


Mayer Brown Limited		Page 0
Lion House Oriental Road Woking, GU22 8AR	Residential Development Main Road, Rookley	
Date 26/11/2020 File MD RUN 26_11_20 BACK UP...	Designed by Gavin Toogood Checked by KWF	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD







FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 450756 84322 SZ 50756 84322
Data Type	Point
Maximum Rainfall (mm/hr)	50
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)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits


Network Design Table for Surface Network 1

« - 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	9.666	0.171	56.5	0.007	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	6.358	0.108	59.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	6.576	0.110	59.6	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	5.134	0.087	59.0	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.004	7.072	0.101	70.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.005	20.904	0.782	26.7	0.000	0.00	0.0	0.600	o	100	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	50.00	5.16	52.039	0.007	0.0	0.0	0.0	1.03	8.1	0.9
1.001	50.00	5.26	51.868	0.007	0.0	0.0	0.0	1.00	7.9	0.9
1.002	50.00	5.37	51.760	0.007	0.0	0.0	0.0	1.00	7.8	0.9
1.003	50.00	5.46	51.650	0.014	0.0	0.0	0.0	1.00	7.9	1.9
1.004	50.00	5.59	51.563	0.014	0.0	0.0	0.0	0.92	7.2	1.9
1.005	50.00	5.82	51.462	0.014	0.0	0.0	0.0	1.50	11.8	1.9


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Network Design Table for Surface Network 1












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
2.000	9.473	0.174	54.5	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	6.123	0.104	58.9	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.002	4.547	0.109	41.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.003	6.587	0.085	77.9	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.004	6.612	0.105	63.0	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.005	8.800	0.148	59.6	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.006	14.165	1.085	13.1	0.039	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	27.593	0.345	80.0	0.061	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.007	11.003	0.138	79.7	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.000	6.156	0.433	14.2	0.015	5.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	6.958	0.232	30.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.008	41.127	1.340	30.7	0.075	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	6.363	0.318	20.0	0.015	5.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	5.550	0.278	20.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.009	28.993	0.193	150.2	0.067	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)
2.000	50.00	5.15	51.403	0.000	0.0	0.0	0.0	1.05	8.2	0.0
2.001	50.00	5.25	51.229	0.007	0.0	0.0	0.0	1.01	7.9	0.9
2.002	50.00	5.32	51.126	0.007	0.0	0.0	0.0	1.20	9.4	0.9
2.003	50.00	5.44	51.017	0.007	0.0	0.0	0.0	0.87	6.9	0.9
2.004	50.00	5.55	50.932	0.014	0.0	0.0	0.0	0.97	7.6	1.9
2.005	50.00	5.70	50.828	0.014	0.0	0.0	0.0	1.00	7.9	1.9
1.006	50.00	5.90	50.630	0.067	0.0	0.0	0.0	2.80	49.5	9.1
3.000	50.00	5.41	49.847	0.061	0.0	0.0	0.0	1.13	19.9	8.3
1.007	50.00	6.03	49.428	0.138	0.0	0.0	0.0	1.47	58.3	18.7
4.000	50.00	5.05	50.080	0.015	0.0	0.0	0.0	2.06	16.2	2.0
4.001	50.00	5.13	49.647	0.015	0.0	0.0	0.0	1.41	11.1	2.0
1.008	50.00	6.32	49.290	0.228	0.0	0.0	0.0	2.37	94.2	30.9
5.000	50.00	5.06	48.308	0.015	0.0	0.0	0.0	1.73	13.6	2.0
5.001	50.00	5.11	47.990	0.015	0.0	0.0	0.0	1.73	13.6	2.0
1.009	50.00	6.69	47.497	0.310	0.0	0.0	0.0	1.28	90.5	42.0


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Network Design Table for Surface Network 1









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
6.000	37.261	0.471	79.1	0.067	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.010	30.168	0.201	150.1	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.000	11.047	0.126	87.6	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	12.435	0.157	79.2	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.000	12.384	0.130	95.5	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
7.002	12.651	0.089	142.1	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
9.000	12.265	0.130	94.1	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
7.003	12.023	0.120	100.2	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
10.000	9.176	0.100	91.8	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
7.004	9.259	0.120	77.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.005	6.414	0.102	63.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.011	30.530	0.148	206.3	0.026	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.000	50.00	5.55	47.940	0.067	0.0	0.0	0.0	1.13	20.0	9.1
1.010	50.00	7.03	47.229	0.407	0.0	0.0	0.0	1.48	163.1	55.1
7.000	50.00	5.22	48.032	0.000	0.0	0.0	0.0	0.82	6.5	0.0
7.001	50.00	5.46	47.906	0.009	0.0	0.0	0.0	0.87	6.8	1.2
8.000	50.00	5.26	47.878	0.000	0.0	0.0	0.0	0.79	6.2	0.0
7.002	50.00	5.71	47.699	0.018	0.0	0.0	0.0	0.84	14.9	2.4
9.000	50.00	5.26	47.790	0.000	0.0	0.0	0.0	0.79	6.2	0.0
7.003	50.00	5.91	47.610	0.027	0.0	0.0	0.0	1.00	17.7	3.7
10.000	50.00	5.19	47.640	0.000	0.0	0.0	0.0	0.80	6.3	0.0
7.004	50.00	6.05	47.490	0.027	0.0	0.0	0.0	1.15	20.2	3.7
7.005	50.00	6.13	47.370	0.027	0.0	0.0	0.0	1.27	22.4	3.7
1.011	50.00	7.44	47.028	0.460	0.0	0.0	0.0	1.26	138.9	62.3


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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
1.012	15.121	1.405	10.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
11.000	13.340	0.089	149.9	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
11.001	12.950	0.086	150.6	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.002	13.532	0.090	150.4	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.003	21.006	0.140	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.004	29.906	1.200	24.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.013	6.641	0.044	150.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.014	2.573	0.156	16.5	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)
1.012	50.00	7.48	47.105	0.460	0.0	0.0	0.0	5.55	612.9	62.3
11.000	50.00	5.27	47.306	0.018	0.0	0.0	0.0	0.82	14.5	2.4
11.001	50.00	5.54	47.217	0.029	0.0	0.0	0.0	0.82	14.4	3.9
11.002	50.00	5.81	47.130	0.040	0.0	0.0	0.0	0.82	14.4	5.4
11.003	50.00	6.14	47.040	0.040	0.0	0.0	0.0	1.07	42.3	5.4
11.004	50.00	6.39	46.900	0.040	0.0	0.0	0.0	2.03	35.8	5.4
1.013	50.00	7.56	45.700	0.500	0.0	0.0	0.0	1.47	162.6	67.7
1.014	50.00	7.58	45.656	0.500	0.0	0.0	0.0	2.49	44.0«	67.7

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Manhole Schedules for Surface Network 1

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)
PS2	52.992	0.953	Open Manhole	450	1.000	52.039	100				
PS7	52.832	0.965	Open Manhole	450	1.001	51.868	100	1.000	51.868	100	
PS6	52.773	1.013	Open Manhole	450	1.002	51.760	100	1.001	51.760	100	
PS5	52.798	1.148	Open Manhole	450	1.003	51.650	100	1.002	51.650	100	
PS4	52.868	1.305	Open Manhole	450	1.004	51.563	100	1.003	51.563	100	
PS3	52.921	1.459	Open Manhole	450	1.005	51.462	100	1.004	51.462	100	
PS13	51.884	0.481	Open Manhole	450	2.000	51.403	100				
PS12	51.872	0.643	Open Manhole	450	2.001	51.229	100	2.000	51.229	100	
PS11	51.840	0.715	Open Manhole	450	2.002	51.126	100	2.001	51.125	100	
PS10	51.802	0.785	Open Manhole	450	2.003	51.017	100	2.002	51.017	100	
PS9	51.862	0.930	Open Manhole	450	2.004	50.932	100	2.003	50.932	100	
PS8	51.812	0.985	Open Manhole	450	2.005	50.828	100	2.004	50.827	100	
S1	51.746	1.116	Open Manhole	1200	1.006	50.630	150	1.005	50.680	100	
								2.005	50.680	100	
S2	51.249	1.402	Open Manhole	1200	3.000	49.847	150				
S3	51.000	1.572	Open Manhole	1200	1.007	49.428	225	1.006	49.545	150	42
								3.000	49.502	150	
PS37	51.105	1.025	Open Manhole	450	4.000	50.080	100				
PS36	50.998	1.351	Open Manhole	450	4.001	49.647	100	4.000	49.647	100	
S4	50.902	1.612	Open Manhole	1200	1.008	49.290	225	1.007	49.290	225	
								4.001	49.415	100	
PS46	49.863	1.555	Open Manhole	450	5.000	48.308	100				
PS43	48.922	0.932	Open Manhole	450	5.001	47.990	100	5.000	47.990	100	
S5	49.243	1.746	Open Manhole	1200	1.009	47.497	300	1.008	47.950	225	378
								5.001	47.713	100	16
S6	48.862	0.922	Open Manhole	1200	6.000	47.940	150				
S7	48.242	1.013	Open Manhole	900 x 825	1.010	47.229	375	1.009	47.304	300	
								6.000	47.469	150	15
PS20	48.894	0.862	Open Manhole	450	7.000	48.032	100				
PS18	48.918	1.012	Open Manhole	450	7.001	47.906	100	7.000	47.906	100	
PS19	48.470	0.592	Open Manhole	250	8.000	47.878	100				
PS17	48.572	0.873	Open Manhole	450	7.002	47.699	150	7.001	47.749	100	
								8.000	47.749	100	
PS21	48.159	0.369	Open Manhole	600 x 450	9.000	47.790	100				
PS16	48.452	0.842	Open Manhole	450	7.003	47.610	150	7.002	47.610	150	
								9.000	47.660	100	
PS22	47.994	0.354	Open Manhole	450	10.000	47.640	100				
PS15	48.226	0.736	Open Manhole	250	7.004	47.490	150	7.003	47.490	150	

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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)
PS14	48.423	1.053	Open Manhole	450	7.005	47.370	150	7.004	47.540	100
S8	48.472	1.444	Open Manhole	1350	1.011	47.028	375	1.010	47.370	150
Outfall to pond	48.649	1.769	Open Manhole	1350	1.012	47.105	375	7.005	47.028	375
PS51	48.313	1.007	Open Manhole	600 x 450	11.000	47.306	150	1.011	46.880	375
PS50	47.761	0.544	Open Manhole	600 x 450	11.001	47.217	150	11.000	47.217	150
PS49	47.487	0.357	Open Manhole	600 x 450	11.002	47.130	150	11.001	47.131	150
PS48	47.327	0.287	Open Manhole	600 x 450	11.003	47.040	225	11.002	47.040	150
Outfall 2	47.449	0.549	Open Manhole	1200	11.004	46.900	150	11.003	46.900	225
Pond outlet	47.613	1.913	Open Manhole	1350	1.013	45.700	375	1.012	45.700	375
Flow control MH	47.250	1.594	Open Manhole	1200	1.014	45.656	150	11.004	45.700	150
Outfall to ditch	46.179	0.679	Open Manhole	0		OUTFALL		1.013	45.656	375
								1.014	45.500	150

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
PS2	450724.664	84299.448	450724.664	84299.448	Required	
PS7	450727.536	84290.218	450727.536	84290.218	Required	
PS6	450729.440	84284.152	450729.440	84284.152	Required	
PS5	450732.054	84278.117	450732.054	84278.117	Required	
PS4	450733.345	84273.148	450733.345	84273.148	Required	
PS3	450736.088	84266.629	450736.088	84266.629	Required	
PS13	450741.585	84303.542	450741.585	84303.542	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
PS12	450744.145	84294.421	450744.145	84294.421	Required	
PS11	450746.065	84288.607	450746.065	84288.607	Required	
PS10	450748.428	84284.723	450748.428	84284.723	Required	
PS9	450750.615	84278.509	450750.615	84278.509	Required	
PS8	450753.148	84272.402	450753.148	84272.402	Required	
S1	450756.876	84264.430	450756.876	84264.430	Required	
S2	450762.457	84294.261	450762.457	84294.261	Required	
S3	450770.610	84267.900	450770.610	84267.900	Required	
PS37	450784.425	84249.776	450784.425	84249.776	Required	
PS36	450781.472	84255.178	450781.472	84255.178	Required	
S4	450779.864	84261.947	450779.864	84261.947	Required	
PS46	450813.814	84272.336	450813.814	84272.336	Required	
PS43	450816.117	84278.268	450816.117	84278.268	Required	
S5	450814.793	84283.658	450814.793	84283.658	Required	
S6	450825.879	84330.590	450825.879	84330.590	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S7	450840.811	84296.451	450840.811	84296.451	Required	
PS20	450832.880	84342.384	450832.880	84342.384	Required	
PS18	450843.022	84346.762	450843.022	84346.762	Required	
PS19	450838.991	84331.265	450838.991	84331.265	Required	
PS17	450850.172	84336.588	450850.172	84336.588	Required	
PS21	450844.930	84320.159	450844.930	84320.159	Required	
PS16	450856.031	84325.375	450856.031	84325.375	Required	
PS22	450850.894	84309.605	450850.894	84309.605	Required	
PS15	450859.082	84313.746	450859.082	84313.746	Required	
PS14	450868.027	84311.356	450868.027	84311.356	Required	
S8	450869.694	84305.163	450869.694	84305.163	Required	
Outfall to pond	450900.088	84308.037	450900.088	84308.037	Required	
PS51	450835.213	84267.821	450835.213	84267.821	Required	
PS50	450847.227	84273.618	450847.227	84273.618	Required	
PS49	450859.475	84277.825	450859.475	84277.825	Required	

Lion House
 Oriental Road
 Woking, GU22 8AR

Residential Development
 Main Road, Rookley



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Manhole Schedules for Surface Network 1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
PS48	450872.980	84276.970	450872.980	84276.970	Required	
Outfall 2	450892.909	84283.609	450892.909	84283.609	Required	
Pond outlet	450914.688	84304.104	450914.688	84304.104	Required	
Flow control MH	450921.052	84302.204	450921.052	84302.204	Required	
Outfall to ditch	450923.515	84301.459			No Entry	

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PIPELINE SCHEDULES for Surface Network 1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	o	100	PS2	52.992	52.039	0.853	Open Manhole		450
1.001	o	100	PS7	52.832	51.868	0.865	Open Manhole		450
1.002	o	100	PS6	52.773	51.760	0.913	Open Manhole		450
1.003	o	100	PS5	52.798	51.650	1.048	Open Manhole		450
1.004	o	100	PS4	52.868	51.563	1.205	Open Manhole		450
1.005	o	100	PS3	52.921	51.462	1.359	Open Manhole		450
2.000	o	100	PS13	51.884	51.403	0.381	Open Manhole		450
2.001	o	100	PS12	51.872	51.229	0.543	Open Manhole		450
2.002	o	100	PS11	51.840	51.126	0.614	Open Manhole		450
2.003	o	100	PS10	51.802	51.017	0.685	Open Manhole		450
2.004	o	100	PS9	51.862	50.932	0.830	Open Manhole		450
2.005	o	100	PS8	51.812	50.828	0.884	Open Manhole		450
1.006	o	150	S1	51.746	50.630	0.966	Open Manhole		1200
3.000	o	150	S2	51.249	49.847	1.252	Open Manhole		1200
1.007	o	225	S3	51.000	49.428	1.347	Open Manhole		1200
4.000	o	100	PS37	51.105	50.080	0.925	Open Manhole		450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	9.666	56.5	PS7	52.832	51.868	0.864	Open Manhole		450
1.001	6.358	59.0	PS6	52.773	51.760	0.913	Open Manhole		450
1.002	6.576	59.6	PS5	52.798	51.650	1.048	Open Manhole		450
1.003	5.134	59.0	PS4	52.868	51.563	1.205	Open Manhole		450
1.004	7.072	70.2	PS3	52.921	51.462	1.359	Open Manhole		450
1.005	20.904	26.7	S1	51.746	50.680	0.966	Open Manhole		1200
2.000	9.473	54.5	PS12	51.872	51.229	0.543	Open Manhole		450
2.001	6.123	58.9	PS11	51.840	51.125	0.615	Open Manhole		450
2.002	4.547	41.8	PS10	51.802	51.017	0.685	Open Manhole		450
2.003	6.587	77.9	PS9	51.862	50.932	0.830	Open Manhole		450
2.004	6.612	63.0	PS8	51.812	50.827	0.885	Open Manhole		450
2.005	8.800	59.6	S1	51.746	50.680	0.966	Open Manhole		1200
1.006	14.165	13.1	S3	51.000	49.545	1.305	Open Manhole		1200
3.000	27.593	80.0	S3	51.000	49.502	1.348	Open Manhole		1200
1.007	11.003	79.7	S4	50.902	49.290	1.387	Open Manhole		1200
4.000	6.156	14.2	PS36	50.998	49.647	1.251	Open Manhole		450

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PIPELINE SCHEDULES for Surface Network 1

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)
4.001	o	100	PS36	50.998	49.647	1.251	Open Manhole	450
1.008	o	225	S4	50.902	49.290	1.387	Open Manhole	1200
5.000	o	100	PS46	49.863	48.308	1.455	Open Manhole	450
5.001	o	100	PS43	48.922	47.990	0.832	Open Manhole	450
1.009	o	300	S5	49.243	47.497	1.446	Open Manhole	1200
6.000	o	150	S6	48.862	47.940	0.772	Open Manhole	1200
1.010	o	375	S7	48.242	47.229	0.638	Open Manhole	900 x 825
7.000	o	100	PS20	48.894	48.032	0.762	Open Manhole	450
7.001	o	100	PS18	48.918	47.906	0.912	Open Manhole	450
8.000	o	100	PS19	48.470	47.878	0.492	Open Manhole	250
7.002	o	150	PS17	48.572	47.699	0.723	Open Manhole	450
9.000	o	100	PS21	48.159	47.790	0.269	Open Manhole	600 x 450

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)
4.001	6.958	30.0	S4	50.902	49.415	1.387	Open Manhole	1200
1.008	41.127	30.7	S5	49.243	47.950	1.068	Open Manhole	1200
5.000	6.363	20.0	PS43	48.922	47.990	0.832	Open Manhole	450
5.001	5.550	20.0	S5	49.243	47.713	1.430	Open Manhole	1200
1.009	28.993	150.2	S7	48.242	47.304	0.638	Open Manhole	900 x 825
6.000	37.261	79.1	S7	48.242	47.469	0.623	Open Manhole	900 x 825
1.010	30.168	150.1	S8	48.472	47.028	1.069	Open Manhole	1350
7.000	11.047	87.6	PS18	48.918	47.906	0.912	Open Manhole	450
7.001	12.435	79.2	PS17	48.572	47.749	0.723	Open Manhole	450
8.000	12.384	95.5	PS17	48.572	47.749	0.723	Open Manhole	450
7.002	12.651	142.1	PS16	48.452	47.610	0.692	Open Manhole	450
9.000	12.265	94.1	PS16	48.452	47.660	0.692	Open Manhole	450

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PIPELINE SCHEDULES for Surface Network 1

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)
7.003	o	150	PS16	48.452	47.610	0.692	Open Manhole	450
10.000	o	100	PS22	47.994	47.640	0.254	Open Manhole	450
7.004	o	150	PS15	48.226	47.490	0.586	Open Manhole	250
7.005	o	150	PS14	48.423	47.370	0.903	Open Manhole	450
1.011	o	375	S8	48.472	47.028	1.069	Open Manhole	1350
1.012	o	375	Outfall to pond	48.649	47.105	1.169	Open Manhole	1350
11.000	o	150	PS51	48.313	47.306	0.857	Open Manhole	600 x 450
11.001	o	150	PS50	47.761	47.217	0.394	Open Manhole	600 x 450
11.002	o	150	PS49	47.487	47.130	0.207	Open Manhole	600 x 450
11.003	o	225	PS48	47.327	47.040	0.062	Open Manhole	600 x 450
11.004	o	150	Outfall 2	47.449	46.900	0.399	Open Manhole	1200
1.013	o	375	Pond outlet	47.613	45.700	1.538	Open Manhole	1350
1.014	o	150	Flow control MH	47.250	45.656	1.444	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)
7.003	12.023	100.2	PS15	48.226	47.490	0.586	Open Manhole	250
10.000	9.176	91.8	PS15	48.226	47.540	0.586	Open Manhole	250
7.004	9.259	77.2	PS14	48.423	47.370	0.903	Open Manhole	450
7.005	6.414	63.1	S8	48.472	47.268	1.054	Open Manhole	1350
1.011	30.530	206.3	Outfall to pond	48.649	46.880	1.394	Open Manhole	1350
1.012	15.121	10.8	Pond outlet	47.613	45.700	1.538	Open Manhole	1350
11.000	13.340	149.9	PS50	47.761	47.217	0.394	Open Manhole	600 x 450
11.001	12.950	150.6	PS49	47.487	47.131	0.206	Open Manhole	600 x 450
11.002	13.532	150.4	PS48	47.327	47.040	0.137	Open Manhole	600 x 450
11.003	21.006	150.0	Outfall 2	47.449	46.900	0.324	Open Manhole	1200
11.004	29.906	24.9	Pond outlet	47.613	45.700	1.763	Open Manhole	1350
1.013	6.641	150.9	Flow control MH	47.250	45.656	1.219	Open Manhole	1200
1.014	2.573	16.5	Outfall to ditch	46.179	45.500	0.529	Open Manhole	0

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Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.014	Outfall to ditch	46.179	45.500	0.000	0	0
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Simulation Criteria for Surface Network 1

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	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
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 450756 84322 SZ 50756 84322
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Surface Network 1


Hydro-Brake® Optimum Manhole: Flow control MH, DS/PN: 1.014, Volume (m³):
2.4

Unit Reference	MD-SHE-0097-5000-1600-5000
Design Head (m)	1.600
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	97
Invert Level (m)	45.656
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	5.0
Flush-Flo™	0.425	4.7
Kick-Flo®	0.865	3.8
Mean Flow over Head Range	-	4.2

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	3.1	1.200	4.4	3.000	6.7	7.000	10.0
0.200	4.3	1.400	4.7	3.500	7.2	7.500	10.3
0.300	4.6	1.600	5.0	4.000	7.7	8.000	10.7
0.400	4.7	1.800	5.3	4.500	8.1	8.500	11.0
0.500	4.7	2.000	5.5	5.000	8.5	9.000	11.3
0.600	4.6	2.200	5.8	5.500	8.9	9.500	11.6
0.800	4.1	2.400	6.0	6.000	9.3		
1.000	4.0	2.600	6.3	6.500	9.7		


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Storage Structures for Surface Network 1

Tank or Pond Manhole: Flow control MH, DS/PN: 1.014

Invert Level (m) 45.656


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	180.0	2.800	0.0	5.600	0.0	8.400	0.0
0.400	180.0	3.200	0.0	6.000	0.0	8.800	0.0
0.800	180.0	3.600	0.0	6.400	0.0	9.200	0.0
1.200	180.0	4.000	0.0	6.800	0.0	9.600	0.0
1.600	180.0	4.400	0.0	7.200	0.0	10.000	0.0
2.000	0.0	4.800	0.0	7.600	0.0		
2.400	0.0	5.200	0.0	8.000	0.0		

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Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Pipe Volume (m ³)	Storage Structure Volume (m ³)	Total Volume (m ³)
1.000	PS2	0.076	0.000	0.076
1.001	PS7	0.050	0.000	0.050
1.002	PS6	0.052	0.000	0.052
1.003	PS5	0.040	0.000	0.040
1.004	PS4	0.056	0.000	0.056
1.005	PS3	0.164	0.000	0.164
2.000	PS13	0.074	0.000	0.074
2.001	PS12	0.048	0.000	0.048
2.002	PS11	0.036	0.000	0.036
2.003	PS10	0.052	0.000	0.052
2.004	PS9	0.052	0.000	0.052
2.005	PS8	0.069	0.000	0.069
1.006	S1	0.250	0.000	0.250
3.000	S2	0.488	0.000	0.488
1.007	S3	0.437	0.000	0.437
4.000	PS37	0.048	0.000	0.048
4.001	PS36	0.055	0.000	0.055
1.008	S4	1.635	0.000	1.635
5.000	PS46	0.050	0.000	0.050
5.001	PS43	0.044	0.000	0.044
1.009	S5	2.049	0.000	2.049
6.000	S6	0.658	0.000	0.658
1.010	S7	3.332	0.000	3.332
7.000	PS20	0.087	0.000	0.087
7.001	PS18	0.098	0.000	0.098
8.000	PS19	0.097	0.000	0.097
7.002	PS17	0.224	0.000	0.224
9.000	PS21	0.096	0.000	0.096
7.003	PS16	0.212	0.000	0.212
10.000	PS22	0.072	0.000	0.072
7.004	PS15	0.164	0.000	0.164
7.005	PS14	0.113	0.000	0.113
1.011	S8	3.372	0.000	3.372
1.012	Outfall to pond	1.670	0.000	1.670
11.000	PS51	0.236	0.000	0.236
11.001	PS50	0.229	0.000	0.229
11.002	PS49	0.239	0.000	0.239
11.003	PS48	0.835	0.000	0.835
11.004	Outfall 2	0.528	0.000	0.528
1.013	Pond outlet	0.733	0.000	0.733
1.014	Flow control MH	0.045	312.000	312.045
Total		18.867	312.000	330.867

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

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 450756 84322 SZ 50756 84322
Data Type Point
Cv (Summer) 0.840
Cv (Winter) 0.750

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


Profile(s) Summer and Winter
Duration(s) (mins) 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 40, 40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS2	60 Summer	100	+40%					52.085
1.001	PS7	60 Summer	100	+40%					51.915
1.002	PS6	60 Summer	100	+40%					51.808
1.003	PS5	60 Summer	100	+40%					51.730
1.004	PS4	60 Summer	100	+40%					51.652
1.005	PS3	60 Summer	100	+40%					51.516
2.000	PS13	60 Summer	2	+40%					51.403
2.001	PS12	60 Summer	100	+40%					51.278
2.002	PS11	60 Summer	100	+40%					51.171
2.003	PS10	60 Summer	100	+40%					51.070
2.004	PS9	60 Summer	100	+40%					51.012
2.005	PS8	60 Summer	100	+40%					50.904
1.006	S1	60 Summer	100	+40%					50.724
3.000	S2	60 Summer	100	+40%	30/60 Summer				50.569
1.007	S3	60 Summer	100	+40%	100/60 Summer				49.994
4.000	PS37	60 Summer	100	+40%					50.129
4.001	PS36	60 Summer	100	+40%	100/60 Summer				49.908

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1


PN	US/MH Name	Surcharged		Flooded		Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
1.000	PS2	-0.054	0.000	0.44			3.3	OK	
1.001	PS7	-0.052	0.000	0.46			3.3	OK	
1.002	PS6	-0.052	0.000	0.46			3.3	OK	
1.003	PS5	-0.020	0.000	0.95			6.6	OK	
1.004	PS4	-0.011	0.000	1.00			6.5	OK	
1.005	PS3	-0.046	0.000	0.58			6.5	OK	
2.000	PS13	-0.100	0.000	0.00			0.0	OK	
2.001	PS12	-0.051	0.000	0.48			3.4	OK	
2.002	PS11	-0.055	0.000	0.41			3.4	OK	
2.003	PS10	-0.047	0.000	0.55			3.4	OK	
2.004	PS9	-0.020	0.000	0.98			6.7	OK	
2.005	PS8	-0.024	0.000	0.93			6.7	OK	
1.006	S1	-0.056	0.000	0.70			31.8	OK	
3.000	S2	0.572	0.000	1.33			25.3	SURCHARGED	
1.007	S3	0.341	0.000	1.16			57.1	SURCHARGED	
4.000	PS37	-0.051	0.000	0.49			7.0	OK	
4.001	PS36	0.161	0.000	0.68			6.8	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.008	S4	60 Summer	100	+40%	100/60 Summer		
5.000	PS46	60 Summer	100	+40%	100/60 Summer		
5.001	PS43	60 Summer	100	+40%	100/60 Summer		
1.009	S5	60 Summer	100	+40%	30/60 Summer		
6.000	S6	60 Summer	100	+40%	30/60 Summer		
1.010	S7	60 Summer	100	+40%	30/60 Summer		
7.000	PS20	60 Summer	2	+40%			
7.001	PS18	60 Summer	100	+40%			
8.000	PS19	60 Summer	2	+40%			
7.002	PS17	60 Summer	100	+40%			
9.000	PS21	60 Summer	2	+40%			
7.003	PS16	60 Summer	100	+40%			
10.000	PS22	60 Summer	100	+40%			
7.004	PS15	60 Summer	100	+40%	100/60 Summer		
7.005	PS14	60 Summer	100	+40%	100/60 Summer		
1.011	S8	60 Summer	100	+40%	30/60 Summer		
1.012	Outfall to pond	60 Summer	100	+40%			
11.000	PS51	60 Summer	100	+40%	100/60 Summer		
11.001	PS50	60 Summer	100	+40%	100/60 Summer		
11.002	PS49	60 Summer	100	+40%	30/60 Summer		
11.003	PS48	360 Summer	100	+40%			
11.004	Outfall 2	360 Summer	100	+40%	100/120 Summer		
1.013	Pond outlet	360 Summer	100	+40%	2/120 Summer		
1.014	Flow control MH	360 Summer	100	+40%	2/60 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
1.008	S4		49.810	0.295	0.000	1.04		
5.000	PS46		48.509	0.101	0.000	0.55		
5.001	PS43		48.418	0.328	0.000	0.54		
1.009	S5		48.338	0.541	0.000	1.55		
6.000	S6		48.753	0.663	0.000	1.37		
1.010	S7		47.871	0.267	0.000	1.14		
7.000	PS20		48.032	-0.100	0.000	0.00		
7.001	PS18		47.967	-0.039	0.000	0.68		
8.000	PS19		47.878	-0.100	0.000	0.00		
7.002	PS17		47.787	-0.062	0.000	0.64		
9.000	PS21		47.790	-0.100	0.000	0.00		
7.003	PS16		47.747	-0.013	0.000	0.80		
10.000	PS22		47.688	-0.052	0.000	0.01		
7.004	PS15		47.688	0.048	0.000	0.66		
7.005	PS14		47.643	0.123	0.000	0.59		
1.011	S8		47.608	0.205	0.000	1.51		
1.012	Outfall to pond		47.269	-0.211	0.000	0.40		
11.000	PS51		47.467	0.011	0.000	0.62		
11.001	PS50		47.433	0.066	0.000	0.99		

Mayer Brown Limited		Page 19
Lion House Oriental Road Woking, GU22 8AR	Residential Development Main Road, Rookley	
Date 26/11/2020 File MD RUN 26_11_20 BACK UP...	Designed by Gavin Toogood Checked by KWF	
Innovyze	Network 2020.1	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Overflow Act.	Water Surcharged Flooded			Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
			Level (m)	Depth (m)	Volume (m ³)			
11.002	PS49		47.348	0.068	0.000	1.34		
11.003	PS48		47.247	-0.018	0.000	0.14		
11.004	Outfall 2		47.246	0.196	0.000	0.16		
1.013	Pond outlet		47.243	1.168	0.000	0.64		
1.014	Flow control MH		47.242	1.436	0.000	0.20		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
5.000	PS46	6.7	SURCHARGED	
5.001	PS43	6.5	SURCHARGED	
1.009	S5	126.9	SURCHARGED	
6.000	S6	26.4	FLOOD RISK	
1.010	S7	164.5	SURCHARGED	
7.000	PS20	0.0	OK	
7.001	PS18	4.3	OK	
8.000	PS19	0.0	OK	
7.002	PS17	8.7	OK	
9.000	PS21	0.0	OK	
7.003	PS16	12.9	OK	
10.000	PS22	0.1	OK	
7.004	PS15	11.8	SURCHARGED	
7.005	PS14	11.1	SURCHARGED	
1.011	S8	185.3	SURCHARGED	
1.012	Outfall to pond	185.1	OK	
11.000	PS51	8.1	SURCHARGED	
11.001	PS50	13.0	SURCHARGED	
11.002	PS49	17.8	FLOOD RISK	
11.003	PS48	5.6	FLOOD RISK	
11.004	Outfall 2	5.6	FLOOD RISK	
1.013	Pond outlet	68.4	SURCHARGED	
1.014	Flow control MH	5.0	FLOOD RISK	