

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)	2	Volumetric Runoff Coeff. 1.000
		PIMP (%) 100
FEH Rainfall Version	2013	Add Flow / Climate Change (%) 0
Site Location	GB 500029 102020 TQ 00029 02020	Minimum Backdrop Height (m) 0.200
Data Type	Point	Maximum Backdrop Height (m) 1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m) 1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s) 1.00
Foul Sewage (l/s/ha)	0.000	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	28.361	0.057	497.6	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit	
1.001	97.123	0.194	500.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.002	87.923	0.176	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
2.000	15.131	0.050	300.0	0.063	5.00	0.0	0.600	o	375	Pipe/Conduit	
2.001	11.875	0.040	300.0	0.008	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.002	14.026	0.047	300.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.003	16.490	0.055	300.0	0.038	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.004	19.563	0.065	300.0	0.023	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.005	15.182	0.051	300.0	0.071	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.006	5.417	0.018	300.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	109.265	0.372	293.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.000	25.908	0.065	400.0	0.067	5.00	0.0	0.600	o	450	Pipe/Conduit	
3.001	53.816	0.135	400.0	0.103	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	11.885	0.070	170.0	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	10.990	0.178	61.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	31.007	0.062	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.005	145.437	0.291	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.006	35.161	0.165	213.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.007	32.217	0.535	60.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	20.274	0.140	144.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.000	28.521	0.082	349.1	0.119	5.00	0.0	0.600	o	525	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.44	5.567	0.000	0.0	0.0	0.0	1.08	306.7	0.0
1.001	50.00	6.93	5.510	0.000	0.0	0.0	0.0	1.08	305.8	0.0
1.002	50.00	8.29	5.316	0.000	0.0	0.0	0.0	1.08	306.0	0.0
2.000	50.00	5.24	5.466	0.063	0.0	0.0	0.0	1.04	115.0	11.4
2.001	50.00	5.43	5.415	0.071	0.0	0.0	0.0	1.04	115.0	12.8
2.002	50.00	5.66	5.375	0.071	0.0	0.0	0.0	1.04	115.0	12.8
2.003	50.00	5.92	5.329	0.109	0.0	0.0	0.0	1.04	115.0	19.6
2.004	50.00	6.23	5.274	0.132	0.0	0.0	0.0	1.04	115.0	23.8
2.005	50.00	6.48	5.209	0.202	0.0	0.0	0.0	1.04	115.0	36.5
2.006	50.00	6.56	5.158	0.202	0.0	0.0	0.0	1.04	115.0	36.5
1.003	49.13	9.57	5.140	0.202	0.0	0.0	0.0	1.42	400.2	36.5
3.000	50.00	5.43	5.145	0.067	0.0	0.0	0.0	1.01	160.7	12.0
3.001	50.00	6.32	5.080	0.170	0.0	0.0	0.0	1.01	160.7	30.7
4.000	50.00	5.20	5.241	0.045	0.0	0.0	0.0	1.00	39.8	8.1
3.002	50.00	6.39	4.946	0.215	0.0	0.0	0.0	2.59	411.7	38.8
1.004	47.85	10.05	4.768	0.417	0.0	0.0	0.0	1.08	306.0	72.0
1.005	42.76	12.29	4.706	0.417	0.0	0.0	0.0	1.08	306.0	72.0
1.006	42.08	12.64	4.415	0.417	0.0	0.0	0.0	1.66	470.7	72.0
1.007	41.69	12.85	4.250	0.417	0.0	0.0	0.0	2.62	417.3	72.0
1.008	41.32	13.05	3.715	0.417	0.0	0.0	0.0	1.69	268.4	72.0
5.000	50.00	5.40	5.008	0.119	0.0	0.0	0.0	1.19	258.3	21.5

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
5.001	23.491	0.067	349.1	0.034	0.00	0.0	0.600	o	525	Pipe/Conduit	
6.000	34.792	0.205	170.0	0.093	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	29.256	0.083	351.7	0.096	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.003	21.042	0.060	351.7	0.028	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.004	52.899	0.151	350.3	0.152	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.005	48.754	0.139	350.7	0.074	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.006	25.998	0.074	351.3	0.051	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.007	36.373	0.179	203.3	0.101	0.00	0.0	0.600	o	525	Pipe/Conduit	
7.000	23.828	0.079	300.0	0.051	5.00	0.0	0.600	o	375	Pipe/Conduit	
7.001	45.710	0.152	300.0	0.118	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.002	20.537	0.061	334.8	0.013	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.008	54.810	0.205	267.2	0.051	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.009	9.745	0.032	300.0	0.016	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.010	45.798	0.153	300.0	0.041	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.011	21.668	0.067	322.2	0.018	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.012	19.844	0.215	92.5	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
8.000	41.263	0.183	225.0	0.088	5.00	0.0	0.600	o	300	Pipe/Conduit	
9.000	17.810	0.078	228.7	0.029	5.00	0.0	0.600	o	300	Pipe/Conduit	
8.001	14.886	0.207	72.0	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.002	31.507	0.215	146.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	10.152	0.080	126.8	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.010	8.690	0.085	101.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	38.228	0.109	350.0	0.147	5.00	0.0	0.600	o	450	Pipe/Conduit	
10.001	25.673	0.075	344.1	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.002	17.791	0.051	349.9	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.003	28.657	0.082	350.0	0.047	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.004	18.370	0.056	325.3	0.042	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.011	55.523	0.319	174.1	0.183	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.012	29.136	0.208	140.1	0.063	0.00	0.0	0.600	o	525	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)
5.001	50.00	5.73	4.926	0.153	0.0	0.0	0.0	1.19	258.3	27.7
6.000	50.00	5.58	5.336	0.093	0.0	0.0	0.0	1.00	39.8	16.8
5.002	50.00	6.14	4.859	0.343	0.0	0.0	0.0	1.19	257.3	61.8
5.003	50.00	6.43	4.776	0.371	0.0	0.0	0.0	1.19	257.3	66.9
5.004	50.00	7.17	4.716	0.523	0.0	0.0	0.0	1.19	257.8	94.3
5.005	50.00	7.85	4.565	0.596	0.0	0.0	0.0	1.19	257.7	107.6
5.006	50.00	8.22	4.425	0.647	0.0	0.0	0.0	1.19	257.4	116.8
5.007	50.00	8.61	4.351	0.748	0.0	0.0	0.0	1.57	339.3	135.1
7.000	50.00	5.38	4.615	0.051	0.0	0.0	0.0	1.04	115.0	9.2
7.001	50.00	6.11	4.536	0.169	0.0	0.0	0.0	1.04	115.0	30.6
7.002	50.00	6.46	4.383	0.183	0.0	0.0	0.0	0.98	108.7	33.0
5.008	49.96	9.28	4.172	0.982	0.0	0.0	0.0	1.37	295.6	177.2
5.009	49.60	9.40	3.967	0.998	0.0	0.0	0.0	1.29	278.8	178.8
5.010	48.00	9.99	3.935	1.039	0.0	0.0	0.0	1.29	278.8	180.1
5.011	47.25	10.28	3.782	1.057	0.0	0.0	0.0	1.24	268.9	180.3
5.012	46.90	10.43	3.715	1.057	0.0	0.0	0.0	2.33	504.4	180.3
8.000	50.00	5.66	4.105	0.088	0.0	0.0	0.0	1.04	73.8	15.9
9.000	50.00	5.29	4.000	0.029	0.0	0.0	0.0	1.04	73.2	5.2
8.001	50.00	5.79	3.922	0.138	0.0	0.0	0.0	1.86	131.1	24.9
8.002	50.00	6.20	3.715	0.138	0.0	0.0	0.0	1.30	91.7	24.9
1.009	41.16	13.13	3.500	1.611	0.0	0.0	0.0	1.99	430.3	239.5
1.010	41.03	13.20	3.420	1.611	0.0	0.0	0.0	2.01	320.3	239.5
10.000	50.00	5.59	3.708	0.147	0.0	0.0	0.0	1.08	171.9	26.6
10.001	50.00	5.98	3.599	0.171	0.0	0.0	0.0	1.09	173.4	30.8
10.002	50.00	6.26	3.524	0.195	0.0	0.0	0.0	1.08	171.9	35.1
10.003	50.00	6.70	3.473	0.241	0.0	0.0	0.0	1.08	171.9	43.6
10.004	50.00	6.97	3.391	0.283	0.0	0.0	0.0	1.12	178.4	51.1
1.011	40.07	13.75	3.260	2.078	0.0	0.0	0.0	1.69	366.9	300.7
1.012	39.64	14.01	2.941	2.140	0.0	0.0	0.0	1.89	409.3	306.4

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
1.013	19.938	0.175	113.9	0.068	0.00	0.0	0.600	o	525	Pipe/Conduit	
11.000	20.076	1.140	17.6	0.057	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.014	27.783	0.143	193.8	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
12.000	23.000	0.134	171.3	0.084	5.00	0.0	0.600	o	300	Pipe/Conduit	
12.001	26.839	0.157	171.3	0.015	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.002	15.864	0.435	36.5	0.002	0.00	0.0	0.600	o	300	Pipe/Conduit	
13.000	42.326	0.212	200.0	0.097	5.00	0.0	0.600	o	300	Pipe/Conduit	
12.003	66.498	0.161	414.1	0.203	0.00	0.0	0.600	o	525	Pipe/Conduit	
14.000	25.194	0.105	240.0	0.092	5.00	0.0	0.600	o	300	Pipe/Conduit	
14.001	18.652	0.078	240.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.004	62.334	0.113	550.0	0.206	0.00	0.0	0.600	o	600	Pipe/Conduit	
15.000	80.176	0.146	550.0	0.134	5.00	0.0	0.600	o	600	Pipe/Conduit	
15.001	25.471	0.046	550.0	0.048	0.00	0.0	0.600	o	600	Pipe/Conduit	
15.002	15.321	0.028	550.0	0.009	0.00	0.0	0.600	o	600	Pipe/Conduit	
15.003	50.454	0.092	550.0	0.094	0.00	0.0	0.600	o	600	Pipe/Conduit	
16.000	24.257	0.044	550.0	0.100	5.00	0.0	4.616	o	600	Pipe/Conduit	
16.001	25.880	0.047	550.0	0.071	0.00	0.0	0.600	o	600	Pipe/Conduit	
16.002	24.395	0.044	550.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
12.005	30.798	0.056	550.0	0.046	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.006	12.512	0.023	544.0	0.051	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.007	65.279	0.109	598.9	0.157	0.00	0.0	0.600	o	750	Pipe/Conduit	
17.000	15.348	0.051	300.0	0.064	5.00	0.0	0.600	o	375	Pipe/Conduit	
17.001	19.319	0.064	300.0	0.031	0.00	0.0	0.600	o	375	Pipe/Conduit	
17.002	21.912	0.073	300.0	0.045	0.00	0.0	0.600	o	375	Pipe/Conduit	
17.003	23.594	0.079	300.0	0.093	0.00	0.0	0.600	o	375	Pipe/Conduit	
12.008	14.714	0.036	408.7	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.009	42.836	0.150	285.6	0.000	0.00	0.0	0.600	o	750	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)
1.013	39.38	14.17	2.733	2.209	0.0	0.0	0.0	2.10	454.1	314.1
11.000	50.00	5.11	3.956	0.057	0.0	0.0	0.0	3.13	124.6	10.3
1.014	38.91	14.45	2.558	2.266	0.0	0.0	0.0	1.61	347.5	318.4
12.000	50.00	5.32	5.824	0.084	0.0	0.0	0.0	1.20	84.7	15.2
12.001	50.00	5.69	5.690	0.099	0.0	0.0	0.0	1.20	84.7	17.8
12.002	50.00	5.79	5.533	0.100	0.0	0.0	0.0	2.61	184.6	18.1
13.000	50.00	5.64	5.310	0.097	0.0	0.0	0.0	1.11	78.3	17.5
12.003	50.00	6.81	4.873	0.400	0.0	0.0	0.0	1.09	236.9	72.3
14.000	50.00	5.42	5.059	0.092	0.0	0.0	0.0	1.01	71.4	16.6
14.001	50.00	5.72	4.954	0.092	0.0	0.0	0.0	1.01	71.4	16.6
12.004	50.00	7.81	4.638	0.698	0.0	0.0	0.0	1.03	291.6	126.0
15.000	50.00	6.30	4.836	0.134	0.0	0.0	0.0	1.03	291.6	24.2
15.001	50.00	6.71	4.690	0.182	0.0	0.0	0.0	1.03	291.6	32.9
15.002	50.00	6.95	4.644	0.191	0.0	0.0	0.0	1.03	291.6	34.4
15.003	50.00	7.77	4.616	0.285	0.0	0.0	0.0	1.03	291.6	51.4
16.000	50.00	5.52	4.660	0.100	0.0	0.0	0.0	0.78	221.4	18.1
16.001	50.00	5.93	4.616	0.171	0.0	0.0	0.0	1.03	291.6	30.9
16.002	50.00	6.33	4.569	0.171	0.0	0.0	0.0	1.03	291.6	30.9
12.005	50.00	8.25	4.374	1.200	0.0	0.0	0.0	1.19	524.0	216.7
12.006	50.00	8.42	4.318	1.251	0.0	0.0	0.0	1.19	526.9	225.8
12.007	49.66	9.38	4.295	1.408	0.0	0.0	0.0	1.14	502.0	252.5
17.000	50.00	5.25	4.737	0.064	0.0	0.0	0.0	1.04	115.0	11.6
17.001	50.00	5.56	4.686	0.096	0.0	0.0	0.0	1.04	115.0	17.3
17.002	50.00	5.91	4.622	0.140	0.0	0.0	0.0	1.04	115.0	25.3
17.003	50.00	6.28	4.549	0.233	0.0	0.0	0.0	1.04	115.0	42.0
12.008	49.17	9.56	4.186	1.641	0.0	0.0	0.0	1.38	608.8	291.3
12.009	48.01	9.99	4.150	1.641	0.0	0.0	0.0	1.65	729.4	291.3

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
18.000	25.118	0.367	68.5	0.085	5.00	0.0	0.600	o	300	Pipe/Conduit	
18.001	41.777	0.316	132.3	0.089	0.00	0.0	0.600	o	300	Pipe/Conduit	
19.000	31.417	0.185	170.0	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
18.002	21.203	0.287	73.9	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
18.003	34.151	0.150	227.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
12.010	15.406	0.124	124.2	0.015	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.011	10.249	0.018	569.4	0.015	0.00	0.0	0.600	o	750	Pipe/Conduit	
20.000	64.238	0.268	240.0	0.222	5.00	0.0	0.600	o	300	Pipe/Conduit	
21.000	21.114	0.060	350.0	0.097	5.00	0.0	0.600	o	450	Pipe/Conduit	
12.012	60.660	0.135	449.3	0.095	0.00	0.0	0.600	o	750	Pipe/Conduit	
22.000	77.694	0.202	385.0	0.195	5.00	0.0	0.600	o	450	Pipe/Conduit	
22.001	72.686	0.189	385.0	0.101	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.002	16.187	0.042	385.0	0.011	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.003	43.336	0.113	385.0	0.076	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.004	39.028	0.101	385.0	0.065	0.00	0.0	0.600	o	450	Pipe/Conduit	
22.005	28.451	0.074	385.0	0.043	0.00	0.0	0.600	o	450	Pipe/Conduit	
12.013	43.769	0.155	282.4	0.098	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.014	22.569	0.041	550.5	0.020	0.00	0.0	0.600	o	750	Pipe/Conduit	
23.000	12.958	0.054	240.0	0.053	5.00	0.0	0.600	o	300	Pipe/Conduit	
23.001	35.802	0.149	240.0	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
23.002	14.587	0.061	240.0	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
23.003	33.784	0.141	240.0	0.066	0.00	0.0	0.600	o	300	Pipe/Conduit	
24.000	23.032	0.066	349.5	0.033	5.00	0.0	0.600	o	450	Pipe/Conduit	
12.015	72.316	0.129	560.6	0.138	0.00	0.0	0.600	o	750	Pipe/Conduit	
25.000	10.799	0.329	32.8	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
18.000	50.00	5.22	5.270	0.085	0.0	0.0	0.0	1.90	134.5	15.3
18.001	50.00	5.73	4.903	0.174	0.0	0.0	0.0	1.37	96.5	31.4
19.000	50.00	5.52	4.847	0.055	0.0	0.0	0.0	1.00	39.8	9.9
18.002	50.00	5.88	4.437	0.265	0.0	0.0	0.0	2.37	376.5	47.8
18.003	50.00	6.30	4.150	0.265	0.0	0.0	0.0	1.34	213.6	47.8
12.010	47.74	10.09	4.000	1.920	0.0	0.0	0.0	2.51	1108.7	331.1
12.011	47.37	10.24	3.876	1.936	0.0	0.0	0.0	1.17	514.9	331.1
20.000	50.00	6.06	4.576	0.222	0.0	0.0	0.0	1.01	71.4	40.1
21.000	50.00	5.33	4.218	0.097	0.0	0.0	0.0	1.08	171.9	17.6
12.012	45.51	11.01	3.858	2.350	0.0	0.0	0.0	1.31	580.3	386.1
22.000	50.00	6.26	4.743	0.195	0.0	0.0	0.0	1.03	163.8	35.1
22.001	50.00	7.43	4.542	0.296	0.0	0.0	0.0	1.03	163.8	53.5
22.002	50.00	7.70	4.353	0.308	0.0	0.0	0.0	1.03	163.8	55.5
22.003	50.00	8.40	4.311	0.384	0.0	0.0	0.0	1.03	163.8	69.3
22.004	50.00	9.03	4.198	0.449	0.0	0.0	0.0	1.03	163.8	81.1
22.005	49.36	9.49	4.097	0.492	0.0	0.0	0.0	1.03	163.8	87.7
12.013	44.52	11.45	3.723	2.939	0.0	0.0	0.0	1.66	733.5	472.6
12.014	43.84	11.77	3.569	2.959	0.0	0.0	0.0	1.19	523.8	472.6
23.000	50.00	5.21	4.307	0.053	0.0	0.0	0.0	1.01	71.4	9.6
23.001	50.00	5.80	4.253	0.115	0.0	0.0	0.0	1.01	71.4	20.8
23.002	50.00	6.04	4.104	0.136	0.0	0.0	0.0	1.01	71.4	24.6
23.003	50.00	6.60	4.043	0.203	0.0	0.0	0.0	1.01	71.4	36.6
24.000	50.00	5.35	3.894	0.033	0.0	0.0	0.0	1.08	172.0	5.9
12.015	41.79	12.79	3.528	3.333	0.0	0.0	0.0	1.17	519.0	503.0
25.000	50.00	5.07	4.177	0.000	0.0	0.0	0.0	2.75	194.6	0.0

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
12.016	21.599	0.042	514.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
26.000	36.236	0.091	400.0	0.111	5.00	0.0	0.600	o	450	Pipe/Conduit	
26.001	13.029	0.033	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.002	18.382	0.046	400.0	0.004	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.003	63.195	0.158	400.0	0.064	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.004	24.665	0.062	400.0	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.005	6.024	0.015	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.000	20.483	0.109	187.3	0.010	5.00	0.0	0.600	o	300	Pipe/Conduit	
26.006	16.026	0.050	322.3	0.089	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.007	6.306	0.105	60.1	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
26.008	17.566	0.040	439.1	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
26.009	19.086	0.049	389.5	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
12.017	13.157	0.023	572.1	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
28.000	16.115	0.067	240.0	0.095	5.00	0.0	0.600	o	300	Pipe/Conduit	
28.001	14.024	0.058	240.0	0.088	0.00	0.0	0.600	o	300	Pipe/Conduit	
28.002	19.661	0.082	240.0	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.018	17.738	0.032	554.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.019	13.808	0.025	552.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.020	40.282	0.100	402.8	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.021	12.469	0.914	13.6	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
12.022	11.266	0.071	158.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
1.015	21.917	0.100	219.2	0.062	0.00	0.0	0.600	o	750	Pipe/Conduit	
29.000	39.592	0.103	385.0	0.075	5.00	0.0	0.600	o	450	Pipe/Conduit	
29.001	18.737	0.049	385.0	0.074	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.002	23.617	0.061	385.0	0.020	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.003	18.621	0.048	385.0	0.008	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.004	19.221	0.050	385.0	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.005	13.712	0.036	385.0	0.008	0.00	0.0	0.600	o	450	Pipe/Conduit	
30.000	43.447	0.178	244.6	0.095	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
12.016	41.25	13.08	3.398	3.333	0.0	0.0	0.0	1.23	542.1	503.0
26.000	50.00	5.60	4.304	0.111	0.0	0.0	0.0	1.01	160.7	20.1
26.001	50.00	5.81	4.213	0.111	0.0	0.0	0.0	1.01	160.7	20.1
26.002	50.00	6.12	4.180	0.115	0.0	0.0	0.0	1.01	160.7	20.8
26.003	50.00	7.16	4.134	0.179	0.0	0.0	0.0	1.01	160.7	32.3
26.004	50.00	7.57	3.976	0.200	0.0	0.0	0.0	1.01	160.7	36.1
26.005	50.00	7.66	3.915	0.200	0.0	0.0	0.0	1.01	160.7	36.1
27.000	50.00	5.30	4.159	0.010	0.0	0.0	0.0	1.15	81.0	1.7
26.006	50.00	7.90	3.900	0.298	0.0	0.0	0.0	1.13	179.2	53.8
26.007	50.00	7.94	3.775	0.298	0.0	0.0	0.0	2.89	626.5	53.8
26.008	50.00	8.21	3.670	0.298	0.0	0.0	0.0	1.06	230.0	53.8
26.009	50.00	8.50	3.630	0.298	0.0	0.0	0.0	1.13	244.4	53.8
12.017	40.91	13.27	3.356	3.630	0.0	0.0	0.0	1.16	513.7«	536.3
28.000	50.00	5.27	3.991	0.095	0.0	0.0	0.0	1.01	71.4	17.2
28.001	50.00	5.50	3.923	0.183	0.0	0.0	0.0	1.01	71.4	33.0
28.002	50.00	5.82	3.865	0.200	0.0	0.0	0.0	1.01	71.4	36.1
12.018	40.47	13.52	3.333	3.830	0.0	0.0	0.0	1.18	522.0«	559.7
12.019	40.13	13.72	3.300	3.830	0.0	0.0	0.0	1.18	522.9«	559.7
12.020	39.32	14.20	3.275	3.830	0.0	0.0	0.0	1.39	613.2	559.7
12.021	39.28	14.23	3.175	3.830	0.0	0.0	0.0	7.60	3356.9	559.7
12.022	39.14	14.31	2.261	3.830	0.0	0.0	0.0	2.22	982.5	559.7
1.015	38.61	14.65	2.190	6.158	0.0	0.0	0.0	1.89	833.3«	858.5
29.000	50.00	5.64	3.883	0.075	0.0	0.0	0.0	1.03	163.8	13.5
29.001	50.00	5.94	3.780	0.149	0.0	0.0	0.0	1.03	163.8	26.9
29.002	50.00	6.33	3.732	0.169	0.0	0.0	0.0	1.03	163.8	30.5
29.003	50.00	6.63	3.670	0.177	0.0	0.0	0.0	1.03	163.8	31.9
29.004	50.00	6.94	3.622	0.207	0.0	0.0	0.0	1.03	163.8	37.4
29.005	50.00	7.16	3.572	0.215	0.0	0.0	0.0	1.03	163.8	38.9
30.000	50.00	5.72	3.861	0.095	0.0	0.0	0.0	1.00	70.7	17.2

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
29.006	13.125	0.026	499.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.007	98.853	0.160	617.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
31.000	43.720	0.182	240.0	0.120	5.00	0.0	0.600	o	300	Pipe/Conduit	
31.001	14.782	0.062	240.0	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
31.002	26.408	0.110	240.0	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
31.003	22.192	0.086	258.2	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit	
32.000	49.845	0.222	225.0	0.152	5.00	0.0	0.600	o	300	Pipe/Conduit	
32.001	9.993	0.041	245.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
32.002	22.275	0.076	292.1	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
31.004	13.017	0.036	366.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
31.005	13.374	0.085	157.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
29.008	10.005	0.035	287.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.009	31.172	0.250	124.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
29.010	24.828	0.198	125.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
29.011	42.740	0.042	1017.6	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
29.012	7.483	0.585	12.8	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.016	26.608	0.350	76.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
29.006	50.00	7.40	3.536	0.311	0.0	0.0	0.0	0.90	143.7	56.1
29.007	49.51	9.43	3.510	0.311	0.0	0.0	0.0	0.81	128.9	56.1
31.000	50.00	5.72	4.060	0.120	0.0	0.0	0.0	1.01	71.4	21.6
31.001	50.00	5.96	3.878	0.156	0.0	0.0	0.0	1.01	71.4	28.2
31.002	50.00	6.40	3.817	0.177	0.0	0.0	0.0	1.01	71.4	31.9
31.003	50.00	6.73	3.631	0.255	0.0	0.0	0.0	1.12	124.0	46.0
32.000	50.00	5.80	3.924	0.152	0.0	0.0	0.0	1.04	73.8	27.4
32.001	50.00	5.96	3.703	0.152	0.0	0.0	0.0	1.00	70.7	27.4
32.002	50.00	6.37	3.662	0.156	0.0	0.0	0.0	0.91	64.7	28.2
31.004	50.00	6.96	3.546	0.411	0.0	0.0	0.0	0.94	103.9	74.2
31.005	50.00	7.12	3.510	0.411	0.0	0.0	0.0	1.44	159.3	74.2
29.008	49.12	9.57	3.350	0.722	0.0	0.0	0.0	1.19	189.9	128.0
29.009	48.35	9.86	3.315	0.722	0.0	0.0	0.0	1.82	289.5	128.0
29.010	47.81	10.07	2.990	0.722	0.0	0.0	0.0	2.00	432.7	128.0
29.011	45.32	11.09	2.792	0.722	0.0	0.0	0.0	0.69	150.2	128.0
29.012	45.27	11.11	2.750	0.722	0.0	0.0	0.0	6.29	1360.8	128.0
1.016	38.36	14.81	2.090	6.880	0.0	0.0	0.0	2.80	790.3	953.0

Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall C. Name	Level I. (m)	Level I. (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.016	S26	3.915	1.740	0.000	1500	0
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Simulation Criteria for Surface Network 1

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	5	Number of Storage Structures	11	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 500029 102020 TQ 00029	Cv (Winter)	1.000
Data Type	Point Storm	Storm Duration (mins)	30

Rogers Cory Ptn Ltd				Page 6							
The Old School Old School Road Hook RG27 9NJ		Climping 5139									
Date 30/10/2024 15:57		Designed by JC									
File SW1(24-03-27).MDX		Checked by TRS									
Micro Drainage		Network 2020.1.3									
<u>Online Controls for Surface Network 1</u>											
<u>Hydro-Brake® Optimum Manhole: S159, DS/PN: 1.010, Volume (m³): 4.5</u>											
Unit Reference MD-SCU-0090-1000-1500-1000		Sump Available		Yes							
Design Head (m)		1.500		Diameter (mm) 90							
Design Flow (l/s)		10.0		Invert Level (m) 3.420							
Flush-Flo™		Calculated		Minimum Outlet Pipe Diameter (mm) 150							
Objective		Linear discharge profile		Suggested Manhole Diameter (mm) 1200							
Application		Surface									
Control Points		Head (m) Flow (l/s)		Control Points Head (m) Flow (l/s)							
Design Point (Calculated)		1.500 10.0		Kick-Flo® 0.134 3.3							
Flush-Flo™		0.115 3.3		Mean Flow over Head Range - 6.8							
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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	0.600	6.5	1.600	10.3	2.600	13.0	5.000	17.8	7.500	21.6
0.200	3.9	0.800	7.4	1.800	10.9	3.000	13.9	5.500	18.6	8.000	22.3
0.300	4.7	1.000	8.3	2.000	11.5	3.500	15.0	6.000	19.4	8.500	22.9
0.400	5.4	1.200	9.0	2.200	12.0	4.000	16.0	6.500	20.2	9.000	23.6
0.500	6.0	1.400	9.7	2.400	12.5	4.500	16.9	7.000	20.9	9.500	24.2
<u>Hydro-Brake® Optimum Manhole: S158, DS/PN: 12.011, Volume (m³): 9.8</u>											
Unit Reference MD-SCU-0090-1000-1500-1000		Sump Available		Yes							
Design Head (m)		1.500		Diameter (mm) 90							
Design Flow (l/s)		10.0		Invert Level (m) 3.876							
Flush-Flo™		Calculated		Minimum Outlet Pipe Diameter (mm) 150							
Objective		Linear discharge profile		Suggested Manhole Diameter (mm) 1200							
Application		Surface									
Control Points		Head (m) Flow (l/s)		Control Points Head (m) Flow (l/s)							
Design Point (Calculated)		1.500 10.0		Kick-Flo® 0.134 3.3							
Flush-Flo™		0.115 3.3		Mean Flow over Head Range - 6.8							
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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	0.600	6.5	1.600	10.3	2.600	13.0	5.000	17.8	7.500	21.6
0.200	3.9	0.800	7.4	1.800	10.9	3.000	13.9	5.500	18.6	8.000	22.3
0.300	4.7	1.000	8.3	2.000	11.5	3.500	15.0	6.000	19.4	8.500	22.9
0.400	5.4	1.200	9.0	2.200	12.0	4.000	16.0	6.500	20.2	9.000	23.6
0.500	6.0	1.400	9.7	2.400	12.5	4.500	16.9	7.000	20.9	9.500	24.2
<u>Hydro-Brake® Optimum Manhole: S70, DS/PN: 26.009, Volume (m³): 6.1</u>											
Unit Reference MD-SCU-0110-1500-1500-1500		Sump Available		Yes							
Design Head (m)		1.500		Diameter (mm) 110							
Design Flow (l/s)		15.0		Invert Level (m) 3.630							
Flush-Flo™		Calculated		Minimum Outlet Pipe Diameter (mm) 150							
Objective		Linear discharge profile		Suggested Manhole Diameter (mm) 1200							
Application		Surface									
Control Points		Head (m) Flow (l/s)		Control Points Head (m) Flow (l/s)							
Design Point (Calculated)		1.500 15.0		Kick-Flo® 0.166 5.3							
Flush-Flo™		0.136 5.4		Mean Flow over Head Range - 10.1							
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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.600	9.7	1.600	15.5	2.600	19.5	5.000	26.7	7.500	32.5
0.200	5.8	0.800	11.1	1.800	16.4	3.000	20.9	5.500	28.0	8.000	33.6
0.300	7.0	1.000	12.4	2.000	17.2	3.500	22.5	6.000	29.2	8.500	34.6
0.400	8.0	1.200	13.5	2.200	18.0	4.000	24.0	6.500	30.3	9.000	35.5
0.500	8.9	1.400	14.5	2.400	18.8	4.500	25.4	7.000	31.4	9.500	36.5
<u>Hydro-Brake® Optimum Manhole: S163, DS/PN: 29.009, Volume (m³): 3.8</u>											
Unit Reference MD-SCU-0090-1000-1500-1000		Sump Available		Yes							
Design Head (m)		1.500		Diameter (mm) 90							
Design Flow (l/s)		10.0		Invert Level (m) 3.315							
Flush-Flo™		Calculated		Minimum Outlet Pipe Diameter (mm) 150							
Objective		Linear discharge profile		Suggested Manhole Diameter (mm) 1200							
Application		Surface									
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Hydro-Brake® Optimum Manhole: S163, DS/PN: 29.009, Volume (m³): 3.8

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	10.0	Kick-Flo®	0.134	3.3
Flush-Flo™	0.115	3.3	Mean Flow over Head Range	-	6.8

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	0.600	6.5	1.600	10.3	2.600	13.0	5.000	17.8	7.500	21.6
0.200	3.9	0.800	7.4	1.800	10.9	3.000	13.9	5.500	18.6	8.000	22.3
0.300	4.7	1.000	8.3	2.000	11.5	3.500	15.0	6.000	19.4	8.500	22.9
0.400	5.4	1.200	9.0	2.200	12.0	4.000	16.0	6.500	20.2	9.000	23.6
0.500	6.0	1.400	9.7	2.400	12.5	4.500	16.9	7.000	20.9	9.500	24.2

Hydro-Brake® Optimum Manhole: S25, DS/PN: 1.016, Volume (m³): 13.5

Unit Reference	MD-SCU-0109-1900-2600-1900	Sump Available	Yes
Design Head (m)	2.600	Diameter (mm)	109
Design Flow (l/s)	19.0	Invert Level (m)	2.090
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Linear discharge profile	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.600	19.0	Kick-Flo®	0.163	5.2
Flush-Flo™	0.134	5.3	Mean Flow over Head Range	-	12.9

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.1	0.600	9.5	1.600	15.1	2.600	19.0	5.000	26.0	7.500	31.7
0.200	5.7	0.800	10.8	1.800	15.9	3.000	20.3	5.500	27.2	8.000	32.7
0.300	6.8	1.000	12.0	2.000	16.8	3.500	21.9	6.000	28.4	8.500	33.6
0.400	7.8	1.200	13.1	2.200	17.5	4.000	23.4	6.500	29.5	9.000	34.6
0.500	8.7	1.400	14.1	2.400	18.3	4.500	24.7	7.000	30.6	9.500	35.5

Rogers Cory Ptn Ltd		Page 8																																																																																																																																																																																																																																																																							
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Storage Structures for Surface Network 1 Cellular Storage Manhole: S165, DS/PN: 5.001 Invert Level (m) 4.950 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>28.0</td><td>0.0</td><td>0.800</td><td>28.0</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr></table> Cellular Storage Manhole: S167, DS/PN: 5.003 Invert Level (m) 4.800 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>28.0</td><td>0.0</td><td>0.800</td><td>28.0</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr></table> Tank or Pond Manhole: S87, DS/PN: 1.009 Invert Level (m) 3.500 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>664.5</td><td>0.400</td><td>809.1</td><td>0.800</td><td>964.3</td><td>1.200</td><td>1129.5</td><td>1.600</td><td>1304.6</td></tr><tr><td>0.100</td><td>699.2</td><td>0.500</td><td>846.9</td><td>0.900</td><td>1004.6</td><td>1.300</td><td>1172.3</td><td>1.700</td><td>1350.0</td></tr><tr><td>0.200</td><td>735.2</td><td>0.600</td><td>885.4</td><td>1.000</td><td>1045.6</td><td>1.400</td><td>1215.8</td><td>1.800</td><td>1395.9</td></tr><tr><td>0.300</td><td>771.8</td><td>0.700</td><td>924.5</td><td>1.100</td><td>1087.2</td><td>1.500</td><td>1259.9</td><td>1.900</td><td>1442.5</td></tr></table> Cellular Storage Manhole: S5, DS/PN: 12.004 Invert Level (m) 4.638 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>75.0</td><td>0.0</td><td>0.400</td><td>75.0</td><td>0.0</td><td>0.401</td><td>0.0</td><td>0.0</td></tr></table> Tank or Pond Manhole: S12, DS/PN: 12.010 Invert Level (m) 4.000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1003.0</td><td>0.400</td><td>1238.4</td><td>0.800</td><td>1489.1</td><td>1.200</td><td>1754.1</td><td>1.600</td><td>2033.4</td></tr><tr><td>0.100</td><td>1059.6</td><td>0.500</td><td>1299.7</td><td>0.900</td><td>1554.0</td><td>1.300</td><td>1822.6</td><td>1.700</td><td>2105.4</td></tr><tr><td>0.200</td><td>1118.3</td><td>0.600</td><td>1362.0</td><td>1.000</td><td>1619.9</td><td>1.400</td><td>1892.0</td><td>1.800</td><td>2178.3</td></tr><tr><td>0.300</td><td>1177.9</td><td>0.700</td><td>1425.1</td><td>1.100</td><td>1686.5</td><td>1.500</td><td>1962.2</td><td>1.900</td><td>2252.1</td></tr></table> Tank or Pond Manhole: S69, DS/PN: 26.008 Invert Level (m) 3.675 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>57.5</td><td>0.400</td><td>104.9</td><td>0.800</td><td>161.6</td><td>1.200</td><td>227.3</td><td>1.600</td><td>302.0</td></tr><tr><td>0.100</td><td>68.4</td><td>0.500</td><td>118.3</td><td>0.900</td><td>177.2</td><td>1.300</td><td>245.1</td><td>1.700</td><td>322.1</td></tr><tr><td>0.200</td><td>80.0</td><td>0.600</td><td>132.1</td><td>1.000</td><td>193.3</td><td>1.400</td><td>263.5</td><td>1.800</td><td>342.8</td></tr><tr><td>0.300</td><td>92.2</td><td>0.700</td><td>146.6</td><td>1.100</td><td>210.0</td><td>1.500</td><td>282.5</td><td>1.900</td><td>364.0</td></tr></table> Cellular Storage Manhole: S55, DS/PN: 12.018 Invert Level (m) 3.350 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>402.8</td><td>0.0</td><td>0.800</td><td>402.8</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr></table> Tank or Pond Manhole: S21, DS/PN: 12.021 Invert Level (m) 3.175 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>333.9</td><td>0.300</td><td>420.0</td><td>0.600</td><td>511.8</td><td>0.900</td><td>608.6</td><td>1.200</td><td>710.5</td></tr><tr><td>0.100</td><td>361.7</td><td>0.400</td><td>450.0</td><td>0.700</td><td>543.5</td><td>1.000</td><td>642.0</td><td>1.300</td><td>745.6</td></tr><tr><td>0.200</td><td>390.6</td><td>0.500</td><td>480.6</td><td>0.800</td><td>575.7</td><td>1.100</td><td>676.0</td><td>1.400</td><td>781.2</td></tr></table> Tank or Pond Manhole: S138, DS/PN: 29.008 Invert Level (m) 3.350				Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	28.0	0.0	0.800	28.0	0.0	0.801	0.0	0.0	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	28.0	0.0	0.800	28.0	0.0	0.801	0.0	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	664.5	0.400	809.1	0.800	964.3	1.200	1129.5	1.600	1304.6	0.100	699.2	0.500	846.9	0.900	1004.6	1.300	1172.3	1.700	1350.0	0.200	735.2	0.600	885.4	1.000	1045.6	1.400	1215.8	1.800	1395.9	0.300	771.8	0.700	924.5	1.100	1087.2	1.500	1259.9	1.900	1442.5	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	75.0	0.0	0.400	75.0	0.0	0.401	0.0	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1003.0	0.400	1238.4	0.800	1489.1	1.200	1754.1	1.600	2033.4	0.100	1059.6	0.500	1299.7	0.900	1554.0	1.300	1822.6	1.700	2105.4	0.200	1118.3	0.600	1362.0	1.000	1619.9	1.400	1892.0	1.800	2178.3	0.300	1177.9	0.700	1425.1	1.100	1686.5	1.500	1962.2	1.900	2252.1	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	57.5	0.400	104.9	0.800	161.6	1.200	227.3	1.600	302.0	0.100	68.4	0.500	118.3	0.900	177.2	1.300	245.1	1.700	322.1	0.200	80.0	0.600	132.1	1.000	193.3	1.400	263.5	1.800	342.8	0.300	92.2	0.700	146.6	1.100	210.0	1.500	282.5	1.900	364.0	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	402.8	0.0	0.800	402.8	0.0	0.801	0.0	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	333.9	0.300	420.0	0.600	511.8	0.900	608.6	1.200	710.5	0.100	361.7	0.400	450.0	0.700	543.5	1.000	642.0	1.300	745.6	0.200	390.6	0.500	480.6	0.800	575.7	1.100	676.0	1.400	781.2
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																																																																																																																																																																																																																	
0.000	28.0	0.0	0.800	28.0	0.0	0.801	0.0	0.0																																																																																																																																																																																																																																																																	
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0.000	75.0	0.0	0.400	75.0	0.0	0.401	0.0	0.0																																																																																																																																																																																																																																																																	
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0.000	1003.0	0.400	1238.4	0.800	1489.1	1.200	1754.1	1.600	2033.4																																																																																																																																																																																																																																																																
0.100	1059.6	0.500	1299.7	0.900	1554.0	1.300	1822.6	1.700	2105.4																																																																																																																																																																																																																																																																
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0.300	1177.9	0.700	1425.1	1.100	1686.5	1.500	1962.2	1.900	2252.1																																																																																																																																																																																																																																																																
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Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)																																																																																																																																																																																																																																																																	
0.000	402.8	0.0	0.800	402.8	0.0	0.801	0.0	0.0																																																																																																																																																																																																																																																																	
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																																																																																																																																																																																																
0.000	333.9	0.300	420.0	0.600	511.8	0.900	608.6	1.200	710.5																																																																																																																																																																																																																																																																
0.100	361.7	0.400	450.0	0.700	543.5	1.000	642.0	1.300	745.6																																																																																																																																																																																																																																																																
0.200	390.6	0.500	480.6	0.800	575.7	1.100	676.0	1.400	781.2																																																																																																																																																																																																																																																																
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Tank or Pond Manhole: S138, DS/PN: 29.008

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	486.1	0.300	694.7	0.600	909.7	0.900	1129.8	1.200	1354.9	1.485	1573.2
0.100	554.1	0.400	765.8	0.700	982.5	1.000	1204.3	1.300	1431.0		
0.200	624.1	0.500	837.5	0.800	1055.9	1.100	1279.3	1.400	1507.7		

Cellular Storage Manhole: S139, DS/PN: 29.010

Invert Level (m) 2.990 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	483.0	0.0	0.800	483.0	0.0	0.801	0.0	0.0

Cellular Storage Manhole: S24, DS/PN: 29.012

Invert Level (m) 2.750 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	920.0	0.0	0.800	920.0	0.0	0.801	0.0	0.0

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

		Half Drain	Pipe		
		US/MH	Time	Flow	Level
PN	Name		(mins)	(l/s)	Exceeded
1.000	S73			0.0	OK
1.001	S74			0.0	OK
1.002	S76			0.0	OK
2.000	S92			16.5	OK
2.001	S93			17.9	OK
2.002	S94			17.7	OK
2.003	S95			25.5	OK
2.004	S96			30.0	OK
2.005	S97			44.1	OK
2.006	S98			44.0	OK
1.003	S100			41.4	OK
3.000	S99			17.2	OK
3.001	S101			39.3	OK
4.000	S122			11.8	OK
3.002	S102			49.7	OK
1.004	S118			82.4	OK
1.005	S82			75.1	OK
1.006	S83			74.4	OK
1.007	S85			74.6	OK
1.008	S86			13.9	OK
5.000	S107			30.8	OK
5.001	S165	8		33.1	OK
6.000	S113			24.5	OK
5.002	S108			73.9	OK
5.003	S167	10		76.3	OK
5.004	S109			101.0	OK
5.005	S110			110.6	OK
5.006	S111			116.7	OK
5.007	S112			128.0	OK
7.000	S121			13.3	OK
7.001	S103			39.3	OK
7.002	S106			41.6	OK
5.008	S105			165.7	OK
5.009	S124			166.1	OK
5.010	S125			168.5	OK
5.011	S126			169.1	OK
5.012	S127			35.1	OK
8.000	S47			22.7	OK
9.000	S46			1.0	OK
8.001	S128			4.7	OK
8.002	S129			4.5	SURCHARGED
1.009	S87			8.0	SURCHARGED
1.010	S159			6.2	SURCHARGED
10.000	S50			38.0	OK
10.001	S51			22.6	OK
10.002	S49			24.1	OK
10.003	S48			28.3	OK
10.004	S152			30.0	OK
1.011	S88			50.4	OK
1.012	S89			41.4	SURCHARGED
1.013	S90			9.7	SURCHARGED
11.000	S156			15.1	OK
1.014	S91			9.4	SURCHARGED
12.000	S1			22.1	OK
12.001	S2			25.1	OK
12.002	S3			25.5	OK
13.000	S38			25.5	OK
12.003	S4			92.8	OK

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Micro Drainage		Network 2020.1.3			
<u>5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1</u>					

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Micro Drainage		
Network 2020.1.3		

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Half Drain Pipe					
US/MH		Time	Flow	Level	
PN	Name	(mins)	(l/s)	Status	Exceeded
31.004	S145		73.3	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

										Water	Surcharged	Flooded			Half Drain
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	
31.005	S146	30 Summer	5	+0%	30/30 Summer				3.729	-0.156	0.000	0.64			
29.008	S138	360 Winter	5	+0%	30/2160 Summer				3.655	-0.145	0.000	0.04			
29.009	S163	360 Winter	5	+0%	30/240 Summer				3.654	-0.111	0.000	0.02			
29.010	S139	10080 Summer	5	+0%	5/1440 Summer				3.544	0.029	0.000	0.01			2657
29.011	S140	10080 Summer	5	+0%	5/180 Summer				3.544	0.227	0.000	0.03			
29.012	S24	10080 Summer	5	+0%	5/180 Summer				3.544	0.269	0.000	0.02			3042
1.016	S25	10080 Summer	5	+0%	5/30 Summer				3.676	0.986	0.000	0.02			

		Pipe					
		US/MH	Flow			Level	
PN	Name		(l/s)	Status	Exceeded		
31.005	S146		73.3	OK			
29.008	S138		5.0	OK			
29.009	S163		5.0	OK			
29.010	S139		3.9	SURCHARGED			
29.011	S140		3.7	SURCHARGED			
29.012	S24		11.9	SURCHARGED			
1.016	S25		14.0	SURCHARGED			

10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

		Half Drain	Pipe		
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	S73		0.0	OK	
1.001	S74		0.0	OK	
1.002	S76		0.0	OK	
2.000	S92		20.5	OK	
2.001	S93		22.6	OK	
2.002	S94		22.5	OK	
2.003	S95		33.2	OK	
2.004	S96		39.5	OK	
2.005	S97		59.2	OK	
2.006	S98		58.9	OK	
1.003	S100		54.7	OK	
3.000	S99		21.6	OK	
3.001	S101		54.0	OK	
4.000	S122		14.7	OK	
3.002	S102		68.5	OK	
1.004	S118		110.4	OK	
1.005	S82		98.0	OK	
1.006	S83		97.0	OK	
1.007	S85		97.1	OK	
1.008	S86		16.2	SURCHARGED	
5.000	S107		38.4	OK	
5.001	S165	7	42.9	OK	
6.000	S113		30.6	OK	
5.002	S108		95.7	OK	
5.003	S167	9	100.5	OK	
5.004	S109		130.4	OK	
5.005	S110		142.1	OK	
5.006	S111		146.8	OK	
5.007	S112		156.5	OK	
7.000	S121		16.7	OK	
7.001	S103		55.0	OK	
7.002	S106		57.9	OK	
5.008	S105		202.6	OK	
5.009	S124		189.9	OK	
5.010	S125		193.4	OK	
5.011	S126		41.1	OK	
5.012	S127		40.3	OK	
8.000	S47		28.3	OK	
9.000	S46		1.1	OK	
8.001	S128		5.5	OK	
8.002	S129		5.2	SURCHARGED	
1.009	S87		8.0	SURCHARGED	
1.010	S159		6.3	SURCHARGED	
10.000	S50		35.7	OK	2
10.001	S51		37.6	OK	
10.002	S49		53.7	OK	
10.003	S48		45.8	SURCHARGED	
10.004	S152		29.0	SURCHARGED	
1.011	S88		50.1	SURCHARGED	
1.012	S89		48.5	SURCHARGED	
1.013	S90		13.5	SURCHARGED	
11.000	S156		18.8	OK	
1.014	S91		13.3	SURCHARGED	
12.000	S1		27.5	OK	
12.001	S2		31.8	OK	

10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

		Half Drain	Pipe		
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded
12.002	S3		32.4	OK	
13.000	S38		31.4	OK	
12.003	S4		124.8	OK	
14.000	S39		30.1	OK	
14.001	S40		29.7	OK	
12.004	S5	12	170.1	OK	
15.000	S27		40.7	OK	
15.001	S28		41.6	OK	
15.002	S29		37.8	OK	
15.003	S30		58.6	OK	
16.000	S116		31.9	OK	
16.001	S115		49.4	OK	
16.002	S114		38.6	OK	
12.005	S7		233.3	OK	
12.006	S8		237.7	OK	
12.007	S9		249.2	OK	
17.000	S153		20.8	OK	
17.001	S154		30.6	OK	
17.002	S155		44.5	OK	
17.003	S72		72.7	OK	
12.008	S10		281.4	OK	
12.009	S11		52.9	OK	
18.000	S41		27.8	OK	
18.001	S42		58.7	OK	
19.000	S117		17.9	OK	
18.002	S45		89.0	OK	
18.003	S162		8.6	OK	
12.010	S12		6.8	OK	
12.011	S158		6.8	OK	
20.000	S71		71.3	SURCHARGED	
21.000	S44		31.9	OK	
12.012	S13		124.1	OK	
22.000	S33		60.1	OK	
22.001	S161		84.6	OK	
22.002	S34		84.0	OK	
22.003	S35		94.5	OK	
22.004	S36		102.6	OK	
22.005	S37		107.4	OK	
12.013	S14		222.7	OK	
12.014	S15		215.6	OK	
23.000	S56		17.5	OK	
23.001	S57		37.9	OK	
23.002	S58		44.4	OK	
23.003	S59		63.5	OK	
24.000	S151		10.3	OK	
12.015	S16		277.9	OK	
25.000	S168		0.0	OK	
12.016	S17		261.7	OK	
26.000	S60		35.5	OK	
26.001	S61		34.6	OK	
26.002	S62		35.6	OK	
26.003	S63		50.0	OK	
26.004	S64		30.6	OK	
26.005	S65		29.8	OK	
27.000	S67		3.1	OK	
26.006	S66		44.4	OK	
26.007	S68		42.0	OK	
26.008	S69		8.7	OK	
26.009	S70		8.7	SURCHARGED	
12.017	S18		263.9	OK	
28.000	S52		29.9	OK	
28.001	S53		57.6	OK	
28.002	S54		62.1	OK	
12.018	S55	44	172.4	OK	
12.019	S19		172.4	OK	
12.020	S20		149.6	OK	
12.021	S21		30.1	OK	
12.022	S22		25.4	SURCHARGED	
1.015	S157		36.0	SURCHARGED	
29.000	S130		23.9	OK	
29.001	S131		44.8	OK	
29.002	S132		48.6	OK	
29.003	S133		46.5	OK	
29.004	S134		50.1	OK	
29.005	S135		50.4	OK	
30.000	S150		30.4	OK	
29.006	S136		75.7	OK	
29.007	S137		69.4	OK	
31.000	S141		38.2	OK	
31.001	S142		44.7	OK	
31.002	S143		48.2	OK	
31.003	S144		68.3	SURCHARGED	

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10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Half Drain Pipe					
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded
32.000	S147		47.5	OK	1

10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

										Water	Surcharged	Flooded	Half Drain		
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	
32.001	S148	30 Summer	10	+0%	5/30 Summer				4.088	0.085	0.000	0.79			
32.002	S149	30 Summer	10	+0%	5/30 Summer				4.012	0.050	0.000	0.76			
31.004	S145	30 Summer	10	+0%	10/30 Summer				3.936	0.015	0.000	1.45			
31.005	S146	30 Summer	10	+0%	30/30 Summer				3.796	-0.089	0.000	0.94			
29.008	S138	360 Winter	10	+0%	30/2160 Summer				3.705	-0.095	0.000	0.04			
29.009	S163	360 Winter	10	+0%	30/240 Summer				3.703	-0.062	0.000	0.02			
29.010	S139	2160 Winter	10	+0%	5/1440 Summer				3.656	0.141	0.000	0.05			
29.011	S140	2160 Winter	10	+0%	5/180 Summer				3.719	0.402	0.000	0.05			
29.012	S24	2160 Winter	10	+0%	5/180 Summer				3.740	0.465	0.000	0.02			
1.016	S25	2160 Winter	10	+0%	5/30 Summer				3.737	1.047	0.000	0.03			

		Pipe			
PN	US/MH Name	Flow (l/s)	Status	Level Exceeded	
32.001	S148	43.5	SURCHARGED		
32.002	S149	43.4	SURCHARGED		
31.004	S145	106.4	SURCHARGED		
31.005	S146	106.8	OK		
29.008	S138	5.3	OK		
29.009	S163	5.3	OK		
29.010	S139	17.7	SURCHARGED		
29.011	S140	6.7	SURCHARGED		
29.012	S24	9.7	SURCHARGED		
1.016	S25	15.0	SURCHARGED		

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

		Half Drain		Pipe		
		US/MH	Time	Flow	Level	
PN	Name		(mins)	(l/s)	Status	Exceeded
1.000	S73			0.0	OK	
1.001	S74			0.0	OK	
1.002	S76			0.0	OK	
2.000	S92			26.9	OK	
2.001	S93			29.1	OK	
2.002	S94			28.3	OK	
2.003	S95			41.4	OK	
2.004	S96			49.2	OK	
2.005	S97			75.2	OK	
2.006	S98			75.3	OK	
1.003	S100			70.1	OK	
3.000	S99			28.4	OK	
3.001	S101			71.1	OK	
4.000	S122			19.3	OK	
3.002	S102			90.1	OK	
1.004	S118			141.8	OK	
1.005	S82			126.8	OK	
1.006	S83			124.5	OK	
1.007	S85			124.2	OK	
1.008	S86			19.8	SURCHARGED	
5.000	S107			50.3	OK	
5.001	S165		8	53.8	OK	
6.000	S113			38.9	SURCHARGED	
5.002	S108			123.9	OK	
5.003	S167		10	131.1	OK	
5.004	S109			171.4	OK	
5.005	S110			182.2	OK	
5.006	S111			186.5	OK	
5.007	S112			200.4	OK	
7.000	S121			21.9	OK	
7.001	S103			72.1	OK	
7.002	S106			69.2	SURCHARGED	
5.008	S105			248.6	SURCHARGED	
5.009	S124			245.1	SURCHARGED	
5.010	S125			249.6	SURCHARGED	
5.011	S126			49.1	SURCHARGED	
5.012	S127			48.1	SURCHARGED	
8.000	S47			3.6	OK	
9.000	S46			1.2	SURCHARGED	
8.001	S128			5.5	SURCHARGED	
8.002	S129			5.3	SURCHARGED	
1.009	S87			9.3	SURCHARGED	
1.010	S159			6.7	SURCHARGED	
10.000	S50			58.6	SURCHARGED	2
10.001	S51			57.7	SURCHARGED	
10.002	S49			58.9	SURCHARGED	
10.003	S48			68.1	SURCHARGED	
10.004	S152			71.6	SURCHARGED	
1.011	S88			99.6	SURCHARGED	
1.012	S89			57.3	SURCHARGED	
1.013	S90			20.9	SURCHARGED	
11.000	S156			24.7	OK	
1.014	S91			20.1	SURCHARGED	
12.000	S1			36.2	OK	
12.001	S2			41.8	OK	

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

		Half Drain Pipe			
		US/MH	Time	Flow	Level
PN	Name		(mins)	(l/s)	Exceeded
12.002	S3			42.6	OK
13.000	S38			41.2	OK
12.003	S4			162.8	OK
14.000	S39			39.5	OK
14.001	S40			37.6	OK
12.004	S5		16	240.0	OK
15.000	S27			53.3	OK
15.001	S28			47.8	OK
15.002	S29			50.3	OK
15.003	S30			69.9	OK
16.000	S116			41.5	OK
16.001	S115			62.5	OK
16.002	S114			47.0	OK
12.005	S7			284.2	OK
12.006	S8			288.6	OK
12.007	S9			307.5	OK
17.000	S153			27.0	OK
17.001	S154			39.3	OK
17.002	S155			57.6	OK
17.003	S72			94.6	OK
12.008	S10			339.0	OK
12.009	S11			63.2	OK
18.000	S41			36.5	OK
18.001	S42			76.2	OK
19.000	S117			23.5	OK
18.002	S45			10.8	OK
18.003	S162			10.4	SURCHARGED
12.010	S12			7.3	OK
12.011	S158			7.3	SURCHARGED
20.000	S71			93.9	SURCHARGED
21.000	S44			41.9	OK
12.012	S13			160.2	OK
22.000	S33			78.9	OK
22.001	S161			110.7	OK
22.002	S34			109.4	OK
22.003	S35			122.7	OK
22.004	S36			133.2	OK
22.005	S37			139.4	OK
12.013	S14			283.0	OK
12.014	S15			266.1	OK
23.000	S56			21.8	OK
23.001	S57			45.5	OK
23.002	S58			51.3	SURCHARGED
23.003	S59			74.9	SURCHARGED
24.000	S151			13.0	OK
12.015	S16			346.9	OK
25.000	S168			0.0	OK
12.016	S17			300.1	OK
26.000	S60			46.7	OK
26.001	S61			45.5	OK
26.002	S62			46.7	OK
26.003	S63			65.8	OK
26.004	S64			42.8	OK
26.005	S65			41.0	OK
27.000	S67			2.2	OK
26.006	S66			62.2	OK
26.007	S68			49.5	SURCHARGED
26.008	S69			12.2	SURCHARGED
26.009	S70			8.4	SURCHARGED
12.017	S18			290.6	OK
28.000	S52			39.8	SURCHARGED
28.001	S53			77.1	SURCHARGED
28.002	S54			84.0	SURCHARGED
12.018	S55			229.9	OK
12.019	S19			29.6	OK
12.020	S20			29.5	OK
12.021	S21			38.9	OK
12.022	S22			33.9	SURCHARGED
1.015	S157			46.6	SURCHARGED
29.000	S130			31.2	OK
29.001	S131			56.8	OK
29.002	S132			59.5	OK
29.003	S133			57.8	OK
29.004	S134			61.0	OK
29.005	S135			61.2	OK
30.000	S150			39.9	OK
29.006	S136			82.9	OK
29.007	S137			3.5	OK
31.000	S141			48.6	SURCHARGED
31.001	S142			52.6	SURCHARGED
31.002	S143			58.4	SURCHARGED
31.003	S144			83.6	SURCHARGED

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

Half Drain Pipe					
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded
32.000	S147		59.4	SURCHARGED	1

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

										Water	Surcharged	Flooded			Half Drain
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	
32.001	S148	30 Summer	30	+0%	5/30 Summer				4.197	0.194	0.000	1.04			
32.002	S149	30 Summer	30	+0%	5/30 Summer				4.117	0.155	0.000	1.02			
31.004	S145	30 Summer	30	+0%	10/30 Summer				4.036	0.115	0.000	1.90			
31.005	S146	30 Summer	30	+0%	30/30 Summer				3.906	0.021	0.000	1.22			
29.008	S138	2880 Winter	30	+0%	30/2160 Summer				3.820	0.020	0.000	0.03			
29.009	S163	2880 Winter	30	+0%	30/240 Summer				3.831	0.065	0.000	0.02			
29.010	S139	2160 Winter	30	+0%	5/1440 Summer				3.861	0.346	0.000	0.06			
29.011	S140	2160 Winter	30	+0%	5/180 Summer				3.861	0.544	0.000	0.07			
29.012	S24	2160 Winter	30	+0%	5/180 Summer				3.867	0.592	0.000	0.02			
1.016	S25	2160 Winter	30	+0%	5/30 Summer				3.866	1.176	0.000	0.03			

					Pipe
					US/MH Flow
PN	Name	(l/s)	Status	Level Exceeded	
32.001	S148	57.4	SURCHARGED		
32.002	S149	58.2	SURCHARGED		
31.004	S145	139.2	SURCHARGED		
31.005	S146	138.9	SURCHARGED		
29.008	S138	4.2	SURCHARGED		
29.009	S163	4.2	SURCHARGED		
29.010	S139	19.3	SURCHARGED		
29.011	S140	8.2	SURCHARGED		
29.012	S24	9.7	SURCHARGED		
1.016	S25	15.7	SURCHARGED		

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 5 Number of Storage Structures 11 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 1.000
Site Location GB 500029 102020 TQ 00029 02020 Cv (Winter) 1.000

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

Profile(s) Summer and Winter
Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880,
4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 10, 30, 100
Climate Change (%) 0, 0, 0, 45

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

									Water	Surcharged	Flooded				
	US/MH			Return	Climate	First (X)		First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow
PN	Name	Storm		Period	Change	Surcharge		Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)
1.000	S73	30	Summer	100	+45%						5.567	-0.600	0.000	0.00	
1.001	S74	30	Summer	100	+45%						5.510	-0.600	0.000	0.00	
1.002	S76	30	Summer	100	+45%						5.373	-0.543	0.000	0.00	
2.000	S92	30	Summer	100	+45%	100/30	Summer				6.136	0.296	0.000	0.49	
2.001	S93	30	Summer	100	+45%	100/30	Summer				6.060	0.270	0.000	0.58	
2.002	S94	30	Summer	100	+45%	100/30	Summer				5.987	0.237	0.000	0.56	
2.003	S95	30	Summer	100	+45%	100/30	Summer				5.912	0.208	0.000	0.81	
2.004	S96	30	Summer	100	+45%	100/30	Summer				5.833	0.184	0.000	0.93	
2.005	S97	30	Summer	100	+45%	100/30	Summer				5.748	0.164	0.000	1.47	
2.006	S98	30	Summer	100	+45%	100/30	Summer				5.618	0.085	0.000	1.79	
1.003	S100	30	Summer	100	+45%						5.388	-0.352	0.000	0.31	
3.000	S99	30	Summer	100	+45%						5.462	-0.133	0.000	0.38	
3.001	S101	30	Summer	100	+45%						5.422	-0.109	0.000	0.89	
4.000	S122	30	Summer	100	+45%						5.465	0.000	0.000	1.02	
3.002	S102	30	Summer	100	+45%						5.268	-0.127	0.000	0.64	
1.004	S118	30	Summer	100	+45%						5.236	-0.132	0.000	0.95	
1.005	S82	30	Summer	100	+45%						5.122	-0.184	0.000	0.74	
1.006	S83	960	Summer	100	+45%						4.957	-0.058	0.000	0.08	
1.007	S85	960	Summer	100	+45%	100/120	Summer				4.956	0.256	0.000	0.08	
1.008	S86	960	Summer	100	+45%	10/240	Summer				4.955	0.790	0.000	0.14	
5.000	S107	30	Summer	100	+45%	100/30	Summer				6.369	0.836	0.000	0.40	
5.001	S165	30	Summer	100	+45%	100/30	Summer				6.352	0.901	0.000	0.42	
6.000	S113	30	Summer	100	+45%	30/30	Summer				6.678	1.117	0.000	1.66	
5.002	S108	30	Summer	100	+45%	100/30	Summer				6.332	0.948	0.000	0.80	
5.003	S167	30	Summer	100	+45%	100/30	Summer				6.282	0.981	0.000	0.90	
5.004	S109	30	Summer	100	+45%	100/30	Summer				6.232	0.991	0.000	0.96	
5.005	S110	30	Summer	100	+45%	100/30	Summer				6.066	0.976	0.000	1.06	
5.006	S111	30	Summer	100	+45%	100/30	Summer				5.916	0.966	0.000	1.21	
5.007	S112	30	Summer	100	+45%	100/30	Summer				5.827	0.951	0.000	0.96	
7.000	S121	30	Summer	100	+45%	100/30	Summer				5.918	0.928	0.000	0.31	
7.001	S103	30	Summer	100	+45%	100/30	Summer				5.869	0.959	0.000	0.99	
7.002	S106	30	Summer	100	+45%	30/30	Summer				5.761	1.003	0.000	1.12	
5.008	S105	30	Summer	100	+45%	30/30	Summer				5.683	0.986	0.000	1.46	
5.009	S124	30	Summer	100	+45%	30/30	Summer				5.277	0.785	0.000	2.15	
5.010	S125	30	Summer	100	+45%	30/30	Summer				5.019	0.559	0.000	1.64	
5.011	S126	960	Summer	100	+45%	30/30	Summer				4.957	0.650	0.000	0.30	
5.012	S127	960	Summer	100	+45%	30/120	Summer				4.955	0.716	0.000	0.18	
8.000	S47	960	Summer	100	+45%	100/60	Summer				4.955	0.550	0.000	0.09	
9.000	S46	960	Summer	100	+45%	30/180	Winter				4.955	0.655	0.000	0.03	
8.001	S128	960	Summer	100	+45%	30/120	Summer				4.955	0.733	0.000	0.09	
8.002	S129	960	Summer	100	+45%	5/180	Summer				4.954	0.939	0.000	0.12	
1.009	S87	960	Summer	100	+45%	5/180	Summer				4.954	0.929	0.000	0.05	
1.010	S159	180	Summer	100	+45%	5/60	Summer				5.301	1.431	0.000	0.05	
10.000	S50	30	Summer	100	+45%	30/30	Summer	100/30	Summer		5.721	1.563	2.889	0.61	
10.001	S51	30	Summer	100	+45%	30/30	Summer				5.641	1.592	0.000	0.69	
10.002	S49	30	Summer	100	+45%	30/30	Summer				5.406	1.432	0.000	0.82	
10.003	S48	30	Summer	100	+45%	10/60	Summer				5.149	1.226	0.000	0.97	
10.004	S152	60	Summer	100	+45%	10/30	Summer				5.061	1.220	0.000	0.99	
1.011	S88	60	Summer	100	+45%	10/30	Summer				4.989	1.204	0.000	0.64	
1.012	S89	30	Summer	100	+45%	5/30	Summer				4.886	1.420	0.000	0.87	
1.013	S90	1440	Winter	100	+45%	5/30	Summer				4.644	1.386	0.000	0.10	
11.000	S156	1440	Winter	100	+45%	100/30	Summer				4.631	0.450	0.000	0.03	
1.014	S91	1440	Winter	100	+45%	5/30	Summer				4.642	1.559	0.000	0.12	
12.000	S1	30	Summer	100	+45%	100/30	Summer				6.513	0.389	0.000	0.85	
12.001	S2	30	Summer	100	+45%	100/30	Summer				6.417	0.428	0.000	0.91	

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

		Half Drain	Pipe		
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	S73		0.0	OK	
1.001	S74		0.0	OK	
1.002	S76		1.1	OK	
2.000	S92		45.3	SURCHARGED	
2.001	S93		50.9	SURCHARGED	
2.002	S94		51.0	SURCHARGED	
2.003	S95		76.1	SURCHARGED	
2.004	S96		89.8	SURCHARGED	
2.005	S97		135.9	SURCHARGED	
2.006	S98		135.0	SURCHARGED	
1.003	S100		118.1	OK	
3.000	S99		51.9	OK	
3.001	S101		130.2	OK	
4.000	S122		34.6	OK	
3.002	S102		152.3	OK	
1.004	S118		239.1	OK	
1.005	S82		216.6	OK	
1.006	S83		31.7	OK	
1.007	S85		30.6	SURCHARGED	
1.008	S86		29.4	SURCHARGED	
5.000	S107		85.8	SURCHARGED	
5.001	S165	19	87.6	FLOOD RISK	
6.000	S113		62.1	FLOOD RISK	
5.002	S108		171.4	SURCHARGED	
5.003	S167	17	182.0	SURCHARGED	
5.004	S109		222.6	FLOOD RISK	
5.005	S110		242.1	FLOOD RISK	
5.006	S111		254.0	SURCHARGED	
5.007	S112		280.6	SURCHARGED	
7.000	S121		30.3	FLOOD RISK	
7.001	S103		105.0	FLOOD RISK	
7.002	S106		103.0	SURCHARGED	
5.008	S105		387.8	SURCHARGED	
5.009	S124		393.4	SURCHARGED	
5.010	S125		405.3	SURCHARGED	
5.011	S126		63.3	SURCHARGED	
5.012	S127		63.1	SURCHARGED	
8.000	S47		6.4	SURCHARGED	
9.000	S46		2.0	SURCHARGED	
8.001	S128		9.8	SURCHARGED	
8.002	S129		9.6	SURCHARGED	
1.009	S87		12.9	SURCHARGED	
1.010	S159		8.0	SURCHARGED	
10.000	S50		93.4	FLOOD	2
10.001	S51		101.2	FLOOD RISK	
10.002	S49		111.4	SURCHARGED	
10.003	S48		142.6	SURCHARGED	
10.004	S152		140.9	SURCHARGED	
1.011	S88		212.4	SURCHARGED	
1.012	S89		295.1	SURCHARGED	
1.013	S90		31.7	SURCHARGED	
11.000	S156		2.9	SURCHARGED	
1.014	S91		34.4	SURCHARGED	
12.000	S1		63.5	SURCHARGED	
12.001	S2		69.5	SURCHARGED	

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

		Half Drain Pipe			
		US/MH	Time	Flow	Level
PN	Name		(mins)	(l/s)	Exceeded
12.002	S3			64.8	SURCHARGED
13.000	S38			66.9	SURCHARGED
12.003	S4			251.3	SURCHARGED
14.000	S39			64.3	SURCHARGED
14.001	S40			58.4	SURCHARGED
12.004	S5		21	422.7	SURCHARGED
15.000	S27			90.6	SURCHARGED
15.001	S28			99.2	SURCHARGED
15.002	S29			102.1	SURCHARGED
15.003	S30			130.8	SURCHARGED
16.000	S116			70.7	SURCHARGED
16.001	S115			104.6	SURCHARGED
16.002	S114			95.1	SURCHARGED
12.005	S7			610.4	SURCHARGED
12.006	S8			630.4	SURCHARGED
12.007	S9			668.6	SURCHARGED
17.000	S153			46.1	SURCHARGED
17.001	S154			67.8	SURCHARGED
17.002	S155			99.7	SURCHARGED
17.003	S72			166.5	SURCHARGED
12.008	S10			771.6	SURCHARGED
12.009	S11			51.2	SURCHARGED
18.000	S41			65.1	SURCHARGED
18.001	S42			131.3	SURCHARGED
19.000	S117			1.9	SURCHARGED
18.002	S45			9.1	SURCHARGED
18.003	S162			9.0	SURCHARGED
12.010	S12			8.5	SURCHARGED
12.011	S158			6.8	SURCHARGED
20.000	S71			161.2	FLOOD RISK
21.000	S44			73.1	SURCHARGED
12.012	S13			243.1	SURCHARGED
22.000	S33			129.8	SURCHARGED
22.001	S161			172.2	SURCHARGED
22.002	S34			173.8	SURCHARGED
22.003	S35			200.7	SURCHARGED
22.004	S36			221.6	SURCHARGED
22.005	S37			232.9	SURCHARGED
12.013	S14			498.9	SURCHARGED
12.014	S15			503.7	SURCHARGED
23.000	S56			37.1	SURCHARGED
23.001	S57			77.1	SURCHARGED
23.002	S58			89.9	SURCHARGED
23.003	S59			132.7	SURCHARGED
24.000	S151			21.7	SURCHARGED
12.015	S16			654.7	SURCHARGED
25.000	S168			0.0	SURCHARGED
12.016	S17			48.4	SURCHARGED
26.000	S60			27.8	SURCHARGED
26.001	S61			26.6	SURCHARGED
26.002	S62			27.3	SURCHARGED
26.003	S63			39.8	SURCHARGED
26.004	S64			43.5	SURCHARGED
26.005	S65			43.0	SURCHARGED
27.000	S67			2.1	SURCHARGED
26.006	S66			62.8	SURCHARGED
26.007	S68			62.2	SURCHARGED
26.008	S69			24.2	SURCHARGED
26.009	S70			8.8	FLOOD RISK
12.017	S18			53.4	SURCHARGED
28.000	S52			74.0	SURCHARGED
28.001	S53			138.7	SURCHARGED
28.002	S54			7.0	SURCHARGED
12.018	S55			55.5	SURCHARGED
12.019	S19			55.3	SURCHARGED
12.020	S20			54.5	FLOOD RISK
12.021	S21			44.1	FLOOD RISK
12.022	S22			43.1	SURCHARGED
1.015	S157			80.8	SURCHARGED
29.000	S130			54.8	SURCHARGED
29.001	S131			1.9	SURCHARGED
29.002	S132			2.2	SURCHARGED
29.003	S133			2.2	SURCHARGED
29.004	S134			2.5	SURCHARGED
29.005	S135			2.5	SURCHARGED
30.000	S150			1.2	SURCHARGED
29.006	S136			3.7	SURCHARGED
29.007	S137			3.6	SURCHARGED
31.000	S141			79.1	FLOOD RISK
31.001	S142			99.9	SURCHARGED
31.002	S143			111.1	SURCHARGED
31.003	S144			155.9	FLOOD RISK

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Micro Drainage Network 2020.1.3		

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

Half Drain Pipe					
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded
32.000	S147		99.6	FLOOD	1

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

										Water	Surcharged	Flooded	Half Drain		
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Time
PN	Name	Storm		Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(mins)
32.001	S148	30	Summer	100	+45%	5/30	Summer			4.989	0.986	0.000	1.75		
32.002	S149	30	Summer	100	+45%	5/30	Summer			4.841	0.880	0.000	1.74		
31.004	S145	30	Summer	100	+45%	10/30	Summer			4.611	0.691	0.000	3.43		
31.005	S146	10080	Summer	100	+45%	30/30	Summer			4.522	0.637	0.000	0.04		
29.008	S138	10080	Summer	100	+45%	30/2160	Summer			4.522	0.722	0.000	0.03		
29.009	S163	10080	Summer	100	+45%	30/240	Summer			4.539	0.774	0.000	0.01		
29.010	S139	1440	Winter	100	+45%	5/1440	Summer			4.633	1.118	0.000	0.07		
29.011	S140	1440	Winter	100	+45%	5/180	Summer			4.636	1.319	0.000	0.02		
29.012	S24	1440	Winter	100	+45%	5/180	Summer			4.641	1.366	0.000	0.01		
1.016	S25	1440	Winter	100	+45%	5/30	Summer			4.642	1.952	0.000	0.03		