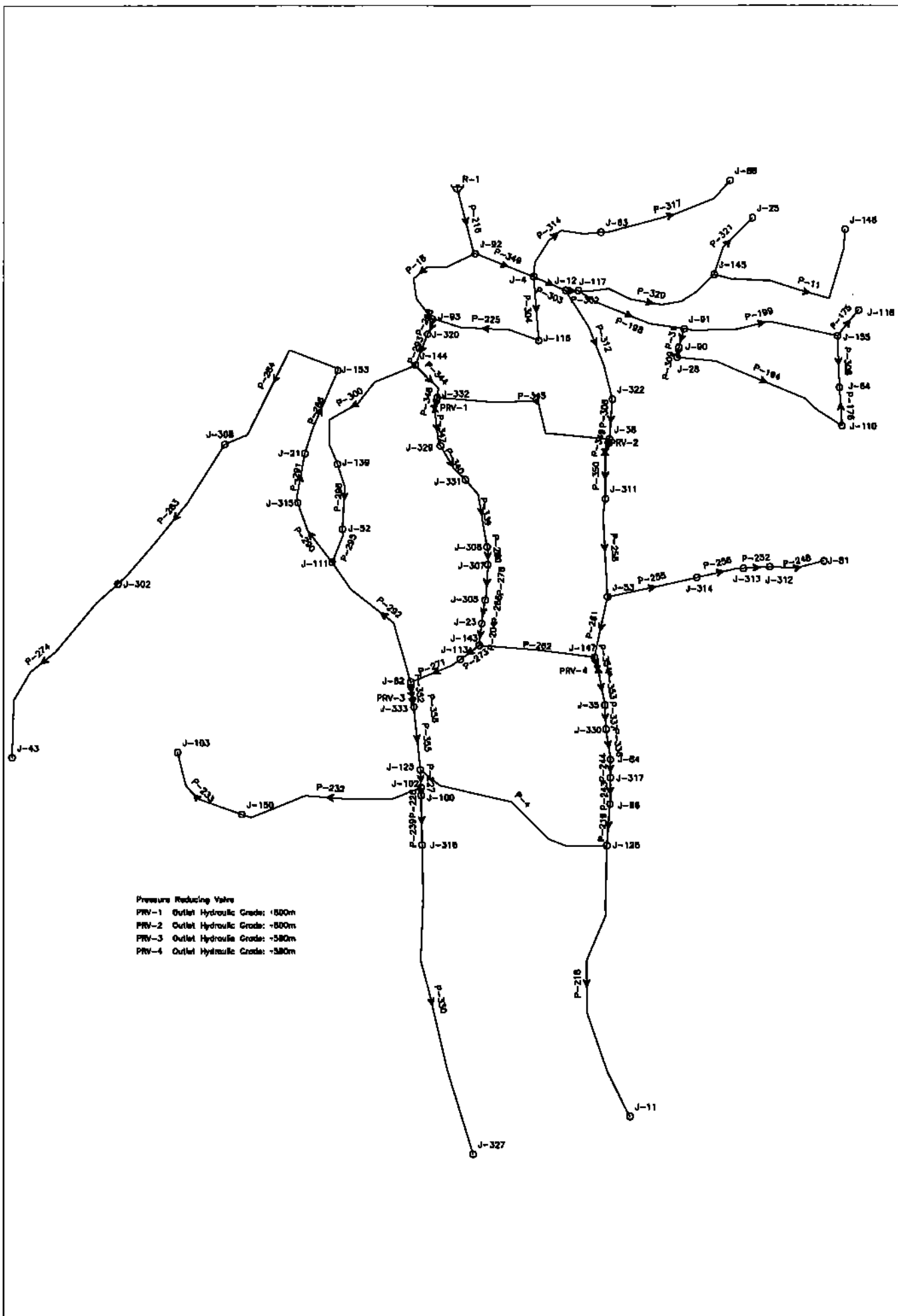


添付資料 11 水理解析

Kuceviste Network Model



Kuceviste Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-4	610	0.11	634.72	24.70
J-11	520	0.11	580.18	60.10
J-12	610	0.11	634.69	24.60
J-21	560	0.11	599.21	39.10
J-23	570	0.11	599.51	29.50
J-25	620	0.11	634.60	14.60
J-28	590	0.11	634.41	44.30
J-35	560	0.11	580.20	20.20
J-38	580	0.11	634.42	54.30
J-43	550	0.11	599.14	49.00
J-52	570	0.11	634.37	64.20
J-53	570	0.11	599.88	29.80
J-63	620	0.11	634.71	14.70
J-64	590	0.11	634.38	44.30
J-66	560	0.11	580.19	20.10
J-81	570	0.11	599.78	29.70
J-82	560	0.11	599.38	39.30
J-84	560	0.11	580.19	20.10
J-86	630	0.11	634.71	4.70
J-90	590	0.11	634.41	44.30
J-91	600	0.11	634.43	34.40
J-92	615	0.11	634.80	19.80
J-93	600	0.11	634.54	34.50
J-100	550	0.11	579.94	29.90
J-102	550	0.11	579.94	29.90
J-103	540	0.11	579.89	39.80
J-110	590	0.11	634.38	44.30
J-111	560	0.11	599.27	39.20
J-113	560	0.11	599.45	39.40
J-116	600	0.11	634.64	34.60
J-117	610	0.11	634.67	24.60
J-118	600	0.11	634.38	34.30

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-125	550	0.11	579.95	29.90
J-126	550	0.11	580.19	30.10
J-139	560	0.11	634.37	54.30
J-143	560	0.11	599.48	30.40
J-144	580	0.11	634.41	54.30
J-145	610	0.11	634.60	24.60
J-146	620	0.11	634.59	14.60
J-147	560	0.11	599.06	39.00
J-150	540	0.11	579.90	39.00
J-153	560	0.11	599.18	39.10
J-155	600	0.11	634.38	34.30
J-302	550	0.11	599.14	49.00
J-305	570	0.11	599.55	29.50
J-306	570	0.11	599.65	29.60
J-307	570	0.11	599.62	29.60
J-308	550	0.11	599.15	49.10
J-311	560	0.11	599.96	19.90
J-312	570	0.11	599.79	29.70
J-313	570	0.11	599.79	29.70
J-314	570	0.11	599.81	29.80
J-315	560	0.11	599.23	39.10
J-316	550	0.11	579.93	29.90
J-317	560	0.11	580.19	20.10
J-320	590	0.11	634.50	44.40
J-322	560	0.11	634.49	54.40
J-327	520	0.11	579.91	59.80
J-329	580	0.11	599.91	19.90
J-330	560	0.11	580.19	20.20
J-331	580	0.11	599.81	19.80
J-332	580	0.11	634.32	54.20
J-333	560	0.11	580.00	20.00

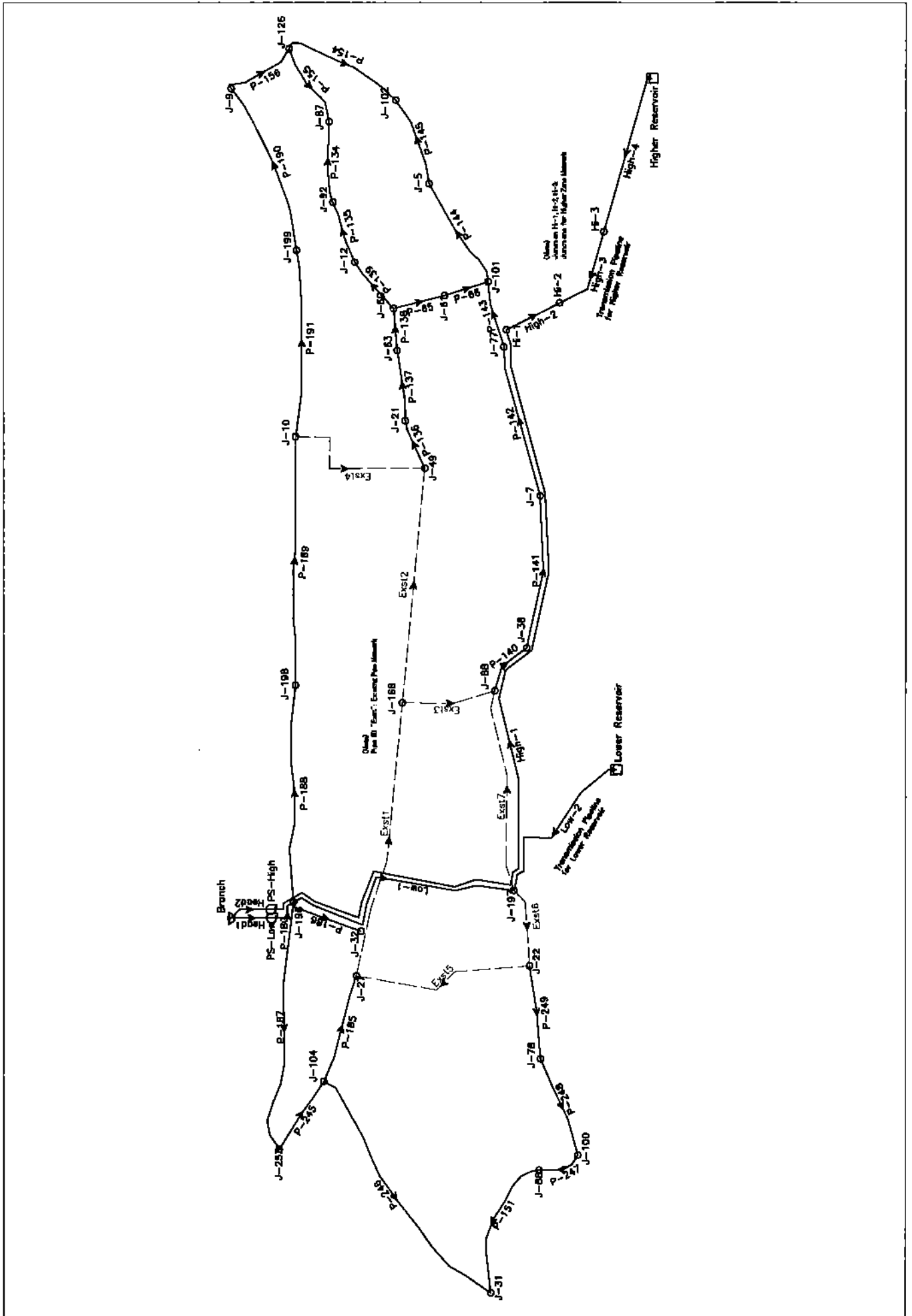
Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-4	J-125	J-126	PE	65	245.00	110	Closed	0.00	0.00	579.95	580.19	0.00	0.00
P-11	J-145	J-146	PE	65	220.00	110	Open	0.11	0.03	634.60	634.59	0.01	0.05
P-16	J-92	J-93	PE	100	134.00	110	Open	2.46	0.31	634.80	634.54	0.26	1.93
P-31	J-90	J-91	PE	65	22.00	110	Open	-0.40	0.12	634.41	634.43	0.01	0.55
P-175	J-155	J-116	PE	50	39.00	110	Open	0.11	0.06	634.38	634.38	0.01	0.18
P-176	J-64	J-110	PE	65	45.00	110	Open	-0.07	0.02	634.38	634.38	0.00	0.02
P-194	J-110	J-28	PE	65	212.00	110	Open	-0.16	0.06	634.38	634.41	0.03	0.13
P-198	J-117	J-81	PE	65	132.00	110	Open	0.77	0.23	634.67	634.43	0.24	1.83
P-199	J-91	J-155	PE	65	182.00	110	Open	0.26	0.08	634.43	634.38	0.04	0.24
P-204	J-143	J-23	PE	100	26.00	110	Open	-1.98	0.25	599.48	599.51	0.03	1.29
P-216	R-1	J-92	PE	140	78.00	110	Open	6.93	0.46	635.00	634.80	0.20	2.55
P-218	J-11	J-126	PE	100	327.00	110	Open	-0.11	0.01	580.18	580.19	0.00	0.01
P-219	J-126	J-60	PE	100	46.00	110	Open	-0.22	0.03	580.19	580.19	0.00	0.02
P-225	J-93	J-116	PE	65	128.00	110	Open	-0.40	0.14	634.54	634.64	0.10	0.75
P-226	J-100	J-102	PE	60	9.00	110	Open	-0.33	0.07	579.94	579.94	0.00	0.14
P-227	J-102	J-125	PE	60	20.00	110	Open	-0.66	0.13	579.94	579.95	0.01	0.50
P-232	J-102	J-150	PE	65	217.00	110	Open	0.22	0.07	579.94	579.90	0.04	0.18
P-233	J-150	J-103	PE	65	114.00	110	Open	0.11	0.03	579.90	579.89	0.01	0.05
P-239	J-316	J-106	PE	65	57.00	110	Open	-0.22	0.07	579.93	579.94	0.01	0.18
P-243	J-66	J-317	PE	100	30.00	110	Open	-0.33	0.04	580.19	580.19	0.00	0.05
P-244	J-317	J-84	PE	100	21.00	110	Open	-0.44	0.06	580.19	580.19	0.00	0.08
P-248	J-312	J-81	PE	65	64.00	110	Open	0.11	0.03	599.79	599.79	0.00	0.05
P-252	J-313	J-312	PE	65	30.00	110	Open	0.22	0.07	599.79	599.79	0.01	0.18
P-255	J-53	J-314	PE	65	106.00	110	Open	0.44	0.13	599.88	599.61	0.07	0.65
P-256	J-314	J-313	PE	65	56.00	110	Open	0.33	0.10	599.81	599.79	0.02	0.38
P-258	J-311	J-53	PE	100	114.00	110	Open	1.43	0.18	599.96	599.89	0.08	0.71
P-261	J-147	J-53	PE	100	72.00	110	Open	-0.89	0.11	599.86	599.88	0.02	0.29
P-262	J-147	J-143	PE	100	135.00	110	Closed	0.00	0.00	599.86	599.48	0.00	0.00
P-266	J-23	J-305	PE	100	27.00	110	Open	-2.09	0.27	599.51	599.55	0.04	1.43
P-271	J-113	J-62	PE	100	64.00	110	Open	1.76	0.22	599.45	599.38	0.07	1.04
P-273	J-113	J-143	PE	100	27.00	110	Open	-1.87	0.24	599.45	599.48	0.03	1.16
P-274	J-43	J-302	PE	80	249.00	110	Open	-0.11	0.02	599.14	599.14	0.00	0.02
P-278	J-305	J-307	PE	100	41.00	110	Open	-2.20	0.28	599.55	599.62	0.06	1.57
P-280	J-305	J-307	PE	100	21.00	110	Open	2.31	0.29	599.65	599.62	0.04	1.72
P-283	J-302	J-308	PE	80	205.00	110	Open	-0.22	0.04	599.14	599.15	0.01	0.07
P-284	J-308	J-153	PE	60	201.00	110	Open	-0.33	0.07	599.15	599.18	0.03	0.14
P-288	J-153	J-21	PE	60	104.00	110	Open	-0.44	0.09	599.18	599.21	0.02	0.24
P-290	J-315	J-111	PE	80	81.00	110	Open	-0.66	0.13	599.23	599.27	0.04	0.50
P-291	J-21	J-315	PE	80	58.00	110	Open	-0.66	0.11	599.21	599.23	0.02	0.36
P-292	J-111	J-82	PE	80	173.00	110	Open	-0.77	0.15	599.27	599.38	0.12	0.67
P-293	J-144	J-320	PE	100	39.00	110	Open	-2.71	0.35	634.41	634.50	0.09	2.31
P-295	J-52	J-111	PE	65	41.00	110	Closed	0.00	0.00	634.37	599.27	0.00	0.00
P-296	J-52	J-139	PE	65	77.00	110	Open	-0.11	0.03	634.37	634.37	0.00	0.05
P-298	J-320	J-93	PE	100	19.00	110	Open	-2.82	0.36	634.50	634.54	0.05	2.49
P-300	J-144	J-139	PE	65	174.00	110	Open	0.22	0.07	634.41	634.37	0.03	0.18
P-302	J-117	J-12	PE	80	15.00	110	Open	-1.21	0.24	634.67	634.69	0.02	1.54

Kuceviste Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-303	J-12	J-4	PE	140	41.00	110	Open	-3.45	0.22	634.69	634.72	0.03	0.70
P-304	J-4	J-116	PE	65	74.00	110	Open	0.59	0.18	634.72	634.64	0.08	1.10
P-306	J-38	J-322	PE	100	46.00	110	Open	-2.02	0.26	634.42	634.49	0.06	1.34
P-308	J-155	J-64	PE	65	60.00	110	Open	0.04	0.01	634.36	634.38	0.00	0.01
P-309	J-26	J-80	PE	65	12.00	110	Open	-0.29	0.09	634.41	634.41	0.00	0.31
P-312	J-12	J-322	PE	100	139.00	110	Open	2.13	0.27	634.69	634.49	0.20	1.48
P-314	J-4	J-63	PE	80	112.00	110	Open	0.22	0.04	634.72	634.71	0.01	0.07
P-317	J-89	J-63	PE	80	166.00	110	Open	-0.11	0.02	634.71	634.71	0.00	0.02
P-320	J-117	J-145	PE	65	174.00	110	Open	0.33	0.10	634.67	634.60	0.07	0.38
P-321	J-145	J-25	PE	65	81.00	110	Open	0.11	0.03	634.60	634.60	0.00	0.05
P-330	J-327	J-316	PE	65	365.00	110	Open	-0.11	0.03	579.91	579.93	0.02	0.05
P-336	J-84	J-330	PE	100	35.00	110	Open	-0.55	0.07	580.19	580.19	0.00	0.12
P-337	J-330	J-35	PE	100	28.00	110	Open	-0.66	0.08	580.19	580.20	0.00	0.17
P-339	J-306	J-331	PE	100	84.00	110	Open	-2.42	0.31	589.65	589.61	0.16	1.87
P-340	J-331	J-329	PE	100	49.00	110	Open	-2.63	0.32	589.61	589.91	0.10	2.04
P-344	J-332	J-144	PE	100	49.00	110	Open	-2.38	0.30	634.32	634.41	0.09	1.62
P-345	J-332	J-38	PE	65	230.00	110	Open	-0.37	0.11	634.32	634.42	0.11	0.47
P-346	J-82	J-4	PE	140	73.00	110	Open	4.36	0.28	634.00	634.72	0.08	1.08
P-347	J-329	PRV-1	PE	100	44.00	110	Open	-2.64	0.34	589.91	600.01	0.10	2.20
P-348	PRV-1	J-332	PE	100	13.00	110	Open	-2.64	0.34	634.29	634.32	0.03	2.20
P-349	J-38	PRV-2	PE	100	16.00	110	Open	1.54	0.20	634.42	634.41	0.01	0.81
P-350	PRV-2	J-311	PE	100	54.00	110	Open	1.54	0.20	600.01	589.86	0.04	0.81
P-352	PRV-3	J-82	PE	80	16.00	110	Open	-0.88	0.17	589.37	589.38	0.01	0.85
P-353	J-35	PRV-4	PE	100	42.00	110	Open	-0.77	0.10	580.20	580.21	0.01	0.22
P-354	PRV-4	J-147	PE	100	14.00	110	Open	-0.77	0.10	589.86	589.86	0.00	0.22
P-355	J-125	J-333	PE	80	73.00	110	Open	-0.77	0.15	579.95	580.00	0.05	0.67
P-356	J-333	PRV-3	PE	80	13.00	110	Open	-0.88	0.17	580.00	580.01	0.01	0.85

Radisani Lower Zone Network Model



Radisani Lower Zone Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
Hf-1	380	9.00	470.93	90.75
Hf-2	400	9.00	470.69	70.55
Hf-3	420	9.00	470.71	50.61
J-5	360	0.90	400.80	20.76
J-7	360	0.90	401.82	41.74
J-9	380	0.90	401.04	21.00
J-10	380	0.90	403.69	23.64
J-12	380	0.90	400.84	20.79
J-21	380	0.90	402.39	22.33
J-22	360	0.90	405.31	45.22
J-27	330	0.90	404.64	74.49
J-31	330	0.90	404.61	74.46
J-32	340	0.90	407.21	67.07
J-38	360	0.90	403.06	42.98
J-49	380	0.90	403.35	23.30
J-60	380	0.90	400.99	20.95
J-61	380	0.90	400.94	20.89
J-63	380	0.90	401.39	21.35

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-77	380	0.90	401.09	21.05
J-78	350	0.90	404.87	54.76
J-86	350	0.90	404.61	54.50
J-87	380	0.90	400.78	20.74
J-88	350	0.90	403.74	43.65
J-92	380	0.90	400.78	20.74
J-100	350	0.90	404.64	54.53
J-101	380	0.90	400.93	20.89
J-102	380	0.90	400.79	20.75
J-104	330	0.90	404.74	74.59
J-126	380	0.90	400.61	20.77
J-168	360	0.90	403.74	43.66
J-196	340	0.90	407.25	67.12
J-197	360	0.90	406.94	46.84
J-198	350	0.90	405.45	55.34
J-199	380	0.90	402.01	21.07
J-253	315	0.90	405.15	89.97

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
Ext1	J-27	J-168	Ductile Iron	100	543.15	110	Open	2.67	0.34	404.64	403.74	0.90	1.65
Ext2	J-168	J-49	Ductile Iron	100	459.94	110	Open	1.58	0.20	403.74	403.35	0.39	0.86
Ext3	J-88	J-168	Ductile Iron	100	184.40	110	Open	-0.19	0.02	403.74	403.74	0.00	0.02
Ext4	J-10	J-49	Ductile Iron	150	315.77	110	Open	5.19	0.29	403.69	403.35	0.34	1.07
Ext5	J-27	J-22	Ductile Iron	100	356.62	110	Open	-2.43	0.31	404.64	405.31	0.67	1.88
Ext6	J-22	J-197	Ductile Iron	100	156.06	110	Open	-6.10	0.78	405.31	406.94	1.62	10.40
Ext7	J-197	J-88	Ductile Iron	100	397.46	110	Open	5.31	0.68	406.94	403.74	3.20	8.04
Head1	Branch	PS-Low	Ductile Iron	200	78.94	110	Open	24.63	0.78	350.00	349.53	0.37	4.71
Head2	Branch	PS-High	Ductile Iron	200	84.73	110	Open	16.34	0.52	350.00	349.81	0.19	2.20
High-1	PS-High	Hi-1	Ductile Iron	200	1,707.18	110	Open	16.34	0.52	474.09	470.93	3.76	2.20
High-2	Hi-1	Hi-2	Ductile Iron	150	117.96	110	Open	7.34	0.42	470.93	470.69	0.24	2.03
High-3	Hi-2	Hi-3	Ductile Iron	150	177.09	110	Open	-1.66	0.09	470.69	470.71	0.02	0.13
High-4	Higher Reserve	Hi-3	Ductile Iron	150	317.60	110	Open	10.66	0.60	472.00	470.71	1.29	4.06
Low-1	J-196	J-197	Ductile Iron	200	520.60	110	Open	8.14	0.26	407.25	406.94	0.32	0.61
Low-2	J-197	Lower Reserve	Ductile Iron	200	358.14	110	Open	-4.17	0.13	406.94	407.00	0.06	0.18
P-65	J-60	J-61	Ductile Iron	100	102.72	110	Open	1.20	0.15	400.99	400.94	0.05	0.51
P-66	J-61	J-101	Ductile Iron	100	89.31	110	Open	0.30	0.04	400.94	400.93	0.00	0.04
P-134	J-87	J-92	Ductile Iron	100	157.58	110	Open	-0.18	0.02	400.78	400.78	0.00	0.01
P-135	J-92	J-12	Ductile Iron	100	124.65	110	Open	-1.08	0.14	400.78	400.84	0.06	0.42
P-136	J-49	J-21	Ductile Iron	100	100.58	110	Open	5.87	0.75	403.35	402.38	0.97	9.69
P-137	J-21	J-63	Ductile Iron	100	138.68	110	Open	4.97	0.63	402.38	401.39	0.99	7.12
P-138	J-63	J-60	Ductile Iron	100	81.69	110	Open	4.07	0.52	401.39	400.99	0.40	4.92
P-139	J-60	J-12	Ductile Iron	100	117.06	110	Open	1.98	0.25	400.99	400.84	0.15	1.29
P-140	J-88	J-38	Ductile Iron	100	110.34	110	Open	4.60	0.59	403.74	403.06	0.68	6.15
P-141	J-38	J-7	Ductile Iron	100	301.45	110	Open	3.70	0.47	403.06	401.82	1.24	4.11
P-142	J-7	J-77	Ductile Iron	100	300.23	110	Open	2.80	0.36	401.82	401.09	0.74	2.45
P-143	J-77	J-101	Ductile Iron	100	130.78	110	Open	1.90	0.24	401.09	400.93	0.16	1.19
P-144	J-101	J-5	Ductile Iron	100	225.55	110	Open	1.29	0.16	400.93	400.80	0.13	0.59
P-145	J-5	J-102	Ductile Iron	100	177.09	110	Open	0.39	0.05	400.80	400.79	0.01	0.06
P-151	J-31	J-86	Ductile Iron	152.4	284.38	110	Open	-0.08	0.00	404.61	404.61	0.00	0.00
P-154	J-126	J-102	Ductile Iron	100	247.80	110	Open	0.51	0.06	400.81	400.79	0.03	0.10
P-155	J-87	J-126	Ductile Iron	100	168.12	110	Open	-0.72	0.09	400.78	400.81	0.03	0.20
P-156	J-9	J-126	Ductile Iron	100	151.18	110	Open	2.13	0.27	401.04	400.81	0.22	1.48
P-180	PS-Low	J-196	Ductile Iron	200	69.19	110	Open	24.63	0.78	407.58	407.25	0.33	4.71
P-185	J-104	J-27	Ductile Iron	100	215.19	110	Open	1.14	0.15	404.74	404.64	0.10	0.47
P-186	J-196	J-32	Ductile Iron	100	148.95	110	Open	0.90	0.11	407.25	407.21	0.05	0.30
P-187	J-196	J-253	Ductile Iron	100	493.78	110	Open	3.77	0.48	407.25	405.15	2.10	4.26
P-188	J-196	J-198	Ductile Iron	150	425.81	110	Open	10.92	0.62	407.25	405.45	1.81	4.24
P-189	J-190	J-10	Ductile Iron	150	486.16	110	Open	10.02	0.57	405.45	403.69	1.78	3.62
P-190	J-199	J-9	Ductile Iron	100	342.90	110	Open	3.03	0.39	402.01	401.04	0.96	2.85
P-191	J-199	J-10	Ductile Iron	100	363.63	110	Open	-3.93	0.50	402.01	403.69	1.68	4.61
P-245	J-253	J-104	Ductile Iron	100	158.19	110	Open	2.87	0.37	405.15	404.74	0.41	2.57
P-246	J-104	J-31	Ductile Iron	100	538.45	110	Open	0.82	0.10	404.74	404.61	0.14	0.26
P-247	J-85	J-100	Ductile Iron	100	89.61	110	Open	-0.98	0.12	404.61	404.64	0.03	0.35
P-248	J-100	J-78	Ductile Iron	100	201.47	110	Open	-1.80	0.24	404.64	404.87	0.24	1.17
P-249	J-78	J-22	Ductile Iron	100	182.27	110	Open	-2.70	0.35	404.87	405.31	0.44	2.42

Radisani Higher Zone Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-110	430	0.28	459.69	29.80
J-111	430	0.28	459.69	29.80
J-112	440	0.28	459.48	19.40
J-113	440	0.28	459.47	19.40
J-114	440	0.28	469.92	29.90
J-115	440	0.28	469.00	29.90
J-116	410	0.28	460.34	50.28
J-117	420	0.28	460.41	40.30
J-118	400	0.28	461.25	61.10
J-119	410	0.28	460.85	50.80
J-121	400	0.28	464.37	64.20
J-122	410	0.28	461.70	51.60
J-123	400	0.28	461.59	61.50
J-124	430	0.28	459.94	29.90
J-125	430	0.28	459.67	29.80
J-128	420	0.28	467.39	47.30
J-130	400	0.28	464.28	68.10
J-131	400	0.28	466.34	66.20
J-133	470	0.00	471.85	1.80
J-134	440	0.28	459.28	19.20
J-135	440	0.28	459.25	19.20
J-137	400	0.28	461.35	61.20
J-138	410	0.28	460.85	50.70
J-139	420	0.28	460.85	40.80
J-140	410	0.28	460.93	50.80
J-141	400	0.28	462.13	62.00
J-142	400	0.28	461.98	61.90
J-143	400	0.28	461.43	61.30
J-144	400	0.28	461.20	61.10
J-145	410	0.28	460.48	50.40
J-146	400	0.28	460.86	60.50
J-147	410	0.28	460.13	50.00
J-148	410	0.28	460.08	50.00
J-149	420	0.28	469.69	49.60
J-150	400	0.28	462.03	61.90
J-151	400	0.28	461.51	61.40
J-152	400	0.28	461.76	61.60
J-153	400	0.28	461.08	61.00
J-154	400	0.28	461.07	61.00
J-155	400	0.28	460.64	60.50
J-156	400	0.28	460.64	60.50
J-157	440	0.28	459.39	19.40
J-158	430	0.28	461.92	61.90
J-159	410	0.28	461.94	61.90
J-160	400	0.28	460.62	60.50
J-161	440	0.28	459.57	19.50
J-162	440	0.28	459.51	19.50
J-163	430	0.28	459.70	29.60
J-164	400	0.28	461.14	61.00
J-165	400	0.28	461.12	61.00
J-166	400	0.28	461.04	60.90
J-167	400	0.28	461.76	61.60
J-168	400	0.28	461.61	61.50

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-169	400	0.28	464.98	64.80
J-170	420	0.28	466.89	46.80
J-171	400	0.28	464.06	63.90
J-172	380	0.28	462.55	82.40
J-173	440	0.28	459.51	19.50
J-174	420	0.28	460.50	40.50
J-175	420	0.28	468.08	48.00
J-176	400	0.28	465.64	65.50
J-177	400	0.28	463.45	63.30
J-178	430	0.28	460.39	30.30
J-179	440	0.28	459.23	19.20
J-180	420	0.28	460.73	40.60
J-181	380	0.28	464.63	84.50
J-182	430	0.28	461.91	61.80
J-183	410	0.28	460.28	50.20
J-184	410	0.28	460.20	50.10
J-185	410	0.28	460.84	50.70
J-186	410	0.28	460.88	50.80
J-187	400	0.28	463.11	63.00
J-188	400	0.28	462.92	62.80
J-189	400	0.28	469.57	69.40
J-190	400	0.28	462.22	62.10
J-191	400	0.28	460.32	60.20
J-192	410	0.28	460.81	50.70
J-193	410	0.28	460.82	50.70
J-194	410	0.28	460.02	49.90
J-195	410	0.28	460.03	49.90
J-196	410	0.28	460.94	50.80
J-198	400	0.28	461.10	61.00
J-199	410	0.28	460.97	50.90
J-200	410	0.28	461.00	50.90
J-201	410	0.28	462.01	61.90
J-202	400	0.28	460.71	60.60
J-204	410	0.28	459.96	49.90
J-205	430	0.28	459.77	49.70
J-207	380	0.28	468.68	88.50
J-208	400	0.28	460.43	60.30
J-209	400	0.28	465.27	65.10
J-210	380	0.28	462.88	82.70
J-212	430	0.28	459.69	29.60
J-213	430	0.28	460.38	30.30
J-214	380	0.28	464.16	84.00
J-215	400	0.28	462.76	62.60
J-216	400	0.28	461.26	61.10
J-217	400	0.28	461.22	61.10
J-218	410	0.28	460.05	50.00
J-219	410	0.28	460.05	50.00
J-220	380	0.28	469.57	69.40
J-221	400	0.28	460.65	60.50
J-222	400	0.28	462.44	62.30
J-323	400	0.28	461.15	61.00
J-328	410	0.28	460.87	50.80
J-329	410	0.28	460.80	50.80

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-31	J-192	J-193	Ductile Iron	80	65.84	110	Open	-0.28	0.06	460.81	460.82	0.01	0.10
P-32	J-193	J-185	Ductile Iron	80	60.35	110	Open	-0.56	0.11	460.82	460.84	0.02	0.37
P-34	J-105	J-186	Ductile Iron	80	50.29	110	Open	-0.84	0.17	460.84	460.88	0.04	0.78
P-36	J-196	J-196	Ductile Iron	80	48.77	110	Open	-1.12	0.22	460.88	460.94	0.07	1.34
P-39	J-109	J-130	Ductile Iron	100	138.07	110	Open	5.77	0.73	469.57	468.28	1.29	9.37
P-40	J-130	J-131	Ductile Iron	100	226.77	110	Open	5.49	0.70	468.28	466.34	1.94	8.54
P-41	J-131	J-176	Ductile Iron	100	90.83	110	Open	5.21	0.66	466.34	465.64	0.70	7.75
P-42	J-176	J-209	Ductile Iron	100	32.43	110	Open	4.93	0.63	465.64	465.27	0.37	7.00
P-43	J-209	J-189	Ductile Iron	100	47.24	110	Open	4.65	0.59	465.27	464.98	0.30	6.28
P-49	J-121	J-171	Ductile Iron	100	43.89	110	Open	4.92	0.63	464.37	464.06	0.31	6.97
P-50	J-171	J-177	Ductile Iron	100	36.45	110	Open	4.64	0.59	464.06	463.45	0.62	8.25
P-51	J-177	J-107	Ductile Iron	100	59.74	110	Open	4.36	0.55	463.45	463.11	0.33	5.57
P-52	J-187	J-188	Ductile Iron	100	39.93	110	Open	4.08	0.52	463.11	462.92	0.20	4.93
P-53	J-188	J-215	Ductile Iron	100	35.97	110	Open	3.80	0.48	462.92	462.76	0.16	4.32
P-54	J-141	J-142	Ductile Iron	100	48.77	110	Open	3.16	0.40	462.73	461.98	0.75	3.07
P-55	J-142	J-122	Ductile Iron	100	106.36	110	Open	2.88	0.37	461.98	461.70	0.28	2.59
P-57	J-122	J-123	Ductile Iron	100	53.04	110	Open	2.60	0.33	461.70	461.59	0.11	2.14
P-58	J-172	J-150	Ductile Iron	150	75.90	110	Open	14.21	0.80	462.55	462.03	0.52	6.91
P-61	J-151	J-143	Ductile Iron	150	44.81	110	Open	6.92	0.39	461.51	461.43	0.08	1.82
P-62	J-216	J-217	Ductile Iron	100	163.66	110	Open	0.76	0.10	461.26	461.22	0.04	0.22
P-64	J-221	J-155	Ductile Iron	100	26.96	110	Open	0.56	0.07	460.85	460.64	0.00	0.12
P-65	J-155	J-156	Ductile Iron	100	117.65	110	Open	0.28	0.04	460.64	460.64	0.00	0.03
P-66	J-194	J-195	Ductile Iron	80	82.30	110	Open	-0.28	0.06	460.02	460.03	0.01	0.10

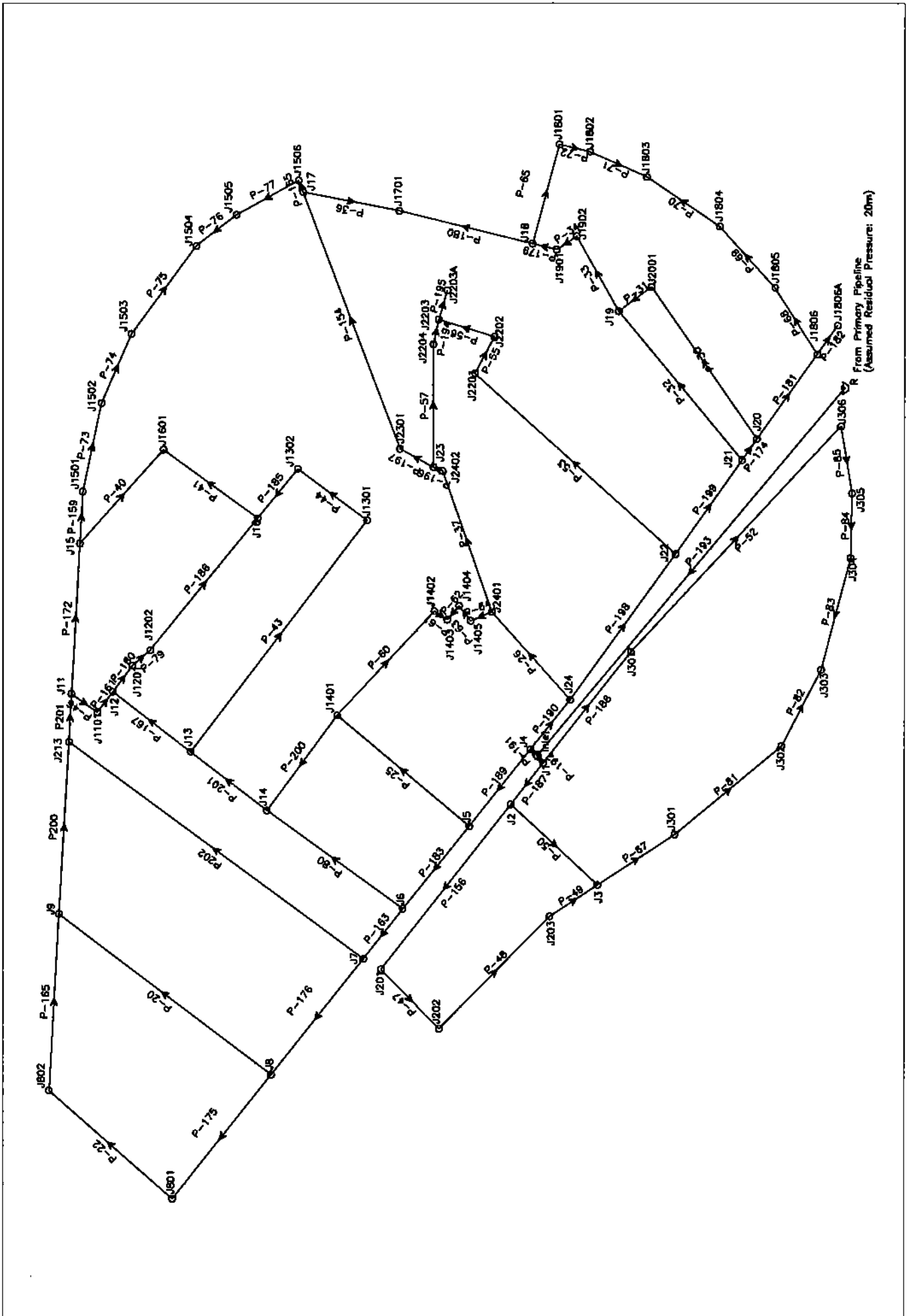
Radisani Higher Zone Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-67	J-195	J-219	Ductile Iron	80	78.33	110	Open	-0.56	0.11	460.03	460.05	0.03	0.37
P-68	J-147	J-148	Ductile Iron	100	82.60	110	Open	1.37	0.17	460.13	460.08	0.05	0.85
P-70	J-124	J-125	Ductile Iron	100	45.72	110	Open	2.25	0.29	459.94	459.87	0.07	1.64
P-72	J-173	J-157	Ductile Iron	80	88.70	110	Open	1.12	0.22	459.51	459.39	0.12	1.34
P-74	J-157	J-134	Ductile Iron	80	145.91	110	Open	0.84	0.17	459.39	459.28	0.12	0.78
P-75	J-134	J-135	Ductile Iron	80	75.28	110	Open	0.56	0.11	459.28	459.25	0.03	0.37
P-76	J-135	J-179	Ductile Iron	80	180.14	110	Open	0.20	0.06	459.25	459.23	0.02	0.10
P-77	J-212	J-110	Ductile Iron	100	65.14	110	Open	0.27	0.03	459.69	459.69	0.00	0.03
P-78	J-110	J-111	Ductile Iron	100	73.15	110	Open	-0.01	0.00	459.69	459.69	0.00	0.00
P-79	J-111	J-163	Ductile Iron	100	189.64	110	Open	-0.29	0.04	459.69	459.70	0.01	0.04
P-80	J-218	J-145	Ductile Iron	100	203.00	110	Open	-2.56	0.33	460.05	460.48	0.42	2.08
P-86	J-137	J-152	Ductile Iron	100	140.51	110	Open	-3.07	0.39	461.35	461.76	0.41	2.91
P-87	J-152	J-190	Ductile Iron	100	135.64	110	Open	-3.35	0.43	461.76	462.22	0.46	3.42
P-88	J-190	J-172	Ductile Iron	100	82.60	110	Open	-3.63	0.46	462.22	462.55	0.33	3.97
P-91	J-144	J-164	Ductile Iron	150	95.36	110	Open	3.56	0.20	461.20	461.14	0.05	0.53
P-92	J-164	J-165	Ductile Iron	150	46.94	110	Open	3.28	0.19	461.20	461.12	0.02	0.46
P-93	J-165	J-198	Ductile Iron	150	55.17	110	Open	3.00	0.17	461.12	461.10	0.02	0.39
P-94	J-198	J-153	Ductile Iron	150	57.00	110	Open	2.72	0.15	461.10	461.08	0.02	0.32
P-95	J-153	J-154	Ductile Iron	150	30.18	110	Open	2.44	0.14	461.08	461.07	0.01	0.26
P-97	J-147	J-204	Ductile Iron	100	105.46	110	Open	2.23	0.28	460.13	459.96	0.17	1.61
P-98	J-204	J-205	Ductile Iron	100	148.13	110	Open	1.95	0.25	459.96	459.77	0.19	1.26
P-100	J-161	J-162	Ductile Iron	80	81.08	110	Open	0.84	0.17	459.57	459.51	0.06	0.78
P-101	J-162	J-112	Ductile Iron	80	55.78	110	Open	0.56	0.11	459.51	459.48	0.02	0.37
P-102	J-112	J-113	Ductile Iron	80	98.76	110	Open	0.28	0.08	459.48	459.47	0.01	0.10
P-103	J-117	J-174	Ductile Iron	100	107.59	110	Open	-2.35	0.30	460.41	460.60	0.19	1.78
P-107	J-180	J-139	Ductile Iron	100	46.33	110	Open	-2.91	0.37	460.73	460.85	0.12	2.64
P-108	J-139	J-140	Ductile Iron	150	176.99	110	Open	-3.19	0.18	460.85	460.93	0.07	0.43
P-109	J-140	J-199	Ductile Iron	150	80.77	110	Open	-3.47	0.20	460.93	460.97	0.04	0.51
P-110	J-199	J-200	Ductile Iron	150	55.78	110	Open	-3.75	0.21	460.97	461.00	0.03	0.59
P-111	J-200	J-166	Ductile Iron	150	84.62	110	Open	-4.03	0.23	461.00	461.04	0.04	0.67
P-112	J-166	J-154	Ductile Iron	150	39.01	110	Open	-4.31	0.24	461.04	461.07	0.03	0.76
P-114	J-114	J-115	Ductile Iron	100	79.25	110	Open	6.48	0.03	469.92	469.00	0.92	11.84
P-115	J-115	J-175	Ductile Iron	100	85.65	110	Open	6.20	0.79	469.00	468.08	0.92	10.73
P-116	J-175	J-128	Ductile Iron	100	70.10	110	Open	5.92	0.75	468.08	467.39	0.69	9.85
P-118	J-169	J-181	Ductile Iron	100	58.52	110	Open	4.53	0.58	464.98	464.63	0.35	6.00
P-119	J-181	J-214	Ductile Iron	100	86.87	110	Open	4.25	0.54	464.63	464.16	0.46	5.33
P-120	J-182	J-158	Ductile Iron	80	111.56	110	Open	-0.28	0.06	461.91	461.92	0.01	0.10
P-121	J-150	J-159	Ductile Iron	80	57.61	110	Open	-0.58	0.11	461.92	461.94	0.02	0.37
P-122	J-159	J-201	Ductile Iron	80	82.30	110	Open	-0.84	0.17	461.94	462.01	0.06	0.78
P-124	J-167	J-168	Ductile Iron	150	94.79	110	Open	6.46	0.37	461.76	461.61	0.15	1.60
P-126	J-116	J-117	Ductile Iron	100	91.14	110	Open	-1.51	0.19	460.34	460.41	0.07	0.78
P-127	J-117	J-178	Ductile Iron	80	87.06	110	Open	0.56	0.11	460.41	460.39	0.02	0.37
P-128	J-170	J-213	Ductile Iron	80	82.48	110	Open	0.28	0.06	460.39	460.38	0.01	0.10
P-131	J-130	J-119	Ductile Iron	100	86.45	110	Open	-0.28	0.04	460.85	460.85	0.00	0.03
P-132	J-183	J-164	Ductile Iron	100	80.05	110	Open	2.05	0.26	460.28	460.20	0.08	1.38
P-133	J-154	J-160	Ductile Iron	100	183.90	110	Open	2.98	0.38	461.07	460.62	0.45	2.76
P-136	J-169	J-170	Ductile Iron	100	232.87	110	Open	-5.36	0.68	464.98	466.88	1.91	8.19
P-239	J-126	J-170	Ductile Iron	100	56.00	110	Open	5.64	0.72	467.39	466.88	0.50	9.00
P-241	J-191	J-184	Ductile Iron	100	85.04	110	Open	2.11	0.27	460.32	460.20	0.12	1.45
P-242	J-184	J-147	Ductile Iron	100	15.54	110	Open	3.88	0.49	460.20	460.13	0.07	4.49
P-244	J-216	J-124	Ductile Iron	100	53.64	110	Open	2.53	0.32	460.05	459.94	0.11	2.04
P-247	J-220	J-189	Ductile Iron	150	115.82	110	Open	0.18	0.01	469.57	469.57	0.00	0.00
P-248	J-189	J-149	Ductile Iron	150	90.22	110	Open	-5.85	0.33	469.57	469.69	0.12	1.34
P-249	J-154	J-216	Ductile Iron	150	177.39	110	Open	-5.14	0.29	461.07	461.26	0.19	1.05
P-250	J-216	J-158	Ductile Iron	150	234.70	110	Open	-6.18	0.35	461.26	461.61	0.35	1.48
P-251	J-201	J-141	Ductile Iron	80	90.22	110	Open	-1.12	0.22	462.01	462.13	0.12	1.33
P-252	J-141	J-222	Ductile Iron	100	50.90	110	Open	-4.56	0.58	462.13	462.44	0.31	6.06
P-254	J-217	J-137	Ductile Iron	100	51.82	110	Open	-2.79	0.36	461.22	461.35	0.13	2.44
P-257	J-150	J-167	Ductile Iron	150	40.54	110	Open	13.93	0.79	462.03	461.76	0.27	6.66
P-258	J-167	J-151	Ductile Iron	150	128.80	110	Open	7.20	0.41	461.76	461.51	0.25	1.96
P-260	J-207	J-220	Ductile Iron	150	103.02	110	Open	-16.03	0.91	468.68	469.57	0.89	8.63
P-261	J-125	J-163	Ductile Iron	100	131.37	110	Open	1.97	0.25	459.87	459.70	0.17	1.28
P-262	J-163	J-173	Ductile Iron	80	93.27	110	Open	1.40	0.28	459.70	459.51	0.19	2.02
P-263	J-160	J-221	Ductile Iron	100	59.13	110	Open	-1.07	0.14	460.62	460.65	0.02	0.41
P-265	J-143	J-118	Ductile Iron	150	107.59	110	Open	6.64	0.38	461.43	461.25	0.16	1.69
P-266	J-118	J-144	Ductile Iron	150	87.48	110	Open	3.84	0.22	461.25	461.20	0.05	0.61
P-267	J-205	J-212	Ductile Iron	100	84.73	110	Open	1.67	0.21	469.77	459.69	0.08	0.94
P-268	J-212	J-161	Ductile Iron	80	94.10	110	Open	1.12	0.22	459.69	459.57	0.13	1.34
P-269	J-205	J-183	Ductile Iron	80	113.00	110	Open	1.10	0.22	460.28	460.28	0.15	1.29
P-270	J-183	J-116	Ductile Iron	100	101.80	110	Open	-1.23	0.18	460.28	460.34	0.05	0.54
P-271	J-210	J-215	Ductile Iron	100	190.50	110	Open	1.32	0.17	462.89	462.76	0.12	0.61
P-272	J-215	J-222	Ductile Iron	100	48.16	110	Open	4.84	0.62	462.76	462.44	0.33	6.77
P-274	J-214	J-207	Ductile Iron	150	541.32	110	Open	-15.75	0.89	464.16	468.68	4.52	8.36
P-275	J-172	J-210	Ductile Iron	150	30.18	110	Open	-19.12	1.03	462.55	462.88	0.33	10.83
P-276	J-210	J-214	Ductile Iron	150	101.19	110	Open	-19.72	1.12	462.88	464.16	1.28	12.68
P-277	J-148	J-219	Ductile Iron	100	55.17	110	Open	1.09	0.14	460.08	460.05	0.02	0.43
P-278	J-219	J-218	Ductile Iron	100	63.09	110	Open	0.25	0.03	460.05	460.05	0.00	0.03
P-281	J-149	J-114	Ductile Iron	150	155.14	110	Open	-6.14	0.35	468.69	469.92	0.23	1.46
P-282	J-114	J-133	Ductile Iron	150	393.45	110	Open	-12.91	0.73	469.92	471.85	1.93	5.78
P-283	J-160	J-208	Ductile Iron	100	44.81	110	Open	3.77	0.48	460.62	460.43	0.19	4.26
P-284	J-208	J-191	Ductile Iron	100	57.91	110	Open	2.39	0.30	460.43	460.32	0.11	1.83
P-285	J-118	J-186	Ductile Iron	100	150.88	110	Open	2.52	0.32	461.25	460.94	0.31	2.02
P-287	J-221	J-202	Ductile Iron	100	56.39	110	Open	-1.91	0.24	460.65	460.71	0.07	1.21

Radisani Higher Zone Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-289	T-1	J-133	Ductile Iron	150	26.21	110	Open	12.91	0.73	472.00	471.85	0.15	5.78
P-291	J-119	J-328	Ductile Iron	100	122.53	110	Open	-0.56	0.07	460.85	460.87	0.02	0.12
P-292	J-328	J-329	Ductile Iron	100	106.39	110	Open	-0.84	0.11	460.87	460.90	0.03	0.28
P-293	J-329	J-196	Ductile Iron	100	105.46	110	Open	-1.12	0.14	460.90	460.94	0.05	0.45
P-294	J-202	J-146	Ductile Iron	80	167.64	110	Open	0.53	0.11	460.71	460.66	0.06	0.33
P-295	J-146	J-145	Ductile Iron	100	72.24	110	Open	2.84	0.36	460.66	460.46	0.16	2.53
P-296	R-1	PMP-1	Ductile Iron	150	57.61	110	Open	16.49	0.93	400.00	399.48	0.52	9.10
P-297	PMP-1	J-220	Ductile Iron	150	64.92	110	Open	16.49	0.93	470.17	469.57	0.59	9.10
P-298	J-180	J-174	Ductile Iron	100	58.83	110	Open	2.63	0.34	460.73	460.60	0.13	2.19
P-299	J-169	J-121	Ductile Iron	100	78.64	110	Open	5.20	0.66	464.98	464.37	0.61	7.72
P-300	J-202	J-323	Ductile Iron	100	186.23	110	Open	-2.72	0.35	460.71	461.15	0.43	2.32
P-301	J-323	J-123	Ductile Iron	100	256.03	110	Open	-2.32	0.30	461.15	461.59	0.44	1.73
P-302	J-217	J-323	Ductile Iron	100	23.77	110	Open	3.27	0.42	461.22	461.15	0.00	3.27
P-303	J-323	J-146	Ductile Iron	100	229.21	110	Open	2.59	0.33	461.15	460.66	0.49	2.13

Goce Delcev Network Model



Goce Delcev Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
Inlet	230	0.28	249.6	19.56
J1	230	0.28	249.58	19.54
J11	230	0.28	248.24	18.20
J1101	230	0.28	248.22	18.19
J12	230	0.28	248.22	18.18
J1201	230	0.28	248.20	18.16
J1202	230	0.28	248.19	18.15
J13	230	0.28	248.25	18.22
J1301	230	0.28	248.17	18.13
J1302	230	0.28	248.16	18.13
J14	230	0.28	248.45	18.41
J1401	230	0.28	248.50	18.47
J1402	230	0.28	248.48	18.44
J1403	230	0.28	248.48	18.44
J1404	230	0.28	248.48	18.44
J1405	230	0.28	248.48	18.45
J15	230	0.28	248.16	18.13
J1501	230	0.28	248.16	18.12
J1502	230	0.28	248.14	18.10
J1503	230	0.28	248.13	18.10
J1504	230	0.28	248.13	18.10
J1505	230	0.28	248.13	18.10
J1506	230	0.28	248.14	18.10
J16	230	0.28	248.16	18.13
J1601	230	0.28	248.16	18.12
J17	230	0.28	248.14	18.10
J1701	230	0.28	248.14	18.10
J18	230	0.28	248.14	18.10
J1801	230	0.28	248.10	18.07
J1802	230	0.28	248.10	18.06
J1803	230	0.28	248.10	18.06
J1804	230	0.28	248.10	18.07
J1805	230	0.28	248.12	18.08
J1806	230	0.28	248.10	18.12
J1806A	230	0.28	248.15	18.12
J19	230	0.28	248.21	18.17
J1901	230	0.28	248.14	18.11
J1902	230	0.28	248.15	18.12

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J2	230	0.28	249.52	19.48
J20	230	0.28	248.26	18.22
J2001	230	0.28	248.21	18.17
J201	230	0.28	249.49	19.45
J202	230	0.28	249.46	19.42
J203	230	0.28	249.44	19.41
J21	230	0.28	248.32	18.29
J213	230	0.28	248.29	18.25
J22	230	0.28	248.46	18.42
J2201	230	0.28	248.26	18.23
J2202	230	0.28	248.25	18.21
J2203	230	0.28	248.24	18.20
J2203A	230	0.28	248.24	18.20
J2204	230	0.28	248.24	18.20
J23	230	0.28	248.26	18.23
J2301	230	0.28	248.24	18.21
J24	230	0.28	248.81	18.77
J2401	230	0.28	248.49	18.46
J2402	230	0.28	248.27	18.24
J3	230	0.28	249.44	19.41
J301	230	0.28	249.41	19.37
J302	230	0.28	249.39	19.35
J303	230	0.28	249.39	19.35
J304	230	0.28	249.39	19.35
J305	230	0.28	249.40	19.36
J306	230	0.28	249.43	19.39
J307	230	0.28	249.52	19.48
J4	230	0.28	249.14	19.11
J5	230	0.28	248.79	18.75
J6	230	0.28	248.62	18.59
J7	230	0.28	248.56	18.52
J8	230	0.28	248.52	18.48
J801	230	0.28	248.51	18.47
J802	230	0.28	248.42	18.38
J9	230	0.28	248.39	18.35

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-20	J9	J8	PE	80	200.86	110	Open	-0.76	0.15	248.39	248.52	0.13	0.64
P-22	J802	J801	PE	80	123.44	110	Open	-0.79	0.16	248.42	248.51	0.09	0.70
P-25	J1401	J5	PE	80	130.15	110	Open	-1.46	0.29	248.50	248.79	0.28	2.19
P-28	J2401	J24	PE	100	88.70	110	Open	-3.43	0.44	248.49	248.81	0.32	3.57
P-30	J20	J2001	PE	80	138.99	110	Open	0.55	0.11	248.26	248.21	0.05	0.36
P-31	J2001	J19	PE	80	30.78	110	Open	0.26	0.05	248.21	248.21	0.00	0.10
P-32	J21	J19	PE	100	145.69	110	Open	1.53	0.19	248.32	248.21	0.12	0.60
P-33	J19	J1902	PE	100	64.62	110	Open	1.53	0.19	248.21	248.15	0.05	0.60
P-34	J1902	J1901	PE	100	18.29	110	Open	1.25	0.16	248.15	248.14	0.01	0.55
P-36	J1701	J17	PE	100	74.07	110	Open	-0.22	0.03	248.14	248.14	0.00	0.02
P-37	J2401	J2402	PE	100	112.47	110	Open	2.46	0.31	248.49	248.27	0.22	1.94
P-40	J15	J1801	PE	80	84.79	110	Open	0.14	0.03	248.18	248.16	0.00	0.03
P-41	J1801	J18	PE	80	87.48	110	Open	-0.14	0.03	248.18	248.16	0.00	0.03
P-43	J13	J1301	PE	80	219.15	110	Open	0.58	0.11	248.25	248.17	0.09	0.39
P-44	J1301	J1302	PE	80	65.23	110	Open	0.30	0.06	248.17	248.16	0.01	0.12
P-46	J1101	J11	PE	80	24.08	110	Open	-0.74	0.15	248.22	248.24	0.01	0.62
P-47	J201	J202	PE	80	62.48	110	Open	0.61	0.12	249.49	249.46	0.03	0.44
P-48	J202	J203	PE	80	116.57	110	Open	0.33	0.07	249.46	249.44	0.02	0.14
P-49	J203	J3	PE	80	43.28	110	Open	0.06	0.01	249.44	249.44	0.00	0.01
P-50	J3	J2	PE	80	89.61	110	Open	-0.89	0.15	249.44	249.52	0.08	0.67
P-52	J307	J306	PE	100	232.87	110	Open	1.00	0.13	249.52	249.43	0.08	0.36
P-53	J22	J2201	PE	80	203.91	110	Open	0.94	0.19	248.46	248.26	0.20	0.96
P-55	J2201	J2202	PE	80	31.09	110	Open	0.65	0.13	248.26	248.25	0.02	0.50
P-56	J2202	J2203	PE	80	43.89	110	Open	0.36	0.08	248.25	248.24	0.01	0.10
P-57	J23	J2204	PE	80	92.05	110	Open	0.45	0.09	248.26	248.24	0.02	0.25
P-60	J1401	J1402	PE	80	107.59	110	Open	0.42	0.08	248.50	248.48	0.02	0.22
P-61	J1402	J1403	PE	80	11.59	110	Open	0.15	0.03	248.48	248.48	0.00	0.03
P-62	J1403	J1404	PE	80	13.72	110	Open	-0.13	0.03	248.48	248.48	0.00	0.03
P-63	J1404	J1405	PE	80	14.33	110	Open	-0.41	0.08	248.48	248.48	0.00	0.21
P-64	J1405	J2401	PE	80	17.37	110	Open	-0.69	0.14	248.49	248.49	0.01	0.54
P-65	J18	J1801	PE	80	76.81	110	Open	0.63	0.13	248.14	248.10	0.04	0.46
P-67	J3	J301	PE	80	69.49	110	Open	0.67	0.13	249.44	249.41	0.04	0.52
P-68	J1806	J1805	PE	80	59.44	110	Open	0.76	0.15	248.16	248.12	0.04	0.64
P-69	J1805	J1804	PE	80	61.87	110	Open	0.48	0.10	248.12	248.10	0.02	0.28
P-70	J1804	J1803	PE	80	65.45	110	Open	0.20	0.04	248.10	248.10	0.00	0.05
P-71	J1803	J1802	PE	80	45.94	110	Open	-0.09	0.02	248.10	248.10	0.00	0.01
P-72	J1802	J1801	PE	80	24.08	110	Open	-0.36	0.07	248.10	248.10	0.00	0.16
P-73	J1501	J1502	PE	100	67.97	110	Open	0.70	0.09	248.15	248.14	0.01	0.19

Goce Delcev Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-74	J1502	J1503	PE	100	56.69	110	Open	0.43	0.05	248.14	248.13	0.00	0.08
P-75	J1503	J1504	PE	100	81.99	110	Open	0.15	0.02	248.13	248.13	0.00	0.01
P-76	J1504	J1505	PE	100	36.10	110	Open	-0.13	0.02	248.13	248.13	0.00	0.01
P-77	J1505	J1506	PE	100	53.34	110	Open	-0.41	0.05	248.13	248.14	0.00	0.07
P-79	J1201	J1202	PE	80	17.98	110	Open	0.67	0.13	248.20	248.19	0.01	0.51
P-80	J14	J6	PE	80	126.49	110	Open	-1.13	0.23	248.45	248.62	0.17	1.37
P-81	J301	J302	PE	80	105.18	110	Open	0.39	0.08	249.41	249.39	0.02	0.19
P-82	J302	J303	PE	80	64.92	110	Open	0.11	0.02	249.39	249.39	0.00	0.02
P-83	J303	J304	PE	80	86.87	110	Open	-0.16	0.03	249.39	249.39	0.00	0.04
P-84	J304	J305	PE	80	48.77	110	Open	-0.44	0.09	249.39	249.40	0.01	0.24
P-85	J305	J306	PE	80	51.21	110	Open	-0.72	0.14	249.40	249.43	0.03	0.59
P-154	J2301	J17	PE	100	205.74	110	Open	1.18	0.15	240.24	248.14	0.10	0.50
P-155	J17	J1506	PE	100	9.45	110	Open	0.69	0.09	248.14	248.14	0.00	0.16
P-156	J201	J2	PE	100	157.89	110	Open	-0.89	0.11	249.49	249.52	0.03	0.22
P-159	J15	J1501	PE	100	39.01	110	Open	0.98	0.12	248.16	248.15	0.01	0.26
P-160	J1201	J12	PE	80	24.69	110	Open	-0.95	0.19	240.20	248.22	0.02	0.98
P-161	J12	J1101	PE	80	19.51	110	Open	-0.46	0.09	240.22	248.22	0.01	0.26
P-163	J7	J6	PE	125	47.85	110	Open	-4.09	0.33	240.56	248.62	0.06	1.23
P-165	J802	J9	PE	80	132.89	110	Open	0.51	0.10	240.42	248.39	0.03	0.23
P-167	J12	J13	PE	80	74.37	110	Open	-0.76	0.15	240.22	248.25	0.04	0.48
P-172	J11	J15	PE	100	113.39	110	Open	1.40	0.18	240.24	248.16	0.08	0.68
P-174	J21	J20	PE	80	19.51	110	Open	2.14	0.43	240.32	248.26	0.06	3.26
P-175	J801	J8	PE	125	118.87	110	Open	-1.07	0.09	240.51	248.52	0.01	0.10
P-176	J8	J7	PE	125	111.25	110	Open	-2.10	0.17	240.52	248.56	0.04	0.36
P-179	J1901	J18	PE	100	18.90	110	Open	0.97	0.12	240.14	248.14	0.01	0.35
P-180	J18	J1701	PE	100	103.63	110	Open	0.05	0.01	240.14	248.14	0.00	0.00
P-181	J20	J1806	PE	80	78.33	110	Open	1.31	0.26	248.26	248.16	0.10	1.31
P-182	J1806	J1806A	PE	80	26.52	110	Open	0.28	0.06	248.16	248.15	0.00	0.10
P-183	J6	J5	PE	125	79.86	110	Open	-5.50	0.45	240.52	248.79	0.17	2.12
P-185	J1302	J16	PE	80	47.85	110	Open	0.02	0.00	248.16	248.16	0.00	0.00
P-186	J15	J1202	PE	80	128.02	110	Open	-0.39	0.08	248.16	248.19	0.02	0.19
P-187	J2	J1	PE	100	39.62	110	Open	-2.05	0.26	249.52	249.58	0.06	1.39
P-188	J1	J307	PE	100	106.68	110	Open	1.27	0.15	249.58	249.52	0.06	0.57
P-189	J5	J4	PE	125	74.07	110	Open	-7.24	0.59	249.79	249.14	0.36	4.81
P-190	J4	J24	PE	125	47.05	110	Open	8.87	0.72	249.14	248.81	0.34	7.02
P-191	J1	Inlet	PE	100	7.32	110	Open	-3.61	0.48	249.58	249.60	0.02	2.89
P-192	Inlet	J4	PE	100	7.01	110	Open	16.39	2.09	249.60	249.14	0.45	64.82
P-193	R	Inlet	PE	250	361.00	110	Open	20.28	0.41	250.00	249.60	0.40	1.11
P-194	J2204	J2203	PE	80	16.90	110	Open	0.17	0.03	248.24	248.24	0.00	0.04
P-195	J2203	J2203A	PE	80	22.06	110	Open	0.26	0.06	248.24	248.24	0.00	0.10
P-196	J2402	J23	PE	100	7.62	110	Open	2.18	0.28	248.27	248.26	0.01	1.55
P-197	J23	J2301	PE	100	28.65	110	Open	1.46	0.19	248.26	248.24	0.02	0.73
P-198	J24	J22	PE	125	135.64	110	Open	5.17	0.42	248.81	248.46	0.35	2.58
P-199	J22	J21	PE	125	86.58	110	Open	3.95	0.32	248.45	248.32	0.14	1.57
P-200	J1401	J14	PE	80	89.00	110	Open	0.76	0.15	248.50	248.45	0.06	0.65
P-201	J14	J13	PE	80	72.24	110	Open	1.62	0.32	248.45	248.25	0.19	2.64
P200	J9	J213	PE	80	129.54	110	Open	0.99	0.20	248.39	248.29	0.10	0.76
P201	J213	J11	PE	100	36.27	110	Open	2.42	0.31	248.29	248.24	0.05	1.38
P202	J7	J213	PE	100	275.84	110	Open	1.71	0.22	248.56	248.29	0.27	0.98

Jurumleri Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-1	230	0.19	252.66	22.62
J-2	230	0.19	252.69	22.64
J-3	230	0.19	252.01	21.97
J-4	230	0.19	252.15	22.11
J-5	230	0.19	251.93	21.89
J-6	230	0.19	251.94	21.89
J-7	230	0.19	251.91	21.87
J-8	230	0.19	250.81	20.76
J-10	230	0.19	251.20	21.16
J-11	230	0.19	251.95	21.91
J-12	230	0.19	251.98	21.94
J-13	230	0.19	254.09	24.04
J-14	230	0.19	253.66	23.62
J-15	230	0.19	251.84	21.80
J-16	230	0.19	251.84	21.80
J-17	230	0.19	252.16	22.12
J-18	230	0.19	252.06	22.02
J-19	230	0.19	251.97	21.93
J-20	230	0.19	251.87	21.82
J-21	230	0.19	255.00	24.95
J-21	230	0.19	252.44	22.39
J-22	230	0.19	254.87	24.82
J-22	230	0.19	252.40	22.36
J-22A	230	0.19	254.86	24.81
J-22B	230	0.19	254.85	24.80
J-23	230	0.19	254.98	24.93
J-23	230	0.19	251.91	21.87
J-24	230	0.19	251.88	21.84
J-25	230	0.19	252.84	22.80
J-26	230	0.19	252.85	22.80
J-27	230	0.19	252.98	22.94
J-28	230	0.19	253.01	22.96
J-29	230	0.19	250.77	20.73
J-30	230	0.19	251.89	21.85
J-31	230	0.19	251.66	21.62
J-32	230	0.19	251.73	21.69
J-33	230	0.19	251.71	21.66
J-36	230	0.19	250.33	20.29
J-37	230	0.19	250.34	20.30
J-38	230	0.19	252.08	22.03
J-39	230	0.19	252.12	22.08
J-42	230	0.19	252.58	22.52
J-43	230	0.19	252.46	22.41
J-46	230	0.19	251.99	21.95
J-47	230	0.19	252.00	21.95
J-48	230	0.19	251.87	21.83
J-49	230	0.19	250.34	20.30
J-50	230	0.19	250.35	20.31
J-51	230	0.19	252.15	22.10
J-52	230	0.19	252.02	21.97
J-53	230	0.19	251.99	21.95
J-54	230	0.19	252.17	22.13
J-55	230	0.19	252.25	22.21
J-58	230	0.19	252.71	22.67
J-59	230	0.19	251.82	21.77
J-60	230	0.19	251.82	21.78
J-63	230	0.19	250.38	20.34
J-64	230	0.19	250.40	20.36
J-65	230	0.19	252.18	22.14
J-66	230	0.19	252.15	22.11
J-69	230	0.19	251.90	21.86
J-71	230	0.19	252.09	22.04
J-72	230	0.19	252.12	22.08
J-73	230	0.19	252.01	21.97
J-74	230	0.19	251.89	21.84
J-75	230	0.19	251.87	21.83
J-78	230	0.19	252.05	22.01
J-79	230	0.19	252.15	22.10
J-80	230	0.19	252.17	22.13
J-81	230	0.19	252.99	22.95
J-82	230	0.19	252.15	22.10
J-83	230	0.19	252.00	21.95
J-84	230	0.19	252.00	21.96
J-87	230	0.19	252.11	22.07
J-88	230	0.19	252.15	22.11
J-89	230	0.19	251.84	21.80
J-90	230	0.19	252.78	22.73
J-91	230	0.19	252.09	22.04
J-92	230	0.19	252.09	22.05
J-93	230	0.19	252.97	22.93
J-94	230	0.19	252.97	22.93
J-95	230	0.19	250.63	20.59
J-96	230	0.19	252.34	22.30

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-97	230	0.19	252.34	22.29
J-98	230	0.19	252.07	22.03
J-99	230	0.19	251.05	21.81
J-100	230	0.19	251.06	21.81
J-101	230	0.19	252.19	22.15
J-103	230	0.19	252.96	22.92
J-104	230	0.19	252.15	22.10
J-107	230	0.19	252.02	21.98
J-115	230	0.19	251.88	21.84
J-116	230	0.19	252.04	22.00
J-119	230	0.19	252.04	22.00
J-120	230	0.19	252.10	22.05
J-122	230	0.19	252.98	22.93
J-123	230	0.19	252.08	22.04
J-124	230	0.19	252.61	22.57
J-125	230	0.19	251.84	21.80
J-125	230	0.19	251.84	21.80
J-127	230	0.19	251.93	21.89
J-128	230	0.19	250.73	20.69
J-130	230	0.19	251.87	21.82
J-131	230	0.19	252.17	22.12
J-132	230	0.19	250.43	20.39
J-133	230	0.19	253.36	23.32
J-135	230	0.19	252.26	22.21
J-136	230	0.19	252.18	22.13
J-137	230	0.19	251.86	21.82
J-138	230	0.19	252.07	22.03
J-139	230	0.19	250.62	20.58
J-140	230	0.19	251.92	21.88
J-141	230	0.19	252.98	22.91
J-145	230	0.19	250.77	20.73
J-146	230	0.19	253.11	23.06
J-147	230	0.19	251.85	21.81
J-148	230	0.19	251.97	21.92
J-149	230	0.19	251.91	21.87
J-151	230	0.19	251.53	21.49
J-152	230	0.19	251.53	21.49
J-153	230	0.19	252.91	22.86
J-154	230	0.19	252.91	22.86
J-155	230	0.19	251.85	21.81
J-157	230	0.19	252.96	22.91
J-158	230	0.19	253.45	23.40
J-161	230	0.19	252.03	21.99
J-162	230	0.19	252.03	21.99
J-164	230	0.19	251.85	21.80
J-165	230	0.19	251.87	21.82
J-166	230	0.19	251.87	21.82
J-169	230	0.19	251.87	21.82
J-170	230	0.19	252.02	21.98
J-172	230	0.19	251.19	21.15
J-173	230	0.19	252.92	22.87
J-174	230	0.19	253.08	23.03
J-175	230	0.19	253.08	23.03
J-176	230	0.19	251.85	21.81
J-182	230	0.19	252.07	22.02
J-183	230	0.19	252.22	22.17
J-184	230	0.19	251.92	21.87
J-185	230	0.19	251.90	21.86
J-186	230	0.19	251.95	21.91
J-187	230	0.19	253.35	23.30
J-188	230	0.19	252.65	22.60
J-189	230	0.19	252.65	22.60
J-190	230	0.19	251.86	21.81
J-191	230	0.19	251.80	21.76
J-193	230	0.19	251.87	21.82
J-196	230	0.19	250.36	20.32
J-197	230	0.19	250.36	20.31
J-198	230	0.19	251.44	21.40
J-199	230	0.19	251.45	21.41
J-200	230	0.19	253.08	23.03
J-201	230	0.19	253.08	23.03
J-202	230	0.19	252.16	22.12
J-203	230	0.19	253.17	23.13
J-204	230	0.19	251.79	21.75
J-205	230	0.19	251.94	21.89
J-206	230	0.19	251.90	21.85
J-207	230	0.19	251.92	21.88
J-208	230	0.19	251.86	21.81
J-209	230	0.19	251.88	21.83
J-210	230	0.19	251.95	21.91
J-2101	230	0.19	254.96	24.91
J-2102	230	0.19	254.99	24.94
J-211	230	0.19	250.33	20.29

Jurumleri Network Calculation

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-212	230	0.19	251.86	21.81
J-213	230	0.19	251.02	20.99
J-214	230	0.19	251.02	20.98
J-217	230	0.19	252.07	22.02
J-218	230	0.19	252.14	22.09
J-219	230	0.19	251.79	21.74
J-220	230	0.19	251.90	21.86
J-2201	230	0.19	254.86	24.81
J-221	230	0.19	251.82	21.78
J-222	230	0.19	250.63	20.59
J-223	230	0.19	250.63	20.59
J-226	230	0.19	254.56	24.51
J-227	230	0.19	252.41	22.36
J-228	230	0.19	251.84	21.80
J-232	230	0.19	251.82	21.77
J-233	230	0.19	251.78	21.74

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-1	J-186	J-63	PE	80	139.90	110	Open	-0.37	0.07	250.36	250.38	0.02	0.17
P-2	J-63	J-64	PE	100	26.35	110	Open	-1.48	0.19	250.38	250.40	0.02	0.76
P-3	J-64	J-132	PE	100	33.53	110	Open	-1.67	0.21	250.40	250.43	0.03	0.94
P-4	J-132	J-128	PE	100	259.39	110	Open	-1.85	0.24	250.43	250.73	0.30	1.14
P-7	J-2102	J-23	PE	80	191.72	110	Open	0.19	0.04	254.99	254.98	0.01	0.05
P-8	J-36	J-37	PE	50	15.85	110	Open	-0.19	0.09	250.33	250.34	0.01	0.47
P-9	J-37	J-211	PE	80	199.03	110	Open	0.19	0.04	250.34	250.33	0.01	0.05
P-10	J-25	J-26	PE	80	135.33	110	Open	-0.19	0.04	252.84	252.85	0.01	0.05
P-11	J-26	J-42	PE	140	69.49	110	Open	9.02	0.59	252.85	252.56	0.29	4.17
P-12	J-42	J-43	PE	140	25.60	110	Open	6.84	0.57	252.56	252.46	0.10	4.01
P-15	J-135	J-136	PE	140	23.18	110	Open	6.09	0.53	252.26	252.18	0.08	3.41
P-16	J-69	J-23	PE	80	132.28	110	Open	-0.19	0.04	251.90	251.91	0.01	0.05
P-21	J-29	J-9	PE	80	198.42	110	Open	-0.37	0.07	250.77	250.61	0.03	0.17
P-22	J-213	J-214	PE	80	156.06	110	Open	0.19	0.04	251.02	251.02	0.01	0.05
P-23	J-10	J-172	PE	80	142.04	110	Open	0.19	0.04	251.20	251.19	0.01	0.05
P-24	J-217	J-162	PE	80	26.96	110	Open	-0.19	0.04	252.07	252.07	0.00	0.05
P-25	J-182	J-188	PE	80	28.04	110	Open	-0.37	0.07	252.07	252.07	0.00	0.17
P-26	J-138	J-71	PE	80	39.01	110	Open	-0.56	0.11	252.07	252.09	0.01	0.36
P-27	J-71	J-72	PE	80	63.09	110	Open	-0.74	0.15	252.09	252.12	0.04	0.52
P-28	J-227	J-21	PE	50	66.14	110	Open	-0.19	0.09	252.41	252.44	0.03	0.47
P-29	J-198	J-199	PE	80	167.34	110	Open	-0.19	0.04	251.44	251.45	0.01	0.05
P-31	J-37	J-49	PE	100	46.33	110	Open	-0.56	0.07	250.34	250.34	0.01	0.12
P-32	J-49	J-50	PE	100	17.07	110	Open	-0.74	0.09	250.34	250.35	0.00	0.21
P-33	J-50	J-63	PE	100	111.56	110	Open	-0.93	0.12	250.35	250.38	0.04	0.32
P-34	J-174	J-175	PE	80	87.17	110	Open	0.19	0.04	253.08	253.08	0.00	0.05
P-35	J-131	J-54	PE	80	74.98	110	Open	-0.19	0.04	252.17	252.17	0.00	0.05
P-36	J-184	J-185	PE	80	77.72	110	Open	0.37	0.07	251.92	251.90	0.01	0.17
P-37	J-140	J-74	PE	100	61.57	110	Open	1.25	0.15	251.92	251.89	0.03	0.55
P-38	J-75	J-20	PE	100	52.43	110	Open	0.32	0.04	251.87	251.87	0.00	0.05
P-40	J-209	J-185	PE	80	54.56	110	Open	0.37	0.07	251.88	251.87	0.01	0.17
P-41	J-165	J-166	PE	80	27.43	110	Open	0.19	0.04	251.87	251.87	0.00	0.05
P-71	J-206	J-207	PE	50	50.90	110	Open	-0.19	0.09	251.90	251.92	0.02	0.47
P-74	J-30	J-31	PE	100	109.79	110	Open	0.83	0.11	251.89	251.86	0.03	0.26
P-75	J-31	J-100	PE	100	40.23	110	Open	0.65	0.08	251.86	251.86	0.01	0.16
P-76	J-48	J-24	PE	80	124.38	110	Open	-0.19	0.04	251.87	251.88	0.01	0.05
P-77	J-218	J-202	PE	50	50.90	110	Open	-0.19	0.09	252.14	252.16	0.02	0.47
P-78	J-183	J-72	PE	80	97.54	110	Open	0.93	0.18	252.22	252.12	0.09	0.94
P-79	J-139	J-95	PE	80	69.80	110	Open	-0.19	0.04	250.62	250.63	0.00	0.05
P-82	J-137	J-208	PE	100	50.90	110	Open	0.36	0.05	251.86	251.86	0.00	0.05
P-86	J-123	J-52	PE	140	118.87	110	Open	2.98	0.19	252.08	252.02	0.06	0.54
P-87	J-52	J-53	PE	140	53.34	110	Open	2.79	0.18	252.02	251.99	0.03	0.48
P-88	J-53	J-166	PE	140	93.57	110	Open	2.61	0.17	251.99	251.95	0.04	0.42
P-90	J-5	J-6	PE	100	57.61	110	Open	-0.64	0.08	251.93	251.94	0.01	0.16
P-91	J-6	J-11	PE	100	62.48	110	Open	-0.82	0.10	251.94	251.95	0.02	0.25
P-92	J-11	J-12	PE	100	54.86	110	Open	-1.19	0.15	251.95	251.98	0.03	0.51
P-93	J-12	J-170	PE	100	58.22	110	Open	-1.38	0.18	251.98	252.02	0.04	0.66
P-94	J-170	J-116	PE	100	28.35	110	Open	-1.56	0.20	252.02	252.04	0.02	0.84
P-95	J-116	J-38	PE	100	31.70	110	Open	-1.75	0.22	252.04	252.08	0.03	1.03
P-96	J-38	J-39	PE	100	34.75	110	Open	-1.93	0.25	252.08	252.12	0.04	1.24
P-97	J-39	J-54	PE	100	33.83	110	Open	-2.12	0.27	252.12	252.17	0.05	1.47
P-98	J-54	J-55	PE	100	41.76	110	Open	-2.49	0.32	252.17	252.25	0.08	1.90
P-99	J-165	J-220	PE	80	37.19	110	Open	0.19	0.04	251.90	251.90	0.00	0.05
P-102	J-164	J-193	PE	80	38.10	110	Open	-0.67	0.13	251.85	251.87	0.02	0.52
P-103	J-193	J-205	PE	80	88.39	110	Open	-0.85	0.17	251.87	251.94	0.07	0.81
P-104	J-205	J-3	PE	80	86.45	110	Open	-1.04	0.21	251.94	252.01	0.08	1.16
P-105	J-3	J-4	PE	80	86.26	110	Open	-1.23	0.24	252.01	252.15	0.14	1.58
P-106	J-4	J-51	PE	80	81.38	110	Open	0.19	0.04	252.15	252.15	0.00	0.05
P-107	J-51	J-92	PE	80	86.87	110	Open	-0.19	0.04	252.09	252.09	0.00	0.05
P-108	J-92	J-120	PE	80	24.08	110	Open	-0.37	0.07	252.09	252.10	0.00	0.17
P-109	J-120	J-87	PE	80	44.20	110	Open	-0.56	0.11	252.10	252.11	0.02	0.36
P-110	J-87	J-88	PE	80	60.35	110	Open	-0.74	0.15	252.11	252.15	0.04	0.62

Jurumleri Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-111	J-98	J-119	PE	140	42.98	110	Open	3.71	0.24	252.07	252.04	0.03	0.00
P-113	J-161	J-162	PE	80	81.38	110	Open	0.19	0.04	252.03	252.03	0.00	0.05
P-114	J-190	J-191	PE	80	80.88	110	Open	0.74	0.15	251.86	251.80	0.05	0.62
P-115	J-191	J-204	PE	80	33.53	110	Open	0.56	0.11	251.80	251.79	0.01	0.36
P-116	J-204	J-219	PE	80	33.53	110	Open	0.37	0.07	251.79	251.79	0.01	0.17
P-117	J-219	J-233	PE	80	39.32	110	Open	0.19	0.04	251.79	251.78	0.00	0.05
P-118	J-46	J-47	PE	80	88.70	110	Open	-0.19	0.04	251.99	252.00	0.00	0.05
P-120	J-151	J-152	PE	80	55.17	110	Open	-0.19	0.04	251.53	251.53	0.00	0.05
P-121	J-32	J-33	PE	50	56.39	110	Open	0.19	0.09	251.73	251.71	0.03	0.47
P-122	J-63	J-64	PE	80	163.98	110	Open	-0.19	0.04	252.00	252.00	0.01	0.05
P-123	J-64	J-107	PE	80	122.22	110	Open	-0.37	0.07	252.00	252.02	0.02	0.17
P-124	J-29	J-145	PE	80	64.92	110	Open	0.19	0.04	250.77	250.77	0.00	0.05
P-125	J-13	J-156	PE	80	106.07	110	Open	2.53	0.50	254.09	253.45	0.64	6.03
P-126	J-156	J-187	PE	80	20.12	110	Open	2.34	0.47	253.45	253.35	0.11	5.24
P-127	J-187	J-203	PE	80	38.40	110	Open	2.16	0.43	253.35	253.17	0.17	4.50
P-128	J-203	J-200	PE	80	24.69	110	Open	1.97	0.39	253.17	253.08	0.09	3.81
P-130	J-93	J-94	PE	80	54.25	110	Open	-0.12	0.02	252.97	252.97	0.00	0.02
P-131	J-94	J-122	PE	80	34.14	110	Open	-0.31	0.06	252.97	252.98	0.00	0.12
P-132	J-122	J-27	PE	80	15.54	110	Open	-0.49	0.10	252.98	252.98	0.00	0.29
P-133	J-27	J-28	PE	80	44.50	110	Open	-0.68	0.13	252.98	253.01	0.02	0.52
P-134	J-28	J-81	PE	80	24.08	110	Open	0.74	0.15	253.01	252.99	0.01	0.62
P-135	J-81	J-103	PE	80	77.11	110	Open	0.56	0.11	252.99	252.95	0.03	0.36
P-136	J-103	J-141	PE	80	31.09	110	Open	0.37	0.07	252.95	252.95	0.01	0.17
P-137	J-141	J-157	PE	80	42.06	110	Open	0.19	0.04	252.95	252.95	0.00	0.05
P-138	J-157	J-189	PE	80	30.48	110	Open	-0.19	0.04	252.65	252.65	0.00	0.05
P-139	J-189	J-1	PE	80	77.72	110	Open	-0.37	0.07	252.65	252.66	0.01	0.17
P-140	J-1	J-2	PE	80	70.10	110	Open	-0.56	0.11	252.66	252.69	0.03	0.36
P-141	J-2	J-58	PE	80	40.54	110	Open	-0.74	0.15	252.69	252.71	0.03	0.62
P-142	J-58	J-90	PE	80	68.58	110	Open	-0.93	0.18	252.71	252.78	0.06	0.94
P-143	J-90	J-124	PE	200	68.86	110	Open	17.28	0.55	252.78	252.61	0.17	2.44
P-144	J-124	J-21	PE	200	72.54	110	Open	17.09	0.54	252.61	252.44	0.17	2.39
P-145	J-21	J-22	PE	200	14.02	110	Open	16.72	0.53	252.44	252.40	0.03	2.30
P-146	J-22	J-55	PE	100	26.52	110	Open	4.43	0.56	252.40	252.25	0.15	5.74
P-147	J-55	J-101	PE	100	56.39	110	Open	1.75	0.22	252.25	252.19	0.06	1.03
P-148	J-101	J-4	PE	100	51.82	110	Open	1.57	0.20	252.19	252.15	0.04	0.84
P-149	J-4	J-69	PE	100	44.81	110	Open	-0.03	0.00	252.15	252.15	0.00	0.00
P-150	J-69	J-202	PE	100	33.83	110	Open	-0.95	0.12	252.15	252.16	0.01	0.33
P-151	J-221	J-60	PE	80	34.44	110	Open	-0.19	0.04	251.82	251.82	0.00	0.05
P-152	J-232	J-59	PE	80	35.66	110	Open	-0.19	0.04	251.82	251.82	0.00	0.05
P-153	J-59	J-60	PE	80	22.25	110	Open	-0.37	0.07	251.82	251.82	0.00	0.17
P-154	J-60	J-69	PE	80	37.19	110	Open	-0.74	0.15	251.82	251.84	0.02	0.62
P-155	J-125	J-126	PE	80	57.30	110	Open	0.19	0.04	251.84	251.84	0.00	0.05
P-157	J-17	J-16	PE	100	67.97	110	Open	2.13	0.27	252.16	252.08	0.10	1.48
P-158	J-18	J-73	PE	100	40.84	110	Open	1.95	0.25	252.08	252.01	0.05	1.25
P-159	J-17	J-90	PE	140	101.80	110	Open	3.90	0.25	252.16	252.07	0.09	0.68
P-160	J-17	J-136	PE	140	7.01	110	Open	-6.21	0.40	252.16	252.18	0.01	2.08
P-163	J-222	J-223	PE	80	80.47	110	Open	-0.19	0.04	250.63	250.63	0.00	0.05
P-165	J2201	J22B	PE	80	114.00	110	Open	0.19	0.04	254.88	254.85	0.01	0.05
P-166	J22A	J22	PE	80	122.53	110	Open	-0.19	0.04	254.86	254.87	0.01	0.05
P-168	J-226	J-13	PE	200	60.96	110	Open	32.04	1.02	254.56	254.09	0.47	7.67
P-169	J-13	J-14	PE	200	65.53	110	Open	29.32	0.93	254.09	253.66	0.43	8.51
P-174	J-93	J-173	PE	200	19.51	110	Open	10.94	0.60	252.97	252.92	0.06	2.90
P-177	J-65	J-66	PE	80	78.03	110	Open	0.56	0.11	252.15	252.15	0.03	0.36
P-178	J-66	J-62	PE	80	17.37	110	Open	0.37	0.07	252.15	252.15	0.00	0.17
P-179	J-62	J-104	PE	80	33.53	110	Open	0.19	0.04	252.15	252.15	0.00	0.05
P-180	J-19	J-20	PE	80	244.45	110	Open	0.61	0.12	251.97	251.87	0.11	0.43
P-182	J-99	J-100	PE	100	25.30	110	Open	-0.46	0.06	251.85	251.86	0.00	0.09
P-183	J-99	J-147	PE	100	97.54	110	Open	0.28	0.04	251.85	251.85	0.00	0.03
P-184	J-147	J-155	PE	100	83.21	110	Open	0.09	0.01	251.85	251.85	0.00	0.00
P-185	J-155	J-176	PE	80	44.81	110	Open	0.19	0.04	251.85	251.85	0.00	0.05
P-186	J-155	J-130	PE	100	99.36	110	Open	-0.65	0.08	251.85	251.87	0.02	0.16
P-187	J-130	J-212	PE	50	24.38	110	Open	0.19	0.09	251.87	251.86	0.01	0.47
P-188	J-73	J-23	PE	100	97.84	110	Open	1.76	0.22	252.01	251.91	0.10	1.04
P-189	J-23	J-24	PE	100	46.94	110	Open	1.39	0.18	251.91	251.88	0.03	0.67
P-190	J-24	J-130	PE	100	31.09	110	Open	1.02	0.13	251.88	251.87	0.01	0.38
P-191	J-155	J-15	PE	80	54.86	110	Open	0.37	0.07	251.85	251.84	0.01	0.17
P-192	J-15	J-16	PE	80	32.31	110	Open	0.19	0.04	251.84	251.84	0.00	0.05
P-193	J-79	J-80	PE	50	48.16	110	Open	-0.19	0.09	252.15	252.17	0.02	0.47
P-194	J-96	J-97	PE	80	112.47	110	Open	0.19	0.04	252.34	252.34	0.01	0.05
P-196	J-153	J-154	PE	80	41.45	110	Open	-0.19	0.04	252.91	252.91	0.00	0.05
P-197	J-154	J-173	PE	80	53.04	110	Open	-0.37	0.07	252.91	252.92	0.01	0.17
P-198	J-206	J-201	PE	80	78.03	110	Open	0.19	0.04	253.08	253.08	0.00	0.05
P-199	J-11	J-210	PE	80	62.18	110	Open	0.19	0.04	251.95	251.95	0.00	0.05
P-200	J-196	J-197	PE	80	37.80	110	Open	0.19	0.04	250.36	250.36	0.00	0.05
P-400	J-14	J-133	PE	200	46.94	110	Open	29.14	0.93	253.66	253.36	0.30	6.43
P-402	J-137	J-168	PE	100	51.51	110	Open	-0.55	0.07	251.88	251.87	0.01	0.12
P-403	J-168	J-115	PE	100	85.39	110	Open	-0.73	0.09	251.87	251.88	0.02	0.20
P-407	J-166	J-5	PE	140	64.01	110	Open	2.42	0.16	251.95	251.93	0.02	0.37
P-408	J-5	J-140	PE	140	14.63	110	Open	2.08	0.19	251.93	251.92	0.01	0.50
P-409	J2101	J21	PE	80	39.62	110	Open	-0.93	0.16	254.96	255.00	0.04	0.94
P-410	J21	J2102	PE	80	62.48	110	Open	0.37	0.07	255.00	254.99	0.01	0.17
P-413	J-148	J-127	PE	140	68.28	110	Open	2.97	0.19	251.97	251.93	0.04	0.53
P-416	J-32	J-78	PE	120	100.28	110	Open	-5.19	0.46	251.73	252.05	0.32	3.17

Jurumleri Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-417	J-78	J-19	PE	80	108.81	110	Open	0.80	0.16	252.05	251.97	0.08	0.71
P-421	J-32	J-152	PE	120	72.85	110	Open	4.81	0.43	251.73	251.53	0.20	2.76
P-423	J-149	J-80	PE	80	61.57	110	Open	1.00	0.20	251.91	251.84	0.07	1.08
P-425	J-26	J-174	PE	140	51.21	110	Open	-9.39	0.61	252.85	252.08	0.73	4.49
P-426	J-174	J-133	PE	140	58.83	110	Open	-9.76	0.63	253.08	252.36	0.72	4.92
P-427	J-152	J-199	PE	120	34.44	110	Open	4.44	0.39	251.53	251.45	0.08	2.38
P-428	J-199	J-10	PE	120	124.05	110	Open	4.07	0.36	251.45	251.20	0.25	2.03
P-430	J-190	J-20	PE	100	60.96	110	Open	-0.75	0.10	251.86	251.87	0.01	0.21
P-431	J-119	J-161	PE	140	14.94	110	Open	3.53	0.29	252.04	252.03	0.01	0.73
P-432	J-181	J-148	PE	140	106.38	110	Open	3.16	0.21	252.03	251.97	0.06	0.60
P-435	J-223	J-128	PE	80	154.84	110	Open	-0.74	0.15	250.63	250.73	0.10	0.62
P-436	J-128	J-8	PE	120	76.20	110	Open	-2.70	0.25	250.73	250.81	0.08	1.00
P-437	J-65	J-123	PE	200	106.38	110	Open	10.26	0.33	252.18	252.08	0.10	0.93
P-438	J-123	J-75	PE	200	61.26	110	Open	7.09	0.23	252.08	252.05	0.03	0.47
P-439	J2101	J22	PE	80	145.89	110	Open	0.74	0.15	254.96	254.87	0.09	0.62
P-440	J22	J2201	PE	80	70.71	110	Open	0.37	0.07	254.87	254.88	0.01	0.17
P-441	J-202	J-80	PE	140	79.66	110	Open	-1.33	0.09	252.16	252.17	0.01	0.12
P-442	J-95	J-43	PE	140	29.57	110	Open	-0.65	0.56	252.34	252.48	0.11	3.85
P-443	J-22	J-103	PE	200	148.74	110	Open	12.11	0.39	252.40	252.22	0.19	1.26
P-444	J-183	J-65	PE	200	34.75	110	Open	11.00	0.35	252.22	252.18	0.04	1.06
P-445	J-136	J-80	PE	140	39.93	110	Open	1.70	0.11	252.16	252.17	0.01	0.19
P-446	J-207	J-149	PE	140	79.55	110	Open	1.40	0.09	251.92	251.91	0.01	0.13
P-447	J-127	J-30	PE	100	99.97	110	Open	1.02	0.13	251.93	251.89	0.04	0.36
P-448	J-184	J-7	PE	140	143.87	110	Open	0.89	0.06	251.92	251.91	0.01	0.06
P-449	J-7	J-115	PE	100	81.69	110	Open	0.92	0.12	251.91	251.88	0.03	0.31
P-450	J-207	J-127	PE	140	42.67	110	Open	-1.77	0.11	251.92	251.93	0.01	0.20
P-451	J-74	J-209	PE	100	28.65	110	Open	1.06	0.14	251.89	251.88	0.01	0.41
P-452	J-209	J-75	PE	100	51.82	110	Open	0.51	0.06	251.88	251.87	0.01	0.10
P-453	J-7	J-149	PE	140	243.54	110	Open	-0.22	0.01	251.91	251.91	0.00	0.00
P-454	J-190	J-208	PE	100	107.29	110	Open	-0.18	0.02	251.86	251.86	0.00	0.01
P-455	J-133	J-148	PE	200	85.65	110	Open	19.19	0.61	253.36	253.11	0.25	2.97
P-456	J-146	J-93	PE	200	46.33	110	Open	19.01	0.61	253.11	252.97	0.14	2.91
P-459	J-95	J-223	PE	80	37.49	110	Open	-0.37	0.07	250.63	250.63	0.01	0.17
P-460	J-173	J-90	PE	200	50.60	110	Open	18.39	0.59	252.92	252.78	0.14	2.74
P-461	J-47	J-107	PE	80	152.40	110	Open	-0.37	0.07	252.00	252.02	0.03	0.17
P-462	J-107	J-78	PE	80	29.26	110	Open	-0.93	0.18	252.02	252.05	0.03	0.94
P-463	J-200	J-28	PE	80	28.04	110	Open	1.60	0.32	253.08	253.01	0.07	2.59
P-464	J-184	J-140	PE	140	31.70	110	Open	-1.44	0.09	251.92	251.92	0.00	0.14
P-465	J-164	J-228	PE	80	46.94	110	Open	0.19	0.04	251.85	251.84	0.00	0.05
P-466	J-90	J-135	PE	140	24.08	110	Open	8.28	0.54	252.34	252.26	0.09	3.55
P-467	J-9	J-213	PE	120	156.36	110	Open	-3.33	0.29	250.81	251.02	0.22	1.40
P-468	J-213	J-10	PE	120	103.33	110	Open	-3.70	0.33	251.02	251.20	0.18	1.70
P-469	J-184	J-125	PE	80	18.29	110	Open	0.30	0.06	251.85	251.84	0.00	0.12
P-470	J-89	J-125	PE	80	12.80	110	Open	0.07	0.01	251.84	251.84	0.00	0.01
Primary	R-1	J21	PE	200	94.18	110	Open	1.48	0.05	255.00	255.00	0.00	0.03
Transmission	R-2	J-226	PE	200	57.00	110	Open	32.22	1.03	255.00	254.56	0.44	7.75

Kolonie Idrizovo Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-375	230	0.19	252.44	22.39
J-376	230	0.19	252.43	22.39
J-377	230	0.19	252.97	22.92
J-378	230	0.19	252.96	22.92
J-379	230	0.19	252.40	22.35
J-380	230	0.19	252.39	22.34
J-381	230	0.19	253.60	23.55
J-382	230	0.19	253.53	23.48
J-384	230	0.19	252.39	22.34
J-385	230	0.19	252.69	22.64
J-386	230	0.19	252.69	22.64
J-387	230	0.19	252.35	22.30
J-388	230	0.19	252.37	22.33
J-391	230	0.19	253.46	23.41
J-393	230	0.19	253.77	23.72
J-394	230	0.19	254.25	24.20
J-395	230	0.19	253.35	23.30
J-396	230	0.19	253.44	23.40
J-397	230	0.19	252.54	22.49
J-398	230	0.19	252.53	22.49
J-399	230	0.19	253.49	23.44
J-400	230	0.19	253.65	23.61
J-401	230	0.19	252.53	22.48
J-402	230	0.19	253.01	22.96
J-403	230	0.19	253.17	23.12
J-406	230	0.19	253.35	23.30
J-407	230	0.19	252.39	22.35

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-408	230	0.19	253.21	23.16
J-409	230	0.19	252.39	22.35
J-410	230	0.19	252.43	22.39
J-412	230	0.19	253.67	23.62
J-413	230	0.19	253.48	23.44
J-414	230	0.19	252.94	22.69
J-415	230	0.19	253.08	23.03
J-417	230	0.19	253.34	23.29
J-418	230	0.19	253.58	23.53
J-419	230	0.19	253.17	23.12
J-420	230	0.19	253.66	23.61
J-422	230	0.19	252.94	22.69
J-423	230	0.19	252.39	22.35
J-424	230	0.19	252.94	22.90
J-425	230	0.19	252.94	22.69
J-426	230	0.19	254.00	23.95
J-428	230	0.19	253.07	23.03
J-429	230	0.19	253.46	23.41
J-430	230	0.19	252.41	22.36
J-431	230	0.19	253.02	22.97
J-432	230	0.19	252.95	22.90
J-433	230	0.19	252.95	22.91
J-434	230	0.19	254.41	24.36
J-437	230	0.19	253.35	23.30
J-490	230	0.19	252.37	22.32
J-491	230	0.19	252.35	22.31
J-492	230	0.19	252.35	22.30

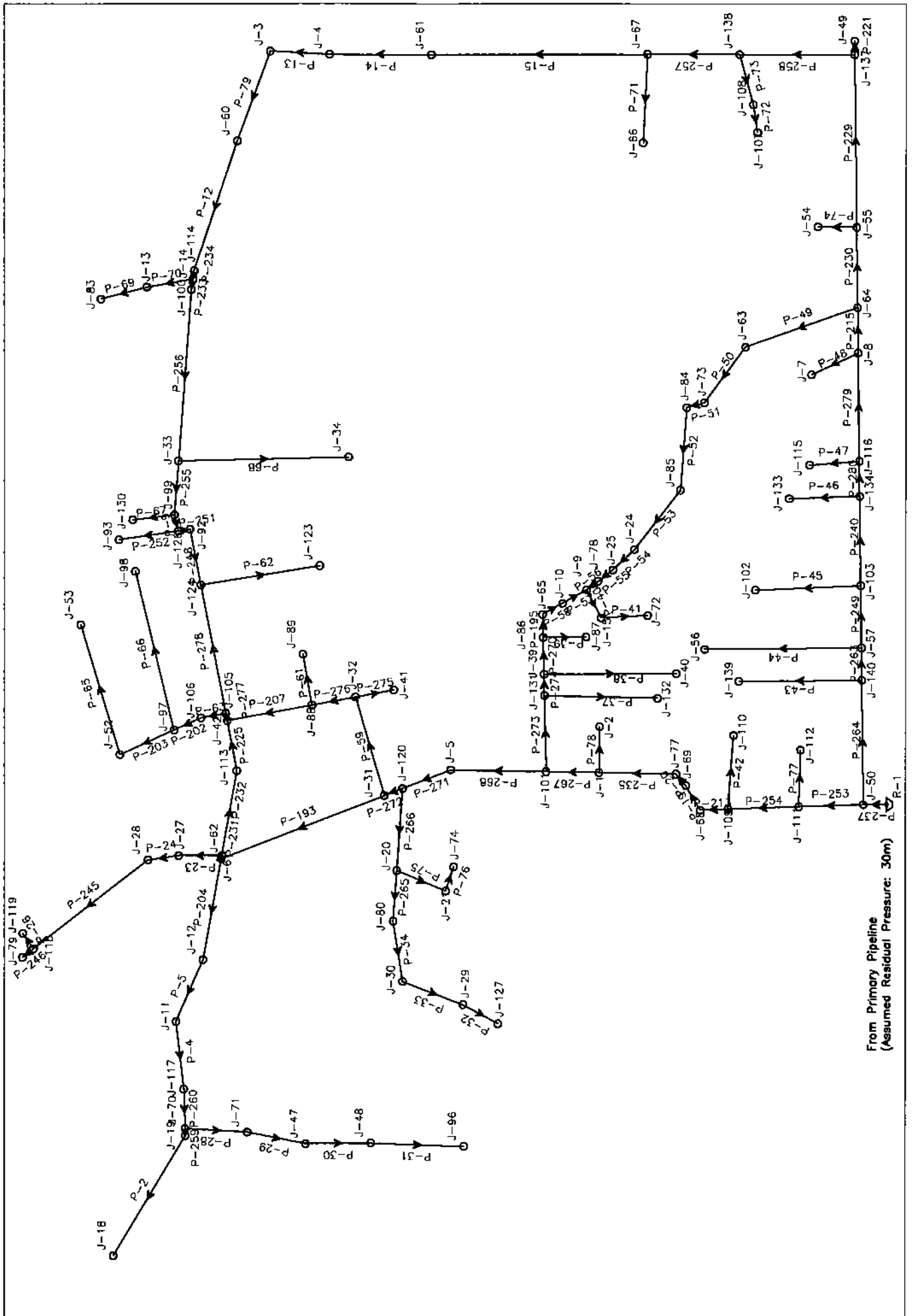
Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-157	J-384	J-407	PE	100	350.82	110	Open	-0.19	0.02	252.39	252.39	0.01	0.02
P-161	J-379	J-380	PE	80	174.04	110	Open	0.19	0.04	252.40	252.39	0.01	0.05
P-163	J-403	J-419	PE	100	135.94	110	Open	-0.19	0.02	253.17	253.17	0.00	0.02
P-164	J-419	J-417	PE	100	82.60	110	Open	-2.52	0.32	253.17	253.34	0.17	2.02
P-166	J-395	J-396	PE	80	103.94	110	Open	-0.93	0.19	253.35	253.44	0.10	0.94
P-168	J-399	J-400	PE	80	74.68	110	Open	-1.48	0.29	253.49	253.65	0.17	2.24
P-169	J-417	J-418	PE	100	160.32	110	Open	-2.15	0.27	253.34	253.58	0.24	1.50
P-174	J-394	J-412	PE	100	152.40	110	Open	3.56	0.45	254.25	253.67	0.59	3.84
P-175	J-420	J-426	PE	100	153.92	110	Open	-2.65	0.34	253.66	254.00	0.34	2.21
P-177	J-381	J-382	PE	100	60.96	110	Open	1.91	0.24	253.60	253.53	0.07	1.21
P-178	J-382	J-406	PE	100	178.92	110	Open	1.73	0.22	253.53	253.35	0.18	1.01
P-182	J-408	J-425	PE	100	63.09	110	Open	3.78	0.48	253.21	252.94	0.27	4.20
P-184	J-385	J-386	PE	80	84.43	110	Open	0.19	0.04	252.69	252.68	0.00	0.05
P-186	J-409	J-423	PE	80	67.36	110	Open	-0.19	0.04	252.39	252.39	0.00	0.05
P-187	J-423	J-430	PE	80	69.19	110	Open	-0.37	0.07	252.39	252.41	0.01	0.17
P-188	J-375	J-376	PE	80	116.13	110	Open	0.19	0.04	252.44	252.43	0.01	0.05
P-189	J-397	J-398	PE	80	44.20	110	Open	0.37	0.07	252.54	252.53	0.01	0.17
P-190	J-398	J-401	PE	80	55.47	110	Open	0.19	0.04	252.53	252.53	0.00	0.05
P-192	J-388	J-410	PE	80	63.70	110	Open	-0.93	0.19	252.37	252.43	0.06	0.94
P-193	J-414	J-424	PE	80	190.20	110	Open	-0.19	0.04	252.94	252.94	0.01	0.05
P-194	J-432	J-433	PE	80	91.74	110	Open	-0.19	0.04	252.95	252.95	0.00	0.05
P-195	J-377	J-378	PE	80	92.96	110	Open	0.19	0.04	252.97	252.96	0.00	0.05
P-254	J-418	J-400	PE	100	115.21	110	Open	-1.38	0.16	253.58	253.65	0.08	0.67
P-255	J-400	J-393	PE	100	38.71	110	Open	-3.05	0.39	253.65	253.77	0.11	2.88
P-259	J-425	J-422	PE	100	23.47	110	Open	-0.11	0.01	252.94	252.94	0.00	0.01
P-265	J-433	J-377	PE	100	35.05	110	Open	-1.04	0.13	252.95	252.97	0.01	0.39
P-268	J-422	J-424	PE	100	137.77	110	Open	-0.30	0.04	252.94	252.94	0.01	0.04
P-269	J-424	J-433	PE	100	51.21	110	Open	-0.67	0.08	252.94	252.95	0.01	0.17
P-270	J-375	J-397	PE	100	42.37	110	Open	-2.78	0.35	252.44	252.54	0.10	2.42
P-272	J-396	J-399	PE	80	32.31	110	Open	-1.11	0.22	253.44	253.49	0.04	1.32
P-273	J-399	J-413	PE	80	60.35	110	Open	0.19	0.04	253.49	253.48	0.00	0.05
P-277	J-407	J-379	PE	100	39.93	110	Open	-0.37	0.05	252.39	252.40	0.00	0.06
P-278	J-379	J-430	PE	100	52.73	110	Open	-0.74	0.09	252.40	252.41	0.01	0.21
P-279	J-417	J-395	PE	100	78.33	110	Open	-0.56	0.07	253.34	253.35	0.01	0.12
P-280	J-395	J-437	PE	100	100.28	110	Open	0.19	0.02	253.35	253.35	0.00	0.02
P-281	J-418	J-381	PE	100	70.71	110	Open	-0.95	0.12	253.58	253.60	0.02	0.33
P-282	J-381	J-420	PE	100	19.20	110	Open	-3.05	0.39	253.60	253.66	0.06	2.88
P-285	J-420	J-412	PE	100	74.98	110	Open	-0.59	0.07	253.66	253.67	0.01	0.14
P-286	J-412	J-429	PE	100	84.73	110	Open	2.79	0.36	253.67	253.46	0.21	2.44
P-289	J-397	J-385	PE	100	43.28	110	Open	-3.33	0.42	252.54	252.69	0.15	3.39
P-290	J-385	J-425	PE	100	61.57	110	Open	-3.70	0.47	252.69	252.94	0.25	4.13
P-291	J-388	J-490	PE	80	60.96	110	Open	0.19	0.04	252.37	252.37	0.00	0.05
P-292	J-307	J-451	PE	80	61.26	110	Open	-0.19	0.04	252.35	252.35	0.00	0.05
P-293	J-491	J-389	PE	80	54.25	110	Open	-0.56	0.11	252.35	252.37	0.02	0.36
P-294	J-491	J-492	PE	80	35.78	110	Open	0.19	0.04	252.35	252.35	0.00	0.05
P-295	J-406	J-408	PE	100	28.57	110	Open	3.96	0.50	253.35	253.21	0.14	4.68
P-297	J-391	J-429	PE	80	96.01	110	Open	-0.19	0.04	253.46	253.46	0.00	0.05
P-298	J-429	J-406	PE	100	60.05	110	Open	2.42	0.31	253.46	253.35	0.11	1.88
P-299	J-393	J-426	PE	100	171.93	110	Open	-3.24	0.41	253.77	254.00	0.23	3.21

Kolonie Idrizovo Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-301	J-430	J-410	PE	100	39.93	110	Open	-1.30	0.17	252.41	252.43	0.02	0.59
P-302	J-410	J-375	PE	100	3.05	110	Open	-2.41	0.31	252.43	252.44	0.01	1.80
P-303	J-431	J-415	PE	100	56.08	110	Open	-1.78	0.23	253.02	253.08	0.06	1.06
P-304	J-415	J-419	PE	100	62.18	110	Open	-2.15	0.27	253.08	253.17	0.09	1.50
P-305	J-426	J-434	PE	100	39.93	110	Open	-6.07	0.77	254.00	254.41	0.41	10.29
P-306	J-434	J-394	PE	100	36.88	110	Open	3.75	0.48	254.41	254.26	0.16	4.22
P-307	J-377	J-431	PE	100	72.54	110	Open	-1.41	0.18	252.97	253.02	0.05	0.69
P-308	J-431	J-402	PE	80	207.87	110	Open	0.19	0.04	253.02	253.01	0.01	0.05
P-309	R-1	J-434	PE	110	20.00	110	Open	10.00	1.05	255.00	254.41	0.33	16.32
P-310	J-428	J-416	PE	80	92.05	110	Open	-0.19	0.04	253.07	253.08	0.00	0.05

Idrizovo Network Model



From Primary Pipeline
(Assumed Residual Pressure: 30m)

Itrizovo Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-1	230	0.20	250.63	20.59
J-2	230	0.20	250.63	20.59
J-3	230	0.20	248.06	16.03
J-4	230	0.20	248.22	16.19
J-5	230	0.20	247.42	17.39
J-6	230	0.20	245.43	15.40
J-7	230	0.20	250.65	20.61
J-8	230	0.20	250.65	20.61
J-9	230	0.20	248.92	18.88
J-10	230	0.20	248.92	18.88
J-11	230	0.20	245.22	15.19
J-12	230	0.20	245.29	15.26
J-13	230	0.20	245.55	15.52
J-14	230	0.20	245.56	15.53
J-15	230	0.20	248.91	18.87
J-16	230	0.20	245.12	15.09
J-19	230	0.20	245.13	15.10
J-20	230	0.20	246.33	16.30
J-21	230	0.20	246.32	16.29
J-24	230	0.20	248.96	18.93
J-25	230	0.20	248.93	18.90
J-27	230	0.20	245.38	15.35
J-28	230	0.20	245.36	15.33
J-29	230	0.20	246.25	16.22
J-30	230	0.20	246.27	16.23
J-31	230	0.20	246.27	16.24
J-32	230	0.20	245.76	15.73
J-33	230	0.20	245.43	15.40
J-34	230	0.20	245.42	15.39
J-39	230	0.20	248.95	18.91
J-40	230	0.20	248.94	18.91
J-41	230	0.20	245.76	15.73
J-42	230	0.20	245.42	15.39
J-47	230	0.20	245.05	15.02
J-48	230	0.20	245.04	15.01
J-49	230	0.20	248.27	18.24
J-50	230	0.20	259.97	29.91
J-52	230	0.20	245.35	15.32
J-53	230	0.20	245.34	15.31
J-54	230	0.20	249.39	19.34
J-55	230	0.20	249.38	19.34
J-56	230	0.20	256.10	26.05
J-57	230	0.20	256.11	26.06
J-60	230	0.20	245.85	15.82
J-61	230	0.20	246.52	16.49
J-62	230	0.20	245.43	15.40
J-63	230	0.20	249.51	19.48
J-64	230	0.20	249.99	19.95
J-65	230	0.20	248.92	18.88
J-66	230	0.20	247.25	17.21
J-67	230	0.20	247.25	17.22
J-68	230	0.20	254.22	24.17
J-69	230	0.20	253.34	23.29
J-70	230	0.20	245.13	15.10

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-71	230	0.20	245.06	15.05
J-72	230	0.20	248.91	18.87
J-73	230	0.20	249.29	19.25
J-74	230	0.20	246.32	16.28
J-77	230	0.20	252.88	22.84
J-78	230	0.20	248.92	18.88
J-79	230	0.20	245.29	15.26
J-80	230	0.20	246.29	16.26
J-83	230	0.20	245.55	15.52
J-84	230	0.20	249.24	19.21
J-85	230	0.20	249.08	19.04
J-86	230	0.20	248.92	18.88
J-87	230	0.20	248.92	18.88
J-88	230	0.20	245.61	15.58
J-89	230	0.20	245.60	15.57
J-92	230	0.20	245.40	15.37
J-93	230	0.20	245.40	15.37
J-96	230	0.20	245.04	15.01
J-97	230	0.20	245.36	15.33
J-98	230	0.20	245.35	15.32
J-99	230	0.20	245.41	15.37
J-100	230	0.20	245.55	15.52
J-101	230	0.20	249.20	19.16
J-102	230	0.20	251.77	24.72
J-103	230	0.20	254.78	24.73
J-105	230	0.20	245.41	15.38
J-106	230	0.20	245.38	15.35
J-107	230	0.20	247.62	17.59
J-108	230	0.20	247.62	17.59
J-109	230	0.20	255.11	25.06
J-110	230	0.20	255.11	25.06
J-111	230	0.20	257.56	27.51
J-112	230	0.20	257.56	27.50
J-113	230	0.20	245.42	15.39
J-114	230	0.20	245.58	15.55
J-115	230	0.20	252.40	22.36
J-116	230	0.20	252.41	22.36
J-117	230	0.20	245.16	15.13
J-118	230	0.20	245.29	15.26
J-119	230	0.20	245.29	15.26
J-120	230	0.20	246.50	16.47
J-123	230	0.20	245.40	15.36
J-124	230	0.20	245.40	15.37
J-126	230	0.20	245.40	15.37
J-127	230	0.20	246.25	16.22
J-130	230	0.20	245.40	15.37
J-131	230	0.20	248.99	18.95
J-132	230	0.20	248.98	18.94
J-133	230	0.20	253.02	22.98
J-134	230	0.20	253.03	22.98
J-137	230	0.20	246.27	16.24
J-139	230	0.20	247.63	17.60
J-139	230	0.20	256.85	26.80
J-140	230	0.20	256.86	26.80

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-2	J-18	J-19	PE	100	142.65	110	Open	-0.20	0.03	245.12	245.13	0.00	0.02
P-4	J-117	J-11	PE	100	68.19	110	Open	-1.61	0.21	245.16	245.22	0.06	0.88
P-5	J-11	J-12	PE	100	68.19	110	Open	-1.81	0.23	245.22	245.29	0.08	1.10
P-9	J-126	J-99	PE	100	17.07	110	Open	-0.64	0.08	245.40	245.41	0.00	0.16
P-12	J-114	J-60	PE	100	139.29	110	Open	-2.45	0.31	245.58	245.55	0.27	1.93
P-13	J-3	J-4	PE	100	61.26	110	Open	-2.86	0.36	246.06	246.22	0.16	2.55
P-14	J-4	J-61	PE	100	104.85	110	Open	-3.06	0.39	246.22	246.52	0.30	2.89
P-15	J-61	J-67	PE	100	223.11	110	Open	-3.26	0.42	246.52	247.25	0.73	3.26
P-19	J-68	J-69	PE	100	29.26	110	Open	10.87	1.38	254.22	253.34	0.89	30.30
P-20	J-69	J-77	PE	100	15.54	110	Open	10.67	1.36	253.34	252.88	0.46	29.27
P-23	J-62	J-27	PE	80	44.20	110	Open	1.01	0.20	245.43	245.39	0.05	1.10
P-24	J-27	J-28	PE	80	32.00	110	Open	0.81	0.16	245.38	245.36	0.02	0.73
P-26	J-116	J-119	PE	80	19.51	110	Open	0.20	0.04	245.29	245.29	0.00	0.06
P-28	J-70	J-71	PE	80	64.01	110	Open	0.81	0.16	245.13	245.08	0.05	0.73
P-29	J-71	J-47	PE	80	61.57	110	Open	0.60	0.12	245.08	245.05	0.03	0.43
P-30	J-47	J-48	PE	80	67.35	110	Open	0.40	0.08	245.05	245.04	0.01	0.20
P-31	J-48	J-66	PE	80	95.40	110	Open	0.20	0.04	245.04	245.04	0.00	0.06
P-32	J-127	J-29	PE	80	40.84	110	Open	-0.20	0.04	246.25	246.25	0.00	0.06
P-33	J-29	J-30	PE	80	66.45	110	Open	-0.40	0.08	246.25	246.27	0.01	0.20
P-34	J-30	J-80	PE	80	62.48	110	Open	-0.60	0.12	246.27	246.29	0.03	0.43
P-37	J-131	J-132	PE	80	117.04	110	Open	0.20	0.04	248.99	248.98	0.01	0.06
P-38	J-39	J-40	PE	80	136.86	110	Open	0.20	0.04	248.95	248.94	0.01	0.06

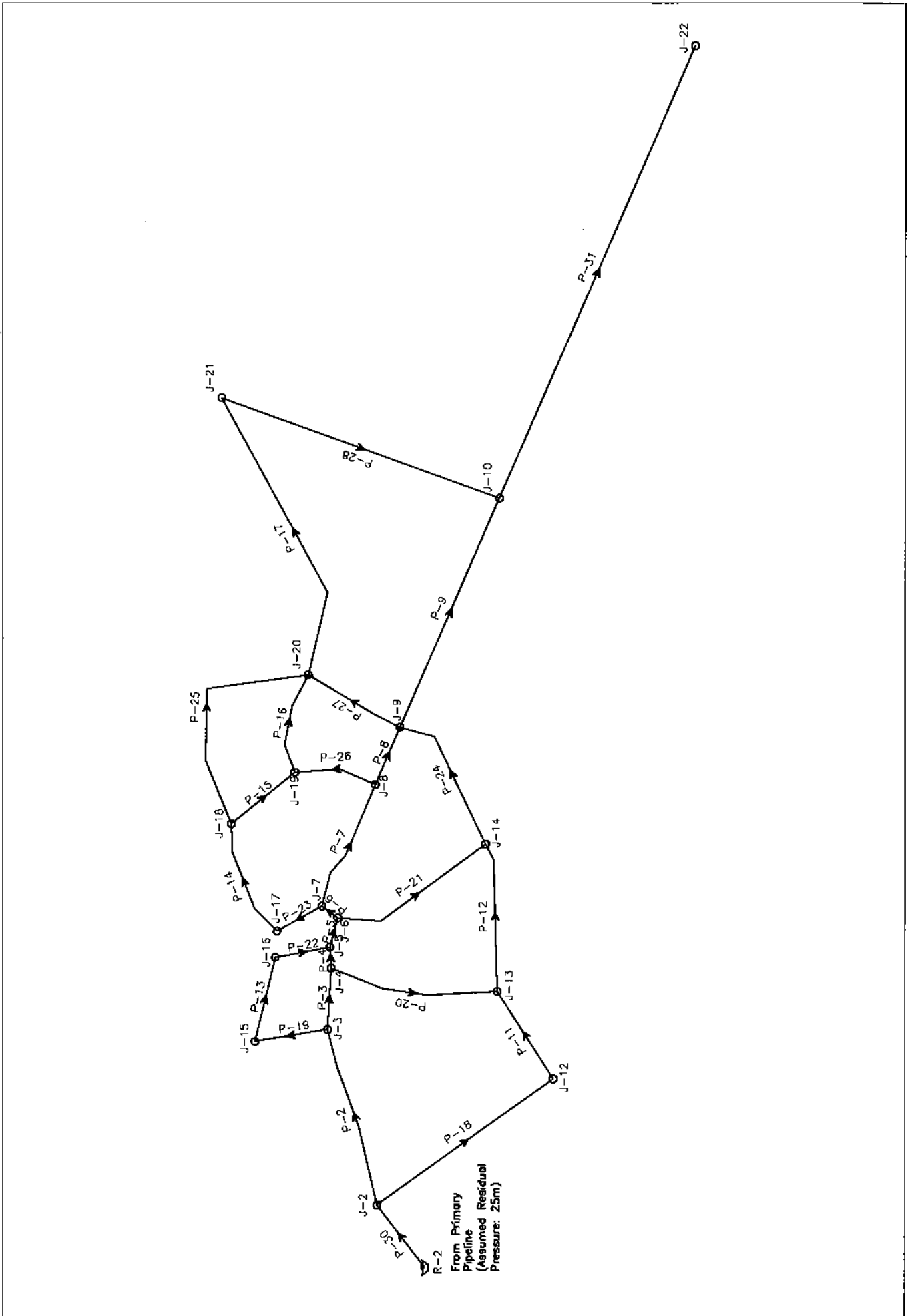
Idrizovo Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-39	J-86	J-87	PE	80	44.81	110	Open	0.20	0.04	248.92	248.92	0.00	0.00
P-40	J-9	J-15	PE	80	32.61	110	Open	0.40	0.08	248.92	248.91	0.01	0.20
P-41	J-15	J-72	PE	80	47.85	110	Open	0.20	0.04	248.91	248.91	0.00	0.00
P-42	J-109	J-110	PE	80	75.59	110	Open	0.20	0.04	255.11	255.11	0.00	0.00
P-43	J-139	J-140	PE	80	127.71	110	Open	-0.20	0.04	256.85	256.66	0.01	0.06
P-44	J-56	J-57	PE	80	162.15	110	Open	-0.20	0.04	256.10	256.11	0.01	0.06
P-45	J-102	J-103	PE	80	109.42	110	Open	-0.20	0.04	254.77	254.78	0.01	0.06
P-46	J-133	J-134	PE	80	73.46	110	Open	-0.20	0.04	253.02	253.03	0.00	0.00
P-47	J-115	J-116	PE	80	51.82	110	Open	-0.20	0.04	252.40	252.41	0.00	0.00
P-48	J-7	J-8	PE	80	53.04	110	Open	-0.20	0.04	250.65	250.66	0.00	0.00
P-49	J-63	J-64	PE	80	123.14	110	Open	-1.98	0.39	249.51	249.99	0.47	3.84
P-50	J-63	J-73	PE	80	71.02	110	Open	1.78	0.35	248.51	248.29	0.22	3.15
P-51	J-73	J-84	PE	80	18.59	110	Open	1.58	0.31	249.29	249.24	0.05	2.52
P-52	J-84	J-85	PE	80	85.04	110	Open	1.38	0.27	248.24	248.06	0.17	1.96
P-53	J-85	J-24	PE	80	76.81	110	Open	1.18	0.23	248.08	248.96	0.11	1.46
P-54	J-24	J-25	PE	80	30.48	110	Open	0.97	0.19	248.98	248.93	0.03	1.03
P-55	J-25	J-78	PE	80	18.90	110	Open	0.77	0.15	248.93	248.92	0.01	0.67
P-56	J-78	J-9	PE	80	14.94	110	Open	0.57	0.11	248.92	248.92	0.01	0.38
P-57	J-9	J-10	PE	80	28.35	110	Open	-0.03	0.01	248.92	248.92	0.00	0.00
P-58	J-10	J-65	PE	80	23.77	110	Open	-0.23	0.05	248.92	248.92	0.00	0.07
P-59	J-31	J-32	PE	80	105.16	110	Open	2.25	0.45	246.27	245.76	0.51	4.86
P-61	J-80	J-89	PE	80	53.04	110	Open	0.20	0.04	245.61	245.60	0.00	0.00
P-62	J-123	J-124	PE	80	124.36	110	Open	-0.20	0.04	245.40	245.40	0.01	0.06
P-63	J-105	J-106	PE	80	25.91	110	Open	1.01	0.20	245.41	245.38	0.03	1.10
P-65	J-52	J-53	PE	80	139.29	110	Open	0.20	0.04	245.35	245.34	0.01	0.06
P-66	J-97	J-98	PE	80	167.64	110	Open	0.20	0.04	245.35	245.35	0.01	0.06
P-67	J-99	J-130	PE	80	42.98	110	Open	0.20	0.04	245.41	245.40	0.00	0.06
P-68	J-33	J-34	PE	80	175.26	110	Open	0.20	0.04	245.43	245.42	0.01	0.06
P-69	J-83	J-13	PE	80	48.46	110	Open	-0.20	0.04	245.55	245.55	0.00	0.06
P-70	J-13	J-14	PE	80	47.85	110	Open	-0.40	0.08	245.55	245.55	0.01	0.20
P-71	J-66	J-67	PE	80	90.22	110	Open	-0.20	0.04	247.25	247.25	0.01	0.06
P-72	J-107	J-108	PE	80	28.96	110	Open	-0.20	0.04	247.62	247.62	0.00	0.06
P-73	J-108	J-138	PE	80	52.73	110	Open	-0.40	0.08	247.62	247.63	0.01	0.20
P-74	J-54	J-55	PE	80	40.23	110	Open	-0.20	0.04	249.38	249.39	0.00	0.06
P-75	J-20	J-21	PE	80	54.25	110	Open	0.40	0.08	248.33	248.32	0.01	0.20
P-76	J-21	J-74	PE	80	25.91	110	Open	0.20	0.04	248.32	248.32	0.00	0.06
P-77	J-111	J-112	PE	80	58.22	110	Open	0.20	0.04	267.56	267.56	0.00	0.06
P-78	J-1	J-2	PE	80	47.24	110	Open	0.20	0.04	250.63	250.63	0.00	0.06
P-79	J-60	J-3	PE	100	97.23	110	Open	-2.56	0.34	245.85	246.06	0.22	2.23
P-193	J-31	J-6	PE	100	180.44	110	Open	3.95	0.50	246.27	245.43	0.84	4.66
P-195	J-86	J-65	PE	80	23.77	110	Open	0.44	0.09	248.92	248.92	0.01	0.23
P-202	J-106	J-97	PE	80	30.18	110	Open	0.81	0.16	245.38	245.36	0.02	0.73
P-203	J-97	J-52	PE	80	60.96	110	Open	0.40	0.08	245.36	245.35	0.01	0.20
P-204	J-12	J-6	PE	100	104.85	110	Open	-2.01	0.26	245.29	245.43	0.14	1.33
P-207	J-88	J-42	PE	80	89.00	110	Open	1.45	0.29	245.61	245.42	0.19	2.14
P-213	J-109	J-68	PE	100	28.35	110	Open	11.07	1.41	255.11	254.22	0.89	31.35
P-215	J-64	J-8	PE	100	46.63	110	Open	-7.25	0.92	249.99	250.66	0.67	14.33
P-221	J-49	J-137	PE	80	14.02	110	Open	-0.20	0.04	248.27	248.27	0.00	0.06
P-225	J-113	J-42	PE	100	52.12	110	Open	0.33	0.04	245.42	245.42	0.00	0.06
P-229	J-137	J-55	PE	100	175.26	110	Open	-4.67	0.59	248.27	249.38	1.11	6.34
P-230	J-55	J-64	PE	100	81.69	110	Open	-5.07	0.65	249.38	249.99	0.60	7.39
P-231	J-6	J-62	PE	100	3.35	110	Open	1.74	0.22	245.43	245.43	0.00	1.02
P-232	J-62	J-113	PE	100	88.70	110	Open	0.53	0.07	245.43	245.42	0.01	0.11
P-233	J-100	J-14	PE	100	10.67	110	Open	-1.65	0.21	245.55	245.56	0.01	0.92
P-234	J-14	J-114	PE	100	8.84	110	Open	-2.25	0.29	245.56	245.58	0.01	1.64
P-235	J-77	J-1	PE	100	79.55	110	Open	10.47	1.33	252.68	250.63	2.25	28.26
P-237	R-1	J-50	PE	250	26.52	110	Open	21.75	0.44	260.00	259.97	0.03	1.26
P-240	J-134	J-103	PE	100	81.74	110	Open	-8.46	1.08	253.03	254.78	1.75	19.06
P-245	J-20	J-118	PE	80	148.74	110	Open	0.60	0.12	245.36	245.29	0.06	0.43
P-248	J-118	J-79	PE	80	14.33	110	Open	0.20	0.04	245.29	245.29	0.00	0.06
P-249	J-124	J-92	PE	100	57.91	110	Open	-0.04	0.00	245.40	245.40	0.00	0.00
P-249	J-103	J-57	PE	100	64.01	110	Open	-8.87	1.13	254.78	255.11	1.33	20.78
P-251	J-92	J-126	PE	100	12.50	110	Open	-0.24	0.03	245.40	245.40	0.00	0.03
P-252	J-126	J-93	PE	80	60.96	110	Open	0.20	0.04	245.40	245.40	0.00	0.06
P-253	J-50	J-111	PE	100	67.36	110	Open	11.88	1.51	259.97	257.56	2.41	35.71
P-254	J-111	J-109	PE	100	73.15	110	Open	11.47	1.46	257.56	255.11	2.45	33.50
P-255	J-99	J-33	PE	100	55.47	110	Open	-1.04	0.13	245.41	245.43	0.02	0.40
P-256	J-33	J-100	PE	100	175.56	110	Open	-1.45	0.18	245.43	245.55	0.13	0.72
P-257	J-67	J-139	PE	100	94.79	110	Open	-3.66	0.47	247.25	247.63	0.30	4.04
P-258	J-138	J-137	PE	100	119.18	110	Open	-4.27	0.54	247.63	248.27	0.64	5.38
P-259	J-10	J-70	PE	80	7.32	110	Open	-0.40	0.08	245.13	245.13	0.00	0.20
P-260	J-70	J-117	PE	100	40.23	110	Open	-1.41	0.18	245.13	245.16	0.03	0.69
P-263	J-57	J-140	PE	100	33.22	110	Open	-9.27	1.18	256.11	255.06	0.75	22.56
P-264	J-140	J-50	PE	100	127.41	110	Open	-9.67	1.23	256.06	259.97	3.11	24.41
P-265	J-80	J-20	PE	80	52.12	110	Open	-0.81	0.16	246.29	246.33	0.04	0.73
P-266	J-20	J-120	PE	80	84.12	110	Open	-1.41	0.28	246.33	246.50	0.17	2.04
P-267	J-1	J-101	PE	100	54.56	110	Open	10.06	1.28	250.63	249.20	1.43	25.28
P-268	J-101	J-5	PE	100	98.76	110	Open	8.22	1.05	248.20	247.42	1.70	18.06
P-270	J-39	J-86	PE	80	37.80	110	Open	0.84	0.17	248.95	248.92	0.03	0.78
P-271	J-5	J-120	PE	100	53.04	110	Open	8.02	1.02	247.42	246.50	0.91	17.25
P-272	J-120	J-31	PE	100	20.12	110	Open	6.41	0.82	246.50	246.27	0.23	11.38
P-273	J-101	J-131	PE	80	78.03	110	Open	1.64	0.33	249.20	248.99	0.21	2.72
P-274	J-131	J-39	PE	80	21.95	110	Open	1.24	0.25	248.99	248.95	0.04	1.62

Idrizovo Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-275	J-41	J-32	PE	60	39.93	110	Open	-0.20	0.04	245.76	245.76	0.00	0.06
P-276	J-32	J-88	PE	60	45.72	110	Open	1.85	0.37	245.76	245.61	0.15	3.38
P-277	J-42	J-165	PE	100	7.62	110	Open	1.57	0.20	245.42	245.41	0.01	0.65
P-278	J-105	J-124	PE	100	134.42	110	Open	0.36	0.05	245.41	245.40	0.01	0.06
P-279	J-8	J-116	PE	100	110.64	110	Open	-7.66	0.98	250.66	252.41	1.75	15.84
P-280	J-116	J-134	PE	100	35.06	110	Open	-0.06	1.03	252.41	253.03	0.62	17.42

Mralino Network Model



Mralino Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-2	230	0.35	254.73	24.66
J-3	230	0.35	254.16	24.13
J-4	230	0.35	254.01	23.98
J-5	230	0.35	253.95	23.91
J-6	230	0.35	253.87	23.83
J-7	230	0.35	253.82	23.78
J-8	230	0.35	253.53	23.48
J-9	230	0.35	253.40	23.35
J-10	230	0.35	252.86	22.82
J-12	230	0.35	254.15	24.10

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-13	230	0.35	253.98	23.93
J-14	230	0.35	253.76	23.72
J-15	230	0.35	254.05	24.00
J-16	230	0.35	253.97	23.92
J-17	230	0.35	253.60	23.63
J-18	230	0.35	253.47	23.43
J-19	230	0.35	253.46	23.42
J-20	230	0.35	253.39	23.35
J-21	230	0.35	253.01	22.97
J-22	230	25.00	251.79	21.74

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-2	J-2	J-3	PE	250	243.50	110	Open	29.90	0.61	254.73	254.18	0.55	2.28
P-3	J-3	J-4	PE	250	81.50	110	Open	28.43	0.58	254.18	254.01	0.17	2.07
P-4	J-4	J-5	PE	250	28.50	110	Open	27.77	0.57	254.01	253.95	0.06	1.98
P-5	J-5	J-6	PE	250	40.50	110	Open	27.84	0.57	253.95	253.87	0.08	1.99
P-6	J-6	J-7	PE	250	26.50	110	Open	26.86	0.55	253.87	253.82	0.05	1.86
P-7	J-7	J-8	PE	250	180.50	110	Open	26.07	0.51	253.82	253.53	0.30	1.64
P-8	J-8	J-9	PE	250	83.50	110	Open	24.01	0.49	253.53	253.40	0.13	1.52
P-9	J-9	J-10	PE	250	335.50	110	Open	24.78	0.50	253.40	252.86	0.54	1.61
P-11	J-12	J-13	PE	80	139.50	110	Open	1.05	0.21	254.15	253.98	0.16	1.18
P-12	J-13	J-14	PE	80	200.00	110	Open	1.01	0.20	253.98	253.76	0.22	1.09
P-13	J-15	J-16	PE	80	115.50	110	Open	0.77	0.15	254.05	253.97	0.08	0.67
P-14	J-17	J-18	PE	80	162.50	110	Open	1.08	0.22	253.68	253.47	0.20	1.26
P-15	J-18	J-19	PE	80	110.00	110	Open	0.29	0.06	253.47	253.46	0.01	0.11
P-16	J-19	J-20	PE	80	139.50	110	Open	0.65	0.13	253.46	253.39	0.07	0.48
P-17	J-20	J-21	PE	80	411.00	110	Open	0.92	0.18	253.39	253.01	0.38	0.93
P-18	J-2	J-12	PE	80	291.50	110	Open	1.40	0.28	254.73	254.15	0.59	2.01
P-19	J-15	J-3	PE	80	99.00	110	Open	-1.12	0.22	254.05	254.18	0.13	1.33
P-20	J-4	J-13	PE	80	230.00	110	Open	0.31	0.06	254.01	253.96	0.03	0.12
P-21	J-6	J-14	PE	80	233.00	110	Open	0.64	0.13	253.87	253.76	0.11	0.47
P-22	J-16	J-5	PE	80	75.00	110	Open	0.42	0.09	253.97	253.95	0.02	0.22
P-23	J-17	J-7	PE	80	69.00	110	Open	-1.43	0.29	253.60	253.82	0.15	2.11
P-24	J-14	J-9	PE	80	208.00	110	Open	1.29	0.26	253.76	253.40	0.36	1.74
P-25	J-18	J-20	PE	80	326.00	110	Open	0.45	0.09	253.47	253.39	0.08	0.24
P-26	J-8	J-19	PE	80	113.00	110	Open	0.71	0.14	253.53	253.46	0.07	0.58
P-27	J-20	J-9	PE	80	142.50	110	Open	-0.17	0.03	253.39	253.40	0.01	0.04
P-28	J-21	J-10	PE	80	398.00	110	Open	0.57	0.11	253.01	252.86	0.15	0.38
P-30	R-2	J-2	PE	250	105.50	110	Open	31.65	0.64	255.00	254.73	0.27	2.53
P-31	J-10	J-22	PE	250	659.00	110	Open	25.00	0.51	252.86	251.79	1.08	1.63

Petrovec Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-3	0	0.23	20.6	20.55
J-4	0	0.23	20.51	20.47
J-5	0	0.23	20.88	20.84
J-7	0	0.23	21.60	21.55
J-12	0	0.23	20.47	20.42
J-14	0	0.23	19.93	19.89
J-15	0	0.23	21.53	21.49
J-16	0	0.23	21.40	21.36
J-24	0	0.23	21.35	21.31
J-25	0	0.23	21.20	21.16
J-26	0	0.23	21.14	21.10
J-29	0	0.23	22.19	22.15
J-33	0	0.23	21.29	21.25
J-35	0	0.23	22.08	22.04
J-36	0	0.23	21.57	21.52
J-37	0	0.23	21.60	21.55
J-38	0	0.23	20.18	20.14
J-39	0	0.23	20.10	20.06
J-43	0	0.23	20.36	20.32
J-47	0	0.23	21.13	21.09
J-48	0	0.23	20.40	20.36
J-50	0	0.23	20.47	20.43
J-52	0	0.23	21.27	21.23
J-53	0	0.23	21.26	21.22
J-54	0	0.23	21.51	21.47
J-57	0	0.23	21.13	21.08
J-58	0	0.23	19.40	19.36
J-61	0	0.23	20.59	20.55
J-62	0	0.23	21.48	21.44
J-63	0	0.23	20.47	20.43
J-64	0	0.23	20.70	20.65
J-65	0	0.23	20.46	20.42
J-70	0	0.23	20.54	20.49
J-74	0	0.23	21.26	21.22
J-78	0	0.23	21.04	21.00
J-79	0	0.23	21.50	21.55
J-83	0	0.23	20.63	20.59
J-84	0	0.23	22.78	22.73
J-88	0	0.23	20.98	20.92
J-89	0	0.23	20.79	20.75
J-91	0	0.23	21.18	21.12
J-93	0	0.23	21.13	21.09
J-96	0	0.23	20.07	20.03
J-100	0	0.23	21.53	21.49
J-101	0	0.23	21.52	21.48
J-103	0	0.23	20.56	20.52
J-105	0	0.23	19.92	19.88
J-108	0	0.23	20.56	20.52
J-109	0	0.23	20.80	20.75
J-110	0	0.23	21.55	21.51
J-113	0	0.23	21.21	21.17
J-114	0	0.23	21.22	21.18
J-116	0	0.23	21.31	21.27
J-118	0	0.23	21.13	21.09
J-120	0	0.23	21.53	21.49
J-123	0	0.23	22.66	22.62
J-124	0	0.23	21.16	21.11
J-129	0	0.23	20.14	20.10
J-132	0	0.23	22.64	22.60
J-201	0	0.23	21.14	21.10
J-202	0	0.23	21.10	21.06

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-203	0	0.23	20.87	20.83
J-204	0	0.23	21.25	21.21
J-205	0	0.23	21.31	21.27
J-206	0	0.23	21.42	21.38
J-207	0	0.23	21.36	21.32
J-208	0	0.23	21.35	21.31
J-209	0	0.23	21.35	21.31
J-210	0	0.23	21.35	21.31
J-211	0	0.23	21.35	21.31
J-212	0	0.23	21.41	21.37
J-213	0	0.23	21.45	21.41
J-214	0	0.23	21.54	21.50
J-215	0	0.23	21.53	21.49
J-216	0	0.23	21.53	21.49
J-217	0	0.23	21.11	21.07
J-218	0	0.23	21.10	21.06
J-219	0	0.23	20.46	20.42
J-220	0	0.23	20.47	20.43
J-221	0	0.23	20.49	20.45
J-222	0	0.23	20.69	20.65
J-223	0	0.23	20.90	20.86
J-224	0	0.23	21.27	21.23
J-225	0	0.23	20.46	20.42
J-228	0	0.23	20.73	20.69
J-227	0	0.23	20.85	20.81
J-228	0	0.23	21.01	20.97
J-229	0	0.23	21.11	21.07
J-230	0	0.23	21.22	21.17
J-231	0	0.23	20.93	20.89
J-232	0	0.23	20.68	20.64
J-233	0	0.23	20.57	20.53
J-234	0	0.23	21.01	20.97
J-235	0	0.23	21.00	20.96
J-236	0	0.23	20.96	20.92
J-237	0	0.23	20.84	20.80
J-238	0	0.23	20.77	20.73
J-239	0	0.23	20.71	20.67
J-240	0	0.23	20.59	20.55
J-241	0	0.23	20.54	20.50
J-242	0	0.23	20.31	20.27
J-243	0	0.23	19.33	19.30
J-244	0	0.23	19.37	19.33
J-245	0	0.23	20.07	20.03
J-246	0	0.23	20.63	20.59
J-247	0	0.23	20.09	20.05
J-248	0	0.23	21.05	21.01
J-249	0	0.23	21.03	21.79
J-250	0	0.23	22.21	22.17
J-251	0	0.23	21.78	21.73
J-252	0	0.23	22.75	22.71
J-253	0	0.23	22.18	22.14
J-254	0	0.23	21.02	21.78
J-255	0	0.23	22.09	22.05
J-256	0	0.23	21.22	21.18
J-257	0	0.23	21.22	21.18
J-258	0	0.23	21.44	21.40
J-259	0	0.23	21.46	21.41
J-260	0	0.23	21.43	21.39
J-261	0	0.23	21.47	21.43
J-262	0	0.23	21.53	21.49
J-263	0	0.00	23.04	22.99

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-9	J-118	J-91	PE	120	228.30	110	Open	-1.01	0.09	21.13	21.15	0.04	0.15
P-11	J-123	J-29	PE	100	161.54	110	Open	3.06	0.39	22.66	22.19	0.47	2.91
P-13	J-3	J-4	PE	50	125.27	110	Open	0.23	0.12	20.60	20.51	0.09	0.71
P-15	J-38	J-95	PE	50	149.05	110	Open	0.23	0.12	20.18	20.07	0.11	0.71
P-17	J-38	J-39	PE	50	99.67	110	Open	0.23	0.12	20.18	20.10	0.07	0.71
P-21	J-109	J-5	PE	80	165.45	110	Open	-0.69	0.14	20.60	20.88	0.09	0.55
P-23	J-52	J-53	PE	80	135.33	110	Open	0.23	0.05	21.27	21.28	0.01	0.07
P-24	J-25	J-26	PE	50	84.12	110	Open	0.23	0.12	21.20	21.14	0.06	0.71
P-29	J-100	J-101	PE	80	137.46	110	Open	0.23	0.05	21.53	21.52	0.01	0.07
P-30	J-36	J-37	PE	80	381.61	110	Open	-0.23	0.05	21.57	21.60	0.03	0.07
P-38	J-33	J-15	PE	120	189.58	110	Open	-3.17	0.28	21.29	21.53	0.24	1.27
P-41	J-63	J-64	PE	80	408.13	110	Open	-0.69	0.14	20.47	20.70	0.22	0.55
P-129	J-201	J-114	PE	50	119.79	110	Open	-0.23	0.12	21.14	21.22	0.09	0.71
P-130	J-114	J-47	PE	80	279.50	110	Open	0.54	0.11	21.22	21.13	0.10	0.34
P-131	J-47	J-202	PE	80	363.93	110	Open	0.23	0.05	21.13	21.10	0.03	0.07

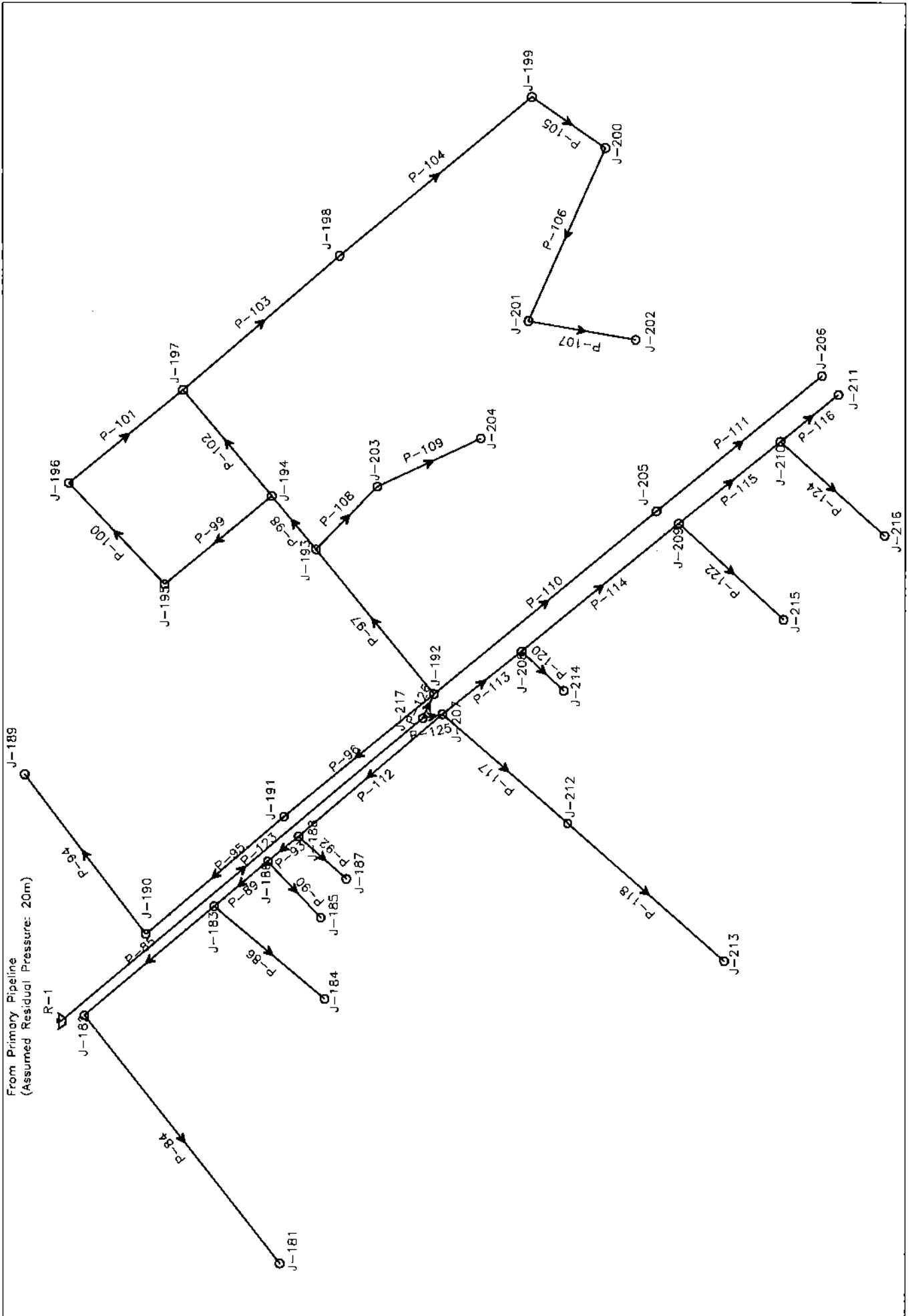
Petrovec Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-132	J-103	J-64	PE	50	191.11	110	Open	-0.23	0.12	20.56	20.70	0.14	0.71
P-133	J-64	J-203	PE	80	121.92	110	Open	-1.16	0.23	20.70	20.87	0.17	1.42
P-134	J-203	J-204	PE	80	193.55	110	Open	-1.39	0.28	20.87	21.26	0.38	1.99
P-135	J-204	J-205	PE	100	67.36	110	Open	-1.62	0.21	21.26	21.31	0.05	0.69
P-136	J-205	J-120	PE	100	190.20	110	Open	-1.85	0.24	21.31	21.53	0.22	1.14
P-137	J-120	J-206	PE	80	134.72	110	Open	0.87	0.17	21.53	21.42	0.11	0.93
P-138	J-206	J-207	PE	80	117.65	110	Open	0.63	0.13	21.42	21.36	0.05	0.47
P-139	J-207	J-208	PE	80	53.64	110	Open	0.40	0.08	21.36	21.35	0.01	0.20
P-140	J-208	J-209	PE	80	81.69	110	Open	0.17	0.03	21.35	21.35	0.00	0.04
P-141	J-209	J-210	PE	80	55.47	110	Open	-0.06	0.01	21.35	21.35	0.00	0.01
P-142	J-210	J-211	PE	80	32.92	110	Open	-0.29	0.06	21.35	21.35	0.00	0.11
P-143	J-211	J-212	PE	80	168.25	110	Open	-0.52	0.10	21.35	21.41	0.05	0.33
P-144	J-212	J-213	PE	80	71.32	110	Open	-0.75	0.15	21.41	21.45	0.05	0.64
P-145	J-213	J-110	PE	80	94.18	110	Open	-0.99	0.20	21.45	21.55	0.10	1.06
P-146	J-110	J-214	PE	120	69.80	110	Open	1.11	0.10	21.55	21.54	0.01	0.16
P-147	J-214	J-215	PE	120	60.05	110	Open	0.88	0.08	21.54	21.53	0.01	0.12
P-148	J-215	J-100	PE	120	46.02	110	Open	0.65	0.06	21.53	21.53	0.00	0.07
P-149	J-100	J-216	PE	120	82.91	110	Open	0.19	0.02	21.53	21.53	0.00	0.01
P-150	J-216	J-120	PE	120	68.58	110	Open	-0.05	0.00	21.53	21.53	0.00	0.00
P-151	J-93	J-217	PE	80	76.50	110	Open	0.46	0.09	21.13	21.11	0.02	0.26
P-152	J-217	J-218	PE	80	140.21	110	Open	0.23	0.05	21.11	21.10	0.01	0.07
P-153	J-219	J-220	PE	80	80.47	110	Open	-0.23	0.05	20.46	20.47	0.01	0.07
P-154	J-220	J-221	PE	80	64.62	110	Open	-0.46	0.09	20.47	20.49	0.02	0.26
P-155	J-221	J-70	PE	80	87.17	110	Open	-0.69	0.14	20.49	20.54	0.05	0.55
P-156	J-70	J-222	PE	80	107.90	110	Open	-1.15	0.23	20.54	20.69	0.15	1.42
P-157	J-222	J-223	PE	80	107.59	110	Open	-1.39	0.28	20.69	20.90	0.21	1.99
P-159	J-223	J-124	PE	80	96.01	110	Open	-1.62	0.32	20.90	21.16	0.25	2.65
P-160	J-124	J-33	PE	100	67.06	110	Open	-2.47	0.31	21.16	21.29	0.13	1.95
P-161	J-33	J-224	PE	80	76.50	110	Open	0.46	0.09	21.29	21.27	0.02	0.26
P-162	J-93	J-124	PE	100	190.50	110	Open	-0.82	0.08	21.13	21.16	0.03	0.15
P-164	J-224	J-74	PE	80	103.63	110	Open	0.23	0.05	21.27	21.26	0.01	0.07
P-165	J-225	J-70	PE	50	99.67	110	Open	-0.23	0.12	20.46	20.54	0.07	0.71
P-166	J-226	J-108	PE	50	88.39	110	Open	-0.23	0.12	20.73	20.80	0.06	0.71
P-167	J-93	J-47	PE	100	161.54	110	Open	-0.07	0.01	21.13	21.13	0.00	0.05
P-168	J-69	J-109	PE	80	80.16	110	Open	-0.23	0.05	20.79	20.80	0.01	0.07
P-170	J-227	J-5	PE	50	45.72	110	Open	-0.23	0.12	20.85	20.88	0.03	0.71
P-171	J-5	J-228	PE	80	69.61	110	Open	-1.16	0.23	20.88	21.01	0.13	1.42
P-172	J-228	J-229	PE	80	52.43	110	Open	-1.39	0.28	21.01	21.11	0.10	1.99
P-174	J-229	J-52	PE	80	80.66	110	Open	-1.62	0.32	21.11	21.27	0.16	2.65
P-175	J-52	J-15	PE	120	74.60	110	Open	-5.41	0.48	21.27	21.53	0.26	3.43
P-177	J-52	J-230	PE	120	41.15	110	Open	3.33	0.29	21.27	21.22	0.06	1.39
P-178	J-230	J-91	PE	120	43.28	110	Open	3.10	0.27	21.22	21.16	0.05	1.22
P-179	J-91	J-231	PE	80	69.19	110	Open	1.65	0.37	21.16	20.93	0.23	3.39
P-180	J-231	J-232	PE	80	92.05	110	Open	1.62	0.32	20.93	20.68	0.24	2.65
P-181	J-16	J-25	PE	120	86.15	110	Open	4.12	0.36	21.40	21.20	0.20	2.07
P-182	J-232	J-83	PE	60	28.04	110	Open	1.39	0.28	20.68	20.63	0.06	1.99
P-183	J-83	J-61	PE	50	59.44	110	Open	0.23	0.12	20.63	20.59	0.04	0.71
P-184	J-83	J-3	PE	80	33.83	110	Open	0.93	0.18	20.63	20.60	0.03	0.94
P-185	J-3	J-233	PE	80	101.50	110	Open	0.46	0.09	20.60	20.57	0.03	0.26
P-186	J-233	J-108	PE	80	88.70	110	Open	0.23	0.05	20.57	20.56	0.01	0.07
P-187	J-88	J-234	PE	50	72.85	110	Open	-0.23	0.12	20.95	21.01	0.05	0.71
P-188	J-234	J-118	PE	50	44.20	110	Open	-0.46	0.24	21.01	21.13	0.11	2.57
P-189	J-50	J-12	PE	100	51.51	110	Open	0.50	0.06	20.47	20.47	0.01	0.10
P-190	J-25	J-57	PE	120	44.50	110	Open	3.66	0.32	21.20	21.13	0.07	1.66
P-191	J-57	J-79	PE	100	19.81	110	Open	3.74	0.45	21.13	21.04	0.08	4.21
P-192	J-54	J-114	PE	80	263.96	110	Open	1.00	0.20	21.51	21.22	0.29	1.08
P-193	J-78	J-235	PE	50	59.74	110	Open	0.23	0.12	21.04	21.00	0.04	0.71
P-194	J-78	J-236	PE	100	23.77	110	Open	3.28	0.42	21.04	20.96	0.08	3.29
P-195	J-236	J-237	PE	100	43.28	110	Open	3.05	0.39	20.96	20.84	0.12	2.88
P-196	J-237	J-238	PE	100	27.43	110	Open	2.82	0.36	20.84	20.77	0.07	2.48
P-197	J-238	J-239	PE	100	30.78	110	Open	2.59	0.33	20.77	20.71	0.07	2.12
P-198	J-239	J-240	PE	100	65.53	110	Open	2.35	0.30	20.71	20.59	0.12	1.78
P-199	J-240	J-241	PE	100	32.61	110	Open	2.12	0.27	20.59	20.54	0.05	1.47
P-200	J-65	J-63	PE	80	163.98	110	Open	-0.23	0.05	20.46	20.47	0.01	0.07
P-202	J-241	J-50	PE	100	60.05	110	Open	1.89	0.24	20.54	20.47	0.07	1.19
P-203	J-50	J-43	PE	80	78.20	110	Open	1.16	0.23	20.47	20.36	0.11	1.42
P-204	J-43	J-38	PE	50	34.44	110	Open	0.69	0.35	20.36	20.18	0.19	5.44
P-205	J-43	J-242	PE	50	75.29	110	Open	0.23	0.12	20.36	20.31	0.05	0.71
P-206	J-243	J-59	PE	50	95.71	110	Open	-0.23	0.12	19.33	19.40	0.07	0.71
P-207	J-59	J-244	PE	50	45.11	110	Open	0.23	0.12	19.40	19.37	0.03	0.71
P-208	J-118	J-57	PE	120	69.19	110	Open	0.32	0.03	21.13	21.13	0.00	0.02
P-209	J-58	J-14	PE	50	96.93	110	Open	-0.69	0.35	19.40	19.93	0.53	5.44
P-210	J-14	J-106	PE	80	168.97	110	Open	0.23	0.05	19.93	19.92	0.01	0.07
P-211	J-245	J-129	PE	50	90.83	110	Open	-0.23	0.12	20.07	20.14	0.06	0.71
P-212	J-129	J-14	PE	80	145.39	110	Open	1.16	0.23	20.14	19.93	0.21	1.42
P-213	J-129	J-12	PE	80	124.66	110	Open	-1.62	0.32	20.14	20.47	0.33	2.65
P-214	J-12	J-246	PE	80	85.95	110	Open	-1.35	0.27	20.47	20.63	0.16	1.89
P-215	J-246	J-247	PE	80	103.63	110	Open	-1.58	0.31	20.63	20.69	0.26	2.53
P-216	J-247	J-248	PE	80	50.29	110	Open	-1.81	0.36	20.69	21.05	0.16	3.26
P-217	J-248	J-249	PE	80	190.50	110	Open	-2.04	0.41	21.05	21.83	0.78	4.07
P-218	J-249	J-84	PE	80	190.80	110	Open	-2.28	0.45	21.83	22.78	0.95	4.95
P-219	J-84	J-250	PE	100	156.36	110	Open	3.45	0.44	22.78	22.21	0.57	3.62
P-220	J-250	J-251	PE	100	135.64	110	Open	3.22	0.41	22.21	21.78	0.43	3.18

Petrovec Network Calculation

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-221	J-251	J-16	PE	100	135.33	110	Open	2.99	0.38	21.78	21.40	0.38	2.77
P-222	J-84	J-252	PE	80	312.72	110	Open	0.23	0.05	22.78	22.75	0.02	0.07
P-223	J-132	J-123	PE	80	319.43	110	Open	-0.23	0.05	22.54	22.56	0.02	0.07
P-224	J-123	J-253	PE	100	163.92	110	Open	3.20	0.41	22.66	22.18	0.48	3.15
P-225	J-253	J-254	PE	100	131.37	110	Open	2.97	0.38	22.18	21.62	0.56	2.74
P-226	J-254	J-7	PE	100	95.10	110	Open	2.74	0.35	21.62	21.60	0.22	2.35
P-227	J-7	J-110	PE	120	57.91	110	Open	2.33	0.21	21.60	21.55	0.04	0.72
P-228	J-7	J-37	PE	100	40.54	110	Open	0.18	0.02	21.60	21.60	0.00	0.01
P-229	J-35	J-29	PE	50	157.89	110	Open	-0.23	0.12	22.08	22.19	0.11	0.71
P-230	J-29	J-255	PE	50	141.43	110	Open	0.23	0.12	22.19	22.09	0.10	0.71
P-232	J-113	J-116	PE	50	145.69	110	Open	-0.23	0.12	21.21	21.31	0.10	0.71
P-233	J-116	J-21	PE	80	68.58	110	Open	-0.69	0.14	21.31	21.35	0.04	0.55
P-234	J-21	J-62	PE	80	92.66	110	Open	-1.16	0.23	21.35	21.48	0.13	1.42
P-235	J-62	J-79	PE	80	34.14	110	Open	-1.65	0.37	21.48	21.60	0.12	3.39
P-236	J-79	J-29	PE	100	331.01	110	Open	-2.37	0.30	21.60	22.19	0.60	1.81
P-237	J-116	J-256	PE	50	125.58	110	Open	0.23	0.12	21.31	21.22	0.09	0.71
P-239	J-257	J-24	PE	50	175.67	110	Open	-0.23	0.12	21.22	21.35	0.13	0.71
P-241	J-258	J-259	PE	60	146.00	110	Open	-0.23	0.05	21.44	21.46	0.01	0.07
P-242	J-259	J-62	PE	80	99.07	110	Open	-0.46	0.09	21.46	21.48	0.03	0.26
P-243	J-260	J-16	PE	120	98.76	110	Open	1.36	0.12	21.43	21.40	0.03	0.27
P-244	J-15	J-261	PE	120	131.67	110	Open	1.82	0.16	21.53	21.47	0.06	0.46
P-245	J-261	J-260	PE	120	110.95	110	Open	1.59	0.14	21.47	21.43	0.04	0.36
P-247	J-262	J-120	PE	250	7.82	110	Open	2.99	0.06	21.53	21.53	0.00	0.03
P-248	J-63	J-48	PE	50	99.06	110	Open	0.23	0.12	20.47	20.40	0.07	0.71
P-249	J-15	J-262	PE	250	6.71	110	Open	-10.63	0.22	21.53	21.53	0.00	0.34
P-250	J-262	J-54	PE	200	1157.33	110	Open	1.23	0.04	21.53	21.51	0.02	0.02
P-251	R-1	J-263	PE	200	327.96	110	Open	28.01	0.89	25.00	23.04	1.96	5.98
P-252	J-263	J-262	PE	200	793.70	110	Open	15.09	0.48	23.04	21.53	1.51	1.90
P-253	J-263	J-84	PE	100	24.69	110	Open	6.19	0.79	23.04	22.78	0.26	10.68
P-254	J-263	J-123	PE	100	30.18	110	Open	6.73	0.86	23.04	22.66	0.38	12.46
P-255	J-79	J-37	PE	100	51.51	110	Open	0.29	0.04	21.60	21.60	0.00	0.04

Rzanicino Network Model



Rzanicino Network Calculation

Junction Report

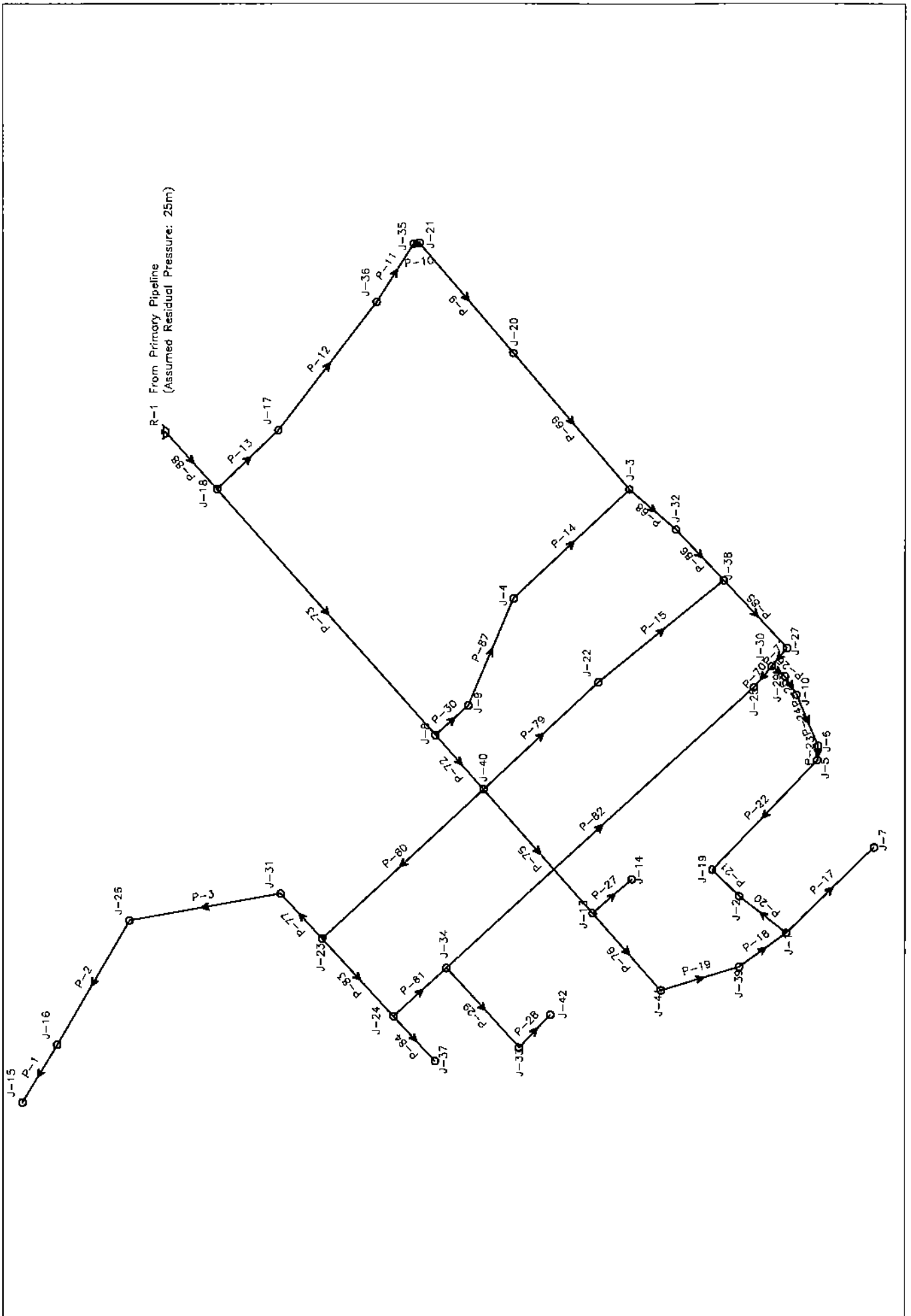
Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-181	0	0.27	19.2	19.17
J-182	0	0.27	19.25	19.21
J-183	0	0.27	19.28	19.24
J-184	0	0.27	19.26	19.22
J-185	0	0.27	19.21	19.17
J-186	0	0.27	19.32	19.28
J-187	0	0.27	19.28	19.24
J-188	0	0.27	19.37	19.33
J-189	0	0.27	19.46	19.42
J-190	0	0.27	19.49	19.45
J-191	0	0.27	19.58	19.54
J-192	0	0.27	19.78	19.75
J-193	0	0.27	18.91	18.87
J-194	0	0.27	18.71	18.68
J-195	0	0.27	18.51	18.57
J-196	0	0.27	18.57	18.53
J-197	0	0.27	18.56	18.52
J-198	0	0.27	17.99	17.95
J-199	0	0.27	17.54	17.50

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-200	0	0.27	17.44	17.41
J-201	0	0.27	17.34	17.31
J-202	0	0.27	17.33	17.30
J-203	0	0.27	18.86	18.82
J-204	0	0.27	18.85	18.81
J-205	0	0.27	19.64	19.60
J-206	0	0.27	19.61	19.57
J-207	0	0.27	19.79	19.75
J-208	0	0.27	19.62	19.58
J-209	0	0.27	19.43	19.39
J-210	0	0.27	19.36	19.34
J-211	0	0.27	19.36	19.34
J-212	0	0.27	19.71	19.67
J-213	0	0.27	19.68	19.64
J-214	0	0.27	19.54	19.50
J-215	0	0.27	19.41	19.37
J-216	0	0.27	19.36	19.32
J-217	0	0.27	19.79	19.75

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-84	J-181	J-182	PE	80	472.14	110	Open	-0.27	0.05	19.20	19.25	0.04	0.09
P-85	J-182	J-183	PE	100	254.20	110	Open	-0.53	0.07	19.25	19.28	0.03	0.11
P-86	J-183	J-184	PE	80	217.63	110	Open	0.27	0.05	19.28	19.26	0.02	0.09
P-89	J-183	J-186	PE	100	105.16	110	Open	-1.06	0.14	19.28	19.32	0.04	0.41
P-90	J-186	J-185	PE	50	116.13	110	Open	0.27	0.14	19.32	19.21	0.11	0.92
P-92	J-187	J-188	PE	50	96.32	110	Open	-0.27	0.14	19.28	19.37	0.09	0.92
P-93	J-188	J-186	PE	100	50.05	110	Open	1.60	0.20	19.37	19.32	0.05	0.67
P-94	J-189	J-190	PE	80	301.14	110	Open	-0.27	0.05	19.46	19.49	0.03	0.09
P-95	J-190	J-191	PE	80	272.19	110	Open	-0.53	0.11	19.49	19.58	0.09	0.34
P-96	J-191	J-192	PE	80	291.39	110	Open	-0.80	0.16	19.58	19.78	0.21	0.71
P-97	J-192	J-193	PE	100	280.11	110	Open	3.19	0.41	19.78	18.91	0.86	3.14
P-98	J-193	J-194	PE	100	104.55	110	Open	2.40	0.31	18.91	18.71	0.19	1.84
P-99	J-194	J-195	PE	80	208.48	110	Open	0.67	0.13	18.71	18.61	0.11	0.51
P-100	J-195	J-196	PE	80	209.70	110	Open	0.40	0.08	18.61	18.57	0.04	0.20
P-101	J-196	J-197	PE	80	228.68	110	Open	0.13	0.03	18.57	18.56	0.01	0.03
P-102	J-197	J-194	PE	100	208.18	110	Open	-1.46	0.19	18.56	18.71	0.15	0.74
P-103	J-197	J-198	PE	80	309.68	110	Open	1.33	0.26	18.56	17.99	0.57	1.84
P-104	J-198	J-199	PE	80	373.38	110	Open	1.06	0.21	17.99	17.54	0.45	1.22
P-105	J-199	J-200	PE	80	135.03	110	Open	0.80	0.16	17.54	17.44	0.10	0.71
P-106	J-200	J-201	PE	80	282.85	110	Open	0.63	0.11	17.44	17.34	0.10	0.34
P-107	J-201	J-202	PE	80	164.90	110	Open	0.27	0.05	17.34	17.33	0.02	0.09
P-108	J-193	J-203	PE	80	131.98	110	Open	0.63	0.11	18.91	18.86	0.04	0.34
P-109	J-203	J-204	PE	80	170.99	110	Open	0.27	0.05	18.86	18.85	0.02	0.09
P-110	J-192	J-205	PE	80	433.43	110	Open	0.63	0.11	19.78	19.64	0.15	0.34
P-111	J-205	J-206	PE	80	321.56	110	Open	0.27	0.05	19.64	19.61	0.03	0.09
P-112	J-186	J-207	PE	100	283.46	110	Open	-2.13	0.27	19.37	19.79	0.42	1.48
P-113	J-207	J-208	PE	100	152.10	110	Open	1.86	0.24	19.79	19.62	0.18	1.16
P-114	J-208	J-209	PE	100	305.10	110	Open	1.33	0.17	19.62	19.43	0.19	0.62
P-115	J-209	J-210	PE	100	196.29	110	Open	0.80	0.10	19.43	19.38	0.05	0.24
P-116	J-210	J-211	PE	100	112.78	110	Open	0.27	0.03	19.38	19.38	0.00	0.03
P-117	J-207	J-212	PE	80	250.55	110	Open	0.63	0.11	19.79	19.71	0.08	0.34
P-118	J-212	J-213	PE	80	314.25	110	Open	0.27	0.05	19.71	19.68	0.03	0.09
P-120	J-214	J-208	PE	50	86.67	110	Open	-0.27	0.14	19.54	19.62	0.08	0.92
P-122	J-215	J-209	PE	80	213.97	110	Open	-0.27	0.05	19.41	19.43	0.02	0.09
P-123	R-1	J-217	PE	250	708.36	110	Open	9.85	0.20	20.00	19.79	0.21	0.29
P-124	J-216	J-210	PE	80	212.14	110	Open	-0.27	0.05	19.36	19.38	0.02	0.09
P-125	J-217	J-207	PE	250	29.57	110	Open	4.79	0.10	19.79	19.79	0.00	0.08
P-126	J-217	J-192	PE	200	39.93	110	Open	4.79	0.15	19.79	19.78	0.01	0.23

Ognanci Network Model



Ognanci Network Calculation

Junction Report

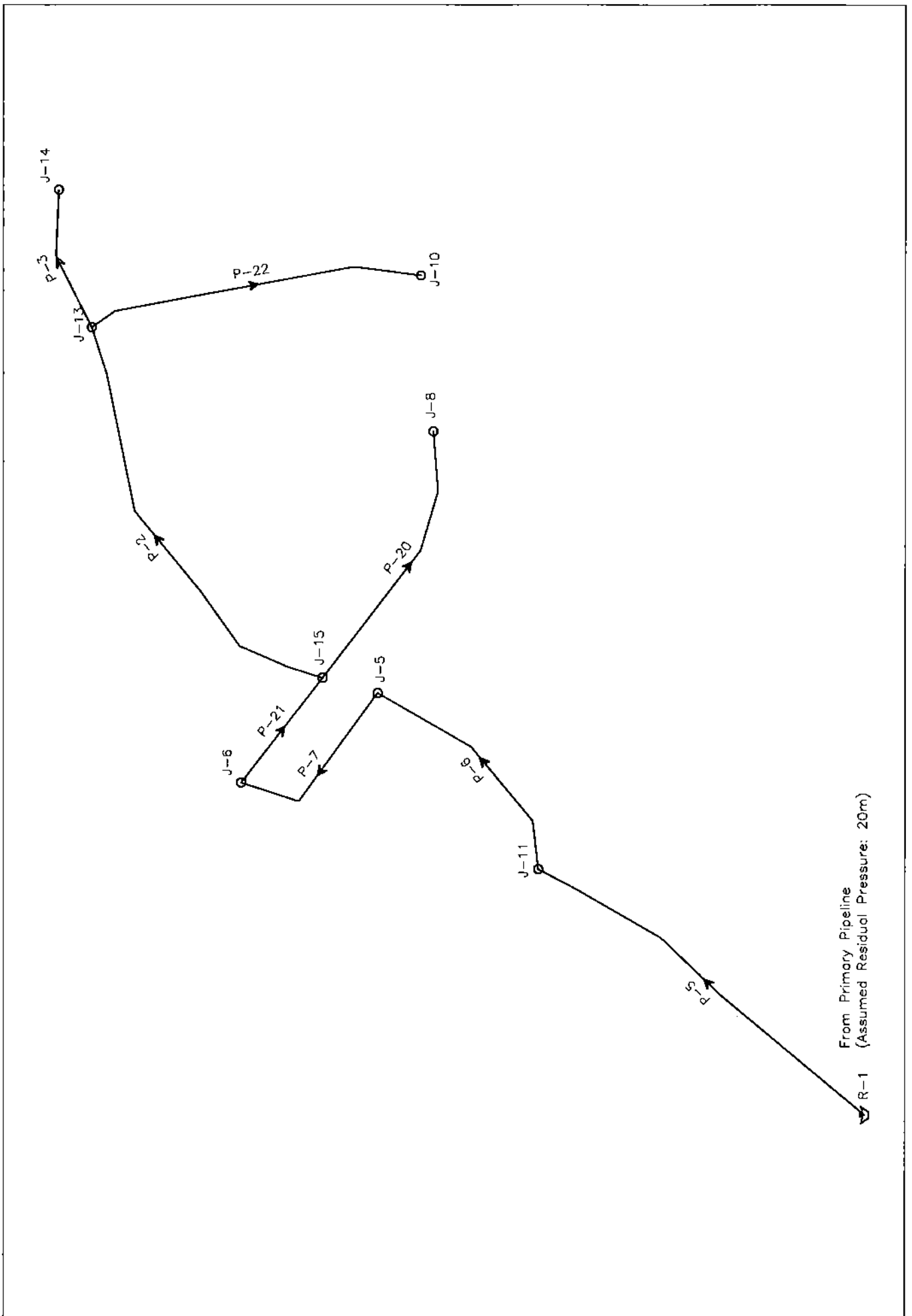
Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-1	225	0.27	248.07	23.02
J-2	225	0.27	248.08	23.01
J-3	225	0.27	248.78	23.74
J-4	225	0.27	248.69	23.85
J-5	225	0.27	248.08	23.03
J-6	225	0.27	248.08	23.03
J-7	225	0.27	248.05	23.01
J-8	225	0.27	249.12	24.07
J-9	225	0.27	249.04	23.99
J-10	225	0.27	248.12	23.08
J-13	225	0.27	248.42	23.37
J-14	225	0.27	248.41	23.37
J-15	225	0.27	248.22	23.17
J-16	225	0.27	248.23	23.18
J-17	225	0.27	249.48	24.43
J-18	225	0.27	249.77	24.72
J-19	225	0.27	248.06	23.01
J-20	225	0.27	248.84	23.79
J-21	225	0.27	248.93	23.88
J-22	225	0.27	248.82	23.78

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-23	225	0.27	248.47	23.43
J-24	225	0.27	248.25	23.20
J-25	225	0.27	248.18	23.14
J-26	225	0.27	248.28	23.23
J-27	225	0.27	248.27	23.22
J-28	225	0.27	248.15	23.10
J-30	225	0.27	248.18	23.14
J-31	225	0.27	248.39	23.35
J-32	225	0.27	248.71	23.67
J-33	225	0.27	248.15	23.10
J-34	225	0.27	248.19	23.14
J-35	225	0.27	248.94	23.89
J-36	225	0.27	249.06	24.02
J-37	225	0.27	248.24	23.20
J-38	225	0.27	248.67	23.63
J-39	225	0.27	248.11	23.07
J-40	225	0.27	249.02	23.97
J-41	225	0.27	248.22	23.17
J-42	225	0.27	248.14	23.10

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-1	J-15	J-18	PE	80	71.63	110	Open	-0.27	0.05	248.22	248.23	0.01	0.09
P-2	J-16	J-26	PE	80	152.10	110	Open	-0.53	0.11	248.23	248.28	0.05	0.34
P-3	J-26	J-31	PE	80	163.37	110	Open	-0.80	0.16	248.28	248.39	0.12	0.71
P-9	J-20	J-21	PE	80	153.31	110	Open	-0.74	0.15	248.84	248.93	0.10	0.63
P-10	J-21	J-35	PE	80	6.40	110	Open	-1.01	0.20	248.93	248.94	0.01	1.10
P-11	J-35	J-36	PE	80	73.15	110	Open	-1.28	0.25	248.94	249.08	0.12	1.70
P-12	J-36	J-17	PE	80	170.99	110	Open	-1.54	0.31	249.06	249.48	0.41	2.42
P-13	J-17	J-10	PE	80	90.22	110	Open	-1.81	0.36	249.48	249.77	0.29	3.25
P-14	J-3	J-4	PE	80	168.86	110	Open	-0.77	0.15	248.78	248.89	0.11	0.68
P-15	J-38	J-22	PE	100	171.91	110	Open	-1.61	0.21	248.67	248.82	0.15	0.89
P-17	J-7	J-1	PE	80	129.84	110	Open	-0.27	0.05	248.06	248.07	0.01	0.69
P-18	J-1	J-39	PE	80	61.87	110	Open	-0.80	0.16	248.07	248.11	0.04	0.71
P-19	J-39	J-41	PE	80	86.87	110	Open	-1.07	0.21	248.11	248.22	0.11	1.22
P-20	J-1	J-2	PE	80	63.70	110	Open	0.27	0.05	248.07	248.06	0.01	0.69
P-21	J-2	J-19	PE	80	39.93	110	Open	0.00	0.00	248.06	248.06	0.00	0.69
P-22	J-19	J-5	PE	80	161.24	110	Open	-0.27	0.05	248.06	248.08	0.01	0.69
P-23	J-5	J-6	PE	80	15.24	110	Open	-0.53	0.11	248.08	248.08	0.01	0.34
P-24	J-6	J-10	PE	80	59.13	110	Open	-0.80	0.16	248.08	248.12	0.04	0.71
P-25	J-10	J-29	PE	80	22.56	110	Open	-1.06	0.21	248.12	248.15	0.03	1.21
P-26	J-29	J-30	PE	80	18.29	110	Open	-1.33	0.26	248.15	248.18	0.03	1.84
P-27	J-13	J-14	PE	80	54.86	110	Open	0.27	0.05	248.42	248.41	0.01	0.69
P-28	J-42	J-33	PE	80	47.85	110	Open	-0.27	0.05	248.14	248.15	0.00	0.99
P-29	J-33	J-34	PE	80	114.60	110	Open	-0.53	0.11	248.15	248.19	0.04	0.34
P-30	J-8	J-9	PE	80	46.94	110	Open	1.30	0.26	249.12	249.04	0.08	1.76
P-68	J-32	J-3	PE	80	65.53	110	Open	-0.98	0.19	248.71	248.78	0.07	1.04
P-69	J-3	J-20	PE	80	190.50	110	Open	-0.48	0.10	248.78	248.84	0.05	0.28
P-70	J-25	J-30	PE	80	28.96	110	Open	-0.20	0.04	248.18	248.18	0.00	0.95
P-71	J-30	J-27	PE	80	25.60	110	Open	-1.79	0.36	248.18	248.27	0.08	3.19
P-72	J-40	J-8	PE	160	77.11	110	Open	-6.74	0.34	249.02	249.12	0.10	1.27
P-73	J-8	J-18	PE	160	349.00	110	Open	-8.31	0.41	249.12	249.77	0.65	1.87
P-75	J-40	J-13	PE	80	175.56	110	Open	1.86	0.37	249.02	248.42	0.60	3.43
P-76	J-13	J-41	PE	80	109.42	110	Open	1.33	0.26	248.42	248.22	0.20	1.84
P-77	J-31	J-23	PE	80	64.92	110	Open	-1.06	0.21	248.39	248.47	0.08	1.22
P-79	J-22	J-40	PE	100	166.73	110	Open	-1.88	0.24	248.82	249.02	0.20	1.10
P-80	J-40	J-23	PE	100	233.17	110	Open	2.73	0.35	249.02	248.47	0.55	2.35
P-81	J-24	J-34	PE	80	75.59	110	Open	0.87	0.17	248.25	248.19	0.06	0.83
P-82	J-34	J-25	PE	80	442.28	110	Open	0.07	0.01	248.19	248.18	0.00	0.91
P-83	J-23	J-24	PE	80	111.56	110	Open	1.40	0.28	248.47	248.25	0.23	2.02
P-84	J-24	J-37	PE	80	64.62	110	Open	0.27	0.05	248.25	248.24	0.01	0.99
P-85	J-27	J-38	PE	80	98.45	110	Open	-2.06	0.41	248.27	248.67	0.41	4.13
P-86	J-38	J-32	PE	80	73.76	110	Open	-0.71	0.14	248.67	248.71	0.04	0.58
P-87	J-9	J-4	PE	80	123.14	110	Open	1.03	0.21	249.04	248.89	0.14	1.15
P-88	R-1	J-18	PE	160	81.69	110	Open	10.38	0.52	250.00	249.77	0.23	2.82

Kjoilija Network Model



Kjoilija Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-5	0	0.44	17.17	17.13
J-6	0	0.44	16.08	16.05
J-8	0	0.44	15.49	15.46
J-10	0	0.44	14.79	14.76
J-11	0	0.44	19.05	19.02
J-13	0	0.44	14.85	14.83
J-14	0	0.44	14.83	14.80
J-15	0	0.44	15.55	15.52

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-2	J-15	J-13	PE	80	384.66	110	Open	1.32	0.26	15.55	14.85	0.70	1.81
P-3	J-13	J-14	PE	80	124.36	110	Open	0.44	0.09	14.85	14.83	0.03	0.24
P-5	R-1	J-11	PE	140	1,300.00	110	Open	3.52	0.23	20.00	19.05	0.95	0.73
P-6	J-11	J-5	PE	80	217.02	110	Open	3.08	0.61	19.05	17.17	1.89	8.69
P-7	J-5	J-6	PE	80	166.73	110	Open	2.64	0.52	17.17	16.08	1.09	6.53
P-20	J-8	J-15	PE	80	241.71	110	Open	-0.44	0.09	15.49	15.55	0.06	0.24
P-21	J-6	J-15	PE	80	113.39	110	Open	2.20	0.44	16.08	15.55	0.53	4.66
P-22	J-13	J-10	PE	80	280.78	110	Open	0.44	0.09	14.85	14.79	0.07	0.24

Cvetovo Network Calculation

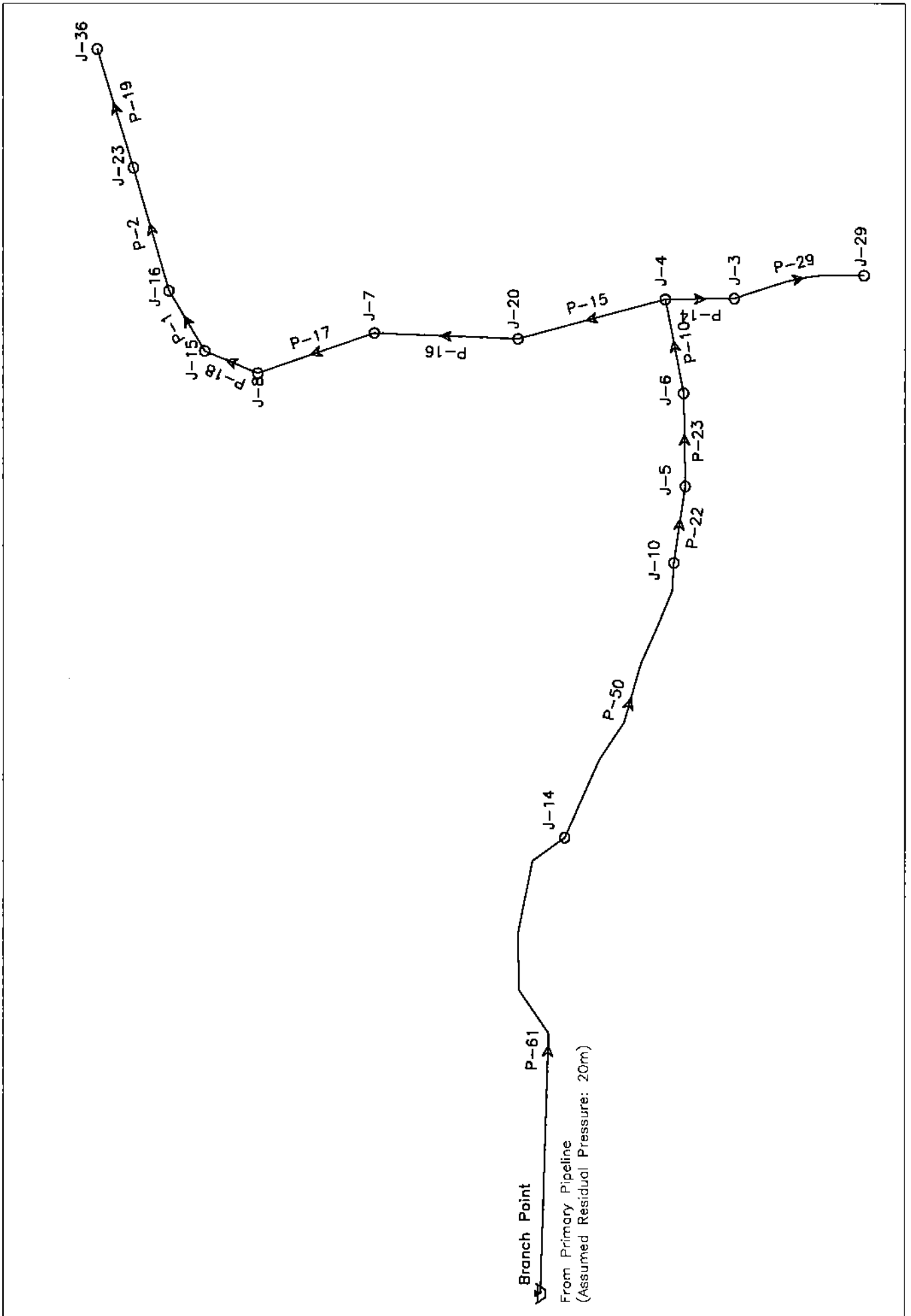
Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-113	830	0.20	902.66	72.51
J-114	837	0.20	902.44	65.30
J-115	840	0.20	904.60	64.47
J-117	830	0.20	902.79	72.65
J-118	830	0.20	902.88	72.74
J-119	825	0.20	901.34	76.19
J-120	825	0.20	901.32	76.17
J-121	830	0.20	901.87	71.73
J-122	830	0.20	901.73	71.58
J-123	835	0.20	902.63	67.50
J-124	830	0.20	902.65	72.50
J-125	840	0.20	904.13	64.90
J-126	840	0.20	903.79	63.65
J-128	837	0.20	902.32	65.19
J-129	837	0.20	902.22	65.09
J-130	825	0.20	901.39	76.23
J-131	835	0.20	901.31	66.18
J-132	835	0.20	901.31	66.17
J-135	840	0.20	903.46	63.33
J-136	815	0.20	901.51	86.34
J-137	815	0.20	901.44	85.27
J-138	835	0.20	902.62	67.48
J-139	826	0.20	901.63	75.48
J-140	830	0.20	902.73	72.58

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-39	J-116	J-125	PE	80	26.52	110	Open	4.53	0.90	904.60	904.13	0.47	17.73
P-40	J-125	J-126	PE	80	21.64	110	Open	4.33	0.86	904.13	903.78	0.35	16.33
P-41	J-126	J-135	PE	80	21.64	110	Open	4.13	0.82	903.78	903.46	0.32	14.98
P-42	J-135	J-118	PE	80	41.76	110	Open	3.94	0.78	903.46	902.88	0.57	13.60
P-43	J-118	J-113	PE	80	31.70	110	Open	2.75	0.55	902.88	902.66	0.22	7.07
P-44	J-113	J-114	PE	80	36.27	110	Open	2.56	0.51	902.66	902.44	0.22	6.16
P-45	J-114	J-128	PE	80	21.95	110	Open	2.36	0.47	902.44	902.32	0.12	5.31
P-46	J-128	J-129	PE	80	22.56	110	Open	2.16	0.43	902.32	902.22	0.10	4.52
P-47	J-129	J-121	PE	80	90.83	110	Open	1.97	0.39	902.22	901.87	0.34	3.79
P-48	J-121	J-122	PE	80	46.33	110	Open	1.77	0.35	901.87	901.73	0.14	3.12
P-49	J-122	J-139	PE	80	37.49	110	Open	1.57	0.31	901.73	901.63	0.09	2.51
P-50	J-139	J-136	PE	80	61.67	110	Open	1.38	0.27	901.63	901.51	0.12	1.96
P-51	J-136	J-137	PE	80	47.85	110	Open	1.18	0.23	901.51	901.44	0.07	1.47
P-52	J-137	J-130	PE	80	54.56	110	Open	0.98	0.20	901.44	901.39	0.06	1.05
P-53	J-130	J-119	PE	80	59.74	110	Open	0.79	0.16	901.39	901.34	0.04	0.69
P-54	J-119	J-120	PE	80	58.83	110	Open	0.58	0.12	901.34	901.32	0.02	0.41
P-55	J-120	J-131	PE	80	51.51	110	Open	0.39	0.08	901.32	901.31	0.01	0.19
P-56	J-131	J-132	PE	80	48.46	110	Open	0.20	0.04	901.31	901.31	0.00	0.05
P-57	J-123	J-124	PE	65	35.95	110	Open	-0.39	0.12	902.63	902.65	0.02	0.53
P-58	J-124	J-140	PE	65	66.75	110	Open	-0.59	0.18	902.65	902.73	0.07	1.12
P-59	J-140	J-117	PE	65	35.36	110	Open	-0.79	0.24	902.73	902.79	0.07	1.91
P-60	J-117	J-118	PE	65	31.39	110	Open	-0.98	0.30	902.79	902.88	0.09	2.89
P-61	J-123	J-138	PE	65	98.45	110	Open	0.20	0.06	902.63	902.62	0.01	0.15
P-86	R-1	J-116	PE	80	261.33	110	Open	4.72	0.94	910.00	904.60	5.40	19.18

Taor Network Model



Taor Network Calculation

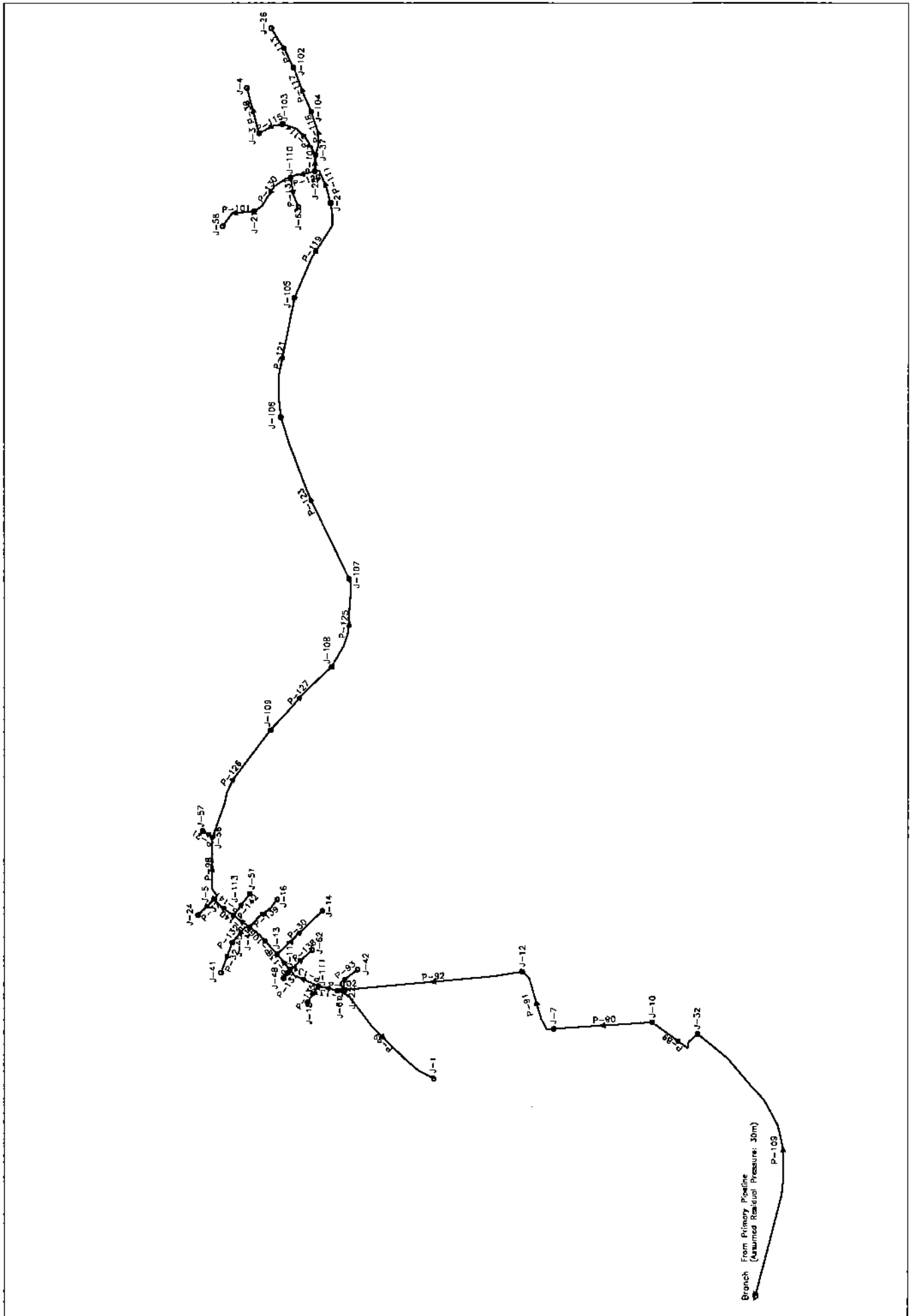
Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-3	240	0.15	259.02	18.98
J-4	240	0.15	259.02	18.98
J-5	240	0.15	259.14	19.10
J-6	240	0.15	259.08	19.04
J-7	240	0.15	258.79	18.75
J-8	240	0.15	258.73	18.69
J-10	240	0.15	259.20	19.16
J-14	240	0.15	259.48	19.44
J-15	240	0.15	258.71	18.67
J-16	240	0.15	258.70	18.66
J-20	240	0.15	258.88	18.85
J-23	240	0.15	258.69	18.65
J-29	240	0.15	259.01	18.97
J-36	240	0.15	258.69	18.65

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-1	J-15	J-16	PE	80	52.43	110	Open	0.45	0.09	258.71	258.70	0.01	0.25
P-2	J-16	J-23	PE	80	85.10	110	Open	0.30	0.06	258.70	258.69	0.01	0.12
P-10	J-6	J-4	PE	100	71.02	110	Open	1.50	0.19	259.08	259.02	0.06	0.77
P-14	J-3	J-4	PE	100	52.12	110	Open	-0.30	0.04	259.02	259.02	0.00	0.04
P-15	J-4	J-20	PE	80	114.30	110	Open	1.05	0.21	259.02	258.88	0.14	1.18
P-16	J-20	J-7	PE	80	107.90	110	Open	0.90	0.18	258.88	258.79	0.10	0.89
P-17	J-7	J-8	PE	80	82.35	110	Open	0.75	0.15	258.79	258.73	0.06	0.64
P-18	J-8	J-15	PE	80	42.98	110	Open	0.60	0.12	258.73	258.71	0.02	0.42
P-19	J-23	J-36	PE	80	92.05	110	Open	0.15	0.03	258.69	258.69	0.00	0.03
P-22	J-10	J-5	PE	100	57.61	110	Open	1.80	0.23	259.20	259.14	0.06	1.08
P-23	J-5	J-6	PE	100	69.49	110	Open	1.65	0.21	259.14	259.08	0.06	0.92
P-29	J-3	J-29	PE	65	99.87	110	Open	0.15	0.05	259.02	259.01	0.01	0.09
P-50	J-14	J-10	PE	100	222.81	110	Open	1.95	0.25	259.48	259.20	0.28	1.26
P-61	Branch Point	J-14	PE	100	359.05	110	Open	2.10	0.27	260.00	259.48	0.52	1.44

Pako Sevo & Novo Selo Network Model



Pako Sevo Novo Selo Network Calculation

Junction Report

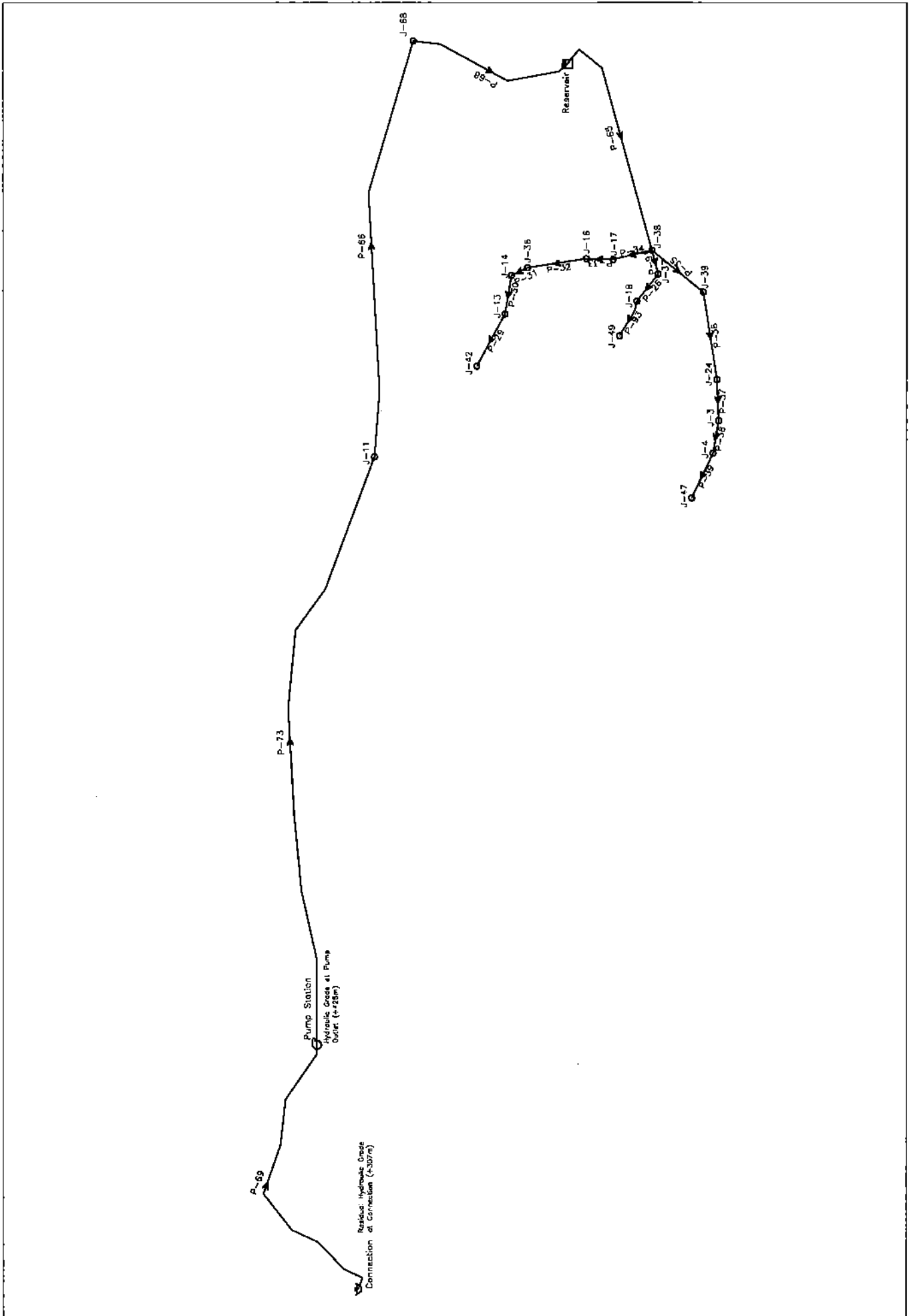
Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-1	225	0.14	267.03	41.95
J-2	225	0.14	263.43	39.35
J-3	241	0.14	262.46	21.41
J-4	241	0.14	262.42	21.37
J-5	225	0.14	266.70	41.62
J-7	225	0.14	268.41	43.32
J-10	225	0.14	268.93	43.85
J-12	225	0.14	268.05	42.96
J-13	225	0.14	266.69	41.80
J-14	225	0.14	266.84	41.75
J-16	225	0.14	266.79	41.70
J-18	225	0.14	267.05	41.97
J-21	241	0.14	263.28	22.23
J-22	225	0.14	267.18	42.09
J-24	225	0.14	266.69	41.60
J-25	225	0.14	263.32	38.24
J-26	235	0.14	262.37	27.32
J-32	225	0.14	269.28	44.19
J-37	225	0.14	262.83	37.75
J-40	246	0.14	266.71	20.67
J-41	246	0.14	266.69	20.65
J-42	225	0.14	267.15	42.07

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-44	225	0.14	266.79	41.70
J-48	225	0.14	266.94	41.85
J-51	225	0.14	266.72	41.64
J-56	225	0.14	266.61	41.53
J-57	225	0.14	266.60	41.52
J-58	241	0.14	263.27	22.23
J-61	225	0.14	267.14	42.06
J-62	225	0.14	266.92	41.84
J-63	235	0.14	263.27	28.21
J-102	235	0.14	262.41	27.35
J-103	235	0.14	262.53	27.48
J-104	235	0.14	262.55	27.49
J-105	225	0.14	263.77	38.69
J-106	225	0.14	264.22	39.14
J-107	225	0.14	264.97	39.88
J-108	225	0.14	265.41	40.33
J-109	225	0.14	265.86	40.80
J-110	235	0.14	263.29	28.23
J-111	225	0.14	267.07	41.98
J-112	225	0.14	266.95	41.86
J-113	225	0.14	266.75	41.66

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-21	J-56	J-57	PE	50	33.83	110	Open	0.14	0.07	266.61	266.60	0.01	0.28
P-30	J-13	J-14	PE	50	184.40	110	Open	0.14	0.07	266.89	266.84	0.05	0.28
P-32	J-40	J-41	PE	50	94.79	110	Open	0.14	0.07	266.71	266.69	0.03	0.28
P-37	J-24	J-5	PE	50	67.67	110	Open	-0.14	0.07	266.69	266.70	0.02	0.28
P-38	J-3	J-4	PE	50	137.18	110	Open	0.14	0.07	262.46	262.42	0.04	0.28
P-89	J-32	J-10	PE	140	185.01	110	Open	5.88	0.38	269.28	268.93	0.35	1.89
P-90	J-10	J-7	PE	140	291.69	110	Open	5.74	0.37	269.93	268.41	0.53	1.90
P-91	J-7	J-12	PE	140	210.01	110	Open	5.60	0.36	268.41	268.05	0.36	1.72
P-92	J-12	J-22	PE	140	528.83	110	Open	5.46	0.35	268.05	267.10	0.87	1.64
P-93	J-22	J-42	PE	50	90.22	110	Open	0.14	0.07	267.18	267.15	0.03	0.28
P-98	J-5	J-56	PE	140	189.28	110	Open	2.80	0.18	266.70	266.61	0.09	0.40
P-99	J-1	J-61	PE	50	389.84	110	Open	-0.14	0.07	267.03	267.14	0.11	0.20
P-101	J-58	J-21	PE	80	110.95	110	Open	-0.14	0.03	263.27	263.28	0.00	0.03
P-102	J-22	J-61	PE	140	22.25	110	Open	5.18	0.34	267.18	267.14	0.03	1.49
P-103	J-25	J-37	PE	50	47.55	110	Open	0.98	0.50	263.32	262.83	0.49	10.29
P-106	J-13	J-44	PE	140	114.00	110	Open	3.92	0.25	266.89	266.79	0.10	0.89
P-109	Branch	J-32	PE	140	871.73	110	Open	6.02	0.39	271.00	269.28	1.72	1.97
P-111	J-2	J-25	PE	100	112.78	110	Open	1.69	0.21	263.43	263.32	0.11	0.95
P-113	J-102	J-26	PE	50	132.28	110	Open	0.14	0.07	262.41	262.37	0.04	0.20
P-114	J-37	J-103	PE	50	139.29	110	Open	0.42	0.21	262.63	262.53	0.30	2.14
P-115	J-103	J-3	PE	50	74.68	110	Open	0.28	0.14	262.53	262.46	0.08	1.01
P-116	J-37	J-104	PE	50	130.76	110	Open	0.42	0.21	262.63	262.55	0.28	2.14
P-117	J-104	J-102	PE	50	138.99	110	Open	0.28	0.14	262.55	262.41	0.14	1.01
P-119	J-105	J-2	PE	100	307.24	110	Open	1.82	0.23	263.77	263.43	0.34	1.11
P-121	J-106	J-105	PE	100	356.01	110	Open	1.96	0.25	264.22	263.77	0.45	1.27
P-123	J-107	J-106	PE	100	517.55	110	Open	2.10	0.27	264.97	264.22	0.75	1.44
P-125	J-106	J-107	PE	100	272.49	110	Open	2.24	0.29	265.41	264.97	0.44	1.63
P-126	J-56	J-109	PE	100	362.71	110	Open	2.52	0.32	266.61	265.89	0.73	2.02
P-127	J-109	J-108	PE	100	259.69	110	Open	2.38	0.30	265.88	265.41	0.47	1.82
P-129	J-25	J-110	PE	80	74.68	110	Open	0.56	0.11	263.32	263.29	0.03	0.37
P-130	J-110	J-21	PE	80	151.49	110	Open	0.28	0.06	263.29	263.28	0.02	0.10
P-131	J-53	J-110	PE	50	89.31	110	Open	-0.14	0.07	263.27	263.29	0.03	0.28
P-132	J-44	J-40	PE	50	71.93	110	Open	0.28	0.14	266.79	266.71	0.07	1.01
P-133	J-61	J-111	PE	140	57.81	110	Open	4.90	0.32	267.14	267.07	0.08	1.35
P-134	J-111	J-112	PE	140	97.84	110	Open	4.62	0.30	267.07	266.95	0.12	1.21
P-135	J-18	J-111	PE	50	57.00	110	Open	-0.14	0.07	267.05	267.07	0.02	0.28
P-136	J-112	J-13	PE	140	59.13	110	Open	4.20	0.27	266.95	266.69	0.06	1.01
P-137	J-48	J-112	PE	50	30.18	110	Open	-0.14	0.07	266.94	266.95	0.01	0.20
P-138	J-112	J-62	PE	50	88.70	110	Open	0.14	0.07	266.95	266.92	0.02	0.28
P-139	J-44	J-16	PE	100	116.43	110	Open	0.14	0.02	266.79	266.79	0.00	0.01
P-140	J-44	J-113	PE	140	59.13	110	Open	3.36	0.22	266.79	266.75	0.04	0.67
P-141	J-113	J-5	PE	140	75.29	110	Open	3.08	0.20	266.75	266.70	0.04	0.57
P-142	J-51	J-113	PE	50	80.47	110	Open	-0.14	0.07	266.72	266.75	0.02	0.28

Strahojadica Network Model



Strahojadica Network Calculation

Junction Report

Junction ID	Elevation (+m)	Peak Hour Demand (l/s)	Hydraulic Grade (+m)	Residual Pressure (m)
J-3	359	0.20	410.98	51.87
J-4	359	0.20	410.91	51.80
J-11	353	0.00	413.50	60.38
J-13	359	0.20	411.07	51.97
J-14	359	0.20	411.15	52.05
J-16	359	0.20	411.21	52.10
J-17	359	0.20	411.24	52.13
J-18	359	0.20	411.28	52.18
J-24	359	0.20	411.16	52.05
J-26	359	0.20	411.16	52.05
J-27	359	0.20	411.29	52.18
J-28	359	0.20	411.30	52.19
J-29	359	0.20	411.22	52.12
J-42	359	0.20	411.04	51.93
J-47	359	0.20	410.68	51.78
J-49	359	0.20	411.28	52.17
J-65	350	0.00	412.43	54.32

Pipe Report

Pipe ID	Start	End	Material	Inner Diameter (mm)	Length (m)	Hazen-Williams C	Control Status	Discharge (l/s)	Velocity (m/s)	Start Hydraulic Grade (+m)	End Hydraulic Grade (+m)	Headloss (m)	Headloss Gradient (m/km)
P-26	J-37	J-18	PE	80	36.58	110	Open	0.40	0.08	411.29	411.28	0.01	0.20
P-29	J-42	J-13	PE	50	62.79	110	Open	-0.20	0.10	411.04	411.07	0.03	0.54
P-30	J-13	J-14	PE	50	41.15	110	Open	-0.40	0.20	411.07	411.15	0.08	1.96
P-31	J-14	J-26	PE	80	18.90	110	Open	-0.60	0.12	411.15	411.16	0.01	0.42
P-32	J-26	J-16	PE	80	64.01	110	Open	-0.80	0.16	411.16	411.21	0.05	0.72
P-33	J-16	J-17	PE	80	28.35	110	Open	-1.00	0.20	411.21	411.24	0.03	1.50
P-34	J-17	J-28	PE	80	42.37	110	Open	-1.20	0.24	411.24	411.30	0.06	1.52
P-35	J-28	J-29	PE	80	70.71	110	Open	1.00	0.20	411.30	411.22	0.08	1.00
P-36	J-29	J-24	PE	80	93.57	110	Open	0.80	0.16	411.22	411.16	0.07	0.72
P-37	J-24	J-3	PE	50	43.28	110	Open	0.60	0.31	411.16	410.98	0.18	4.15
P-38	J-3	J-4	PE	50	34.75	110	Open	0.40	0.20	410.98	410.91	0.07	1.96
P-39	J-4	J-47	PE	50	52.73	110	Open	0.20	0.10	410.91	410.68	0.03	0.54
P-65	Reservoir	J-30	PE	100	250.55	110	Open	3.00	0.38	412.00	411.30	0.70	2.79
P-66	J-11	J-60	PE	80	445.92	110	Open	1.54	0.31	413.50	412.43	1.07	2.41
P-68	J-60	Reservoir	PE	80	178.00	110	Open	1.54	0.31	412.43	412.00	0.43	2.41
P-69	Connection	Pump Station	PE	80	323.70	110	Open	1.54	0.31	307.00	306.22	0.78	2.41
P-73	Pump Station	J-11	PE	80	644.18	110	Open	1.54	0.31	415.06	413.50	1.56	2.41
P-91	J-30	J-37	PE	80	25.91	110	Open	0.60	0.12	411.30	411.29	0.01	0.42
P-93	J-49	J-10	PE	80	41.15	110	Open	-0.20	0.04	411.28	411.28	0.00	0.06

添付資料 12 維持管理費

(1) 維持管理費

1. 電力費

PE名	システム	機器名				金額	
		送水ポンプ (kW)	水中ポンプ (kW)	塩素消毒 (kW)	計算	単価 (MKD/kW)	MKD/年
Cucer Sandevo	Kuceviste		—	0.4	6.44x1x24x365	6.44	22,566
Ilinden	Ilinden	18.5kWx3台=72kW 18時間	37kWx3台 =111kW 14.9時間	1	6.44x365((72x18) +(111x14.9) +(1 x24))	6.44	6,990,449
Studenicani	DolnoKolicani	2.2kWx1台=2.2 13.3時間	—	—	6.44x2.2x13.3x 365	6.44	68,779
Zelenikovo	Strahojadica	4kWx1台、13.3時 間	—	—	6.44x4x13.3x365	6.44	125,052
Skopje (Cair)	Radisani	18.5kWx2台=37 k w、15.4時間 15kWx2台=30kW、 15.4時間	—	—	6.44x365x15.4x(37 +30)	6.44	2,425,349

2. 薬品費

PE名	システム		水量 (m3/d)	注入率 (mg/l)	消費量 (kg/d)	単価 (MKD/kg)	MKD/年
Cucer Sandevo	Kuceviste		355	0.5	1.48	23.6	12,742
Ilinden	Ilinden		7,470	0.5	31.13	23.6	268,111
Studenicani	DolnoKolicani		46	0.5	0.19	23.6	1,651
	Cvetovo		76	0.5	0.32	23.6	2,728

Note: Effective chlorine in the chemical is to be 12%.

3. 人件費

PE名	単価MKD/月	Labor 15,000	Technician 19,000	Engineer 23,000		金額 (MKD/年)
Cucer Sandevo		1	1			408,000
Ilinden		3	1			768,000
Studenicani		1	1			408,000
Zelenikovo		1				180,000
Skopje(Cair)	Radisani	1				180,000

(2) 年間維持管理費

PE名	水買入れ	①電気代	②薬品代	③人件費	④予備品類 ④ = (①+ ②) × 0.5	合計
Cucer Sandevo	—	22,566	12,742	408,000	1,765	445,073
Ilinden	—	6,990,449	268,111	768,000	362,928	8,389,488
Studenicani	—	68,779	4,379	408,000	3,658	484,815
Zelenikovo	586,920	125,052	—	180,000	6,253	898,225
Skopje(Cair)	3,590,542	2,425,349	—	180,000	121,267	6,317,158

用水購入費 (Skopje市水道PEより)

Zelenikovo	201	m3/d	73,365	m3/yr	8	586,920	Der/Y
Skopje(Cair)	2,093	m3/d	763,945	m3/yr	4.7	3,590,542	Der/Y

注記) : Cairの金額はSkopje市水道PEの原価

(3) 生産原価と料金収入

PE名	原価 (MKD/年)	生産水量 ^{#1} (m3/yr)	生産単価 (MKD/m3)	料金収入		水道料金単価 ^{#3} (MKD/m3)	使用量 (m3/月)	支払い可能限 度 (MKD/m3)
				有収率(%) #2	金額 (MKD/年)			
Cucer Sandevo	445,073	129,575	3	80%	1,554,900	15	22	18
Ilinden	8,389,488	2,726,550	3	70%	20,040,143	10.5	22	18
Studenicani	484,815	44,530	11	70%	498,736	16	20	20
Zelenikovo	898,225	73,365	12	75%	990,428	18	20	19
Skopje(Cair)	6,317,158	763,945	8	78%	7,842,934	#4住民: 8.71, その他: 23.55	20	20

注記)

#1 生産水量の中に漏水も含む

#2 Studenicaniを除き、有収率は各PEの現状の数値である。

#3 水道料金単価は各PEが現在徴収している料金を採用した。但し、Studenicaniのみ事業経営として採算の取れる平均的な値である有収率70%を設定した。

#4 家庭: 家庭用水道料金、その他: その他大口需要化用水道料金

(4) Case study for Cvetovo in Studeniciani municipality

Alternative system (In case of water source from No.1 to No.4)

O & M cost

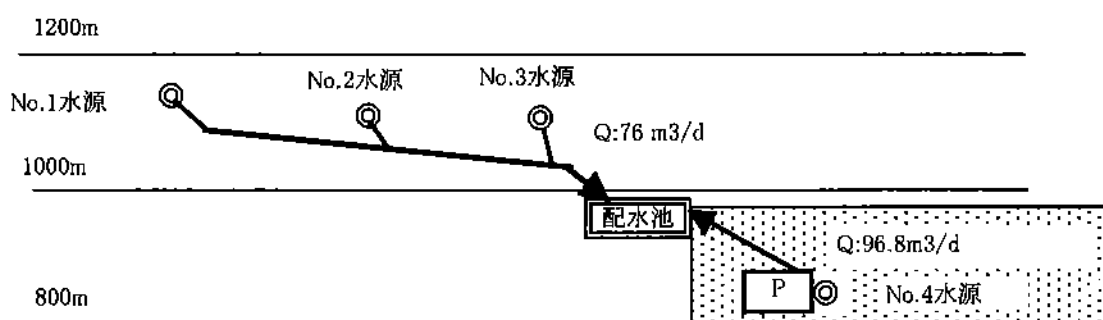
PE	Water buy	① Electric	② Chemical	③ Personnel	④ Maintenance ④ = (①+②) X 0.05	Total
Studeniciani	—	193,830	4,924	588,000	9,938	796,693

Production Cost and Water tariff

PE	Production cost#1 (MKD/yr)	Production water(m3/yr)	Unit cost (MKD/m3)	Water charge (70%)	Water tariff (MKD/m3)	affordable payment (MKD/m3)
Studeniciani	796,693	53,241	15	596,303	16	20
				633,572	17	20
				670,841	18	20
				708,110	19	20
				745,379	20	20
				782,648	21	20
				819,917	22	20

Note:

#1 Additional production cost is Electrical, chemical charge and labor fee.



Water supply system of Cvetovo in Studeniciani

添付資料 13 基本設計概要表

基本設計概要表

1. 協力対象事業名
マケドニア旧ユーゴスラビア共和国 スコピエ周辺地域給水改善計画
2. 我が国が援助することの必要性・妥当性
<p>(1) 我が国が当該国に対し援助することの必要性・妥当性</p> <p>我が国はマケドニア旧ユーゴスラビア共和国（以下、「マ」国）に対し、旧ユーゴ紛争周辺地域安定化支援、同国の市場経済化支援の観点から援助の必要性が高いと判断し、94年度に経済協力政策協議を実施し、技術協力を開始したほか、95年からノンプロジェクト無償資金協力および医療機材整備計画に対する無償資金協力を開始した。96年度からは草の根無償資金協力、開発調査（「全国総合水資源開発管理計画」等）を実施、97年10月には二国間公的債務5億3,000万円の債務救済（債務繰延）に合意した。</p> <p>また、99年には、ユーゴスラビアのコソボ問題により生じた難民の受け入れ国に対する支援として、医療機材供与、食糧増産援助、ノンプロジェクト無償資金協力の合計22億7,400万円を実施することを決定し、我が国はマケドニアにとって最大の二国間ドナー国となっている。</p> <p>(2) プロジェクトの必要性・妥当性</p> <p>「マ」国の年間降水量は400～1,000mmと地域的な偏差が大きく、1980年代半ばから毎年のように渇水が発生し、特に夏季の飲料水の不足が深刻である。また、主要河川がいずれも国際河川のためその開発にあたっては下流国側への影響の回避が必須である。これら状況から総合的な水資源管理体制の確立が望まれており、我が国は、1999年に開発調査「全国総合水資源開発・管理計画調査」を実施し、「マ」国全土を対象とする水資源開発・管理計画に係るマスタープラン（M/P）の策定を支援した。</p> <p>一方、「マ」国政府は12分野にわたる公共事業の長期計画を基に短期投資計画を策定している。2002年に策定された短期投資計画（Public Investment Programme of the Republic of Macedonia, 2002-2004：PIP）では上水道セクターの投資計画として我が国支援によるM/Pを基礎とする水源開発および水道整備計画が示されており、本プロジェクト対象地域のうち4郡の水道施設整備計画が含まれている。また、PIPの公共事業12分野の3カ年の総予算（1,246.13 mil US\$）の中で、上下水道セクターの予算配分は第3位（13.8%）となっており、「マ」国公共事業において水道施設整備の優先度が高いことを示している。</p> <p>本プロジェクトの対象であるスコピエ周辺の7郡20村落の給水施設は老朽化により給水量が不足している。また、水道施設の未整備地域もあり、生活用水の主要な水源である浅井戸が汚水により汚染されており、量・質ともに十分な給水が行われていないことが問題となっている。対象村落が属する7郡の水道普及率は村落郡部では18～78%、都市近郊の郡では85%である。本計画の対象村落のみをみた場合、水道普及率は7%と郡内でも整備が遅れた地域であり、安全な水の安定的供給が緊急の課題となっている。</p>
3. 協力対象事業の目的（プロジェクト目標）
スコピエ周辺の7郡20村落において、上水道施設を整備することにより、住民に安全な水が安定的に供給される。
4. 協力対象事業の内容
<p>(1) 対象地域</p> <p>スコピエ周辺7郡（チュチャーサンボ、チャイル、リツテン、ガジバル、ペトクァツ、スチコニャニ、ゼレコホ）の20村落</p> <p>(2) アウトプット</p> <p>7郡20村落に合計8つの上水道システム（取水施設、消毒施設、ポンプ場、配水池、送・配水管）が整備される。</p>

基本設計概要表

<p>(3) インプット</p> <p>【日本側】 送・配水管、配水池、取水施設、送水ポンプ場、消毒施設の補修・建設（引渡し時の運転指導含む）</p> <p>【相手国側】</p> <ul style="list-style-type: none"> ・ 日本側建設施設への電力引き込み工事、配水池・ポンプ場周辺のフェンスの建設 ・ 上水道システム運営・維持管理主体となる公共事業体職員の訓練 <p>(4) 総事業費 概算事業費 7.76 億円（日本側 7.33 億円、「マ」国側 0.43 億円）</p> <p>(5) スケジュール 詳細設計を含め約 23 ヶ月の工期を予定</p> <p>(6) 実施体制 実施機関：運輸通信省</p>															
<p>5. プロジェクトの成果</p> <p>(1) プロジェクトの裨益対象の範囲及び規模 スコピエ周辺 7 郡（チュチャ・サデボ、チャル、リツゲン、ガジバル、パトクハツ、スチユニヤニ、ゼレコホ）の 20 村落 32,435 人</p> <p>(2) 事業の目的（プロジェクト目標）を示す成果指標</p> <table border="1"> <thead> <tr> <th>項目</th> <th>2002 年（実施前）</th> <th>2008 年（実施後）</th> </tr> </thead> <tbody> <tr> <td>対象村落における給水人口、水道普及率</td> <td>2,274 人（7%）</td> <td>32,435 人（100%）</td> </tr> <tr> <td>給水量</td> <td>30～100 ㍻/人/日</td> <td>65～150 ㍻/人/日</td> </tr> <tr> <td>水質</td> <td>20 村中 17 村で水質基準値不適合</td> <td>全村で基準値適合</td> </tr> <tr> <td>給水時間</td> <td>一部 24 時間（断水は多い）</td> <td>24 時間</td> </tr> </tbody> </table> <p>*1：村落調査結果、未整備地域の住民の水使用量も含む。村落毎の生活環境の差により給水量が異なる。</p>	項目	2002 年（実施前）	2008 年（実施後）	対象村落における給水人口、水道普及率	2,274 人（7%）	32,435 人（100%）	給水量	30～100 ㍻/人/日	65～150 ㍻/人/日	水質	20 村中 17 村で水質基準値不適合	全村で基準値適合	給水時間	一部 24 時間（断水は多い）	24 時間
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<p>6. 外部要因リスク</p> <ul style="list-style-type: none"> ・ 完成した施設から各戸への給水管の接続が、住民負担により遅滞なく実施される。 ・ 対象地域において人口の急激な増加がない。 ・ 自然条件等の変化による水源水質の急激な悪化がない。 															
<p>7. 今後の評価計画</p> <p>(1) 事後評価に用いる成果指標 給水人口、給水普及率、給水量、水質（水質検査適合率）、給水時間</p> <p>(2) 評価のタイミング 2008 年以降</p>															

添付資料 14 Public Communal Enterprise 組織図

Public Enterprise 組織図

