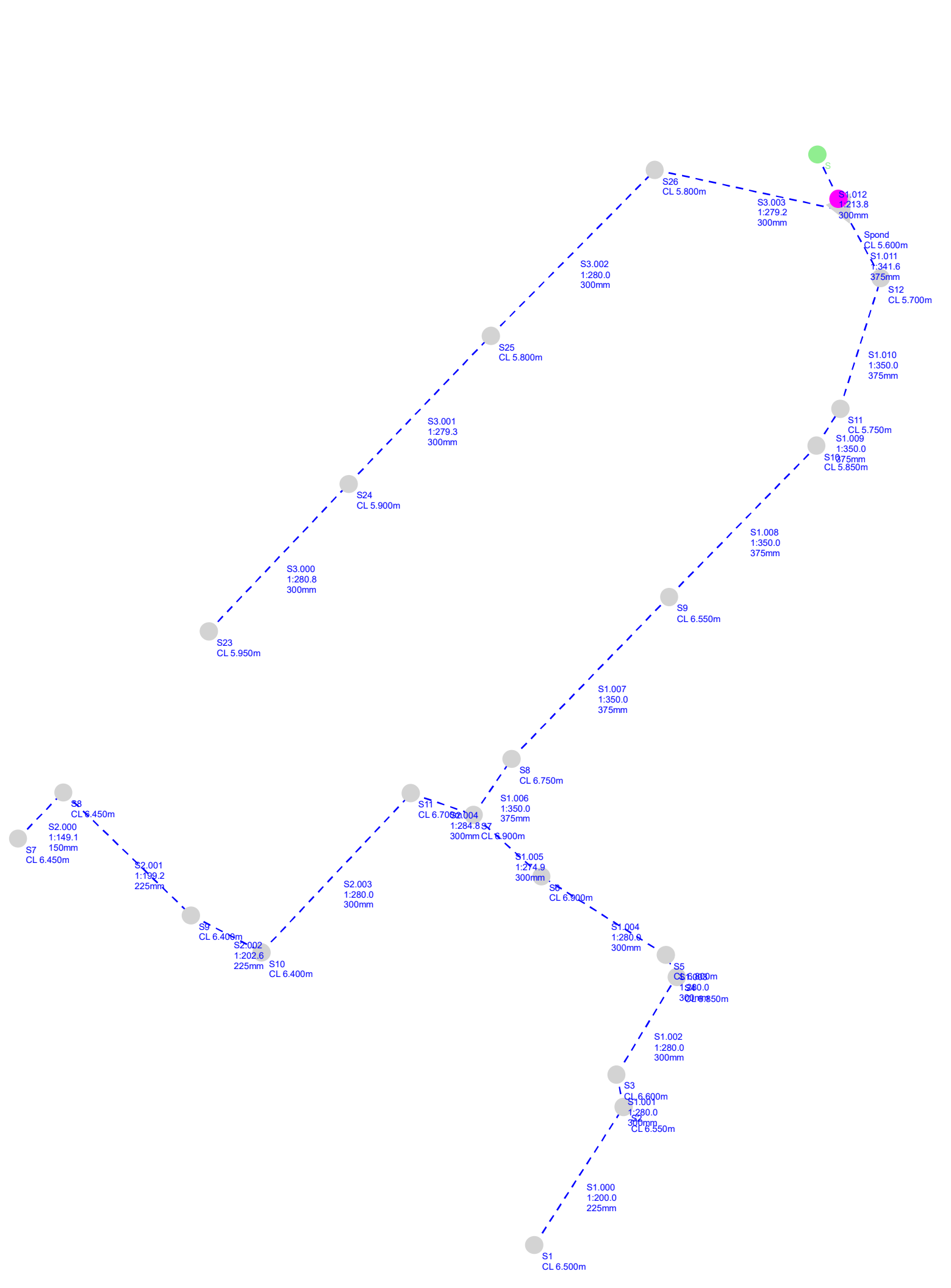




Odyssey		Page 1
Tuscany House	NORTH END ROAD	
White Hart Lane	YAPTON	
Basingstoke RG21 4AF	70 UNITS	
Date 26/07/2020 21:53	Designed by AK	
File 19-156 70 Units	Checked by	
Micro Drainage		Network 2020.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location GB 497682 103581 SU 97682 03581	
Data Type	Point
Maximum Rainfall (mm/hr)	250
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	0.100
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.189	4-8	0.339	8-12	0.025

Total Area Contributing (ha) = 0.553

Total Pipe Volume (m³) = 38.626

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
S1.000	29.593	0.148	200.0	0.059	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	5.957	0.021	280.0	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)
S1.000	63.73	5.54	5.955	0.059	0.0	0.0	0.0	0.92	36.6	10.2
S1.001	63.20	5.64	5.732	0.059	0.0	0.0	0.0	0.93	66.1	10.2

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Odyssey		Page 2
Tuscany House White Hart Lane Basingstoke RG21 4AF	NORTH END ROAD YAPTON 70 UNITS	
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Micro Drainage Network 2020.1

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	20.663	0.074	280.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	4.424	0.016	280.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	26.485	0.095	280.0	0.073	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	16.494	0.060	274.9	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	11.632	0.078	149.1	0.023	5.00	0.0	0.600	o	150	Pipe/Conduit	
S2.001	31.879	0.160	199.2	0.025	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.002	14.342	0.071	202.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.003	39.261	0.140	280.0	0.070	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.004	11.962	0.042	284.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	12.169	0.035	350.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.007	40.643	0.116	350.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.008	37.991	0.109	350.0	0.034	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	7.907	0.023	350.0	0.029	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.010	24.584	0.070	350.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.011	13.662	0.040	341.6	0.038	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	36.556	0.130	280.8	0.038	5.00	0.0	0.600	o	300	Pipe/Conduit	
S3.001	36.928	0.132	279.3	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.002	41.940	0.150	280.0	0.088	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.003	34.901	0.125	279.2	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)
S1.002	61.46	6.01	5.711	0.059	0.0	0.0	0.0	0.93	66.1	10.2
S1.003	61.10	6.09	5.637	0.059	0.0	0.0	0.0	0.93	66.1	10.2
S1.004	59.03	6.56	5.621	0.132	0.0	0.0	0.0	0.93	66.1	21.1
S1.005	57.83	6.85	5.527	0.172	0.0	0.0	0.0	0.94	66.7	26.9
S2.000	65.25	5.24	6.108	0.023	0.0	0.0	0.0	0.82	14.5	4.1
S2.001	62.38	5.81	5.955	0.048	0.0	0.0	0.0	0.92	36.7	8.1
S2.002	61.17	6.07	5.795	0.048	0.0	0.0	0.0	0.91	36.4	8.1
S2.003	58.15	6.77	5.649	0.118	0.0	0.0	0.0	0.93	66.1	18.6
S2.004	57.29	6.99	5.509	0.118	0.0	0.0	0.0	0.93	65.5	18.6
S1.006	56.47	7.20	5.392	0.290	0.0	0.0	0.0	0.96	106.3	44.4
S1.007	53.93	7.90	5.357	0.290	0.0	0.0	0.0	0.96	106.3	44.4
S1.008	51.78	8.56	5.241	0.324	0.0	0.0	0.0	0.96	106.3	45.4
S1.009	51.36	8.70	5.133	0.353	0.0	0.0	0.0	0.96	106.3	49.1
S1.010	50.10	9.12	5.110	0.353	0.0	0.0	0.0	0.96	106.3	49.1
S1.011	49.43	9.36	5.040	0.391	0.0	0.0	0.0	0.97	107.7	52.3
S3.000	63.15	5.65	5.537	0.038	0.0	0.0	0.0	0.93	66.0	6.5
S3.001	60.11	6.31	5.407	0.074	0.0	0.0	0.0	0.94	66.2	12.0
S3.002	57.02	7.06	5.275	0.162	0.0	0.0	0.0	0.93	66.1	25.0
S3.003	54.71	7.68	5.125	0.162	0.0	0.0	0.0	0.94	66.2	25.0

Odyssey										Page 3	
Tuscany House					NORTH END ROAD						
White Hart Lane					YAPTON						
Basingstoke RG21 4AF					70 UNITS						
Date 26/07/2020 21:53					Designed by AK						
File 19-156 70 Units					Checked by						
Micro Drainage					Network 2020.1						
<u>Network Design Table for Storm</u>											
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
S1.012	11.334	0.053	213.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
<u>Network Results Table</u>											
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)	
S1.012	48.95	9.53	5.000	0.553	0.0	0.0	0.0	1.07	75.7	73.3	
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Tuscany House	NORTH END ROAD	
White Hart Lane	YAPTON	
Basingstoke RG21 4AF	70 UNITS	
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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.059	0.059	0.059
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.073	0.073	0.073
1.005	-	-	100	0.040	0.040	0.040
2.000	-	-	100	0.023	0.023	0.023
2.001	-	-	100	0.025	0.025	0.025
2.002	-	-	100	0.000	0.000	0.000
2.003	-	-	100	0.070	0.070	0.070
2.004	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.034	0.034	0.034
1.009	-	-	100	0.029	0.029	0.029
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.038	0.038	0.038
3.000	-	-	100	0.038	0.038	0.038
3.001	-	-	100	0.036	0.036	0.036
3.002	-	-	100	0.088	0.088	0.088
3.003	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.553	0.553	0.553

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)
S1.012	S	5.600	4.947	0.000	0	0

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Tuscany House	NORTH END ROAD	
White Hart Lane	YAPTON	
Basingstoke RG21 4AF	70 UNITS	
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Micro Drainage		Network 2020.1
<u>Online Controls for Storm</u> <u>Pump Manhole: Spond, DS/PN: S1.012, Volume (m³): 4.6</u> Invert Level (m) 5.000		
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Tuscany House	NORTH END ROAD	
White Hart Lane	YAPTON	
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Infiltration Basin Manhole: Spond, DS/PN: S1.012

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1146.0	0.600	1410.0

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Tuscany House	NORTH END ROAD	
White Hart Lane	YAPTON	
Basingstoke RG21 4AF	70 UNITS	
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File 19-156 70 Units	Checked by	
Micro Drainage		Network 2020.1

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	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	FEH
FEH Rainfall Version	2013
Site Location	GB 497682 103581 SU 97682 03581
Data Type	Point
Cv (Summer)	0.750
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)	100
Climate Change (%)	40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	100	+40%	100/15 Summer				6.495
S1.001	S2	15 Winter	100	+40%	100/15 Summer				6.422
S1.002	S3	15 Winter	100	+40%	100/15 Summer				6.410
S1.003	S4	15 Winter	100	+40%	100/15 Summer				6.382
S1.004	S5	15 Winter	100	+40%	100/15 Summer				6.372
S1.005	S6	15 Winter	100	+40%	100/15 Summer				6.292
S2.000	S7	15 Winter	100	+40%	100/15 Summer				6.440
S2.001	S8	15 Winter	100	+40%	100/15 Summer				6.399
S2.002	S9	15 Winter	100	+40%	100/15 Summer				6.351
S2.003	S10	15 Winter	100	+40%	100/15 Summer				6.316
S2.004	S11	15 Winter	100	+40%	100/15 Summer				6.237
S1.006	S7	15 Winter	100	+40%	100/15 Summer				6.200

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Odyssey						Page 8			
Tuscany House				NORTH END ROAD					
White Hart Lane				YAPTON					
Basingstoke RG21 4AF				70 UNITS					
Date 26/07/2020 21:53				Designed by AK					
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Micro Drainage				Network 2020.1					
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									

Odyssey								Page 9	
Tuscany House				NORTH END ROAD					
White Hart Lane				YAPTON					
Basingstoke RG21 4AF				70 UNITS					
Date 26/07/2020 21:53				Designed by AK					
File 19-156 70 Units				Checked by					
Micro Drainage				Network 2020.1					
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.007	S8	15 Winter	100	+40%	100/15 Summer				6.110
S1.008	S9	15 Winter	100	+40%	100/15 Summer				5.947
S1.009	S10	15 Winter	100	+40%	100/15 Summer				5.759
S1.010	S11	15 Winter	100	+40%	100/15 Summer				5.640
S1.011	S12	15 Winter	100	+40%	100/15 Summer				5.489
S3.000	S23	15 Winter	100	+40%					5.836
S3.001	S24	15 Winter	100	+40%	100/15 Summer				5.810
S3.002	S25	15 Winter	100	+40%	100/15 Summer				5.761
S3.003	S26	15 Winter	100	+40%	100/15 Summer				5.497
S1.012	Spond	2160 Winter	100	+40%	100/240 Winter				5.357
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.007	S8	0.377	0.000	1.23			118.6	SURCHARGED	
S1.008	S9	0.331	0.000	1.32			126.6	SURCHARGED	
S1.009	S10	0.251	0.000	1.95			133.8	FLOOD RISK	
S1.010	S11	0.155	0.000	1.45			133.3	FLOOD RISK	
S1.011	S12	0.075	0.000	1.78			141.2	FLOOD RISK	
S3.000	S23	-0.001	0.000	0.35			21.0	FLOOD RISK	
S3.001	S24	0.103	0.000	0.63			38.5	FLOOD RISK	
S3.002	S25	0.187	0.000	1.30			80.1	FLOOD RISK	
S3.003	S26	0.072	0.000	1.29			78.4	SURCHARGED	
S1.012	Spond	0.057	0.000	0.00			0.0	FLOOD RISK	
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