STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for K2275 SW NETWORK 1.SWS

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	48.533	0.194	250.2	0.081	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	21.039	0.084	250.5	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	18.338	0.073	251.2	0.033	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	14.837	0.247	60.1	0.042	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	21.989	0.366	60.1	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	48.034	1.026	46.8	0.076	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	13.909	1.391	10.0	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	13.593	1.359	10.0	0.046	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	17.612	1.429	12.3	0.015	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	51.761	2.588	20.0	0.042	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	11.761	0.588	20.0	0.043	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.000	29.467	0.491	60.0	0.091	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	41.967	0.699	60.0	0.073	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	12.849	0.364	35.3	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	10.03	5.98	97.468	0.081	0.0	0.0	0.0	0.82	32.7	2.2
1.001	9.36	6.41	97.124	0.112	0.0	0.0	0.0	0.82	32.7	2.8
1.002	8.85	6.78	97.040	0.145	0.0	0.0	0.0	0.82	32.6	3.5
2.000	11.56	5.19	98.681	0.042	0.0	0.0	0.0	1.30	23.0	1.3
2.001	11.10	5.41	98.434	0.082	0.0	0.0	0.0	1.69	67.2	2.5
2.002	10.30	5.82	98.068	0.158	0.0	0.0	0.0	1.92	76.2	4.4
1.003	8.79	6.83	96.967	0.321	0.0	0.0	0.0	5.00	353.4	7.6
1.004	8.73	6.87	95.576	0.367	0.0	0.0	0.0	5.00	353.4	8.7
1.005	8.65	6.94	94.217	0.382	0.0	0.0	0.0	4.50	318.3	8.9
3.000	11.15	5.38	99.526	0.042	0.0	0.0	0.0	2.26	40.0	1.3
3.001	11.01	5.45	96.863	0.085	0.0	0.0	0.0	2.94	116.9	2.5
4.000	11.16	5.38	97.904	0.091	0.0	0.0	0.0	1.30	23.0	2.7
4.001	10.36	5.79	97.338	0.164	0.0	0.0	0.0	1.69	67.2	4.6
4.002	10.19	5.89	96.639	0.181	0.0	0.0	0.0	2.21	87.8	5.0

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for K2275 SW NETWORK 1.SWS

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
3.002	41.136	3.060	13.4	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.000	18.025	0.060	300.4	0.052	5.00	0.0	0.600	o	300	Pipe/Conduit	
3.003	8.052	0.018	447.3	0.084	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.004	39.434	0.158	250.0	0.103	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.005	7.624	0.014	544.6	0.034	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.006	20.816	0.038	547.8	0.018	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.007	9.809	0.018	544.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.008	33.691	0.075	449.2	0.097	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.009	9.632	0.118	81.6	0.008	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	14.073	0.031	454.0	0.030	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.007	31.205	0.069	452.2	0.029	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.008	20.494	0.436	47.0	0.035	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.009	9.832	0.499	19.7	0.020	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.010	10.157	0.341	29.8	0.000	0.00	0.0	0.600	o	600	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)
3.002	9.92	6.05	96.200	0.306	0.0	0.0	0.0	4.31	304.7	8.2
5.000	11.25	5.33	93.200	0.052	0.0	0.0	0.0	0.90	63.8	1.6
3.003	9.70	6.19	92.990	0.442	0.0	0.0	0.0	0.95	151.8	11.6
3.004	8.95	6.70	92.972	0.545	0.0	0.0	0.0	1.28	203.8	13.2
3.005	8.76	6.85	92.814	0.579	0.0	0.0	0.0	0.86	137.4	13.7
3.006	8.28	7.25	92.800	0.597	0.0	0.0	0.0	0.86	137.0	13.7
3.007	8.06	7.44	92.762	0.597	0.0	0.0	0.0	0.86	137.4	13.7
3.008	7.47	8.03	92.744	0.694	0.0	0.0	0.0	0.95	151.5	14.0
3.009	7.41	8.10	92.669	0.702	0.0	0.0	0.0	2.25	358.1	14.1
1.006	7.22	8.31	92.401	1.114	0.0	0.0	0.0	1.14	321.3	21.8
1.007	6.85	8.76	92.370	1.143	0.0	0.0	0.0	1.14	321.9	21.8
1.008	6.77	8.86	92.301	1.178	0.0	0.0	0.0	3.56	1006.0	21.8
1.009	6.75	8.89	91.865	1.198	0.0	0.0	0.0	5.50	1556.0	21.9
1.010	6.72	8.93	91.366	1.198	0.0	0.0	0.0	4.47	1264.7	21.9

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for K2275 SW NETWORK 1.SWS

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
1.011	18.292	0.079	231.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.012	11.763	0.062	189.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.013	23.524	0.050	470.5	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.014	5.000	0.011	454.5	0.000	0.00	0.0	0.600	o	600	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)
1.011	6.58	9.12	91.025	1.198	0.0	0.0	0.0	1.60	451.3	21.9
1.012	6.50	9.23	91.000	1.198	0.0	0.0	0.0	1.76	498.9	21.9
1.013	6.26	9.58	90.938	1.198	0.0	0.0	0.0	1.12	315.5	21.9
1.014	6.22	9.65	90.888	1.198	0.0	0.0	0.0	1.14	321.1	21.9

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Manhole Schedules for K2275 SW NETWORK 1.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	102.656	5.188	Open Manhole	1350	1.000	97.468	225				
2	100.671	3.547	Open Manhole	1350	1.001	97.124	225	1.000	97.274	225	150
3	99.782	2.742	Open Manhole	1350	1.002	97.040	225	1.001	97.040	225	
4	102.750	4.069	Open Manhole	1200	2.000	98.681	150				
5	101.964	3.530	Open Manhole	1200	2.001	98.434	225	2.000	98.434	150	
6	100.794	2.726	Open Manhole	1200	2.002	98.068	225	2.001	98.068	225	
7	99.460	2.493	Open Manhole	1350	1.003	96.967	300	1.002	96.967	225	
								2.002	97.042	225	
8	98.900	3.324	Open Manhole	1350	1.004	95.576	300	1.003	95.576	300	
9	98.201	3.984	Open Manhole	1350	1.005	94.217	300	1.004	94.217	300	
10	102.382	2.856	Open Manhole	1200	3.000	99.526	150				
11	100.683	3.820	Open Manhole	1200	3.001	96.863	225	3.000	96.938	150	
12	99.254	1.350	Open Manhole	1200	4.000	97.904	150				
13	98.913	1.575	Open Manhole	1200	4.001	97.338	225	4.000	97.413	150	
14	99.818	3.179	Open Manhole	1200	4.002	96.639	225	4.001	96.639	225	
15	100.177	3.977	Open Manhole	1200	3.002	96.200	300	3.001	96.275	225	
								4.002	96.275	225	
16	95.090	1.890	Open Manhole	1200	5.000	93.200	300				
17	94.987	1.997	Open Manhole	1350	3.003	92.990	450	3.002	93.140	300	
								5.000	93.140	300	
18	94.888	1.916	Open Manhole	1200	3.004	92.972	450	3.003	92.972	450	
19	94.488	1.674	Open Manhole	1350	3.005	92.814	450	3.004	92.814	450	
20	94.495	1.695	Open Manhole	1350	3.006	92.800	450	3.005	92.800	450	
21	94.829	2.067	Open Manhole	1350	3.007	92.762	450	3.006	92.762	450	
22	95.033	2.289	Open Manhole	1350	3.008	92.744	450	3.007	92.744	450	
23	96.382	3.713	Open Manhole	1350	3.009	92.669	450	3.008	92.669	450	
24	96.984	4.583	Open Manhole	1500	1.006	92.401	600	1.005	92.788	300	87
								3.009	92.551	450	
25	96.601	4.231	Open Manhole	1500	1.007	92.370	600	1.006	92.370	600	
26	95.136	2.835	Open Manhole	1500	1.008	92.301	600	1.007	92.301	600	
27	94.564	2.699	Open Manhole	1500	1.009	91.865	600	1.008	91.865	600	
28	93.500	2.134	Open Manhole	1500	1.010	91.366	600	1.009	91.366	600	
29	92.500	1.475	Open Manhole	1500	1.011	91.025	600	1.010	91.025	600	
30	91.750	0.804	Open Manhole	1500	1.012	91.000	600	1.011	90.946	600	

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Manhole Schedules for K2275 SW NETWORK 1.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
31	91.750	0.812	Open Manhole	1500	1.013	90.938	600	1.012	90.938	600	
32	91.750	0.862	Open Manhole	1500	1.014	90.888	600	1.013	90.888	600	
32	91.500	0.623	Open Manhole	1350		OUTFALL		1.014	90.877	600	

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PIPELINE SCHEDULES for K2275 SW NETWORK 1.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	102.656	97.468	4.963	Open Manhole	1350
1.001	o	225	2	100.671	97.124	3.322	Open Manhole	1350
1.002	o	225	3	99.782	97.040	2.517	Open Manhole	1350
2.000	o	150	4	102.750	98.681	3.919	Open Manhole	1200
2.001	o	225	5	101.964	98.434	3.305	Open Manhole	1200
2.002	o	225	6	100.794	98.068	2.501	Open Manhole	1200
1.003	o	300	7	99.460	96.967	2.193	Open Manhole	1350
1.004	o	300	8	98.900	95.576	3.024	Open Manhole	1350
1.005	o	300	9	98.201	94.217	3.684	Open Manhole	1350
3.000	o	150	10	102.382	99.526	2.706	Open Manhole	1200
3.001	o	225	11	100.683	96.863	3.595	Open Manhole	1200
4.000	o	150	12	99.254	97.904	1.200	Open Manhole	1200
4.001	o	225	13	98.913	97.338	1.350	Open Manhole	1200
4.002	o	225	14	99.818	96.639	2.954	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	48.533	250.2	2	100.671	97.274	3.172	Open Manhole	1350
1.001	21.039	250.5	3	99.782	97.040	2.517	Open Manhole	1350
1.002	18.338	251.2	7	99.460	96.967	2.268	Open Manhole	1350
2.000	14.837	60.1	5	101.964	98.434	3.380	Open Manhole	1200
2.001	21.989	60.1	6	100.794	98.068	2.501	Open Manhole	1200
2.002	48.034	46.8	7	99.460	97.042	2.193	Open Manhole	1350
1.003	13.909	10.0	8	98.900	95.576	3.024	Open Manhole	1350
1.004	13.593	10.0	9	98.201	94.217	3.684	Open Manhole	1350
1.005	17.612	12.3	24	96.984	92.788	3.896	Open Manhole	1500
3.000	51.761	20.0	11	100.683	96.938	3.595	Open Manhole	1200
3.001	11.761	20.0	15	100.177	96.275	3.677	Open Manhole	1200
4.000	29.467	60.0	13	98.913	97.413	1.350	Open Manhole	1200
4.001	41.967	60.0	14	99.818	96.639	2.954	Open Manhole	1200
4.002	12.849	35.3	15	100.177	96.275	3.677	Open Manhole	1200

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PIPELINE SCHEDULES for K2275 SW NETWORK 1.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.002	o	300	15	100.177	96.200	3.677	Open Manhole	1200
5.000	o	300	16	95.090	93.200	1.590	Open Manhole	1200
3.003	o	450	17	94.987	92.990	1.547	Open Manhole	1350
3.004	o	450	18	94.888	92.972	1.466	Open Manhole	1200
3.005	o	450	19	94.488	92.814	1.224	Open Manhole	1350
3.006	o	450	20	94.495	92.800	1.245	Open Manhole	1350
3.007	o	450	21	94.829	92.762	1.617	Open Manhole	1350
3.008	o	450	22	95.033	92.744	1.839	Open Manhole	1350
3.009	o	450	23	96.382	92.669	3.263	Open Manhole	1350
1.006	o	600	24	96.984	92.401	3.983	Open Manhole	1500
1.007	o	600	25	96.601	92.370	3.631	Open Manhole	1500
1.008	o	600	26	95.136	92.301	2.235	Open Manhole	1500
1.009	o	600	27	94.564	91.865	2.099	Open Manhole	1500
1.010	o	600	28	93.500	91.366	1.534	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.002	41.136	13.4	17	94.987	93.140	1.547	Open Manhole	1350
5.000	18.025	300.4	17	94.987	93.140	1.547	Open Manhole	1350
3.003	8.052	447.3	18	94.888	92.972	1.466	Open Manhole	1200
3.004	39.434	250.0	19	94.488	92.814	1.224	Open Manhole	1350
3.005	7.624	544.6	20	94.495	92.800	1.245	Open Manhole	1350
3.006	20.816	547.8	21	94.829	92.762	1.617	Open Manhole	1350
3.007	9.809	544.9	22	95.033	92.744	1.839	Open Manhole	1350
3.008	33.691	449.2	23	96.382	92.669	3.263	Open Manhole	1350
3.009	9.632	81.6	24	96.984	92.551	3.983	Open Manhole	1500
1.006	14.073	454.0	25	96.601	92.370	3.631	Open Manhole	1500
1.007	31.205	452.2	26	95.136	92.301	2.235	Open Manhole	1500
1.008	20.494	47.0	27	94.564	91.865	2.099	Open Manhole	1500
1.009	9.832	19.7	28	93.500	91.366	1.534	Open Manhole	1500
1.010	10.157	29.8	29	92.500	91.025	0.875	Open Manhole	1500

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PIPELINE SCHEDULES for K2275 SW NETWORK 1.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.011	o	600	29	92.500	91.025	0.875	Open Manhole	1500
1.012	o	600	30	91.750	91.000	0.150	Open Manhole	1500
1.013	o	600	31	91.750	90.938	0.212	Open Manhole	1500
1.014	o	600	32	91.750	90.888	0.262	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.011	18.292	231.6	30	91.750	90.946	0.204	Open Manhole	1500
1.012	11.763	189.7	31	91.750	90.938	0.212	Open Manhole	1500
1.013	23.524	470.5	32	91.750	90.888	0.262	Open Manhole	1500
1.014	5.000	454.5	32	91.500	90.877	0.023	Open Manhole	1350

Free Flowing Outfall Details for K2275 SW NETWORK 1.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.014	32	91.500	90.877	90.877	1350	0

Simulation Criteria for K2275 SW NETWORK 1.SWS

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 Coeffiecient	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 Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 577291 164528 TQ 77291 64528

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Synthetic Rainfall Details

C (1km)	0.000
D1 (1km)	0.000
D2 (1km)	0.000
D3 (1km)	0.000
E (1km)	0.000
F (1km)	0.000
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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