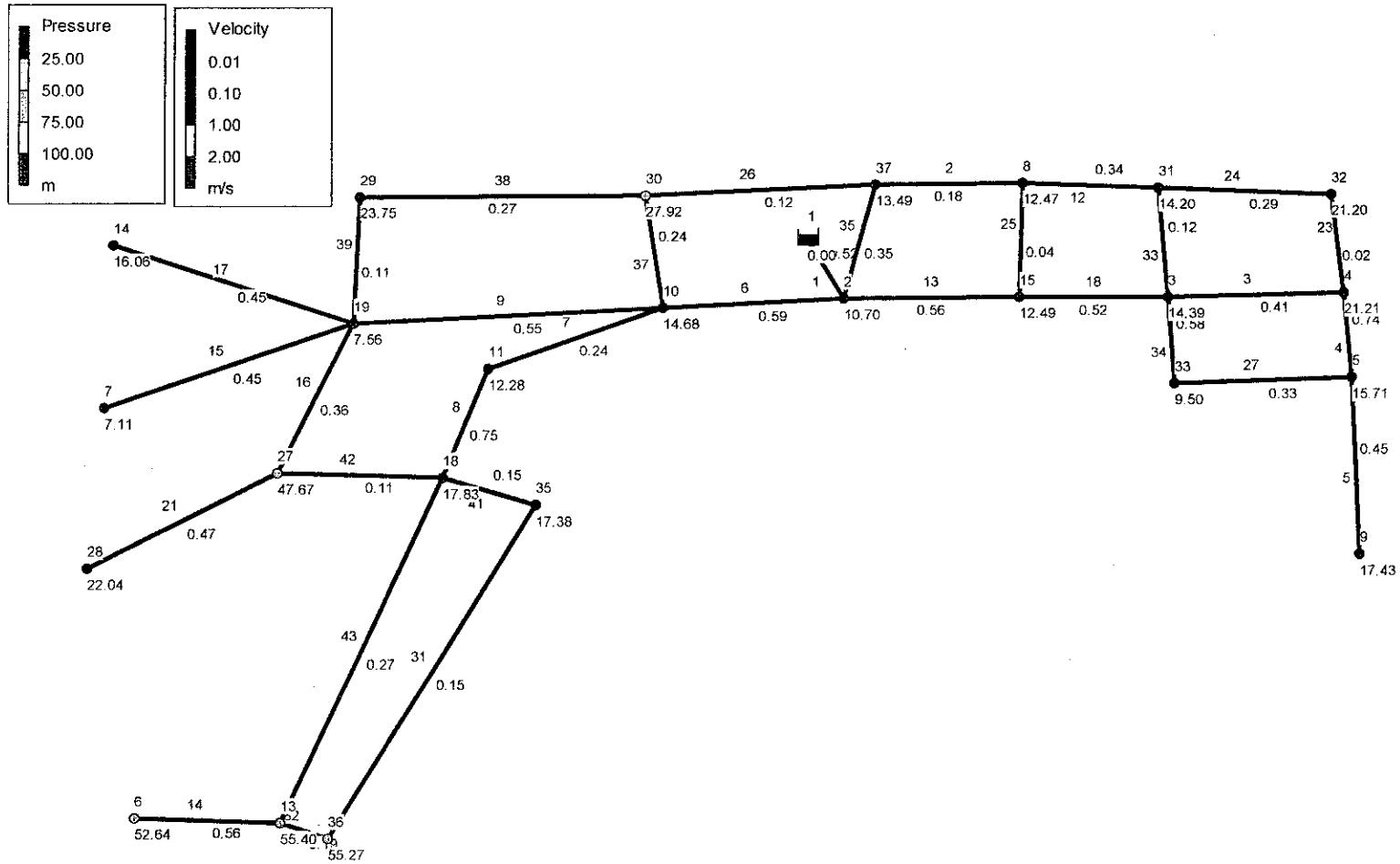


Chapter 7

Hydraulic Calculation Results

Figure G7-1 Layout of GI system for Hydraulic Calculation

Day 1, 12:00 AM



G7-1

Table G7-1 Dimension of Network system (1/2)

Node ID	Elevation m	Base Demand LPS	Demand LPS	Pressure m
Junc 2	750	0.55	0.55	10.70
Junc 3	740	0.49	0.49	14.39
Junc 4	730	0.6	0.60	21.21
Junc 5	730	0.6	0.60	15.71
Junc 9	720	1.49	1.49	17.43
Junc 10	744	0.55	0.55	14.68
Junc 11	746	0.55	0.55	12.28
Junc 13	690	0.68	0.68	55.40
Junc 14	730	1.49	1.49	16.06
Junc 18	730	0.44	0.44	17.83
Junc 19	746	0.44	0.44	7.56
Junc 27	700	0.5	0.50	47.67
Junc 28	717	1.55	1.55	22.04
Junc 29	730	0.55	0.55	23.75
Junc 30	730	0.55	0.55	27.92
Junc 31	740	0.49	0.49	14.20

G7-2

Table G7-2 Dimension of Network system (2/2)

Node ID	Elevation m	Base Demand LPS	Demand LPS	Pressure m
Junc 32	730	0.6	0.60	21.20
Junc 33	740	0.49	0.49	9.50
Junc 35	730	0	0.00	17.38
Junc 36	690	0.68	0.68	55.27
Junc 37	745	0.55	0.55	13.49
Junc 6	690	1.1	1.10	52.64
Junc 7	740	1.5	1.50	7.11
Junc 8	745	0	0.00	12.47
Junc 15	745	0	0.00	12.49
Resvr 1	761	#N/A	-16.44	0.00

G7-3

Table G7-3 Results of Network Link (1/2)

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 1	210	200	16.44	0.52	1.42
Pipe 3	1110	80	2.07	0.41	2.87
Pipe 4	360	50	1.44	0.74	15.27
Pipe 5	1900	65	1.49	0.45	4.36
Pipe 6	810	150	10.34	0.59	2.50
Pipe 7	810	150	4.30	0.24	0.49
Pipe 8	1210	80	3.75	0.75	8.64
Pipe 21	1840	65	1.55	0.47	4.69
Pipe 23	400	50	0.03	0.02	0.02
Pipe 24	1100	50	-0.57	0.29	2.73
Pipe 26	1000	50	0.24	0.12	0.57
Pipe 27	1100	50	-0.65	0.33	3.45
Pipe 31	2400	50	0.30	0.15	0.88
Pipe 32	100	50	-0.38	0.19	1.31
Pipe 33	480	65	-0.39	0.12	0.39
Pipe 34	500	50	1.14	0.58	9.77

G7-4

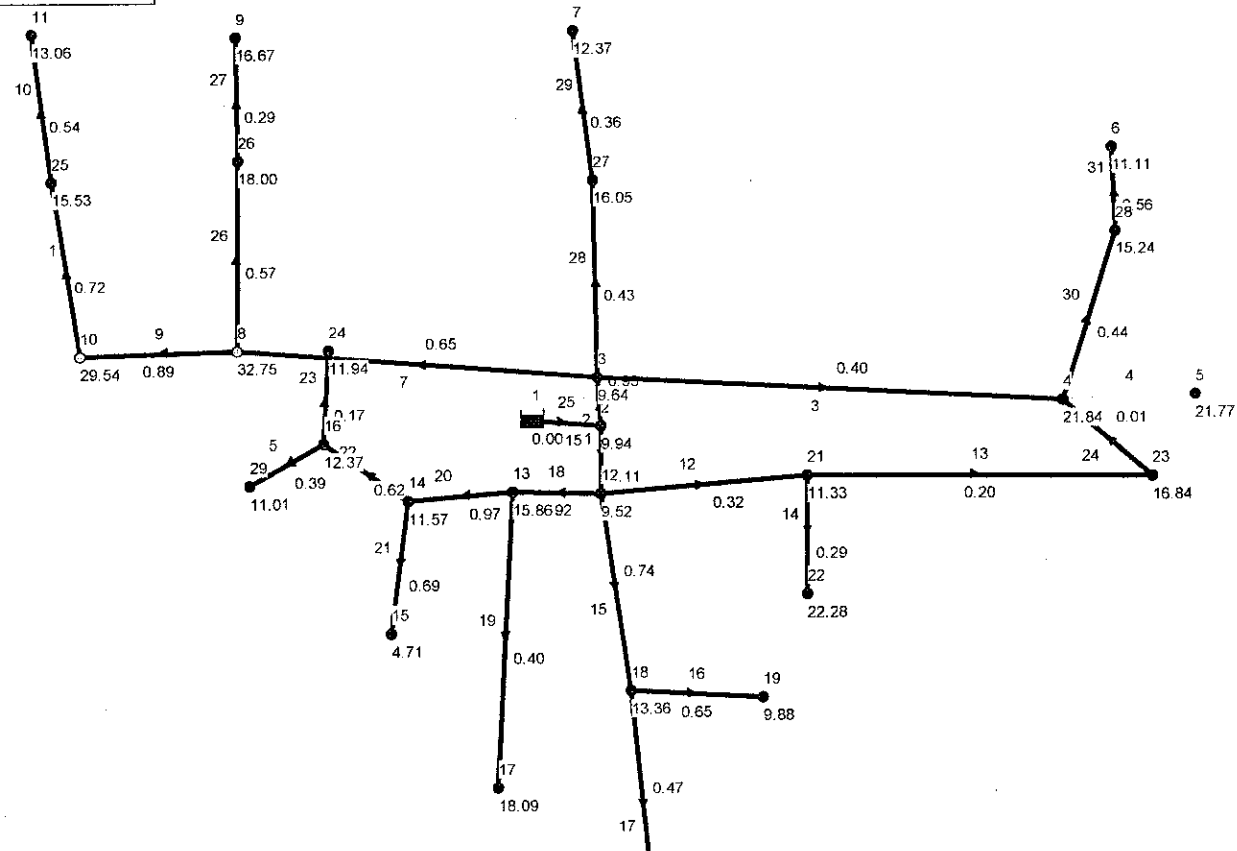
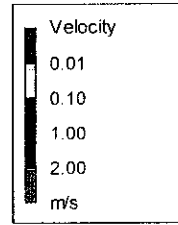
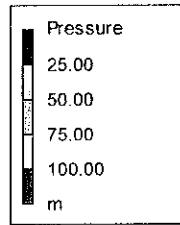
Table G7-4 Results of Network Link (2/2)

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 35	820	65	-1.15	0.35	2.69
Pipe 37	700	80	-1.22	0.24	1.08
Pipe 38	2400	65	0.90	0.27	1.74
Pipe 39	600	65	0.35	0.11	0.32
Pipe 41	500	50	0.30	0.15	0.88
Pipe 14	300	50	1.10	0.56	9.19
Pipe 15	1460	65	1.50	0.45	4.41
Pipe 16	2000	65	1.20	0.36	2.95
Pipe 17	1720	65	1.49	0.45	4.36
Pipe 2	850	50	0.36	0.18	1.20
Pipe 12	900	50	0.67	0.34	3.64
Pipe 13	840	100	4.40	0.56	3.82
Pipe 18	930	100	4.09	0.52	3.34
Pipe 25	630	100	0.31	0.04	0.03
Pipe 42	830	100	0.85	0.11	0.19
Pipe 43	2370	100	2.16	0.27	1.02
Pipe 9	1410	100	-4.28	0.55	3.63

G7-5

Figure G7-2 Layout of G2 system for Hydraulic Calculation

Day 1, 12:00 AM



G7-6

Table G7-5 Dimension of Network system (1/2)

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s
Pipe 2	50	150	-16.41	0.93
Pipe 3	1350	100	3.17	0.40
Pipe 4	850	50	0.10	0.05
Pipe 7	2250	150	-11.52	0.65
Pipe 9	350	100	-7.00	0.89
Pipe 11	50	150	-19.63	1.11
Pipe 12	850	100	2.55	0.32
Pipe 13	1550	65	0.65	0.20
Pipe 14	550	65	0.95	0.29
Pipe 15	950	100	5.83	0.74
Pipe 16	400	65	2.16	0.65
Pipe 17	950	80	2.37	0.47
Pipe 18	500	125	11.25	0.92
Pipe 19	1350	100	3.15	0.40
Pipe 20	400	100	7.60	0.97
Pipe 21	700	65	2.30	0.69
Pipe 22	900	100	4.90	0.62
Pipe 23	1050	100	1.30	0.17
Pipe 24	700	100	-0.04	0.01
Pipe 25	10	200	36.04	1.15
Pipe 1	500	80	3.60	0.72
Pipe 10	400	65	1.80	0.54
Pipe 26	500	50	1.12	0.57
Pipe 27	500	50	0.56	0.29
Pipe 28	900	65	1.42	0.43
Pipe 29	900	50	0.71	0.36
Pipe 30	500	80	2.20	0.44
Pipe 31	450	50	1.10	0.56

Table G7-5 Dimension of Network system (2/2)

Node ID	Elevation m	Demand LPS	Pressure m
Junc 2	430	0.00	9.94
Junc 3	430	0.30	9.64
Junc 4	415	0.91	21.84
Junc 5	415	0.10	21.77
Junc 6	420	1.10	11.11
Junc 7	420	0.71	12.37
Junc 8	400	3.40	32.75
Junc 9	410	0.56	16.67
Junc 10	400	3.40	29.54
Junc 11	410	1.80	13.06
Junc 12	430	0.00	9.52
Junc 13	420	0.50	15.86
Junc 14	420	0.40	11.57
Junc 15	420	2.30	4.71
Junc 16	415	2.30	12.37
Junc 17	415	3.15	18.09
Junc 18	420	1.30	13.36
Junc 19	420	2.16	9.88
Junc 20	420	2.37	9.87
Junc 21	427	0.95	11.33
Junc 22	415	0.95	22.28
Junc 23	420	0.61	16.84
Junc 24	415	1.30	11.94
Junc 25	410	1.80	15.53
Junc 26	410	0.56	18.00
Junc 27	420	0.71	16.05
Junc 28	420	1.10	15.24
Junc 29	415	1.30	11.01
Resvr 1	440	-36.04	0.00

G7-8

Table G7-7 Results of Network Link (1/2)

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s
Pipe 2	50	150	-16.41	0.93
Pipe 3	1350	100	3.17	0.40
Pipe 4	850	50	0.10	0.05
Pipe 7	2250	150	-11.52	0.65
Pipe 9	350	100	-7.00	0.89
Pipe 11	50	150	-19.63	1.11
Pipe 12	850	100	2.55	0.32
Pipe 13	1550	65	0.65	0.20
Pipe 14	550	65	0.95	0.29
Pipe 15	950	100	5.83	0.74
Pipe 16	400	65	2.16	0.65
Pipe 17	950	80	2.37	0.47
Pipe 18	500	125	11.25	0.92
Pipe 19	1350	100	3.15	0.40
Pipe 20	400	100	7.60	0.97
Pipe 21	700	65	2.30	0.69

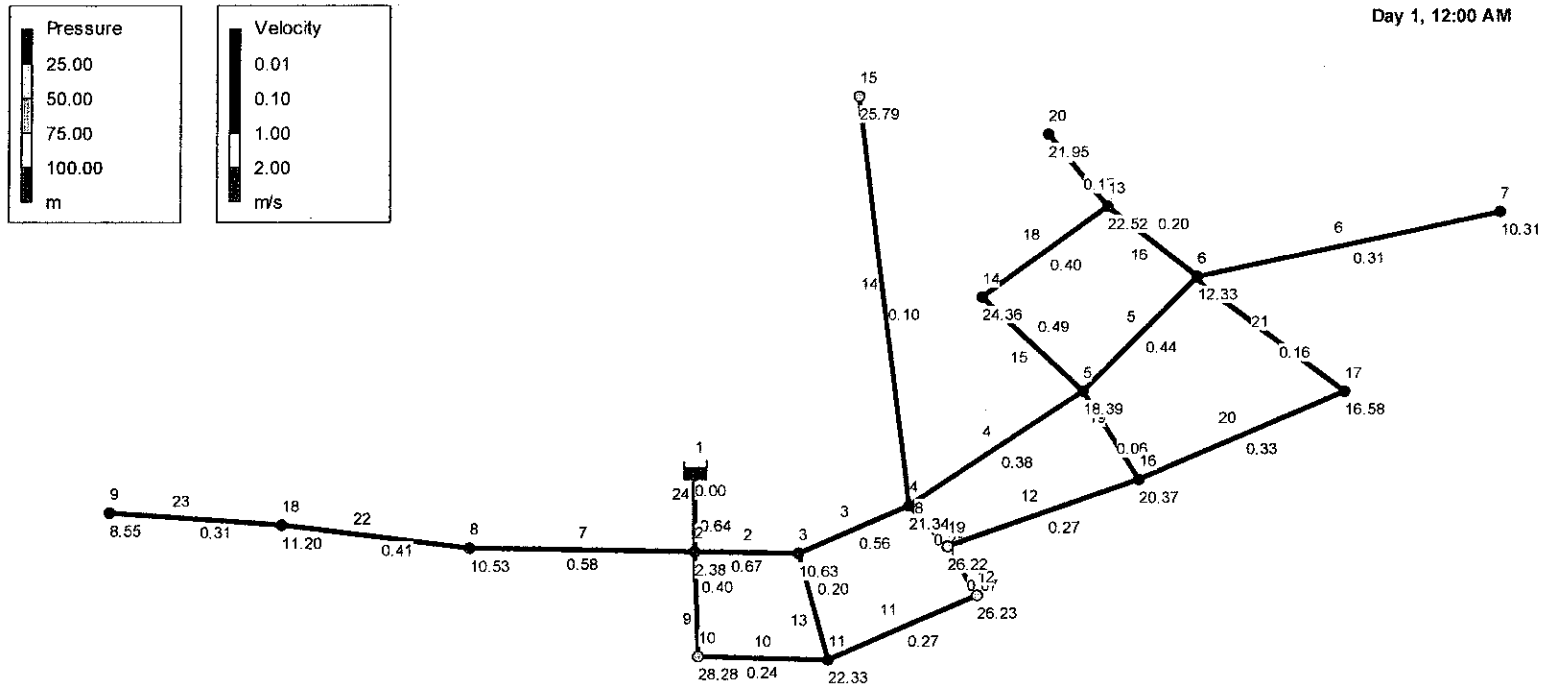
G7-9

Table G7-8 Results of Network Link (2/2)

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s
Pipe 22	900	100	4.90	0.62
Pipe 23	1050	100	1.30	0.17
Pipe 24	700	100	-0.04	0.01
Pipe 25	10	200	36.04	1.15
Pipe 1	500	80	3.60	0.72
Pipe 10	400	65	1.80	0.54
Pipe 26	500	50	1.12	0.57
Pipe 27	500	50	0.56	0.29
Pipe 28	900	65	1.42	0.43
Pipe 29	900	50	0.71	0.36
Pipe 30	500	80	2.20	0.44
Pipe 31	450	50	1.10	0.56
Pipe 5	400	65	1.30	0.39

G7-10

Figure G7-3 Layout of G3 system for Hydraulic Calculation



G7-11

Table G7-9 Dimension of Network system (1/2)

Node ID	Elevation m	Demand LPS	Pressure m
Junc 2	437	1.83	2.38
Junc 3	427	0.82	10.63
Junc 4	415	1.21	21.34
Junc 5	417	1.21	18.39
Junc 6	420	2.46	12.33
Junc 7	420	2.46	10.31
Junc 8	425	2.48	10.53
Junc 9	420	1.03	8.55
Junc 10	410	0.82	28.28
Junc 11	415	0.82	22.33
Junc 12	410	0.82	26.23
Junc 13	410	0.32	22.52
Junc 14	410	0.32	24.36
Junc 16	415	0.88	20.37
Junc 17	416	0.88	16.58
Junc 18	420	1.03	11.20

G7-12

Table G7-10 Dimension of Network system (2/2)

Node ID	Elevation m	Demand LPS	Pressure m
Junc 19	410	0.10	26.22
Junc 15	410	0.33	25.79
Junc 20	410	0.33	21.95
Resvr 1	440	-20.15	0.00

G7-13

Table G7-11 Results of Network Link (1/2)

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 2	550	150	11.76	0.67	3.18
Pipe 3	550	150	9.96	0.56	2.33
Pipe 4	850	150	6.74	0.38	1.12
Pipe 5	1260	100	3.45	0.44	2.43
Pipe 6	1550	100	2.46	0.31	1.30
Pipe 7	950	100	4.54	0.58	4.05
Pipe 9	400	80	2.02	0.40	2.73
Pipe 10	900	80	1.20	0.24	1.06
Pipe 11	830	80	1.36	0.27	1.33
Pipe 13	400	80	0.98	0.20	0.73
Pipe 15	200	65	-1.63	0.49	5.17
Pipe 16	200	65	0.66	0.20	1.00
Pipe 18	530	65	1.31	0.40	3.45
Pipe 20	1430	80	1.68	0.33	1.95
Pipe 21	500	80	0.80	0.16	0.51
Pipe 22	1530	80	2.06	0.41	2.83

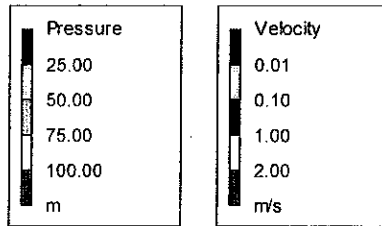
G7-14

Table G7-12 Results of Network Link (2/2)

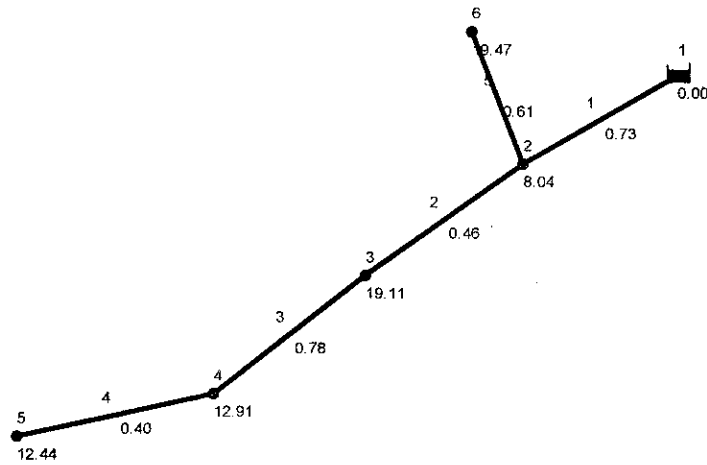
Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 23	1200	65	1.03	0.31	2.21
Pipe 24	300	200	20.15	0.64	2.08
Pipe 1	200	100	0.54	0.07	0.09
Pipe 8	200	100	-1.68	0.21	0.65
Pipe 12	850	100	-2.12	0.27	0.99
Pipe 19	280	100	-0.44	0.06	0.06
Pipe 14	1930	65	0.33	0.10	0.29
Pipe 17	560	50	0.33	0.17	1.03

G7-15

Figure G7-4 Layout of G4 system for Hydraulic Calculation



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G7-16

Table G7-13 Dimension of Network system

Node ID	Elevation m	Demand LPS	Pressure m
Junc 2	645	3.60	8.04
Junc 3	633	2.05	19.11
Junc 4	632	2.96	12.91
Junc 5	630	3.14	12.44
Junc 6	626	1.20	19.47
Resvr 1	658	-12.95	0.00

G7-17

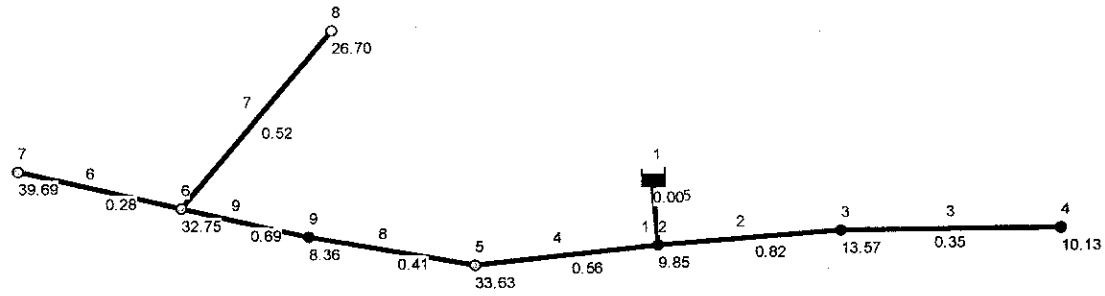
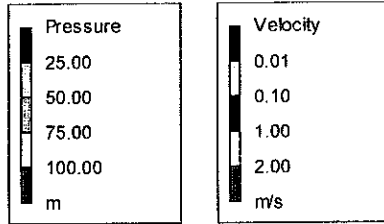
Table G7-14 Results of Network Link

Link ID	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor	Reaction Rate mg/L/d	Quality	Status
Pipe 1	12.95	0.73	3.82	0.021	0.00	0.00	Open
Pipe 2	8.15	0.46	1.60	0.022	0.00	0.00	Open
Pipe 3	6.10	0.78	7.06	0.023	0.00	0.00	Open
Pipe 4	3.14	0.40	2.04	0.025	0.00	0.00	Open
Pipe 5	1.20	0.61	10.81	0.028	0.00	0.00	Open

G7-18

Figure G7-5 Layout of G5 system for Hydraulic Calculation

Day 1, 12:00 AM



G7-19

Table G7-15 Dimension of Network system

Node ID	Elevation m	Demand LPS	Pressure m
Junc 2	741	0.87	9.85
Junc 3	734	3.65	13.57
Junc 4	735	2.78	10.13
Junc 5	716	2.67	33.63
Junc 6	710	1.40	32.75
Junc 7	700	1.40	39.69
Junc 8	713	2.60	26.70
Junc 9	740	1.80	8.36
Resvr 1	751	-17.17	0.00

G7-20

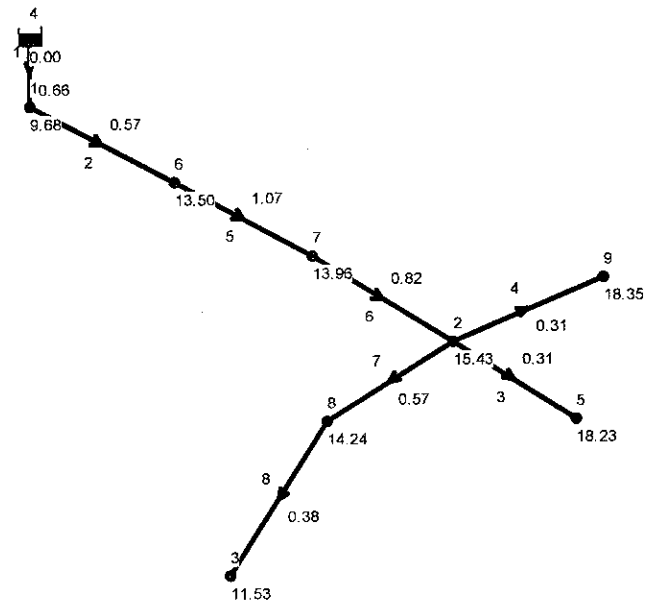
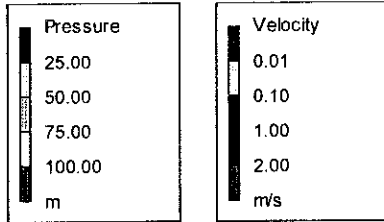
Table G7-16 Results of Network Link

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 1	100	200	17.17	0.55	1.54
Pipe 2	420	100	6.43	0.82	7.80
Pipe 3	1500	100	2.78	0.35	1.63
Pipe 4	530	150	9.87	0.56	2.29
Pipe 6	2200	80	1.40	0.28	1.39
Pipe 7	700	80	2.60	0.52	4.36
Pipe 8	1000	150	7.20	0.41	1.27
Pipe 9	1000	100	5.40	0.69	5.61

G7-21

Figure G7-6 Layout of G6 system for Hydraulic Calculation

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G7-22

Table G7-17 Dimension of Network system

Node ID	Elevation m	Demand LPS	Pressure m
Junc 1	190	1.65	9.68
Junc 2	175	0.75	15.43
Junc 3	176	1.90	11.53
Junc 6	185	1.65	13.50
Junc 7	180	1.95	13.96
Junc 8	175	2.60	14.24
Junc 5	171	0.60	18.23
Junc 9	171	0.60	18.35
Resvr 4	200	-11.70	0.00

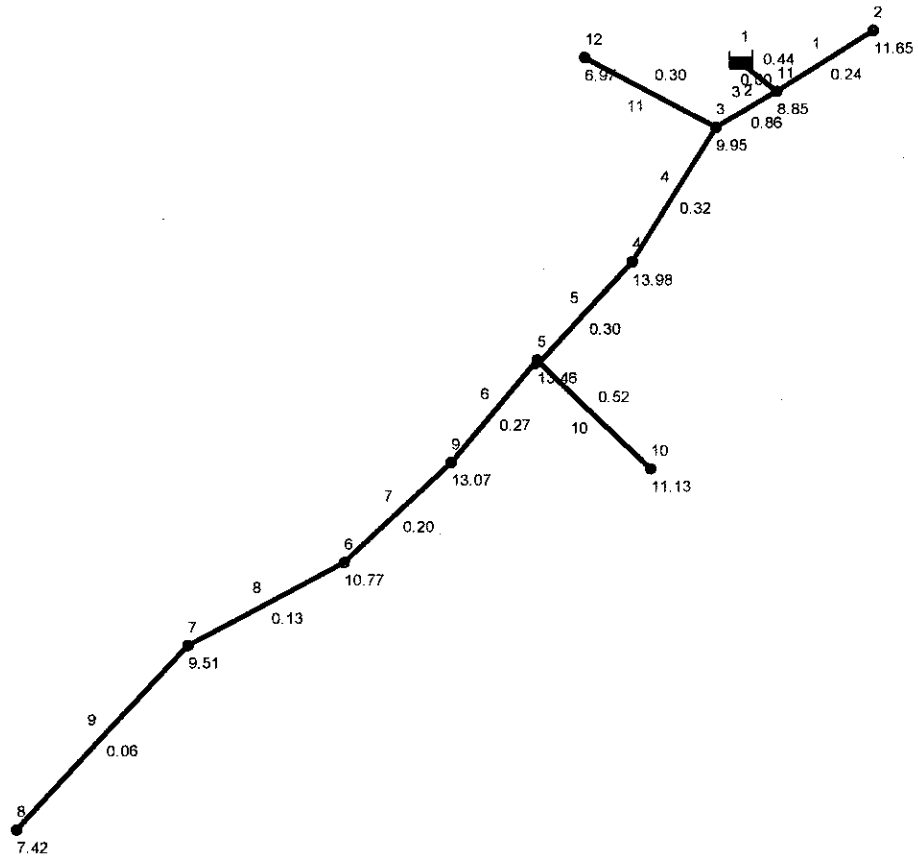
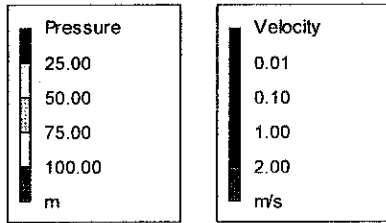
Table G7-18 Results of Network Link

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 1	100	150	11.70	0.66	3.15
Pipe 2	500	150	10.05	0.57	2.37
Pipe 5	350	100	8.40	1.07	12.97
Pipe 6	450	100	6.45	0.82	7.85
Pipe 7	300	100	4.50	0.57	3.98
Pipe 8	700	80	1.90	0.38	2.44
Pipe 3	400	50	0.60	0.31	3.01
Pipe 4	360	50	0.60	0.31	3.01

G7-24

Figure G7-7 Layout of G7 system for Hydraulic Calculation

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G7-25

Table G7-19 Dimension of Network system

Node ID	Elevation m	Demand LPS	Pressure m
Junc 2	464	0.48	11.65
Junc 3	465	0.48	9.95
Junc 4	460	0.51	13.98
Junc 5	460	1.38	13.46
Junc 6	462	0.55	10.77
Junc 9	460	0.55	13.07
Junc 10	460	1.74	11.13
Junc 11	468	0.48	8.85
Junc 12	466	0.58	6.97
Junc 7	463	0.50	9.51
Junc 8	465	0.50	7.42
Resvr 1	477	-7.75	0.00

G7-26

Table G7-20 Results of Network Link

Link ID	Length m	Diameter mm	Flow LPS	Velocity m/s	Headloss m/km
Pipe 1	600	50	-0.48	0.24	2.01
Pipe 2	100	150	7.75	0.44	1.46
Pipe 3	220	100	6.79	0.86	8.65
Pipe 4	1170	150	5.73	0.32	0.83
Pipe 5	740	150	5.22	0.30	0.70
Pipe 6	400	100	2.10	0.27	0.97
Pipe 7	530	100	1.55	0.20	0.56
Pipe 10	400	65	1.74	0.52	5.81
Pipe 11	700	50	-0.58	0.30	2.83
Pipe 8	1000	100	1.00	0.13	0.26
Pipe 9	1250	100	0.50	0.06	0.08

G7-27