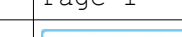


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29 Red Lion Street Chesham Bucks HP5 1EJ	Spring Business Park Havant PTA Job Ref: 9641	
Date 24/10/2019 14:02 File SW01.MDX	Designed by TA Checked by AH	
Innovyze	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes STANDARD Manhole Sizes STANDARD

Designed with Level Soffits

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.728	4-8	0.202

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S1.000	24.717	0.175	141.2	0.033	3.00	0.0	0.600	o	225	Pipe/Conduit		
S1.001	6.679	0.055	121.4	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit		
S1.002	43.734	0.285	153.5	0.036	0.00	0.0	0.600	o	225	Pipe/Conduit		
S1.003	29.663	0.195	152.1	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit		
S1.004	4.315	0.035	123.3	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit		

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	3.38	15.865	0.033	0.0	0.0	0.0	1.10	43.7	4.5
S1.001	50.00	3.47	15.690	0.054	0.0	0.0	0.0	1.19	47.1	7.4
S1.002	50.00	4.16	15.635	0.090	0.0	0.0	0.0	1.05	41.9	12.3
S1.003	50.00	4.63	15.350	0.126	0.0	0.0	0.0	1.06	42.1	17.0
S1.004	50.00	4.69	15.155	0.147	0.0	0.0	0.0	1.18	46.8	19.9

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29 Red Lion Street Chesham Bucks HP5 1EJ						Spring Business Park Havant PTA Job Ref: 9641							
Date 24/10/2019 14:02 File SW01.MDX						Designed by TA Checked by AH							
Innovyze						Network 2019.1							
Network Design Table for Storm													
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design	
S2.000	22.188	0.415	53.5	0.029	3.00	0.0	0.600	o	150	Pipe/Conduit			
S1.005	4.914	0.050	98.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit			
S1.006	5.101	0.065	78.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit			
S3.000	27.053	0.275	98.4	0.014	3.00	0.0	0.600	o	150	Pipe/Conduit			
S3.001	11.201	0.250	44.8	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit			
S3.002	40.304	0.415	97.1	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit			
S3.003	19.005	0.040	475.1	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit			
S3.004	19.005	0.040	475.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit			
S4.000	14.556	0.110	132.3	0.023	3.00	0.0	0.600	o	150	Pipe/Conduit			
S4.001	31.437	0.290	108.4	0.034	0.00	0.0	0.600	o	150	Pipe/Conduit			
S4.002	19.800	0.175	113.1	0.033	0.00	0.0	0.600	o	225	Pipe/Conduit			
S4.003	9.986	0.100	99.9	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit			
S4.004	20.711	0.285	72.7	0.009	0.00	0.0	0.600	o	225	Pipe/Conduit			
S4.005	8.987	0.160	56.2	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit			
S5.000	22.724	0.200	113.6	0.027	3.00	0.0	0.600	o	150	Pipe/Conduit			
S5.001	6.564	0.670	9.8	0.009	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)			
S2.000	50.00	3.27	15.610	0.029	0.0	0.0	0.0	1.38	24.4	3.9			
S1.005	50.00	4.75	15.070	0.176	0.0	0.0	0.0	1.32	52.4	23.9			
S1.006	50.00	4.81	15.020	0.176	0.0	0.0	0.0	1.48	58.7	23.9			
S3.000	50.00	3.45	16.250	0.014	0.0	0.0	0.0	1.01	17.9	1.9			
S3.001	50.00	3.52	15.825	0.027	0.0	0.0	0.0	2.36	166.5	3.6			
S3.002	50.00	3.95	15.575	0.057	0.0	0.0	0.0	1.60	112.8	7.7			
S3.003	50.00	4.39	15.160	0.086	0.0	0.0	0.0	0.71	50.5	11.7			
S3.004	50.00	4.83	15.120	0.086	0.0	0.0	0.0	0.71	50.5	11.7			
S4.000	50.00	3.28	16.350	0.023	0.0	0.0	0.0	0.87	15.4	3.1			
S4.001	50.00	3.82	16.240	0.057	0.0	0.0	0.0	0.96	17.0	7.8			
S4.002	50.00	4.09	15.875	0.090	0.0	0.0	0.0	1.23	48.8	12.2			
S4.003	50.00	4.22	15.700	0.111	0.0	0.0	0.0	1.31	52.0	15.1			
S4.004	50.00	4.44	15.600	0.120	0.0	0.0	0.0	1.54	61.1	16.3			
S4.005	50.00	4.53	15.315	0.131	0.0	0.0	0.0	1.75	69.5	17.7			
S5.000	50.00	3.40	16.100	0.027	0.0	0.0	0.0	0.94	16.6	3.6			
S5.001	50.00	3.44	15.900	0.036	0.0	0.0	0.0	3.24	57.2	4.9			
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29 Red Lion Street Chesham Bucks HP5 1EJ					Spring Business Park Havant PTA Job Ref: 9641							
Date 24/10/2019 14:02 File SW01.MDX					Designed by TA Checked by AH							
Innovyze					Network 2019.1							
Network Design Table for Storm												
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S3.005	17.118	0.070	244.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.000	11.821	0.155	76.3	0.088	3.00	0.0	0.600	o	225	Pipe/Conduit		
S7.000	6.697	0.355	18.9	0.057	3.00	0.0	0.600	o	150	Pipe/Conduit		
S6.001	23.388	0.152	153.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S8.000	6.764	0.507	13.3	0.028	3.00	0.0	0.600	o	150	Pipe/Conduit		
S6.002	7.703	0.050	154.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S9.000	7.882	0.282	28.0	0.105	3.00	0.0	0.600	o	150	Pipe/Conduit		
S6.003	8.182	0.053	154.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S10.000	6.827	0.610	11.2	0.028	3.00	0.0	0.600	o	150	Pipe/Conduit		
S6.004	16.443	0.090	182.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S11.000	8.799	0.700	12.6	0.028	3.00	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)		
S3.005	50.00	5.12	15.080	0.253	0.0	0.0	0.0	1.00	70.8	34.3		
S6.000	50.00	3.13	15.675	0.088	0.0	0.0	0.0	1.50	59.6	11.9		
S7.000	50.00	3.05	15.950	0.057	0.0	0.0	0.0	2.33	41.2	7.7		
S6.001	50.00	3.44	15.445	0.144	0.0	0.0	0.0	1.27	89.4	19.5		
S8.000	50.00	3.04	15.950	0.028	0.0	0.0	0.0	2.77	49.0	3.7		
S6.002	50.00	3.54	15.293	0.172	0.0	0.0	0.0	1.26	89.4	23.3		
S9.000	50.00	3.07	15.675	0.105	0.0	0.0	0.0	1.91	33.8	14.2		
S6.003	50.00	3.65	15.243	0.276	0.0	0.0	0.0	1.26	89.3	37.4		
S10.000	50.00	3.04	15.950	0.028	0.0	0.0	0.0	3.03	53.5	3.7		
S6.004	50.00	3.89	15.190	0.304	0.0	0.0	0.0	1.16	82.0	41.1		
S11.000	50.00	3.05	15.950	0.028	0.0	0.0	0.0	2.86	50.5	3.7		
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Area Summary for Storm <table><tr><th>Pipe Number</th><th>PIMP Type</th><th>PIMP Name</th><th>PIMP (%)</th><th>Gross Area (ha)</th><th>Imp. Area (ha)</th><th>Pipe Total (ha)</th></tr><tr><td>1.000</td><td>User</td><td>-</td><td>100</td><td>0.033</td><td>0.033</td><td>0.033</td></tr><tr><td>1.001</td><td>User</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>1.002</td><td>User</td><td>-</td><td>100</td><td>0.036</td><td>0.036</td><td>0.036</td></tr><tr><td>1.003</td><td>User</td><td>-</td><td>100</td><td>0.035</td><td>0.035</td><td>0.035</td></tr><tr><td>1.004</td><td>User</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>2.000</td><td>User</td><td>-</td><td>100</td><td>0.029</td><td>0.029</td><td>0.029</td></tr><tr><td>1.005</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.006</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>3.000</td><td>User</td><td>-</td><td>100</td><td>0.014</td><td>0.014</td><td>0.014</td></tr><tr><td>3.001</td><td>User</td><td>-</td><td>100</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td>3.002</td><td>User</td><td>-</td><td>100</td><td>0.030</td><td>0.030</td><td>0.030</td></tr><tr><td>3.003</td><td>User</td><td>-</td><td>100</td><td>0.030</td><td>0.030</td><td>0.030</td></tr><tr><td>3.004</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>4.000</td><td>User</td><td>-</td><td>100</td><td>0.023</td><td>0.023</td><td>0.023</td></tr><tr><td>4.001</td><td>User</td><td>-</td><td>100</td><td>0.034</td><td>0.034</td><td>0.034</td></tr><tr><td>4.002</td><td>User</td><td>-</td><td>100</td><td>0.033</td><td>0.033</td><td>0.033</td></tr><tr><td>4.003</td><td>User</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>4.004</td><td>User</td><td>-</td><td>100</td><td>0.009</td><td>0.009</td><td>0.009</td></tr><tr><td>4.005</td><td>User</td><td>-</td><td>100</td><td>0.011</td><td>0.011</td><td>0.011</td></tr><tr><td>5.000</td><td>User</td><td>-</td><td>100</td><td>0.027</td><td>0.027</td><td>0.027</td></tr><tr><td>5.001</td><td>User</td><td>-</td><td>100</td><td>0.009</td><td>0.009</td><td>0.009</td></tr><tr><td>3.005</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>6.000</td><td>User</td><td>-</td><td>100</td><td>0.088</td><td>0.088</td><td>0.088</td></tr><tr><td>7.000</td><td>User</td><td>-</td><td>100</td><td>0.057</td><td>0.057</td><td>0.057</td></tr><tr><td>6.001</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>8.000</td><td>User</td><td>-</td><td>100</td><td>0.028</td><td>0.028</td><td>0.028</td></tr><tr><td>6.002</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>9.000</td><td>User</td><td>-</td><td>100</td><td>0.105</td><td>0.105</td><td>0.105</td></tr><tr><td>6.003</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>10.000</td><td>User</td><td>-</td><td>100</td><td>0.028</td><td>0.028</td><td>0.028</td></tr><tr><td>6.004</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>11.000</td><td>User</td><td>-</td><td>100</td><td>0.028</td><td>0.028</td><td>0.028</td></tr><tr><td>6.005</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>3.006</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>12.000</td><td>User</td><td>-</td><td>100</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td>12.001</td><td>User</td><td>-</td><td>100</td><td>0.030</td><td>0.030</td><td>0.030</td></tr><tr><td>12.002</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>12.003</td><td>User</td><td>-</td><td>100</td><td>0.038</td><td>0.038</td><td>0.038</td></tr><tr><td>12.004</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>3.007</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>13.000</td><td>User</td><td>-</td><td>100</td><td>0.066</td><td>0.066</td><td>0.066</td></tr><tr><td>14.000</td><td>User</td><td>-</td><td>100</td><td>0.023</td><td>0.023</td><td>0.023</td></tr><tr><td>13.001</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.007</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.008</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td colspan="4"></td><td>Total</td><td>Total</td><td>Total</td></tr><tr><td colspan="4"></td><td>0.930</td><td>0.930</td><td>0.930</td></tr></table>			Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)	1.000	User	-	100	0.033	0.033	0.033	1.001	User	-	100	0.021	0.021	0.021	1.002	User	-	100	0.036	0.036	0.036	1.003	User	-	100	0.035	0.035	0.035	1.004	User	-	100	0.021	0.021	0.021	2.000	User	-	100	0.029	0.029	0.029	1.005	-	-	100	0.000	0.000	0.000	1.006	-	-	100	0.000	0.000	0.000	3.000	User	-	100	0.014	0.014	0.014	3.001	User	-	100	0.012	0.012	0.012	3.002	User	-	100	0.030	0.030	0.030	3.003	User	-	100	0.030	0.030	0.030	3.004	-	-	100	0.000	0.000	0.000	4.000	User	-	100	0.023	0.023	0.023	4.001	User	-	100	0.034	0.034	0.034	4.002	User	-	100	0.033	0.033	0.033	4.003	User	-	100	0.021	0.021	0.021	4.004	User	-	100	0.009	0.009	0.009	4.005	User	-	100	0.011	0.011	0.011	5.000	User	-	100	0.027	0.027	0.027	5.001	User	-	100	0.009	0.009	0.009	3.005	-	-	100	0.000	0.000	0.000	6.000	User	-	100	0.088	0.088	0.088	7.000	User	-	100	0.057	0.057	0.057	6.001	-	-	100	0.000	0.000	0.000	8.000	User	-	100	0.028	0.028	0.028	6.002	-	-	100	0.000	0.000	0.000	9.000	User	-	100	0.105	0.105	0.105	6.003	-	-	100	0.000	0.000	0.000	10.000	User	-	100	0.028	0.028	0.028	6.004	-	-	100	0.000	0.000	0.000	11.000	User	-	100	0.028	0.028	0.028	6.005	-	-	100	0.000	0.000	0.000	3.006	-	-	100	0.000	0.000	0.000	12.000	User	-	100	0.012	0.012	0.012	12.001	User	-	100	0.030	0.030	0.030	12.002	-	-	100	0.000	0.000	0.000	12.003	User	-	100	0.038	0.038	0.038	12.004	-	-	100	0.000	0.000	0.000	3.007	-	-	100	0.000	0.000	0.000	13.000	User	-	100	0.066	0.066	0.066	14.000	User	-	100	0.023	0.023	0.023	13.001	-	-	100	0.000	0.000	0.000	1.007	-	-	100	0.000	0.000	0.000	1.008	-	-	100	0.000	0.000	0.000					Total	Total	Total					0.930	0.930	0.930
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)																																																																																																																																																																																																																																																																																																																																												
1.000	User	-	100	0.033	0.033	0.033																																																																																																																																																																																																																																																																																																																																												
1.001	User	-	100	0.021	0.021	0.021																																																																																																																																																																																																																																																																																																																																												
1.002	User	-	100	0.036	0.036	0.036																																																																																																																																																																																																																																																																																																																																												
1.003	User	-	100	0.035	0.035	0.035																																																																																																																																																																																																																																																																																																																																												
1.004	User	-	100	0.021	0.021	0.021																																																																																																																																																																																																																																																																																																																																												
2.000	User	-	100	0.029	0.029	0.029																																																																																																																																																																																																																																																																																																																																												
1.005	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
1.006	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
3.000	User	-	100	0.014	0.014	0.014																																																																																																																																																																																																																																																																																																																																												
3.001	User	-	100	0.012	0.012	0.012																																																																																																																																																																																																																																																																																																																																												
3.002	User	-	100	0.030	0.030	0.030																																																																																																																																																																																																																																																																																																																																												
3.003	User	-	100	0.030	0.030	0.030																																																																																																																																																																																																																																																																																																																																												
3.004	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
4.000	User	-	100	0.023	0.023	0.023																																																																																																																																																																																																																																																																																																																																												
4.001	User	-	100	0.034	0.034	0.034																																																																																																																																																																																																																																																																																																																																												
4.002	User	-	100	0.033	0.033	0.033																																																																																																																																																																																																																																																																																																																																												
4.003	User	-	100	0.021	0.021	0.021																																																																																																																																																																																																																																																																																																																																												
4.004	User	-	100	0.009	0.009	0.009																																																																																																																																																																																																																																																																																																																																												
4.005	User	-	100	0.011	0.011	0.011																																																																																																																																																																																																																																																																																																																																												
5.000	User	-	100	0.027	0.027	0.027																																																																																																																																																																																																																																																																																																																																												
5.001	User	-	100	0.009	0.009	0.009																																																																																																																																																																																																																																																																																																																																												
3.005	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
6.000	User	-	100	0.088	0.088	0.088																																																																																																																																																																																																																																																																																																																																												
7.000	User	-	100	0.057	0.057	0.057																																																																																																																																																																																																																																																																																																																																												
6.001	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
8.000	User	-	100	0.028	0.028	0.028																																																																																																																																																																																																																																																																																																																																												
6.002	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
9.000	User	-	100	0.105	0.105	0.105																																																																																																																																																																																																																																																																																																																																												
6.003	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
10.000	User	-	100	0.028	0.028	0.028																																																																																																																																																																																																																																																																																																																																												
6.004	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
11.000	User	-	100	0.028	0.028	0.028																																																																																																																																																																																																																																																																																																																																												
6.005	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
3.006	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
12.000	User	-	100	0.012	0.012	0.012																																																																																																																																																																																																																																																																																																																																												
12.001	User	-	100	0.030	0.030	0.030																																																																																																																																																																																																																																																																																																																																												
12.002	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
12.003	User	-	100	0.038	0.038	0.038																																																																																																																																																																																																																																																																																																																																												
12.004	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
3.007	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
13.000	User	-	100	0.066	0.066	0.066																																																																																																																																																																																																																																																																																																																																												
14.000	User	-	100	0.023	0.023	0.023																																																																																																																																																																																																																																																																																																																																												
13.001	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
1.007	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
1.008	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																												
				Total	Total	Total																																																																																																																																																																																																																																																																																																																																												
				0.930	0.930	0.930																																																																																																																																																																																																																																																																																																																																												
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29 Red Lion Street Chesham Bucks HP5 1EJ	Spring Business Park Havant PTA Job Ref: 9641	
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Innovyze Network 2019.1		
<u>Simulation Criteria for Storm</u> Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000 Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000 Hot Start (mins) 0 Inlet 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 2 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR Profile Type Summer Return Period (years) 100 Cv (Summer) 0.750 Region England and Wales Cv (Winter) 0.840 M5-60 (mm) 19.300 Storm Duration (mins) 30 Ratio R 0.350		
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29 Red Lion Street Chesham Bucks HP5 1EJ	Spring Business Park Havant PTA Job Ref: 9641																																																																																														
Date 24/10/2019 14:02 File SW01.MDX	Designed by TA Checked by AH																																																																																														
Innovyze	Network 2019.1																																																																																														
Online Controls for Storm Hydro-Brake® Optimum Manhole: S22, DS/PN: S1.007, Volume (m³): 5.1 Unit Reference MD-SHE-0222-2500-0700-2500 Design Head (m)0.700 Design Flow (l/s)25.0 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)222 Invert Level (m)14.955 Minimum Outlet Pipe Diameter (mm)300 Suggested Manhole Diameter (mm)1500 <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>0.700</td><td>25.0</td><td>Kick-Flo®</td><td>0.561</td><td>22.5</td></tr><tr><td>Flush-Flo™</td><td>0.330</td><td>25.0</td><td>Mean Flow over Head Range</td><td>-</td><td>19.8</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>7.5</td><td>1.200</td><td>32.4</td><td>3.000</td><td>50.3</td><td>7.000</td><td>76.0</td></tr><tr><td>0.200</td><td>22.0</td><td>1.400</td><td>34.8</td><td>3.500</td><td>54.2</td><td>7.500</td><td>78.1</td></tr><tr><td>0.300</td><td>24.9</td><td>1.600</td><td>37.2</td><td>4.000</td><td>57.9</td><td>8.000</td><td>80.7</td></tr><tr><td>0.400</td><td>24.8</td><td>1.800</td><td>39.3</td><td>4.500</td><td>61.3</td><td>8.500</td><td>83.2</td></tr><tr><td>0.500</td><td>23.8</td><td>2.000</td><td>41.4</td><td>5.000</td><td>64.5</td><td>9.000</td><td>85.6</td></tr><tr><td>0.600</td><td>23.2</td><td>2.200</td><td>43.3</td><td>5.500</td><td>67.5</td><td>9.500</td><td>88.0</td></tr><tr><td>0.800</td><td>26.6</td><td>2.400</td><td>45.2</td><td>6.000</td><td>70.5</td><td></td><td></td></tr><tr><td>1.000</td><td>29.6</td><td>2.600</td><td>47.0</td><td>6.500</td><td>73.3</td><td></td><td></td></tr></table> <tr><td colspan="3">©1982-2019 Innovyze</td></tr>			Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.700	25.0	Kick-Flo®	0.561	22.5	Flush-Flo™	0.330	25.0	Mean Flow over Head Range	-	19.8	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	7.5	1.200	32.4	3.000	50.3	7.000	76.0	0.200	22.0	1.400	34.8	3.500	54.2	7.500	78.1	0.300	24.9	1.600	37.2	4.000	57.9	8.000	80.7	0.400	24.8	1.800	39.3	4.500	61.3	8.500	83.2	0.500	23.8	2.000	41.4	5.000	64.5	9.000	85.6	0.600	23.2	2.200	43.3	5.500	67.5	9.500	88.0	0.800	26.6	2.400	45.2	6.000	70.5			1.000	29.6	2.600	47.0	6.500	73.3			©1982-2019 Innovyze		
Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)																																																																																										
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0.100	7.5	1.200	32.4	3.000	50.3	7.000	76.0																																																																																								
0.200	22.0	1.400	34.8	3.500	54.2	7.500	78.1																																																																																								
0.300	24.9	1.600	37.2	4.000	57.9	8.000	80.7																																																																																								
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0.500	23.8	2.000	41.4	5.000	64.5	9.000	85.6																																																																																								
0.600	23.2	2.200	43.3	5.500	67.5	9.500	88.0																																																																																								
0.800	26.6	2.400	45.2	6.000	70.5																																																																																										
1.000	29.6	2.600	47.0	6.500	73.3																																																																																										
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Innovyze Network 2019.1		

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S3.004

Invert Level (m) 15.120 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	360.0	0.0	0.501	0.0	0.0
0.500	360.0	0.0			

Cellular Storage Manhole: S15, DS/PN: S12.004

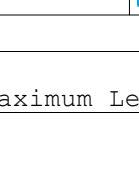
Invert Level (m) 15.012 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	360.0	0.0	0.501	0.0	0.0
0.500	360.0	0.0			

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Innovyze	Network 2019.1						
1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm							
Simulation Criteria							
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000							
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000							
Hot Start Level (mm) 0 Inlet Coefficient 0.800							
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000							
Foul Sewage per hectare (l/s) 0.000							
Number of Input Hydrographs 0 Number of Storage Structures 2							
Number of Online Controls 1 Number of Time/Area Diagrams 0							
Number of Offline Controls 0 Number of Real Time Controls 0							
Synthetic Rainfall Details							
Rainfall Model FSR Ratio R 0.350							
Region England and Wales Cv (Summer) 0.750							
M5-60 (mm) 19.300 Cv (Winter) 0.840							
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) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080							
Return Period(s) (years) 1, 30, 100							
Climate Change (%) 0, 0, 40							
PN	US/MH Name Storm	Return Climate Period Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S16 15 Summer	1 +0%	100/15 Summer				15.915
S1.001	S2 15 Winter	1 +0%	30/15 Winter				15.759
S1.002	S17 15 Winter	1 +0%	30/15 Summer				15.713
S1.003	S18 15 Winter	1 +0%	30/15 Summer				15.443
S1.004	S19 15 Winter	1 +0%	1/15 Winter				15.386
S2.000	S6 15 Summer	1 +0%	100/15 Summer				15.656
S1.005	S20 15 Winter	1 +0%	1/15 Summer				15.375
S1.006	S6 15 Winter	1 +0%	1/15 Summer				15.362
S3.000	S1 15 Summer	1 +0%					16.286
S3.001	S2 15 Summer	1 +0%					15.858
S3.002	S3 15 Winter	1 +0%					15.624
S3.003	S4 15 Winter	1 +0%	100/15 Summer				15.262
S3.004	S5 60 Winter	1 +0%	100/30 Winter				15.172
S4.000	S5 15 Summer	1 +0%	100/15 Summer				16.402
S4.001	S15 15 Winter	1 +0%	30/15 Summer				16.308
S4.002	S6 15 Winter	1 +0%	100/15 Summer				15.950
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Innovyze				Network 2019.1					
1 year Return Period Summary of Critical Results by Maximum Level (Rank 1 for Storm									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S4.003	S7	15 Winter	1	+0%	100/15 Summer				15.784
S4.004	S8	15 Winter	1	+0%	100/15 Summer				15.676
S4.005	S9	15 Winter	1	+0%	30/15 Summer				15.399
S5.000	S20	15 Summer	1	+0%	100/15 Summer				16.153
S5.001	S21	15 Summer	1	+0%					15.932
S3.005	S5	15 Winter	1	+0%	30/15 Summer				15.376
S6.000	S24	15 Summer	1	+0%					15.752
S7.000	S23	15 Summer	1	+0%					16.000
S6.001	S25	15 Summer	1	+0%	30/15 Summer				15.552
S8.000	S25	15 Summer	1	+0%					15.981
S6.002	S26	15 Winter	1	+0%					15.454
S9.000	S27	15 Summer	1	+0%					15.751
S6.003	S25	15 Winter	1	+0%					15.445
S10.000	S29	15 Summer	1	+0%					15.980
S6.004	S25	15 Winter	1	+0%	30/15 Summer				15.431
S11.000	S31	15 Summer	1	+0%					15.980
S6.005	S26	15 Winter	1	+0%	30/15 Summer				15.398
S3.006	S12	15 Winter	1	+0%	1/15 Summer				15.371
S12.000	S11	15 Summer	1	+0%	100/15 Summer				15.727
S12.001	S12	15 Winter	1	+0%	100/15 Summer				15.588
S12.002	S13	15 Winter	1	+0%	100/60 Winter				15.411
S12.003	S14	15 Winter	1	+0%	100/15 Winter				15.148
S12.004	S15	240 Winter	1	+0%	100/15 Summer				15.130
S3.007	S6	15 Winter	1	+0%	1/15 Summer				15.349
S13.000	S33	15 Summer	1	+0%					15.724
S14.000	S34	15 Summer	1	+0%					15.832
S13.001	S27	15 Winter	1	+0%	1/15 Summer				15.357
S1.007	S22	15 Winter	1	+0%	1/15 Summer				15.349
S1.008	S7	15 Winter	1	+0%					15.072
Surcharged Flooded									
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded	
S4.003	S7	-0.141	0.000	0.30		12.9	OK		
S4.004	S8	-0.149	0.000	0.25		13.7	OK		
S4.005	S9	-0.141	0.000	0.26		14.7	OK		
S5.000	S20	-0.097	0.000	0.25		4.0	OK		
S5.001	S21	-0.118	0.000	0.10		5.0	OK		
S3.005	S5	-0.004	0.000	0.08		4.9	OK		
S6.000	S24	-0.148	0.000	0.24		13.4	OK*		
S7.000	S23	-0.100	0.000	0.23		8.7	OK*		
S6.001	S25	-0.193	0.000	0.27		21.7	OK		
S8.000	S25	-0.119	0.000	0.10		4.3	OK*		
S6.002	S26	-0.139	0.000	0.38		23.3	OK*		
S9.000	S27	-0.074	0.000	0.48		15.9	OK*		
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000	Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0	MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0	Inlet 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 2
Number of Online Controls 1	Number of Time/Area Diagrams 0
Number of Offline Controls 0	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R 0.350
Region England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.300 Cv (Winter)	0.840

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)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S16	15 Summer	30	+0%	100/15 Summer				15.950
S1.001	S2	15 Winter	30	+0%	30/15 Winter				15.918
S1.002	S17	15 Winter	30	+0%	30/15 Summer				15.907
S1.003	S18	15 Winter	30	+0%	30/15 Summer				15.833
S1.004	S19	15 Winter	30	+0%	1/15 Winter				15.724
S2.000	S6	15 Winter	30	+0%	100/15 Summer				15.703
S1.005	S20	15 Winter	30	+0%	1/15 Summer				15.664
S1.006	S6	15 Winter	30	+0%	1/15 Summer				15.579
S3.000	S1	15 Summer	30	+0%					16.309
S3.001	S2	15 Summer	30	+0%					15.881
S3.002	S3	15 Summer	30	+0%					15.662
S3.003	S4	15 Summer	30	+0%	100/15 Summer				15.355
S3.004	S5	120 Winter	30	+0%	100/30 Winter				15.289
S4.000	S5	15 Summer	30	+0%	100/15 Summer				16.464
S4.001	S15	15 Summer	30	+0%	30/15 Summer				16.434
S4.002	S6	15 Summer	30	+0%	100/15 Summer				16.006

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Spring Business Park
Havant
PTA Job Ref: 9641

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S4.003	S7	15 Winter	30	+0%	100/15 Summer				15.854
S4.004	S8	15 Winter	30	+0%	100/15 Summer				15.736
S4.005	S9	15 Winter	30	+0%	30/15 Summer				15.587
S5.000	S20	15 Summer	30	+0%	100/15 Summer				16.190
S5.001	S21	15 Summer	30	+0%					15.954
S3.005	S5	15 Winter	30	+0%	30/15 Summer				15.504
S6.000	S24	15 Winter	30	+0%					15.896
S7.000	S23	15 Summer	30	+0%					16.033
S6.001	S25	15 Winter	30	+0%	30/15 Summer				15.867
S8.000	S25	15 Summer	30	+0%					16.000
S6.002	S26	30 Winter	30	+0%					15.593
S9.000	S27	15 Winter	30	+0%					15.825
S6.003	S25	60 Winter	30	+0%					15.543
S10.000	S29	15 Summer	30	+0%					15.998
S6.004	S25	15 Winter	30	+0%	30/15 Summer				15.734
S11.000	S31	15 Summer	30	+0%					15.997
S6.005	S26	15 Winter	30	+0%	30/15 Summer				15.633
S3.006	S12	15 Winter	30	+0%	1/15 Summer				15.531
S12.000	S11	15 Summer	30	+0%	100/15 Summer				15.751
S12.001	S12	15 Summer	30	+0%	100/15 Summer				15.665
S12.002	S13	15 Winter	30	+0%	100/60 Winter				15.451
S12.003	S14	120 Winter	30	+0%	100/15 Winter				15.307
S12.004	S15	120 Winter	30	+0%	100/15 Summer				15.305
S3.007	S6	15 Winter	30	+0%	1/15 Summer				15.462
S13.000	S33	15 Summer	30	+0%					15.757
S14.000	S34	15 Summer	30	+0%					15.852
S13.001	S27	15 Summer	30	+0%	1/15 Summer				15.554
S1.007	S22	15 Winter	30	+0%	1/15 Summer				15.513
S1.008	S7	15 Winter	30	+0%					15.074

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S4.003	S7	-0.071	0.000	0.79		34.3		OK	
S4.004	S8	-0.089	0.000	0.67		37.1		OK	
S4.005	S9	0.047	0.000	0.72		40.8		SURCHARGED	
S5.000	S20	-0.060	0.000	0.62		9.8		OK	
S5.001	S21	-0.096	0.000	0.27		13.0		OK	
S3.005	S5	0.124	0.000	0.13		7.7		SURCHARGED	
S6.000	S24	-0.004	0.000	0.56		31.1		OK*	
S7.000	S23	-0.067	0.000	0.57		21.4		OK*	
S6.001	S25	0.122	0.000	0.46		36.3		SURCHARGED	
S8.000	S25	-0.100	0.000	0.24		10.5		OK*	
S6.002	S26	0.000	0.000	0.63		38.8		SURCHARGED*	
S9.000	S27	0.000	0.000	0.90		29.8		SURCHARGED*	

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

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coefficient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 2

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model

FSR

Ratio R 0.350

Region England and Wales Cv (Summer) 0.750

M5-60 (mm)

19.300 Cv (Winter) 0.840

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)

15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years)

1, 30, 100

Climate Change (%)

0, 0, 40

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
									(m)
S1.000	S16	15 Winter	100	+40%	100/15 Summer				16.428
S1.001	S2	15 Winter	100	+40%	30/15 Winter				16.415
S1.002	S17	15 Winter	100	+40%	30/15 Summer				16.404
S1.003	S18	15 Winter	100	+40%	30/15 Summer				16.327
S1.004	S19	15 Winter	100	+40%	1/15 Winter				16.173
S2.000	S6	15 Winter	100	+40%	100/15 Summer				16.195
S1.005	S20	15 Winter	100	+40%	1/15 Summer				16.071
S1.006	S6	15 Winter	100	+40%	1/15 Summer				15.905
S3.000	S1	15 Summer	100	+40%					16.333
S3.001	S2	15 Summer	100	+40%					15.900
S3.002	S3	15 Summer	100	+40%					15.695
S3.003	S4	120 Winter	100	+40%	100/15 Summer				15.687
S3.004	S5	180 Winter	100	+40%	100/30 Winter				15.621
S4.000	S5	15 Winter	100	+40%	100/15 Summer				16.960
S4.001	S15	15 Winter	100	+40%	30/15 Summer				16.938
S4.002	S6	15 Winter	100	+40%	100/15 Summer				16.302

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S4.003	S7	15 Winter	100	+40%	100/15 Summer				16.167
S4.004	S8	15 Winter	100	+40%	100/15 Summer				16.043
S4.005	S9	15 Winter	100	+40%	30/15 Summer				15.795
S5.000	S20	15 Summer	100	+40%	100/15 Summer				16.303
S5.001	S21	15 Summer	100	+40%					15.972
S3.005	S5	120 Winter	100	+40%	30/15 Summer				15.683
S6.000	S24	60 Winter	100	+40%					15.900
S7.000	S23	30 Winter	100	+40%					16.100
S6.001	S25	15 Winter	100	+40%	30/15 Summer				16.406
S8.000	S25	15 Winter	100	+40%					16.100
S6.002	S26	180 Winter	100	+40%					15.593
S9.000	S27	60 Winter	100	+40%					15.825
S6.003	S25	240 Winter	100	+40%					15.543
S10.000	S29	15 Winter	100	+40%					16.100
S6.004	S25	15 Winter	100	+40%	30/15 Summer				16.185
S11.000	S31	15 Summer	100	+40%					16.015
S6.005	S26	15 Winter	100	+40%	30/15 Summer				15.959
S3.006	S12	15 Winter	100	+40%	1/15 Summer				15.723
S12.000	S11	15 Winter	100	+40%	100/15 Summer				15.899
S12.001	S12	15 Winter	100	+40%	100/15 Summer				15.864
S12.002	S13	120 Winter	100	+40%	100/60 Winter				15.700
S12.003	S14	120 Winter	100	+40%	100/15 Winter				15.689
S12.004	S15	240 Winter	100	+40%	100/15 Summer				15.513
S3.007	S6	120 Winter	100	+40%	1/15 Summer				15.677
S13.000	S33	15 Winter	100	+40%					15.825
S14.000	S34	15 Winter	100	+40%					15.917
S13.001	S27	15 Winter	100	+40%	1/15 Summer				15.837
S1.007	S22	15 Winter	100	+40%	1/15 Summer				15.740
S1.008	S7	15 Summer	100	+40%					15.074
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded	
S4.003	S7	0.242	0.000	1.10		47.7	SURCHARGED		
S4.004	S8	0.218	0.000	0.93		51.6	SURCHARGED		
S4.005	S9	0.255	0.000	1.01		56.8	SURCHARGED		
S5.000	S20	0.053	0.000	1.11		17.5	SURCHARGED		
S5.001	S21	-0.078	0.000	0.47		22.8	OK		
S3.005	S5	0.303	0.000	0.36		21.7	SURCHARGED		
S6.000	S24	0.000	0.000	0.45		24.9	SURCHARGED*		
S7.000	S23	0.000	0.000	0.62		23.3	SURCHARGED*		
S6.001	S25	0.661	0.000	0.68		53.9	FLOOD RISK		
S8.000	S25	0.000	0.000	0.35		15.7	SURCHARGED*		
S6.002	S26	0.000	0.000	0.38		23.6	SURCHARGED*		
S9.000	S27	0.000	0.000	0.89		29.6	SURCHARGED*		
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