Appendix-1

Input Parameters and Computations of Hydraulic Analysis

(1) Case Study 4 North Harni DWDS

The development of hydraulic model is prerequisite for water quality modelling. The input data and output generated for North Harni DWDS for one hour water supply. Table A_1 shows the details of Nodes and Table A_2 shows the details of Link.

Table A_1: Node details (NH-1H)

Node ID	Elevation	Base Demand	Demand	Node ID	Elevation	Base Demand	Demand
	m	CMH	CMH		m	CMH	CMH
Junc 2	100	0	0	Junc 39	100	25.30224	50.6
Junc 3	100	0	0	Junc 40	100	77.79348	155.59
Junc 4	100	67.7106	135.42	Junc 41	100	35.07216	70.14
Junc 5	100	23.66064	47.32	Junc 42	100	51.77088	103.54
Junc 6	100	26.46972	52.94	Junc 43	100	0	0
Junc 7	100	18.26388	36.53	Junc 44	100	17.64612	35.29
Junc 8	100	16.77564	33.55	Junc 45	100	50.04828	100.1
Junc 9	100	51.78276	103.57	Junc 46	100	10.34968	20.7
Junc 10	100	41.8554	83.71	Junc 47	100	22.55444	45.11
Junc 11	100	41.74956	83.5	Junc 48	100	0	0
Junc 12	100	32.27364	64.55	Junc 49	100	41.4774	82.95
Junc 13	100	30.77136	61.54	Junc 50	100	49.27824	98.56
Junc 14	100	36.99216	73.98	Junc 51	100	29.42028	58.84
Junc 15	100	33.09228	66.18	Junc 52	100	21.8214	43.64
Junc 16	100	44.46144	88.92	Junc 53	100	17.901	35.8
Junc 17	100	15.30792	30.62	Junc 54	100	22.86252	45.73
Junc 18	100	41.30676	82.61	Junc 55	100	20.13292	40.27
Junc 19	100	18.34812	36.7	Junc 56	100	15.55676	31.11
Junc 20	100	19.50912	39.02	Junc 57	100	14.25816	28.52
Junc 21	100	5.69524	11.39	Junc 58	100	33.00912	66.02
Junc 22	100	15.55592	31.11	Junc 59	100	24.9264	49.85
Junc 23	100	31.38156	62.76	Junc 60	100	17.28756	34.58
Junc 24	100	12.4146	24.83	Junc 61	100	32.60628	65.21
Junc 25	100	20.5038	41.01	Junc 62	100	27.50436	55.01
Junc 26	100	46.55448	93.11	Junc 63	100	28.88568	57.77
Junc 27	100	33.33852	66.68	Junc 64	100	22.27068	44.54
Junc 28	100	17.41608	34.83	Junc 65	100	26.95032	53.9
Junc 29	100	37.96092	75.92	Junc 66	100	14.1102	28.22
Junc 30	100	0	0	Junc 67	100	23.4144	46.83
Junc 31	100	0	0	Junc 68	100	44.87292	89.75
Junc 32	100	47.81052	95.62	Junc 69	100	34.38504	68.77
Junc 33	100	21.0978	42.2	Junc 70	100	17.76384	35.53
Junc 34	100	44.44632	88.89	Junc 71	100	17.37612	34.75
Junc 35	100	26.73	53.46	Junc 72	100	28.86516	57.73
Junc 36	100	27.8532	55.71	Junc 73	100	39.82176	79.64
Junc 37	100	49.34736	98.69	Junc 74	100	14.43204	28.86
Junc 38	100	33.55668	67.11	Junc 75	100	26.33256	52.67

Table A_2: Link details (NH-1H)

Link ID	Length	Diameter	Roughness	Bulk Coefficient	Flow	Velocity
	m	mm	mm	d^{-1}	CMH	m/s
Pipe 1	37.93	566	0.035	-0.55	4060.11	4.48
Pipe 2	44	400	0.035	-0.55	2396.01	5.3
Pipe 3	293.85	400	0.035	-0.55	1239.22	2.74
Pipe 4	259.69	400	0.035	-0.55	868.03	1.92
Pipe 5	113.73	250	0.035	-0.55	410.62	2.32
Pipe 6	117.43	250	0.035	-0.55	329.16	1.86
Pipe 7	121.56	250	0.035	-0.55	370.1	2.09
Pipe 8	327.52	400	0.035	-0.55	1664.1	3.68
Pipe 9	91.86	400	0.035	-0.55	1166.01	2.58
Pipe 10	348.58	200	0.035	-0.55	160.96	1.42
Pipe 11	111.83	200	0.035	-0.55	77.46	0.68
Pipe 12	232.09	200	0.035	-0.55	218.71	1.93
Pipe 13	206.46	200	0.035	-0.55	59.66	0.53
Pipe 14	107.82	250	0.035	-0.55	279.1	1.58
Pipe 15	77.14	150	0.035	-0.55	94.5	1.49
Pipe 16	154.99	250	0.035	-0.55	177.12	1
Pipe 17	165.81	150	0.035	-0.55	30.62	0.48
Pipe 18	338.11	200	0.035	-0.55	119.31	1.05
Pipe 19	397.69	150	0.035	-0.55	36.7	0.58
Pipe 20	318.51	150	0.035	-0.55	35.8	0.56
Pipe 21	87.72	150	0.035	-0.55	117.1	1.84
Pipe 22	110.79	150	0.035	-0.55	71.38	1.12
Pipe 23	119.36	150	0.035	-0.55	31.11	0.49
Pipe 24	202.51	150	0.035	-0.55	32.96	0.52
Pipe 25	172.02	150	0.035	-0.55	81.52	1.28
Pipe 26	54.64	150	0.035	-0.55	42.5	0.67
Pipe 27	57.34	150	0.035	-0.55	31.11	0.49
Pipe 28	250.36	300	0.035	-0.55	552.66	2.17
Pipe 29	48.85	300	0.035	-0.55	305.62	1.2
Pipe 30	72.94	200	0.035	-0.55	193.13	1.71
Pipe 31	142.66	200	0.035	-0.55	152.13	1.35
Pipe 32	71.07	150	0.035	-0.55	75.92	1.19
Pipe 33	117.36	250	0.035	-0.55	310.93	1.76
Pipe 34	133.81	250	0.035	-0.55	310.93	1.76
Pipe 35	186.44	250	0.035	-0.55	310.93	1.76
Pipe 36	16.91	150	0.035	-0.55	161.85	2.54
Pipe 37	194.65	150	0.035	-0.55	88.89	1.4
Pipe 38	181.84	200	0.035	-0.55	184.28	1.63
Pipe 39	188.13	200	0.035	-0.55	61.73	0.55
Pipe 40	181.97	150	0.035	-0.55	87.66	1.38
Pipe 41	185	150	0.035	-0.55	-30.76	0.48
Pipe 42	183.51	150	0.035	-0.55	25.31	0.4
Pipe 43	109.6	150	0.035	-0.55	-41.37	0.65
Pipe 44	210.44	150	0.035	-0.55	53.46	0.84
Pipe 45	148.62	200	0.035	-0.55	233.57	2.07
Pipe 46	152.93	200	0.035	-0.55	98.69	0.87
Pipe 47	95.42	250	0.035	-0.55	569.02	3.22
Pipe 48	57.4	200	0.035	-0.55	291.37	2.58

Pipe 49	302.93	200	0.035	-0.55	194.14	1.72
Pipe 50	66.95	200	0.035	-0.55	-79.17	0.7
Pipe 51	137.78	200	0.035	-0.55	206.19	1.82
Pipe 52	98.45	200	0.035	-0.55	155.59	1.38
Pipe 53	342.51	150	0.035	-0.55	27.08	0.43
Pipe 54	132.56	250	0.035	-0.55	174.11	0.99
Pipe 55	80.94	250	0.035	-0.55	174.11	0.99
Pipe 56	194	200	0.035	-0.55	138.82	1.23
Pipe 57	92	200	0.035	-0.55	65.81	0.58
Pipe 58	94.61	200	0.035	-0.55	45.11	0.4
Pipe 59	163.67	400	0.035	-0.55	587.76	1.3
Pipe 60	389.23	300	0.035	-0.55	587.76	2.31
Pipe 61	250.21	300	0.035	-0.55	552.18	2.17
Pipe 62	88.99	250	0.035	-0.55	404.41	2.29
Pipe 63	409.9	250	0.035	-0.55	189.12	1.07
Pipe 64	345.48	200	0.035	-0.55	52.67	0.47
Pipe 65	91.62	200	0.035	-0.55	235.77	2.08
Pipe 66	248.99	200	0.035	-0.55	47.37	0.42
Pipe 67	110.48	150	0.035	-0.55	89.84	1.41
Pipe 68	135.95	150	0.035	-0.55	31	0.49
Pipe 69	165.94	250	0.035	-0.55	294.22	1.66
Pipe 70	75.28	250	0.035	-0.55	281.58	1.59
Pipe 71	17.21	200	0.035	-0.55	192	1.7
Pipe 72	237.08	200	0.035	-0.55	126.78	1.12
Pipe 73	266.35	150	0.035	-0.55	55.01	0.86
Pipe 74	138.57	200	0.035	-0.55	103.23	0.91
Pipe 75	114.23	200	0.035	-0.55	172.24	1.52
Pipe 76	118.61	150	0.035	-0.55	28.22	0.44
Pipe 77	273.4	200	0.035	-0.55	168.46	1.49
Pipe 78	223.43	200	0.035	-0.55	34.75	0.31
Pipe 79	144.8	150	0.035	-0.55	78.72	1.24
Pipe 80	114.62	150	0.035	-0.55	28.86	0.45
Pipe 81	240.19	150	0.035	-0.55	29.79	0.47
Pipe 82	199.17	150	0.035	-0.55	90.12	1.42
Pipe 83	104.94	150	0.035	-0.55	-14.18	0.22
Pipe 84	195.74	150	0.035	-0.55	35.53	0.56
Pipe 85	78.46	200	0.035	-0.55	115.87	1.02
Pipe 86	208.42	200	0.035	-0.55	49.85	0.44
Pipe 87	302.53	150	0.035	-0.55	28.52	0.45

(2) Case Study 5 Manjalpur DWDS

The input data and output generated for North Harni DWDS for one hour water supply.

Table A_3 shows the details of Nodes and Table A_4 shows the details of Link.

Table A_3: Node Details (MJ-1H)

Node ID	Elevation	Base Demand	Demand	Node ID	Elevation	Base Demand	Demand
	m	CMH	CMH		m	CMH	CMH
Junc J1	100	28	28	Junc J82	100	35	35
Junc J2	100	22.96	22.96	Junc J83	100	75	75
Junc J3	100	22.96	22.96	Junc J84	100	450	450
Junc J6	100	43.43	43.43	Junc J85	100	500	500
Junc J7	100	48	48	Junc J86	100	45	45
Junc J8	100	143.92	143.92	Junc J87	100	0	0
Junc J9	100	24	24	Junc J88	100	65	65
Junc J10	100	0	0	Junc J89	100	75	75
Junc J11	100	100	100	Junc J90	100	25	25
Junc J12	100	25	25	Junc J91	100	25	25
Junc J13	100	20	20	Junc J92	100	25	25
Junc J15	100	99	99	Junc J93	100	25	25
Junc J17	100	54.43	54.43	Junc J94	100	23.91	23.91
Junc J21	100	122.96	122.96	Junc J95	100	20	20
Junc J22	100	34.43	34.43	Junc J97	100	56	56
Junc J23	100	45.3	45.3	Junc J98	100	25	25
Junc J24	100	5	5	Junc J99	100	50	50
Junc J25	100	76.92	76.92	Junc J100	100	45	45
Junc J28	100	30	30	Junc J101	100	45	45
Junc J29	100	25.33	25.33	Junc J102	100	20	20
Junc J30	100	51	51	Junc J103	100	39	39
Junc J32	100	100	100	Junc J104	100	65	65
Junc J34	100	125.11	125.11	Junc J105	100	73.5	73.5
Junc J35	100	48.3	48.3	Junc J106	100	0	0
Junc J36	100	120	120	Junc J107	100	50	50
Junc J38	100	30	30	Junc J108	100	134	134
Junc J39	100	10	10	Junc J109	100	0	0
Junc J40	100	23.91	23.91	Junc J110	100	50	50
Junc J41	100	95	95	Junc J111	100	67.8	67.8
Junc J42	100	75	75	Junc J112	100	15	15
Junc J43	100	66.59	66.59	Junc J113	100	15	15
Junc J44	100	65.89	65.89	Junc J114	100	20	20
Junc J45	100	50	50	Junc J115	100	20	20
Junc J51	100	28.16	28.16	Junc J116	100	50	50
Junc J52	100	65.63	65.63	Junc J117	100	31	31
Junc J53	100	31.27	31.27	Junc J118	100	31.2	31.2
Junc J54	100	40	40	Junc J119	100	56	56
Junc J55	100	33.65	33.65	Junc J120	100	50	50
Junc J56	100	33.65	33.65	Junc J122	100	44.5	44.5
Junc J57	100	140.65	140.65	Junc J123	100	25	25
Junc J59	100	103.65	103.65	Junc J124	100	20	20
Junc J60	100	80	80	Junc J125	100	23	23
Junc J61	100	124.7	124.7	Junc J126	100	72	72
Junc J62	100	143	143	Junc J127	100	46	46

Junc J63	100	55	55	Junc J128	100	120.5	120.5
Junc J64	100	148.6	148.6	Junc J129	100	130	130
Junc J65	100	77.54	77.54	Junc J130	100	15	15
Junc J66	100	48.6	48.6	Junc J131	100	100	100
Junc J67	100	167.5	167.5	Junc J132	100	5	5
Junc J68	100	117.75	117.75	Junc J133	100	50	50
Junc J69	100	7.54	7.54	Junc J134	100	33	33
Junc J70	100	57.54	57.54	Junc J135	100	55	55
Junc J71	100	70.06	70.06	Junc J136	100	67.7	67.7
Junc J72	100	298.75	298.75	Junc J137	100	50	50
Junc J73	100	100.86	100.86	Junc J138	100	118.6	118.6
Junc J74	100	67.5	67.5	Junc J139	100	45	45
Junc J76	100	10	10	Junc J140	100	75	75
Junc J77	100	70	70	Junc J141	100	150	150
Junc J79	100	117.5	117.5	Junc J142	100	25	25
Junc J14	100	88.75	88.75	Junc J143	100	116	116
Junc J19	100	87.61	87.61	Junc J144	100	10	10
Junc J26	100	37.61	37.61	Junc J145	100	50	50
Junc J33	100	50	50	Junc J146	100	30	30
Junc J37	100	50	50	Junc J147	100	10	10
Junc J58	100	20	20	Junc J148	100	30.5	30.5
Junc J75	100	45	45	Junc J47	100	64	64
Junc J78	100	181.3	181.3	Junc J48	100	10	10
Junc J4	100	0	0	Junc J149	100	95	95
Junc J5	100	85	85	Junc J150	100	55	55
Junc J16	100	150	150	Junc J151	100	50	50
Junc J18	100	15	15	Junc J152	100	55	55
Junc J20	100	32	32	Junc J153	100	55	55
Junc J31	100	25	25	Junc J154	100	40	40
Junc J49	100	25	25	Junc J27	100	0	0
Junc J50	100	20	20	Junc J46	100	10	10
Junc J80	100	35	35	Junc J96	100	0	0
Junc J81	100	85	85	Resvr R1	98	#N/A	-9452.03

Table A_4: Link details (MJ-1H)

Link ID	Length	Diameter	Roughness	Bulk Coefficient	Flow	Velocity
	m	mm	mm	d^{-1}	CMH	m/s
Pipe P12	510	450	0.26	-0.55	1254.92	2.19
Pipe P13	118	300	0.26	-0.55	454.03	1.78
Pipe P16	475	250	0.26	-0.55	310.31	1.76
Pipe P17	236	200	0.26	-0.55	143.92	1.27
Pipe P18	169	200	0.26	-0.55	122.96	1.09
Pipe P19	235	300	0.26	-0.55	442.58	1.74
Pipe P20	150	250	0.26	-0.55	90.95	0.51
Pipe P21	245	300	0.26	-0.55	349.79	1.37
Pipe P23	155	300	0.26	-0.55	279.52	1.1
Pipe P26	238	300	0.26	-0.55	132.8	0.52
Pipe P27	184	300	0.26	-0.55	20	0.08
Pipe P30	100	250	0.26	-0.55	120	0.68
Pipe P31	190	200	0.26	-0.55	12.64	0.11
Pipe P35	100	150	0.26	-0.55	70	1.1

Pipe P36	100	150	0.26	-0.55	30	0.47
Pipe P37	105	150	0.26	-0.55	10	0.16
Pipe P38	150	250	0.26	-0.55	51	0.29
Pipe P40	210	200	0.26	-0.55	80.94	0.72
Pipe P42	180	200	0.26	-0.55	163.24	1.44
Pipe P44	315	450	0.26	-0.55	639.38	1.12
Pipe P50	480	200	0.26	-0.55	-28.16	0.25
Pipe P51	400	400	0.26	-0.55	-93.79	0.21
Pipe P57	280	250	0.26	-0.55	33.65	0.19
Pipe P58	715	500	0.26	-0.55	532.9	0.75
Pipe P59	200	450	0.26	-0.55	459.25	0.8
Pipe P60	250	400	0.26	-0.55	140.65	0.31
Pipe P62	135	200	0.26	-0.55	80	0.71
Pipe P64	250	250	0.26	-0.55	135.4	0.77
Pipe P66	245	250	0.26	-0.55	55	0.31
Pipe P67	170	250	0.26	-0.55	148.6	0.84
Pipe P69	280	200	0.26	-0.55	144.96	1.28
Pipe P71	150	300	0.26	-0.55	188.12	0.74
Pipe P72	270	200	0.26	-0.55	99	0.88
Pipe P74	520	200	0.26	-0.55	-81.58	0.72
Pipe P76	775	600	0.26	-0.55	1377.98	1.35
Pipe P77	145	600	0.26	-0.55	936.47	0.92
Pipe P78	425	600	0.26	-0.55	637.72	0.63
Pipe P79	450	200	0.26	-0.55	52.98	0.47
Pipe P80	340	200	0.26	-0.55	-49.9	0.44
Pipe P81	740	300	0.26	-0.55	216.91	0.85
Pipe P82	160	300	0.26	-0.55	174.47	0.69
Pipe P83	308	200	0.26	-0.55	18.22	0.16
Pipe P87	925	300	0.26	-0.55	187.59	0.74
Pipe P90	465	200	0.26	-0.55	-41.46	0.37
Pipe P2	123	600	0.26	-0.55	-2271.08	2.23
Pipe P3	417	600	0.26	-0.55	2331.21	2.29
Pipe P5	125	400	0.26	-0.55	-717.81	1.59
Pipe P39	285	400	0.26	-0.55	399.89	0.88
Pipe P41	290	400	0.26	-0.55	893.75	1.98
Pipe P43	240	600	0.26	-0.55	310.66	0.31
Pipe P75	300	250	0.26	-0.55	53.25	0.3
Pipe P10	265	600	0.26	-0.55	2705.51	2.66
Pipe P11	205	600	0.26	-0.55	2445.41	2.4
Pipe P14	205	600	0.26	-0.55	2098.81	2.06
Pipe P15	217	200	0.26	-0.55	88.75	0.78
Pipe P24	825	300	0.26	-0.55	149.05	0.59
Pipe P25	130	150	0.26	-0.55	137.61	2.16
Pipe P28	420	200	0.26	-0.55	-76.17	0.67
Pipe P29	165	100	0.26	-0.55	50	1.77
Pipe P33	65	100	0.26	-0.55	50	1.77
Pipe P34	30	300	0.26	-0.55	414.5	1.63
Pipe P53	30	300	0.26	-0.55	224.12	0.88
Pipe P84	230	600	0.26	-0.55	207.7	0.2
Pipe P85	20	600	0.26	-0.55	187.7	0.18
Pipe P86	750	400	0.26	-0.55	284.95	0.63
Pipe P91	350	200	0.26	-0.55	103.65	0.92
Pipe P9	307	300	0.26	-0.55	432.71	1.7
Pipe P48	80	300	0.26	-0.55	-622.74	2.45
Pipe P49	155	300	0.26	-0.55	697.51	2.74
Pipe P54	258	300	0.26	-0.55	55.1	0.22

Pipe P55	150	300	0.26	-0.55	534.01	2.1
Pipe P56	22	300	0.26	-0.55	464.01	1.82
Pipe P61	15	300	0.26	-0.55	439.01	1.73
Pipe P65	123	300	0.26	-0.55	334.01	1.31
Pipe P68	118	300	0.26	-0.55	234.01	0.92
Pipe P73	40	150	0.26	-0.55	25	0.39
Pipe P92	40	150	0.26	-0.55	25	0.39
Pipe P93	40	150	0.26	-0.55	25	0.39
Pipe P94	70	150	0.26	-0.55	25	0.39
Pipe P96	20	100	0.26	-0.55	-57.07	2.02
Pipe P97	176	200	0.26	-0.55	63.67	0.56
Pipe P98	195	200	0.26	-0.55	-33.77	0.3
Pipe P99	210	250	0.26	-0.55	221.23	1.25
Pipe P100	340	250	0.26	-0.55	257.75	1.46
Pipe P101	182	250	0.26	-0.55	-38.34	0.22
Pipe P102	161	250	0.26	-0.55	-172.14	0.97
Pipe P103	234	250	0.26	-0.55	217.18	1.23
Pipe P104	318	250	0.26	-0.55	-289.78	1.64
Pipe P108	202	250	0.26	-0.55	160.3	0.91
Pipe P109	560	150	0.26	-0.55	-23.41	0.37
Pipe P110	180	150	0.26	-0.55	-78.94	1.24
Pipe P111	311	150	0.26	-0.55	-90.48	1.42
Pipe P114	231	300	0.26	-0.55	-348.06	1.37
Pipe P115	70	150	0.26	-0.55	25.04	0.39
Pipe P116	205	150	0.26	-0.55	25	0.39
Pipe P117	230	150	0.26	-0.55	20	0.31
Pipe P118	113	150	0.26	-0.55	-36.73	0.58
Pipe P119	235	150	0.26	-0.55	-36.52	0.57
Pipe P120	123	150	0.26	-0.55	20	0.31
Pipe P121	358	150	0.26	-0.55	-17.97	0.28
Pipe P122	130	150	0.26	-0.55	-46.24	0.73
Pipe P123	44	150	0.26	-0.55	-72	1.13
Pipe P124	145	150	0.26	-0.55	8.39	0.13
Pipe P125	423	150	0.26	-0.55	-62.6	0.98
Pipe P127	248	150	0.26	-0.55	-86.57	1.36
Pipe P128	65	150	0.26	-0.55	-122.23	1.92
Pipe P129	560	250	0.26	-0.55	-183.1	1.04
Pipe P130	355	150	0.26	-0.55	-48.72	0.77
Pipe P131	195	250	0.26	-0.55	-331.86	1.88
Pipe P133	145	250	0.26	-0.55	120.01	0.68
Pipe P134	145	150	0.26	-0.55	11.8	0.19
Pipe P135	56	150	0.26	-0.55	-44.2	0.69
Pipe P136	130	450	0.26	-0.55	608.77	1.06
Pipe P137	70	150	0.26	-0.55	-15	0.24
Pipe P138	207	150	0.26	-0.55	42.79	0.67
Pipe P141	175	250	0.26	-0.55	231.91	1.31
Pipe P142	154	150	0.26	-0.55	61.89	0.97
Pipe P143	130	250	0.26	-0.55	165.01	0.93
Pipe P145	150	250	0.26	-0.55	-205.92	1.17
Pipe P146	172	150	0.26	-0.55	-79.51	1.25
Pipe P148	100	150	0.26	-0.55	-91.22	1.43
Pipe P149	142	200	0.26	-0.55	-11.55	0.1
Pipe P150	102	200	0.26	-0.55	96.6	0.85
Pipe P151	145	200	0.26	-0.55	129.67	1.15
Pipe P152	307	150	0.26	-0.55	83.08	1.31
Pipe P153	154	150	0.26	-0.55	98.09	1.54

Pipe P154	126	200	0.26	-0.55	78.09	0.69
Pipe P157	125	250	0.26	-0.55	-53.48	0.3
Pipe P158	155	250	0.26	-0.55	-93.23	0.53
Pipe P159	387	250	0.26	-0.55	-147.15	0.83
Pipe P160	130	150	0.26	-0.55	62.44	0.98
Pipe P161	186	150	0.26	-0.55	-20.71	0.33
Pipe P162	123	150	0.26	-0.55	-69.01	1.08
Pipe P163	152	150	0.26	-0.55	105.15	1.65
Pipe P164	126	150	0.26	-0.55	30.15	0.47
Pipe P166	290	200	0.26	-0.55	164.74	1.46
Pipe P167	211	200	0.26	-0.55	104.48	0.92
Pipe P168	150	200	0.26	-0.55	45	0.4
Pipe P169	181	150	0.26	-0.55	80	1.26
Pipe P170	100	150	0.26	-0.55	30	0.47
Pipe P171	255	150	0.26	-0.55	48.09	0.76
Pipe P172	188	150	0.26	-0.55	38.09	0.6
Pipe P173	230	200	0.26	-0.55	-24.48	0.22
Pipe P174	192	200	0.26	-0.55	-49.48	0.44
Pipe P175	171	150	0.26	-0.55	119.85	1.88
Pipe P176	186	250	0.26	-0.55	317.37	1.8
Pipe P177	150	250	0.26	-0.55	167.02	0.95
Pipe P4	133	150	0.26	-0.55	-103.39	1.63
Pipe P6	130	250	0.26	-0.55	64	0.36
Pipe P7	231	300	0.26	-0.55	-134.98	0.53
Pipe P8	78	150	0.26	-0.55	-79.51	1.25
Pipe P45	122	200	0.26	-0.55	-226.1	2
Pipe P52	65	450	0.26	-0.55	-702.97	1.23
Pipe P63	355	400	0.26	-0.55	146.01	0.32
Pipe P70	177	450	0.26	-0.55	100.42	0.18
Pipe P107	200	150	0.26	-0.55	-44.32	0.7
Pipe P113	87	200	0.26	-0.55	27.86	0.25
Pipe P132	220	200	0.26	-0.55	-137.57	1.22
Pipe P140	500	150	0.26	-0.55	-36.71	0.58
Pipe P147	87	150	0.26	-0.55	68.5	1.08
Pipe P155	223	150	0.26	-0.55	-26.5	0.42
Pipe P165	106	150	0.26	-0.55	-34.67	0.55
Pipe P178	216	150	0.26	-0.55	-79.67	1.25
Pipe P179	100	150	0.26	-0.55	-46.83	0.74
Pipe P180	122	150	0.26	-0.55	34.9	0.55
Pipe P181	134	150	0.26	-0.55	20.1	0.32
Pipe P182	165	150	0.26	-0.55	-20.92	0.33
Pipe P183	200	150	0.26	-0.55	-15.25	0.24
Pipe P184	219	200	0.26	-0.55	-78.22	0.69
Pipe P185	180	200	0.26	-0.55	-125.61	1.11
Pipe P186	143	150	0.26	-0.55	38.82	0.61
Pipe P187	165	150	0.26	-0.55	-30.59	0.48
Pipe P188	135	150	0.26	-0.55	26.74	0.42
Pipe P189	120	150	0.26	-0.55	-40.03	0.63
Pipe P156	67	600	0.26	-0.55	591.8	0.58
Pipe P191	201	300	0.26	-0.55	-496.98	1.95
Pipe P192	23	300	0.26	-0.55	190.03	0.75
Pipe P193	210	300	0.26	-0.55	396.46	1.56
Pipe P194	181	150	0.26	-0.55	94.77	1.49
Pipe P195	142	200	0.26	-0.55	12.7	0.11
Pipe P196	180	150	0.26	-0.55	110.61	1.74
Pipe P197	120	300	0.26	-0.55	-71.67	0.28

Pipe P198	60	200	0.26	-0.55	12.92	0.11
Pipe P199	140	150	0.26	-0.55	-35.71	0.56
Pipe P200	635	250	0.26	-0.55	56.91	0.32
Pipe P201	135	150	0.26	-0.55	38.11	0.6
Pipe P46	25	250	0.26	-0.55	-52.6	0.3
Pipe P47	15	250	0.26	-0.55	104.3	0.59
Pipe P95	25	200	0.26	-0.55	-41.42	0.37
Pipe P126	125	400	0.26	-0.55	349.89	0.77
Pipe P106	155	150	0.26	-0.55	14.16	0.22
Pipe P190	217	150	0.26	-0.55	43.43	0.68
Pipe P202	755	250	0.26	-0.55	164.77	0.93
Pipe P203	115	250	0.26	-0.55	146.33	0.83
Pipe P204	80	200	0.26	-0.55	-24.96	0.22
Pipe P205	115	150	0.26	-0.55	23.34	0.37
Pipe P139	54	600	0.26	-0.55	1770.25	1.74
Pipe P206	50	250	0.26	-0.55	-339.78	1.92
Pipe P207	67	250	0.26	-0.55	-203.08	1.15
Pipe P208	23	400	0.26	-0.55	-136.7	0.3
Pipe P209	87	150	0.26	-0.55	-69.91	1.1
Pipe P210	200	150	0.26	-0.55	-79.91	1.26
Pipe P211	96	150	0.26	-0.55	10	0.16
Pipe P212	145	600	0.26	-0.55	3079.48	3.03
Pipe P213	35	600	0.26	-0.55	4602.29	4.52
Pipe P1	25	250	0.26	-0.55	118.8	0.67
Pipe P22	300	150	0.26	-0.55	17.65	0.28
Pipe P32	150	200	0.26	-0.55	20.24	0.18