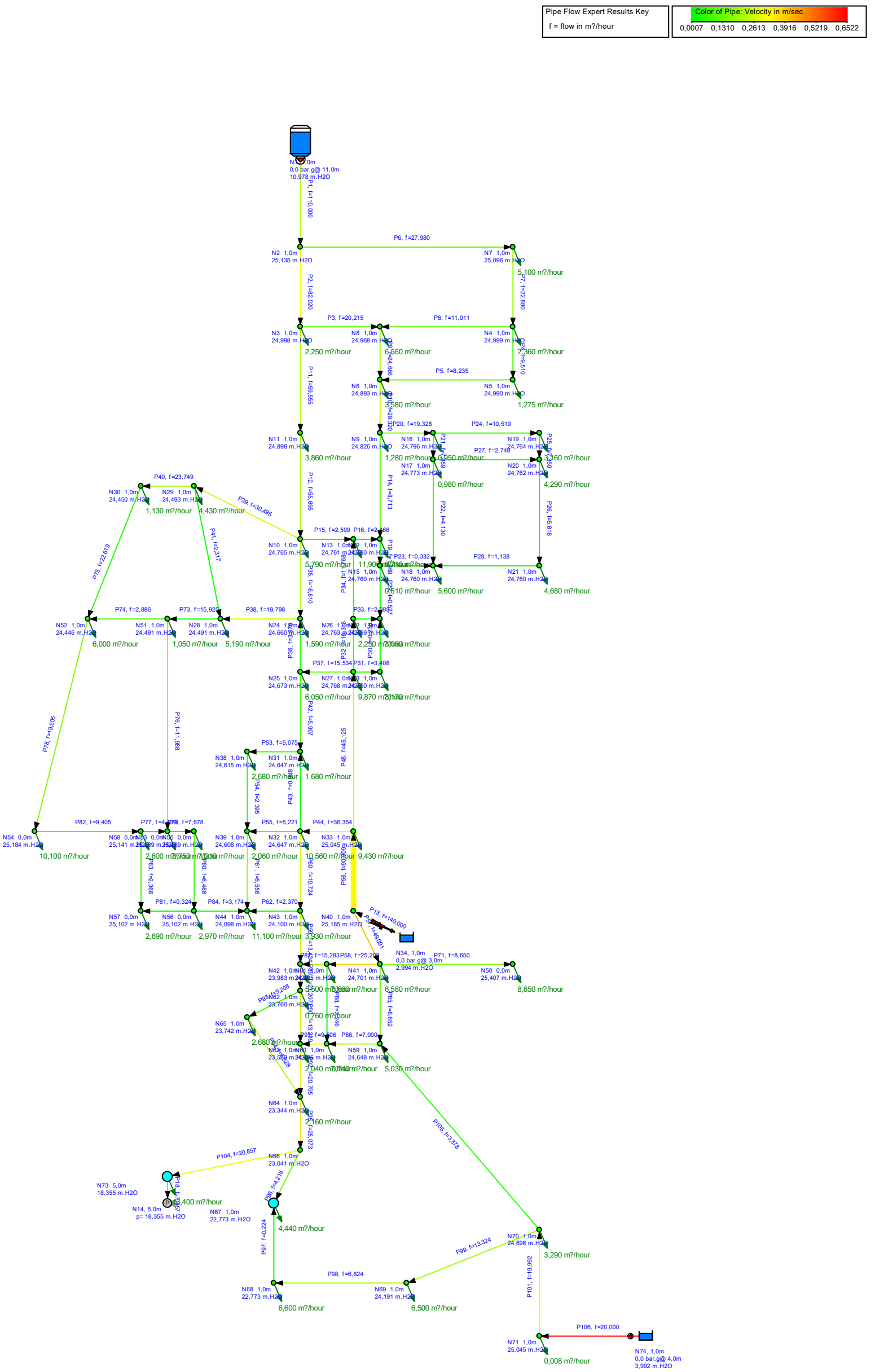
ПРИЛОЖЕНИЕ №1

РЕЗУЛЬТАТЫ ГИДРАВЛИЧЕСКИХ РАСЧЕТОВ СИСТЕМЫ ВОДОСНАБЖЕНИЯ

Вариант 1 – Гидравлический расчет системы водоснабжения при существующем уровне водопотребления


Pipe Flow Expert Results Key
f = flow in m?/hour
Color of Pipe: Velocity in m/sec
0,0007 0,1310 0,2613 0,3916 0,5219 0,6522
0,0 bar.g@ 11,0m
10,978 m.H2O
P1, f=110,000
P6, f=27,980
N2 1,0m
25,135 m.H2O
N7 1,0m
25,096 m.H2O
5,100 m?/hour
P2, f=82,020
P7, f=22,880
P3, f=20,215
P8, f=11,011
N3 1,0m
24,998 m.H2O
N8 1,0m
24,968 m.H2O
N4 1,0m
24,999 m.H2O
2,250 m?/hour
6,560 m?/hour
2,360 m?/hour
P11, f=59,555
P5, f=8,235
N6 1,0m
24,893 m.H2O
N5 1,0m
24,990 m.H2O
3,580 m?/hour
1,275 m?/hour
P20, f=19,328
P24, f=10,519
N11 1,0m
24,898 m.H2O
N9 1,0m
24,826 m.H2O
N16 1,0m
24,796 m.H2O
N19 1,0m
24,764 m.H2O
3,860 m?/hour
1,280 m?/hour
0,350 m?/hour
3,160 m?/hour
P27, f=2,749
N17 1,0m
24,773 m.H2O
N20 1,0m
24,762 m.H2O
0,980 m?/hour
4,290 m?/hour
P40, f=23,749
P12, f=55,695
P14, f=8,713
P22, f=4,130
P26, f=5,818
N30 1,0m
24,450 m.H2O
N29 1,0m
24,493 m.H2O
P39, f=30,495
1,130 m?/hour
4,430 m?/hour
P41, f=2,317
P75, f=22,619
P15, f=2,599
P16, f=2,466
N10 1,0m
24,765 m.H2O
N13 1,0m
24,761 m.H2O
N12 1,0m
24,760 m.H2O
P19, f=8,689
P23, f=0,332
P28, f=1,138
5,790 m?/hour
11,900 m?/hour
0,610 m?/hour
5,600 m?/hour
4,680 m?/hour
P35, f=16,810
P44, f=1,689
N15 1,0m
24,760 m.H2O
N18 1,0m
24,760 m.H2O
N21 1,0m
24,760 m.H2O
P74, f=2,886
P73, f=15,925
P38, f=18,798
P33, f=2,285
P27, f=0,527
N52 1,0m
24,446 m.H2O
N51 1,0m
24,491 m.H2O
N28 1,0m
24,491 m.H2O
N24 1,0m
24,660 m.H2O
N26 1,0m
24,763 m.H2O
6,000 m?/hour
1,050 m?/hour
5,190 m?/hour
1,590 m?/hour
2,250 m?/hour
P36, f=1,
P32, f=1,
P34, f=0,
P37, f=15,534
P31, f=3,408
N25 1,0m
24,673 m.H2O
N27 1,0m
24,768 m.H2O
6,050 m?/hour
9,870 m?/hour
P42, f=5,907
P78, f=19,505
P76, f=11,988
P53, f=5,075
P45, f=45,125
N38 1,0m
24,615 m.H2O
N31 1,0m
24,647 m.H2O
2,680 m?/hour
1,680 m?/hour
P54, f=2,395
P43, f=0,
P82, f=9,405
P77, f=4,
P79, f=7,678
P55, f=5,221
P44, f=36,354
N54 0,0m
25,184 m.H2O
N58 0,0m
25,141 m.H2O
N53 0,0m
N36 0,0m
N39 1,0m
24,608 m.H2O
N32 1,0m
24,647 m.H2O
N33 1,0m
25,045 m.H2O
10,100 m?/hour
2,600 m?/hour
2,060 m?/hour
10,560 m?/hour
9,430 m?/hour
P83, f=2,366
P80, f=6,468
P61, f=5,556
P60, f=19,724
P64, f=9,
P81, f=0,324
P84, f=3,174
P62, f=2,370
P13, f=140,000
N57 0,0m
25,102 m.H2O
N56 0,0m
25,102 m.H2O
N44 1,0m
24,098 m.H2O
N43 1,0m
24,100 m.H2O
N40 1,0m
25,185 m.H2O
2,690 m?/hour
2,970 m?/hour
11,100 m?/hour
3,930 m?/hour
P49, f=13,
P67, f=15,283
P58, f=25,209
N34, 1,0m
0,0 bar.g@ 3,0m
2,994 m.H2O
P71, f=8,650
N50 0,0m
25,407 m.H2O
N42 1,0m
23,983 m.H2O
N35 1,0m
N41 1,0m
24,701 m.H2O
5,500 m?/hour
6,580 m?/hour
8,650 m?/hour
P59, f=9,208
P63, f=20,
P88, f=1,
P85, f=8,652
N62 1,0m
23,760 m.H2O
0,760 m?/hour
N65 1,0m
23,742 m.H2O
P87, f=9,206
P86, f=7,000
P46, f=19,
2,680 m?/hour
N63 1,0m
23,589 m.H2O
N61 1,0m
N60 1,0m
24,648 m.H2O
2,040 m?/hour
0,760 m?/hour
5,030 m?/hour
P66, f=20,705
N64 1,0m
23,344 m.H2O
P65, f=25,073
2,160 m?/hour
P105, f=3,378
P104, f=20,857
N66 1,0m
23,041 m.H2O
N73 5,0m
18,355 m.H2O
P18, f=4,
P17, f=4,
P96, f=4,216
N14, 5,0m
p= 18,355 m.H2O
N67 1,0m
22,773 m.H2O
3,400 m?/hour
4,440 m?/hour
P97, f=0,224
P99, f=13,324
N70 1,0m
24,696 m.H2O
3,290 m?/hour
P98, f=6,824
P101, f=19,992
N68 1,0m
22,773 m.H2O
N69 1,0m
24,191 m.H2O
6,600 m?/hour
6,500 m?/hour
P106, f=20,000
N71 1,0m
25,045 m.H2O
0,008 m?/hour
N74, 1,0m
0,0 bar.g@ 4,0m
3,992 m.H2O

Fluid Data

Zone	Fluid Name	Chemical Formula	Temperature °C	Pressure m.H2O	Density kg/m?	Centistokes	Centipoise	Vapour Pressure m.H2O.a	State
1	Water	H2O	20,000	0,000	998,000000	1,000000	1,002000	0,244732	Liquid

Pump Data

Pipe Id	Pipe Name	Pump Name	Speed rpm	Pref. Op From m?/hour	Pref. Op To m?/hour	Flow In/Out m?/hour	Velocity m/sec	Suction Pressure m.H2O	Discharge Pressure m.H2O	Pump Head (+) m.hd Fluid	Pump NPSHr m.hd (absolute)	Pump NPSHa m.hd (absolute)	Pump Efficiency Percentage	Pump Power Kilowatts
1	P1	Pump	Set Flow Rate			110,000	0,236	10,978	25,234	14,285	Not known	21,107	Not known	Not Known
13	P13	Pump	Set Flow Rate			140,000	0,300	2,994	25,219	22,269	Not known	13,107	Not known	Not Known
106	P106	Pump	Set Flow Rate			20,000	0,652	3,992	26,873	22,927	Not known	14,107	Not known	Not Known

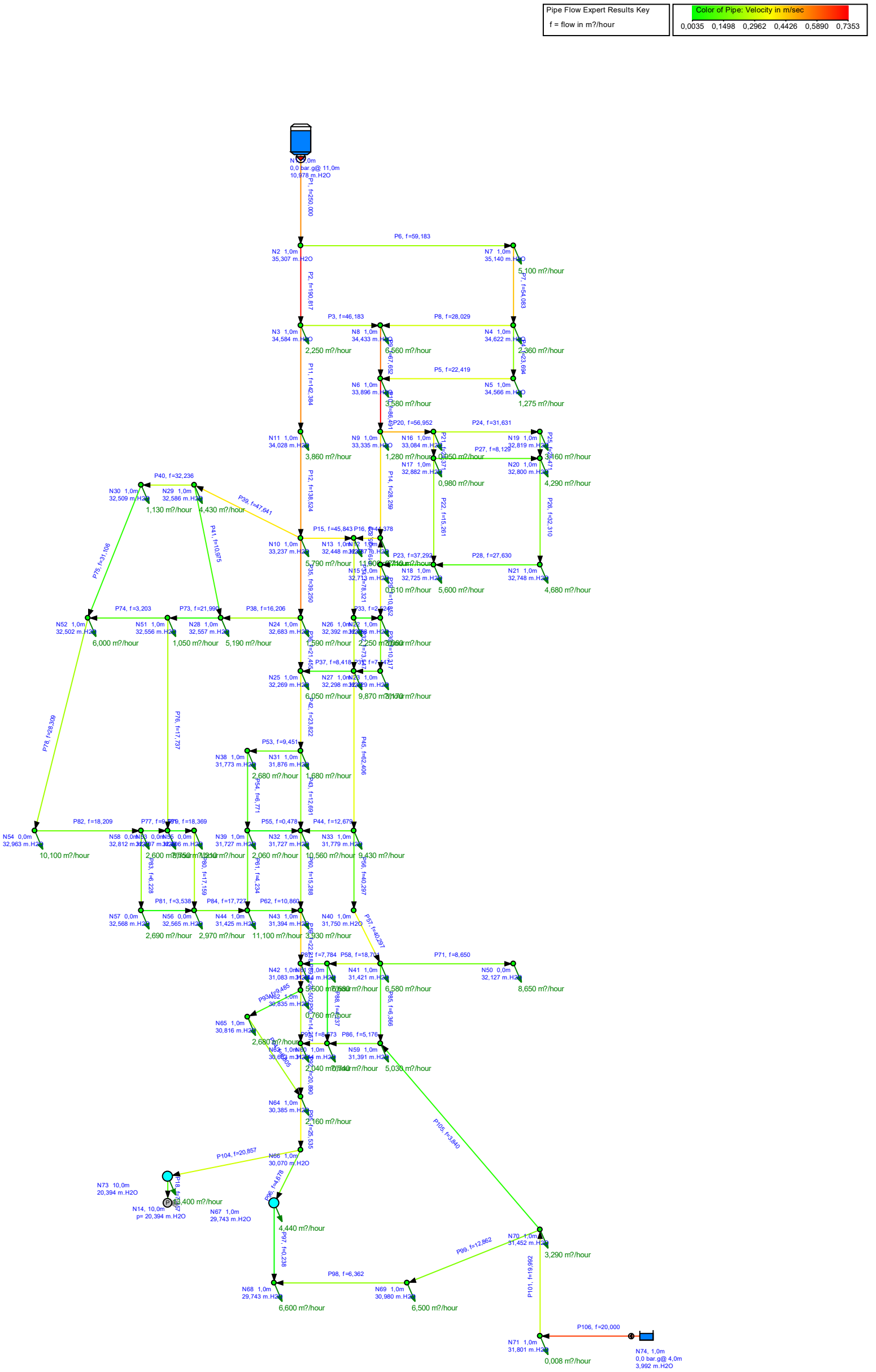
Pipe Data

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
1	P1	406,400	540,000	30,4944	110,000	0,236	-14,157	10,978	25,135
2	P2	304,800	300,000	22,7377	82,020	0,312	0,137	25,135	24,998
3	P3	252,984	385,000	5,6041	20,215	0,112	0,031	24,998	24,968
4	P4	203,962	170,000	2,6363	9,510	0,081	0,010	24,999	24,990
5	P5	155,956	564,000	2,2828	8,235	0,120	0,097	24,990	24,893
6	P6	303,784	680,000	7,7568	27,980	0,107	0,040	25,135	25,096
7	P7	203,962	315,000	6,3429	22,880	0,195	0,096	25,096	24,999
8	P8	181,000	253,500	3,0524	11,011	0,119	0,032	24,999	24,968
9	P9	203,962	210,000	6,8379	24,666	0,210	0,074	24,968	24,893
10	P10	203,962	135,000	8,1283	29,320	0,249	0,067	24,893	24,826
11	P11	303,784	404,000	16,5098	59,555	0,228	0,101	24,998	24,898
12	P12	303,784	606,000	15,4398	55,695	0,213	0,133	24,898	24,765
13	P13	406,400	121,000	38,8111	140,000	0,300	-22,191	2,994	25,185
14	P14	155,956	346,000	2,4153	8,713	0,127	0,066	24,826	24,760
15	P15	203,962	665,000	0,7204	2,599	0,022	0,004	24,765	24,761
16	P16	203,962	215,000	0,6838	2,466	0,021	0,001	24,761	24,760
18	P18	155,956	1,000	2,0672	7,457	0,108	0,000	18,355	18,355
19	P19	203,962	66,900	0,4073	1,469	0,012	0,000	24,760	24,760
20	P20	203,962	138,000	5,3581	19,328	0,164	0,030	24,826	24,796
21	P21	155,956	144,000	2,1787	7,859	0,114	0,023	24,796	24,773
22	P22	155,956	279,000	1,1449	4,130	0,060	0,013	24,773	24,760
23	P23	406,400	540,000	0,0921	0,332	0,001	0,000	24,760	24,760
24	P24	203,962	460,000	2,9160	10,519	0,089	0,032	24,796	24,764
25	P25	254,508	135,000	2,0400	7,359	0,040	0,002	24,764	24,762
26	P26	254,508	290,000	1,6129	5,818	0,032	0,002	24,762	24,760
27	P27	155,956	490,000	0,7622	2,749	0,040	0,011	24,773	24,762
28	P28	303,784	392,000	0,3155	1,138	0,004	0,000	24,760	24,760
29	P29	102,260	132,000	0,1461	0,527	0,018	0,001	24,760	24,759
30	P30	141,859	205,000	0,0659	0,238	0,004	0,000	24,760	24,759
31	P31	141,859	205,000	0,9447	3,408	0,060	0,009	24,768	24,760
32	P32	303,784	250,000	4,5224	16,313	0,063	0,005	24,768	24,763
33	P33	155,956	214,000	0,6363	2,295	0,033	0,003	24,763	24,759
34	P34	303,784	130,000	3,2623	11,768	0,045	0,001	24,763	24,761
35	P35	155,956	155,000	4,6602	16,810	0,244	0,105	24,765	24,660
36	P36	155,956	380,000	0,9918	3,578	0,052	0,014	24,673	24,660
37	P37	203,962	652,000	4,3065	15,534	0,132	0,095	24,768	24,673

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
38	P38	155,956	200,000	5,2113	18,798	0,273	0,169	24,660	24,491
39	P39	203,962	508,200	8,4540	30,495	0,259	0,272	24,765	24,493
40	P40	203,962	130,000	6,5837	23,749	0,202	0,043	24,493	24,450
41	P41	203,962	394,000	0,6422	2,317	0,020	0,002	24,493	24,491
42	P42	155,956	293,000	1,6375	5,907	0,086	0,027	24,673	24,647
43	P43	155,956	380,000	0,2352	0,848	0,012	0,001	24,647	24,647
44	P44	203,962	527,000	10,0781	36,354	0,309	0,397	25,045	24,647
45	P45	257,454	850,000	12,5097	45,125	0,241	0,277	25,045	24,768
53	P53	155,956	465,000	1,4069	5,075	0,074	0,032	24,647	24,615
54	P54	154,051	360,000	0,6640	2,395	0,036	0,007	24,615	24,608
55	P55	135,000	286,000	1,4474	5,221	0,101	0,039	24,647	24,608
56	P56	333,350	420,000	25,2020	90,909	0,289	0,140	25,185	25,045
57	P57	203,962	356,000	13,6091	49,091	0,417	0,484	25,185	24,701
58	P58	154,051	330,000	6,9885	25,209	0,376	0,496	24,701	24,205
59	P59	135,000	143,000	3,7215	13,424	0,261	0,117	24,100	23,983
60	P60	155,956	591,000	5,4680	19,724	0,287	0,547	24,647	24,100
61	P61	104,140	787,000	1,5403	5,556	0,181	0,510	24,608	24,098
62	P62	203,962	425,000	0,6571	2,370	0,020	0,002	24,100	24,098
71	P71	141,859	1385,000	2,3980	8,650	0,152	-0,706	24,701	25,407
73	P73	406,400	120,000	4,4147	15,925	0,034	0,001	24,491	24,491
74	P74	104,140	240,200	0,8001	2,886	0,094	0,045	24,491	24,446
75	P75	406,400	445,000	6,2704	22,619	0,048	0,004	24,450	24,446
76	P76	155,956	993,000	3,3235	11,988	0,174	-0,648	24,491	25,139
77	P77	203,962	97,500	1,2306	4,439	0,038	0,001	25,141	25,139
78	P78	203,962	1159,000	5,4072	19,505	0,166	-0,737	24,446	25,184
79	P79	406,400	139,000	2,1284	7,678	0,016	0,000	25,139	25,139
80	P80	155,956	341,000	1,7930	6,468	0,094	0,037	25,139	25,102
81	P81	203,962	308,000	0,0898	0,324	0,003	0,000	25,102	25,102
82	P82	203,962	767,000	2,6073	9,405	0,080	0,043	25,184	25,141
83	P83	104,140	302,000	0,6559	2,366	0,077	0,038	25,141	25,102
84	P84	203,962	760,000	0,8798	3,174	0,027	1,004	25,102	24,098
85	P85	155,956	283,000	2,3985	8,652	0,126	0,053	24,701	24,648
86	P86	102,260	422,000	1,9406	7,000	0,237	0,443	24,648	24,205
87	P87	155,956	394,070	4,2367	15,283	0,222	0,222	24,205	23,983
88	P88	406,400	540,000	0,8999	3,246	0,007	0,000	24,205	24,205
89	P89	135,000	94,700	6,4335	23,207	0,450	0,224	23,983	23,760
90	P90	135,000	252,000	3,6702	13,239	0,257	0,201	23,760	23,559
91	P91	102,260	340,000	2,6353	9,506	0,322	0,646	24,205	23,559
92	P92	155,956	211,000	5,7400	20,705	0,301	0,215	23,559	23,344

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
93	P93	203,962	330,000	2,5526	9,208	0,078	0,018	23,760	23,742
94	P94	101,600	395,000	1,8096	6,528	0,224	0,398	23,742	23,344
95	P95	155,956	205,000	6,9508	25,073	0,365	0,303	23,344	23,041
96	P96	104,140	703,000	1,1688	4,216	0,137	0,268	23,041	22,773
97	P97	155,956	309,000	0,0621	0,224	0,003	0,000	22,773	22,773
98	P98	104,140	1470,000	1,8917	6,824	0,223	1,418	24,191	22,773
99	P99	155,956	1170,000	3,6937	13,324	0,194	0,505	24,696	24,191
101	P101	155,956	367,000	5,5422	19,992	0,291	0,349	25,045	24,696
104	P104	155,956	672,000	5,7820	20,857	0,303	4,686	23,041	18,355
105	P105	155,956	1490,000	0,9365	3,378	0,049	0,048	24,696	24,648
106	P106	104,140	230,000	5,5444	20,000	0,652	-21,053	3,992	25,045

Вариант 2 - Гидравлический расчет системы водоснабжения при существующем уровне водопотребления с закрытием водозабора по ул. Садовая и перенос нагрузки на водозабор по ул. Промышленная


Pipe Flow Expert Results Key
f = flow in m?/hour
Color of Pipe: Velocity in m/sec
0,0035 0,1498 0,2962 0,4426 0,5890 0,7353
0,0 bar.g@ 11,0m
10,978 m.H2O
P1, f=250,000
P6, f=59,183
N2 1,0m
35,307 m.H2O
N7 1,0m
35,140 m.H2O
5,100 m?/hour
P2, f=190,817
P7, f=54,083
P3, f=46,183
P8, f=28,029
N3 1,0m
34,584 m.H2O
N8 1,0m
34,433 m.H2O
N4 1,0m
34,622 m.H2O
2,250 m?/hour
6,560 m?/hour
2,360 m?/hour
P11, f=142,384
P23, f=67,692
P23, f=23,694
P5, f=22,419
N6 1,0m
33,896 m.H2O
N5 1,0m
34,566 m.H2O
3,580 m?/hour
1,275 m?/hour
P14, f=66,491
P20, f=56,952
P24, f=31,631
N11 1,0m
34,028 m.H2O
N9 1,0m
33,335 m.H2O
N16 1,0m
33,084 m.H2O
N19 1,0m
32,819 m.H2O
3,860 m?/hour
1,280 m?/hour
2,950 m?/hour
3,160 m?/hour
P27, f=8,129
N17 1,0m
32,882 m.H2O
N20 1,0m
32,800 m.H2O
0,980 m?/hour
4,290 m?/hour
P12, f=138,524
P22, f=15,261
P26, f=32,310
P40, f=32,236
N30 1,0m
32,509 m.H2O
N29 1,0m
32,586 m.H2O
1,130 m?/hour
4,430 m?/hour
P39, f=47,641
P15, f=45,843
P16, f=44,378
P41, f=10,975
P75, f=31,108
N10 1,0m
33,237 m.H2O
N13 1,0m
32,448 m.H2O
N12 1,0m
32,437 m.H2O
P23, f=37,292
P28, f=27,630
5,790 m?/hour
11,900 m?/hour
N15 1,0m
32,713 m.H2O
N18 1,0m
32,725 m.H2O
N21 1,0m
32,748 m.H2O
P35, f=39,250
P25, f=78,321
P32, f=10,652
6,610 m?/hour
5,600 m?/hour
4,680 m?/hour
P74, f=3,203
P73, f=21,990
P38, f=16,206
P33, f=2,245
N52 1,0m
32,502 m.H2O
N51 1,0m
32,556 m.H2O
N28 1,0m
32,557 m.H2O
N24 1,0m
32,683 m.H2O
N26 1,0m
32,392 m.H2O
N22 1,0m
32,429 m.H2O
6,000 m?/hour
1,050 m?/hour
5,190 m?/hour
1,590 m?/hour
2,250 m?/hour
2,060 m?/hour
P29, f=21,455
P34, f=73,321
P31, f=10,317
P37, f=8,418
P27, f=7,141
N25 1,0m
32,269 m.H2O
N27 1,0m
32,298 m.H2O
N29 1,0m
32,329 m.H2O
6,050 m?/hour
9,870 m?/hour
3,170 m?/hour
P42, f=23,822
P45, f=62,406
P78, f=26,309
P76, f=17,737
P53, f=9,451
N38 1,0m
31,773 m.H2O
N31 1,0m
31,876 m.H2O
2,680 m?/hour
1,680 m?/hour
P54, f=6,771
P43, f=12,691
P82, f=18,209
P77, f=9,479
P79, f=18,369
P55, f=0,478
P44, f=12,679
N54 0,0m
32,963 m.H2O
N58 0,0m
32,812 m.H2O
N53 0,0m
32,807 m.H2O
N36 0,0m
32,806 m.H2O
N39 1,0m
31,727 m.H2O
N32 1,0m
31,727 m.H2O
N33 1,0m
31,779 m.H2O
10,100 m?/hour
2,600 m?/hour
3,750 m?/hour
2,060 m?/hour
10,560 m?/hour
9,430 m?/hour
P83, f=6,228
P80, f=17,159
P61, f=4,234
P60, f=15,288
P56, f=40,297
P81, f=3,538
P84, f=17,727
P62, f=10,860
N57 0,0m
32,568 m.H2O
N56 0,0m
32,565 m.H2O
N44 1,0m
31,425 m.H2O
N43 1,0m
31,394 m.H2O
N40 1,0m
31,750 m.H2O
2,690 m?/hour
2,970 m?/hour
11,100 m?/hour
3,930 m?/hour
P57, f=40,297
P58, f=18,784
P71, f=8,650
N42 1,0m
31,083 m.H2O
N41 1,0m
31,421 m.H2O
N50 0,0m
32,127 m.H2O
5,500 m?/hour
6,580 m?/hour
8,650 m?/hour
P85, f=6,366
P90, f=9,485
N62 1,0m
30,835 m.H2O
0,760 m?/hour
N65 1,0m
30,816 m.H2O
2,680 m?/hour
P86, f=5,176
N63 1,0m
30,682 m.H2O
N60 1,0m
31,391 m.H2O
2,040 m?/hour
5,030 m?/hour
P105, f=3,940
N64 1,0m
30,385 m.H2O
2,160 m?/hour
P104, f=20,857
N66 1,0m
30,070 m.H2O
N73 10,0m
20,394 m.H2O
13,400 m?/hour
N14, 10,0m
p= 20,394 m.H2O
N67 1,0m
29,743 m.H2O
4,440 m?/hour
P97, f=0,238
P98, f=6,362
P99, f=12,862
N70 1,0m
31,452 m.H2O
3,290 m?/hour
P101, f=19,992
N68 1,0m
29,743 m.H2O
N69 1,0m
30,980 m.H2O
6,600 m?/hour
6,500 m?/hour
P106, f=20,000
N71 1,0m
31,801 m.H2O
0,008 m?/hour
N74, 1,0m
0,0 bar.g@ 4,0m
3,992 m.H2O

Fluid Data

Zone	Fluid Name	Chemical Formula	Temperature °C	Pressure m.H2O	Density kg/m?	Centistokes	Centipoise	Vapour Pressure m.H2O.a	State
1	Water	H2O	20,000	0,000	998,000000	1,000000	1,002000	0,244732	Liquid

Pump Data

Pipe Id	Pipe Name	Pump Name	Speed rpm	Pref. Op From m?/hour	Pref. Op To m?/hour	Flow In/Out m?/hour	Velocity m/sec	Suction Pressure m.H2O	Discharge Pressure m.H2O	Pump Head (+) m.hd Fluid	Pump NPSHr m.hd (absolute)	Pump NPSHa m.hd (absolute)	Pump Efficiency Percentage	Pump Power Kilowatts
1	P1	Pump	Set Flow Rate			250,000	0,535	10,978	35,801	24,872	Not known	21,107	Not known	Not Known
106	P106	Pump	Set Flow Rate			20,000	0,652	3,992	33,629	29,697	Not known	14,107	Not known	Not Known

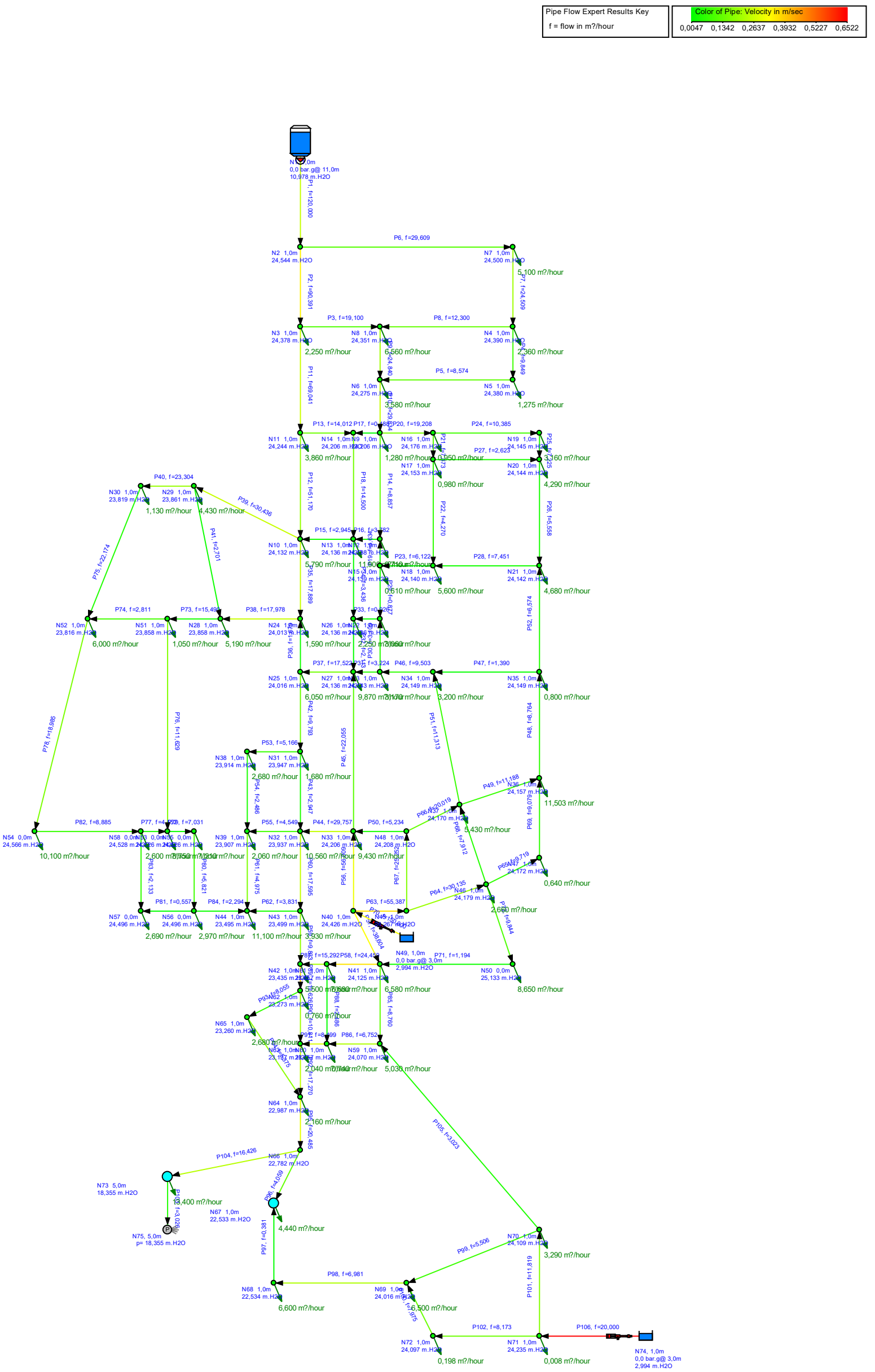
Pipe Data

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
1	P1	406,400	540,000	69,3056	250,000	0,535	-24,329	10,978	35,307
2	P2	304,800	300,000	52,8987	190,817	0,726	0,724	35,307	34,584
3	P3	252,984	385,000	12,8028	46,183	0,255	0,151	34,584	34,433
4	P4	203,962	170,000	6,5685	23,694	0,201	0,056	34,622	34,566
5	P5	155,956	564,000	6,2151	22,419	0,326	0,671	34,566	33,896
6	P6	303,784	680,000	16,4069	59,183	0,227	0,167	35,307	35,140
7	P7	203,962	315,000	14,9931	54,083	0,460	0,518	35,140	34,622
8	P8	181,000	253,500	7,7703	28,029	0,303	0,189	34,622	34,433
9	P9	203,962	210,000	18,7546	67,652	0,575	0,537	34,433	33,896
10	P10	203,962	135,000	23,9772	86,491	0,735	0,561	33,896	33,335
11	P11	303,784	404,000	39,4721	142,384	0,546	0,556	34,584	34,028
12	P12	303,784	606,000	38,4020	138,524	0,531	0,790	34,028	33,237
14	P14	155,956	346,000	7,8340	28,259	0,411	0,648	33,335	32,687
15	P15	203,962	665,000	12,7087	45,843	0,390	0,790	33,237	32,448
16	P16	203,962	215,000	12,3027	44,378	0,377	0,240	32,687	32,448
18	P18	155,956	1,000	2,0672	7,457	0,108	0,000	20,394	20,394
19	P19	203,962	66,900	7,1605	25,829	0,220	0,026	32,713	32,687
20	P20	203,962	138,000	15,7883	56,952	0,484	0,251	33,335	33,084
21	P21	155,956	144,000	6,7561	24,371	0,354	0,202	33,084	32,882
22	P22	155,956	279,000	4,2308	15,261	0,222	0,157	32,882	32,725
23	P23	406,400	540,000	10,3381	37,292	0,080	0,012	32,725	32,713
24	P24	203,962	460,000	8,7688	31,631	0,269	0,264	33,084	32,819
25	P25	254,508	135,000	7,8928	28,471	0,155	0,019	32,819	32,800
26	P26	254,508	290,000	8,9572	32,310	0,176	0,053	32,800	32,748
27	P27	155,956	490,000	2,2536	8,129	0,118	0,082	32,882	32,800
28	P28	303,784	392,000	7,6598	27,630	0,106	0,022	32,748	32,725
29	P29	102,260	132,000	3,0085	10,852	0,367	0,325	32,713	32,388
30	P30	141,859	205,000	2,8600	10,317	0,181	0,059	32,388	32,329
31	P31	141,859	205,000	1,9812	7,147	0,126	0,031	32,329	32,298
32	P32	303,784	250,000	20,3889	73,547	0,282	0,094	32,392	32,298
33	P33	155,956	214,000	0,6998	2,524	0,037	0,004	32,392	32,388
34	P34	303,784	130,000	21,7124	78,321	0,300	0,055	32,448	32,392
35	P35	155,956	155,000	10,8811	39,250	0,571	0,554	33,237	32,683
36	P36	155,956	380,000	5,9477	21,455	0,312	0,415	32,683	32,269
37	P37	203,962	652,000	2,3336	8,418	0,072	0,030	32,298	32,269
38	P38	155,956	200,000	4,4926	16,206	0,236	0,126	32,683	32,557

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
39	P39	203,962	508,200	13,2071	47,641	0,405	0,651	33,237	32,586
40	P40	203,962	130,000	8,9366	32,236	0,274	0,077	32,586	32,509
41	P41	203,962	394,000	3,0424	10,975	0,093	0,030	32,586	32,557
42	P42	155,956	293,000	6,6041	23,822	0,346	0,392	32,269	31,876
43	P43	155,956	380,000	3,5183	12,691	0,185	0,149	31,876	31,727
44	P44	203,962	527,000	3,5148	12,679	0,108	0,052	31,779	31,727
45	P45	257,454	850,000	17,3003	62,406	0,333	0,519	32,298	31,779
53	P53	155,956	465,000	2,6201	9,451	0,137	0,104	31,876	31,773
54	P54	154,051	360,000	1,8771	6,771	0,101	0,045	31,773	31,727
55	P55	135,000	286,000	0,1324	0,478	0,009	0,000	31,727	31,727
56	P56	333,350	420,000	11,1713	40,297	0,128	0,029	31,779	31,750
57	P57	203,962	356,000	11,1713	40,297	0,343	0,328	31,750	31,421
58	P58	154,051	330,000	5,1844	18,701	0,279	0,277	31,421	31,144
59	P59	135,000	143,000	6,1593	22,218	0,431	0,310	31,394	31,083
60	P60	155,956	591,000	4,2381	15,288	0,222	0,333	31,727	31,394
61	P61	104,140	787,000	1,1737	4,234	0,138	0,302	31,727	31,425
62	P62	203,962	425,000	3,0107	10,860	0,092	0,031	31,425	31,394
71	P71	141,859	1385,000	2,3980	8,650	0,152	-0,706	31,421	32,127
73	P73	406,400	120,000	6,0962	21,990	0,047	0,001	32,557	32,556
74	P74	104,140	240,200	0,8879	3,203	0,104	0,054	32,556	32,502
75	P75	406,400	445,000	8,6234	31,106	0,067	0,007	32,509	32,502
76	P76	155,956	993,000	4,9172	17,737	0,258	-0,251	32,556	32,807
77	P77	203,962	97,500	2,6007	9,381	0,080	0,005	32,812	32,807
78	P78	203,962	1159,000	7,8479	28,309	0,241	-0,462	32,502	32,963
79	P79	406,400	139,000	5,0922	18,369	0,039	0,001	32,807	32,806
80	P80	155,956	341,000	4,7568	17,159	0,250	0,241	32,806	32,565
81	P81	203,962	308,000	0,9808	3,538	0,030	0,003	32,568	32,565
82	P82	203,962	767,000	5,0480	18,209	0,155	0,151	32,963	32,812
83	P83	104,140	302,000	1,7265	6,228	0,203	0,244	32,812	32,568
84	P84	203,962	760,000	4,9142	17,727	0,151	1,140	32,565	31,425
85	P85	155,956	283,000	1,7648	6,366	0,093	0,030	31,421	31,391
86	P86	102,260	422,000	1,4350	5,176	0,175	0,248	31,391	31,144
87	P87	155,956	394,070	2,1580	7,784	0,113	0,061	31,144	31,083
88	P88	406,400	540,000	1,1745	4,237	0,009	0,000	31,144	31,144
89	P89	135,000	94,700	6,7926	24,502	0,475	0,249	31,083	30,835
90	P90	135,000	252,000	3,9523	14,257	0,277	0,231	30,835	30,603
91	P91	102,260	340,000	2,4044	8,673	0,293	0,541	31,144	30,603
92	P92	155,956	211,000	5,7912	20,890	0,304	0,218	30,603	30,385
93	P93	203,962	330,000	2,6295	9,485	0,081	0,019	30,835	30,816

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
94	P94	101,600	395,000	1,8866	6,805	0,233	0,431	30,816	30,385
95	P95	155,956	205,000	7,0790	25,535	0,371	0,315	30,385	30,070
96	P96	104,140	703,000	1,2970	4,678	0,153	0,327	30,070	29,743
97	P97	155,956	309,000	0,0661	0,238	0,003	0,000	29,743	29,743
98	P98	104,140	1470,000	1,7636	6,362	0,207	1,237	30,980	29,743
99	P99	155,956	1170,000	3,5655	12,862	0,187	0,472	31,452	30,980
101	P101	155,956	367,000	5,5422	19,992	0,291	0,349	31,801	31,452
104	P104	155,956	672,000	5,7820	20,857	0,303	9,676	30,070	20,394
105	P105	155,956	1490,000	1,0646	3,840	0,056	0,061	31,452	31,391
106	P106	104,140	230,000	5,5444	20,000	0,652	-27,809	3,992	31,801

Вариант 3 – Гидравлический расчет системы водоснабжения при перспективном уровне водопотребления (на 2030 год)


Pipe Flow Expert Results Key
f = flow in m?/hour
Color of Pipe: Velocity in m/sec
0,0047 0,1342 0,2637 0,3932 0,5227 0,6522
N1 0,0m
0,0 bar.g@ 11,0m
10,978 m.H2O
P1, f=120,000
N2 1,0m
24,544 m.H2O
P6, f=29,609
N7 1,0m
24,500 m.H2O
5,100 m?/hour
P2, f=90,391
P7, f=24,509
P3, f=19,100
P8, f=12,300
N3 1,0m
24,378 m.H2O
2,250 m?/hour
N8 1,0m
24,351 m.H2O
6,560 m?/hour
N4 1,0m
24,390 m.H2O
2,360 m?/hour
P11, f=69,041
P5, f=8,574
N6 1,0m
24,275 m.H2O
3,580 m?/hour
N5 1,0m
24,380 m.H2O
1,275 m?/hour
P13, f=14,012
P17, f=0,885
P20, f=19,208
P24, f=10,385
N11 1,0m
24,244 m.H2O
3,860 m?/hour
N14 1,0m
24,206 m.H2O
N9 1,0m
24,206 m.H2O
1,280 m?/hour
N16 1,0m
24,176 m.H2O
0,350 m?/hour
P27, f=2,623
N19 1,0m
24,145 m.H2O
3,160 m?/hour
N17 1,0m
24,153 m.H2O
0,980 m?/hour
N20 1,0m
24,144 m.H2O
4,290 m?/hour
P40, f=23,304
N30 1,0m
23,819 m.H2O
N29 1,0m
23,861 m.H2O
1,130 m?/hour
4,430 m?/hour
P39, f=30,436
P12, f=51,170
P18, f=14,500
P14, f=8,857
P22, f=4,270
P26, f=5,558
P41, f=2,701
P15, f=2,945
P16, f=3,782
N10 1,0m
24,132 m.H2O
5,790 m?/hour
N13 1,0m
24,136 m.H2O
N12 1,0m
24,138 m.H2O
11,190 m?/hour
P23, f=6,122
P28, f=7,451
P75, f=22,174
P35, f=17,889
N15 1,0m
24,139 m.H2O
N18 1,0m
24,140 m.H2O
0,610 m?/hour
5,600 m?/hour
N21 1,0m
24,142 m.H2O
4,680 m?/hour
P74, f=2,811
P73, f=15,494
P38, f=17,978
P33, f=0,827
P52, f=6,574
N52 1,0m
23,816 m.H2O
6,000 m?/hour
N51 1,0m
23,858 m.H2O
N28 1,0m
23,858 m.H2O
1,050 m?/hour
5,190 m?/hour
N24 1,0m
24,013 m.H2O
N26 1,0m
24,136 m.H2O
N22 1,0m
24,136 m.H2O
1,590 m?/hour
2,250 m?/hour
P36, f=17,523
P37, f=17,523
P43, f=3,224
P46, f=9,503
P47, f=1,390
N25 1,0m
24,016 m.H2O
6,050 m?/hour
N27 1,0m
24,136 m.H2O
N23 1,0m
24,143 m.H2O
9,870 m?/hour
N34 1,0m
24,149 m.H2O
3,200 m?/hour
N35 1,0m
24,149 m.H2O
0,800 m?/hour
P78, f=19,895
P76, f=11,629
P42, f=9,739
P45, f=22,055
P51, f=11,313
P48, f=6,764
P53, f=5,166
N38 1,0m
23,914 m.H2O
N31 1,0m
23,947 m.H2O
2,680 m?/hour
1,680 m?/hour
P54, f=2,486
P43, f=2,947
P49, f=11,188
N36 1,0m
24,157 m.H2O
11,503 m?/hour
P66, f=20,019
N37 1,0m
24,170 m.H2O
P68, f=7,912
P69, f=9,079
5,430 m?/hour
P82, f=8,885
P77, f=4,572
P78, f=7,031
P55, f=4,549
P44, f=29,757
P50, f=5,234
N54 0,0m
24,566 m.H2O
10,100 m?/hour
N58 0,0m
24,528 m.H2O
N53 0,0m
24,526 m.H2O
N55 0,0m
24,526 m.H2O
2,600 m?/hour
3,750 m?/hour
2,210 m?/hour
N39 1,0m
23,907 m.H2O
N32 1,0m
23,937 m.H2O
N33 1,0m
24,206 m.H2O
N48 1,0m
24,208 m.H2O
2,060 m?/hour
10,560 m?/hour
9,430 m?/hour
P83, f=2,133
P80, f=5,821
P61, f=4,975
P60, f=17,595
P56, f=5,055
P67, f=2,055
P66, f=9,719
N47 1,0m
24,172 m.H2O
0,640 m?/hour
P64, f=30,135
N46 1,0m
24,179 m.H2O
2,660 m?/hour
P81, f=0,557
P84, f=2,294
P62, f=3,831
P63, f=55,387
N57 0,0m
24,496 m.H2O
N56 0,0m
24,496 m.H2O
N44 1,0m
23,495 m.H2O
N43 1,0m
23,499 m.H2O
N40 1,0m
24,426 m.H2O
N45 1,0m
24,267 m.H2O
2,690 m?/hour
2,970 m?/hour
11,100 m?/hour
3,930 m?/hour
P59, f=9,984
P58, f=15,292
P58, f=24,459
P49, f=0,000
P71, f=1,194
N49, 1,0m
0,0 bar.g@ 3,0m
2,994 m.H2O
N42 1,0m
23,435 m.H2O
N41 1,0m
24,125 m.H2O
N50 0,0m
25,133 m.H2O
5,500 m?/hour
6,580 m?/hour
8,650 m?/hour
P85, f=8,760
P88, f=8,086
P86, f=6,752
N62 1,0m
23,273 m.H2O
0,760 m?/hour
N65 1,0m
23,260 m.H2O
2,680 m?/hour
N63 1,0m
23,147 m.H2O
N60 1,0m
23,147 m.H2O
N61 1,0m
24,070 m.H2O
2,040 m?/hour
0,760 m?/hour
5,030 m?/hour
P87, f=17,270
N64 1,0m
22,987 m.H2O
2,160 m?/hour
P105, f=3,023
P104, f=16,426
N66 1,0m
22,782 m.H2O
N73 5,0m
18,355 m.H2O
P103, f=1,026
13,400 m?/hour
N67 1,0m
22,533 m.H2O
P96, f=4,059
4,440 m?/hour
N75, 5,0m
p= 18,355 m.H2O
P97, f=0,381
P99, f=5,506
N70 1,0m
24,109 m.H2O
3,290 m?/hour
P98, f=6,981
P101, f=11,819
N68 1,0m
22,534 m.H2O
6,600 m?/hour
N69 1,0m
24,016 m.H2O
P100, f=0,975
6,500 m?/hour
P102, f=8,173
P106, f=20,000
N72 1,0m
24,097 m.H2O
0,198 m?/hour
N71 1,0m
24,235 m.H2O
0,008 m?/hour
N74, 1,0m
0,0 bar.g@ 3,0m
2,994 m.H2O

Fluid Data

Zone	Fluid Name	Chemical Formula	Temperature °C	Pressure m.H2O	Density kg/m?	Centistokes	Centipoise	Vapour Pressure m.H2O.a	State
1	Water	H2O	20,000	0,000	998,000000	1,000000	1,002000	0,244732	Liquid

Pump Data

Pipe Id	Pipe Name	Pump Name	Speed rpm	Pref. Op From m?/hour	Pref. Op To m?/hour	Flow In/Out m?/hour	Velocity m/sec	Suction Pressure m.H2O	Discharge Pressure m.H2O	Pump Head (+) m.hd Fluid	Pump NPSHr m.hd (absolute)	Pump NPSHa m.hd (absolute)	Pump Efficiency Percentage	Pump Power Kilowatts
1	P1	Pump	Set Flow Rate			120,000	0,257	10,978	24,661	13,711	Not known	21,107	Not known	Not Known
70	P70	Pump	Set Flow Rate			150,000	0,321	2,994	24,467	21,516	Not known	13,107	Not known	Not Known
106	P106	Pump	Set Flow Rate			20,000	0,652	2,994	26,063	23,115	Not known	13,107	Not known	Not Known

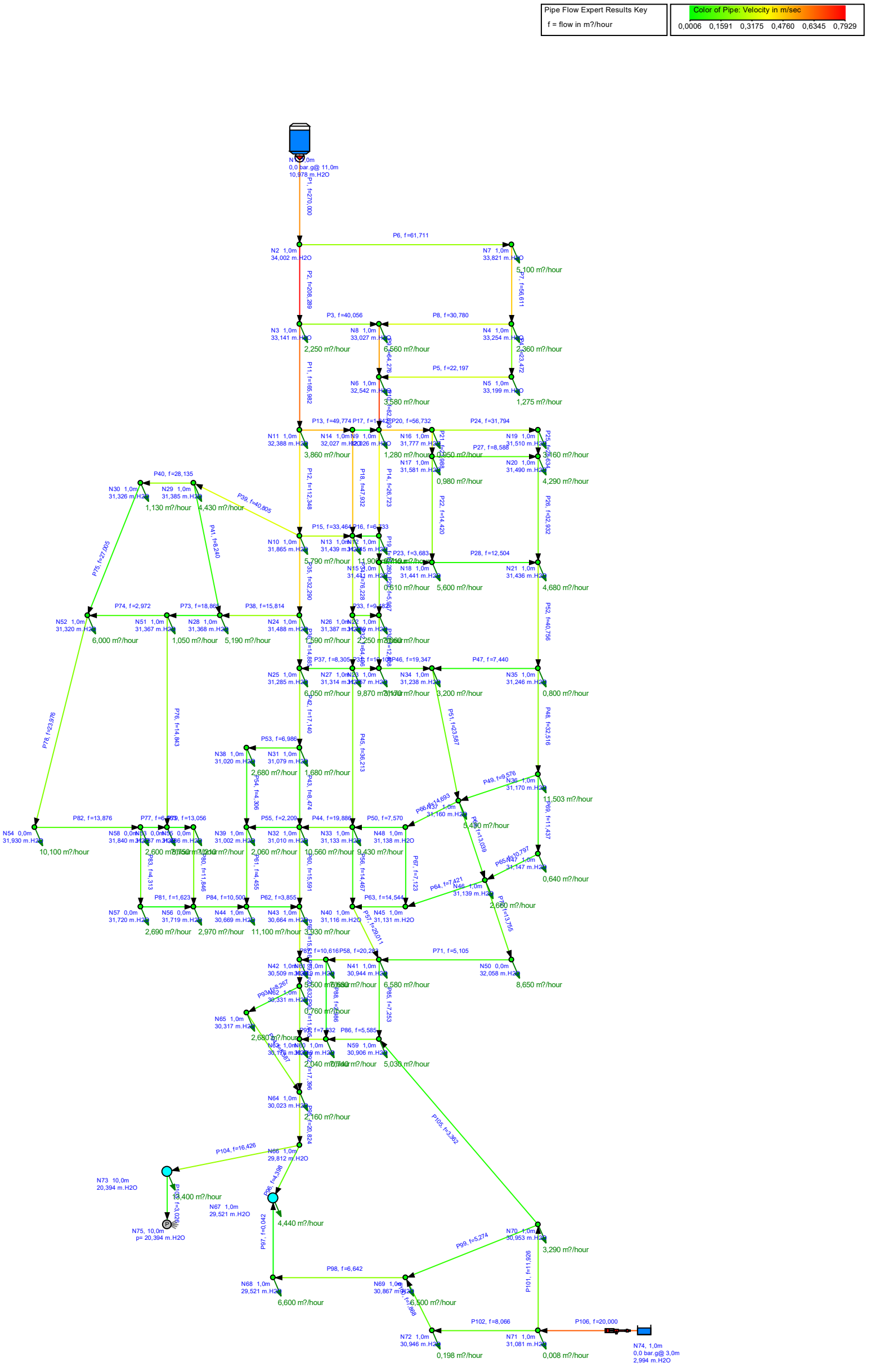
Pipe Data

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
1	P1	406,400	540,000	33,2667	120,000	0,257	-13,566	10,978	24,544
2	P2	304,800	300,000	25,0585	90,391	0,344	0,166	24,544	24,378
3	P3	252,984	385,000	5,2949	19,100	0,106	0,028	24,378	24,351
4	P4	203,962	170,000	2,7304	9,849	0,084	0,010	24,390	24,380
5	P5	155,956	564,000	2,3769	8,574	0,125	0,104	24,380	24,275
6	P6	303,784	680,000	8,2082	29,609	0,113	0,044	24,544	24,500
7	P7	203,962	315,000	6,7943	24,509	0,208	0,110	24,500	24,390
8	P8	181,000	253,500	3,4097	12,300	0,133	0,039	24,390	24,351
9	P9	203,962	210,000	6,8861	24,840	0,211	0,075	24,351	24,275
10	P10	203,962	135,000	8,2705	29,834	0,254	0,069	24,275	24,206
11	P11	303,784	404,000	19,1398	69,041	0,265	0,134	24,378	24,244
12	P12	303,784	606,000	14,1853	51,170	0,196	0,113	24,244	24,132
13	P13	184,683	270,000	3,8844	14,012	0,145	0,038	24,244	24,206
14	P14	155,956	346,000	2,4554	8,857	0,129	0,068	24,206	24,138
15	P15	203,962	665,000	0,8164	2,945	0,025	0,004	24,136	24,132
16	P16	203,962	215,000	1,0483	3,782	0,032	0,002	24,138	24,136
17	P17	184,683	270,000	0,1353	0,488	0,005	0,000	24,206	24,206
18	P18	184,683	470,000	4,0197	14,500	0,150	0,070	24,206	24,136
19	P19	203,962	66,900	1,2847	4,634	0,039	0,001	24,139	24,138
20	P20	203,962	138,000	5,3249	19,208	0,163	0,030	24,206	24,176
21	P21	155,956	144,000	2,1826	7,873	0,114	0,023	24,176	24,153
22	P22	155,956	279,000	1,1838	4,270	0,062	0,014	24,153	24,140
23	P23	406,400	540,000	1,6971	6,122	0,013	0,000	24,140	24,139
24	P24	203,962	460,000	2,8789	10,385	0,088	0,031	24,176	24,145
25	P25	254,508	135,000	2,0029	7,225	0,039	0,001	24,145	24,144
26	P26	254,508	290,000	1,5408	5,558	0,030	0,002	24,144	24,142
27	P27	155,956	490,000	0,7272	2,623	0,038	0,010	24,153	24,144
28	P28	303,784	392,000	2,0657	7,451	0,029	0,002	24,142	24,140
29	P29	102,260	132,000	0,2432	0,877	0,030	0,003	24,139	24,136
30	P30	141,859	205,000	0,8619	3,109	0,055	0,007	24,143	24,136
31	P31	141,859	205,000	0,8938	3,224	0,057	0,008	24,143	24,136
32	P32	303,784	250,000	0,5857	2,113	0,008	0,000	24,136	24,136
33	P33	155,956	214,000	0,2568	0,926	0,013	0,000	24,136	24,136
34	P34	303,784	130,000	0,9527	3,436	0,013	0,000	24,136	24,136
35	P35	155,956	155,000	4,9593	17,889	0,260	0,119	24,132	24,013
36	P36	155,956	380,000	0,4655	1,679	0,024	0,003	24,016	24,013

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
37	P37	203,962	652,000	4,8574	17,522	0,149	0,119	24,136	24,016
38	P38	155,956	200,000	4,9840	17,978	0,261	0,154	24,013	23,858
39	P39	203,962	508,200	8,4374	30,436	0,259	0,271	24,132	23,861
40	P40	203,962	130,000	6,4605	23,304	0,198	0,041	23,861	23,819
41	P41	203,962	394,000	0,7489	2,701	0,023	0,002	23,861	23,858
42	P42	155,956	293,000	2,7147	9,793	0,142	0,070	24,016	23,947
43	P43	155,956	380,000	0,8170	2,947	0,043	0,010	23,947	23,937
44	P44	203,962	527,000	8,2493	29,757	0,253	0,269	24,206	23,937
45	P45	257,454	850,000	6,1142	22,055	0,118	0,070	24,206	24,136
46	P46	230,175	220,000	2,6344	9,503	0,063	0,005	24,149	24,143
47	P47	230,175	524,000	0,3853	1,390	0,009	0,000	24,149	24,149
48	P48	230,175	350,000	2,4294	8,764	0,059	0,008	24,157	24,149
49	P49	230,175	408,000	3,1014	11,188	0,075	0,014	24,170	24,157
50	P50	230,175	276,000	1,4509	5,234	0,035	0,002	24,208	24,206
51	P51	230,175	633,000	3,1362	11,313	0,076	0,021	24,170	24,149
52	P52	230,175	581,000	1,8223	6,574	0,044	0,008	24,149	24,142
53	P53	155,956	465,000	1,4320	5,166	0,075	0,033	23,947	23,914
54	P54	154,051	360,000	0,6891	2,486	0,037	0,007	23,914	23,907
55	P55	135,000	286,000	1,2612	4,549	0,088	0,030	23,937	23,907
56	P56	254,508	420,000	15,5268	56,009	0,306	0,221	24,426	24,206
57	P57	203,962	356,000	10,7019	38,604	0,328	0,302	24,426	24,125
58	P58	154,051	330,000	6,7805	24,459	0,365	0,467	24,125	23,657
59	P59	135,000	143,000	2,7261	9,833	0,191	0,064	23,499	23,435
60	P60	155,956	591,000	4,8777	17,595	0,256	0,438	23,937	23,499
61	P61	104,140	787,000	1,3791	4,975	0,162	0,412	23,907	23,495
62	P62	203,962	425,000	1,0621	3,831	0,033	0,005	23,499	23,495
63	P63	230,175	283,000	15,3546	55,387	0,370	0,160	24,426	24,267
64	P64	230,175	460,000	8,3541	30,135	0,201	0,088	24,267	24,179
65	P65	230,175	280,000	2,6943	9,719	0,065	0,007	24,179	24,172
66	P66	230,175	410,000	5,5497	20,019	0,134	0,038	24,208	24,170
67	P67	230,175	420,000	7,0005	25,252	0,169	0,059	24,267	24,208
68	P68	230,175	480,000	2,1932	7,912	0,053	0,009	24,179	24,170
69	P69	230,175	650,000	2,5169	9,079	0,061	0,015	24,172	24,157
70	P70	406,400	121,000	41,5833	150,000	0,321	-21,432	2,994	24,426
71	P71	141,859	1385,000	0,3311	1,194	0,021	1,009	25,133	24,125
72	P72	184,683	580,000	2,7291	9,844	0,102	-0,954	24,179	25,133
73	P73	406,400	120,000	4,2941	15,490	0,033	0,001	23,858	23,858
74	P74	104,140	240,200	0,7791	2,811	0,092	0,042	23,858	23,816
75	P75	406,400	445,000	6,1472	22,174	0,047	0,004	23,819	23,816

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
76	P76	155,956	993,000	3,2238	11,629	0,169	-0,668	23,858	24,526
77	P77	203,962	97,500	1,1510	4,152	0,035	0,001	24,528	24,526
78	P78	203,962	1159,000	5,2630	18,985	0,161	-0,751	23,816	24,566
79	P79	406,400	139,000	1,9491	7,031	0,015	0,000	24,526	24,526
80	P80	155,956	341,000	1,6137	5,821	0,085	0,030	24,526	24,496
81	P81	203,962	308,000	0,1545	0,557	0,005	0,000	24,496	24,496
82	P82	203,962	767,000	2,4631	8,885	0,076	0,039	24,566	24,528
83	P83	104,140	302,000	0,5913	2,133	0,070	0,032	24,528	24,496
84	P84	203,962	760,000	0,6359	2,294	0,020	1,001	24,496	23,495
85	P85	155,956	283,000	2,4284	8,760	0,127	0,055	24,125	24,070
86	P86	102,260	422,000	1,8719	6,752	0,228	0,413	24,070	23,657
87	P87	155,956	394,070	4,2394	15,292	0,222	0,222	23,657	23,435
88	P88	406,400	540,000	0,6893	2,486	0,005	0,000	23,657	23,657
89	P89	135,000	94,700	5,4407	19,626	0,381	0,161	23,435	23,273
90	P90	135,000	252,000	2,9971	10,811	0,210	0,136	23,273	23,137
91	P91	102,260	340,000	2,3560	8,499	0,287	0,520	23,657	23,137
92	P92	155,956	211,000	4,7875	17,270	0,251	0,151	23,137	22,987
93	P93	203,962	330,000	2,2330	8,055	0,068	0,014	23,273	23,260
94	P94	101,600	395,000	1,4900	5,375	0,184	0,273	23,260	22,987
95	P95	155,956	205,000	5,6788	20,485	0,298	0,204	22,987	22,782
96	P96	104,140	703,000	1,1251	4,059	0,132	0,249	22,782	22,533
97	P97	155,956	309,000	0,1057	0,381	0,006	0,000	22,534	22,533
98	P98	104,140	1470,000	1,9354	6,981	0,228	1,482	24,016	22,534
99	P99	155,956	1170,000	1,5265	5,506	0,080	0,093	24,109	24,016
100	P100	141,859	445,000	2,2108	7,975	0,140	0,081	24,097	24,016
101	P101	155,956	367,000	3,2765	11,819	0,172	0,126	24,235	24,109
102	P102	141,859	720,000	2,2657	8,173	0,144	0,138	24,235	24,097
103	P103	155,956	1,000	0,8389	3,026	0,044	0,000	18,355	18,355
104	P104	155,956	672,000	4,5537	16,426	0,239	4,427	22,782	18,355
105	P105	155,956	1490,000	0,8379	3,023	0,044	0,039	24,109	24,070
106	P106	104,140	230,000	5,5444	20,000	0,652	-21,241	2,994	24,235

Вариант 4 - Гидравлический расчет системы водоснабжения при перспективном уровне водопотребления (на 2030 год) с закрытием водозабора по ул. Садовая и перенос нагрузки на водозабор по ул. Промышленная


Pipe Flow Expert Results Key
f = flow in m?/hour
Color of Pipe: Velocity in m/sec
0,0006 0,1591 0,3175 0,4760 0,6345 0,7929
0,0 bar.g@ 11,0m
10,978 m.H2O
P1, f=270,000
P6, f=61,711
N2 1,0m
34,002 m.H2O
N7 1,0m
33,821 m.H2O
5,100 m?/hour
P2, f=208,289
P7, f=56,611
P3, f=40,056
P8, f=30,780
N3 1,0m
33,141 m.H2O
N8 1,0m
33,027 m.H2O
N4 1,0m
33,254 m.H2O
2,250 m?/hour
6,560 m?/hour
2,360 m?/hour
P11, f=165,982
P5, f=22,197
N6 1,0m
32,542 m.H2O
N5 1,0m
33,199 m.H2O
3,580 m?/hour
1,275 m?/hour
P13, f=49,774
P20, f=56,732
P24, f=31,794
N11 1,0m
32,388 m.H2O
N14 1,0m
32,027 m.H2O
N16 1,0m
31,777 m.H2O
N19 1,0m
31,510 m.H2O
3,860 m?/hour
1,280 m?/hour
2,950 m?/hour
3,160 m?/hour
P27, f=8,588
N17 1,0m
31,581 m.H2O
N20 1,0m
31,490 m.H2O
0,980 m?/hour
4,290 m?/hour
P40, f=28,135
P12, f=112,348
P18, f=47,932
P14, f=26,723
P22, f=14,420
P26, f=32,932
N30 1,0m
31,326 m.H2O
N29 1,0m
31,385 m.H2O
P39, f=40,805
1,130 m?/hour
4,430 m?/hour
P15, f=33,464
P16, f=6,733
P41, f=8,240
P75, f=27,005
N10 1,0m
31,865 m.H2O
N13 1,0m
31,439 m.H2O
P19, f=5,827
P23, f=3,683
P28, f=12,504
5,790 m?/hour
11,900 m?/hour
0,610 m?/hour
5,600 m?/hour
4,680 m?/hour
P35, f=32,290
P74, f=2,972
P73, f=18,865
P38, f=15,814
P33, f=9,827
P92, f=40,756
N52 1,0m
31,320 m.H2O
N51 1,0m
31,367 m.H2O
N28 1,0m
31,368 m.H2O
N24 1,0m
31,488 m.H2O
N26 1,0m
31,387 m.H2O
6,000 m?/hour
1,050 m?/hour
5,190 m?/hour
1,590 m?/hour
2,250 m?/hour
P37, f=8,305
P46, f=19,347
P47, f=7,440
P42, f=17,140
P45, f=36,213
P51, f=23,587
P48, f=32,516
N25 1,0m
31,285 m.H2O
N27 1,0m
31,314 m.H2O
N34 1,0m
31,238 m.H2O
N35 1,0m
31,246 m.H2O
6,050 m?/hour
9,870 m?/hour
3,200 m?/hour
0,800 m?/hour
P53, f=6,986
P78, f=23,678
P76, f=14,843
N38 1,0m
31,020 m.H2O
N31 1,0m
31,079 m.H2O
2,680 m?/hour
1,680 m?/hour
P49, f=9,576
N36 1,0m
31,170 m.H2O
11,503 m?/hour
P54, f=4,306
P43, f=8,474
P66, f=14,693
P69, f=11,437
N37 1,0m
31,160 m.H2O
5,490 m?/hour
P82, f=13,876
P77, f=6,679
P79, f=13,056
P55, f=2,209
P44, f=19,886
P50, f=7,570
P52, f=3,039
N54 0,0m
31,930 m.H2O
N58 0,0m
31,840 m.H2O
N53 0,0m
31,837 m.H2O
N36 0,0m
31,836 m.H2O
N39 1,0m
31,002 m.H2O
N32 1,0m
31,010 m.H2O
N33 1,0m
31,133 m.H2O
N48 1,0m
31,138 m.H2O
10,100 m?/hour
2,600 m?/hour
3,750 m?/hour
2,060 m?/hour
10,560 m?/hour
9,430 m?/hour
P83, f=4,313
P80, f=11,846
P61, f=4,455
P60, f=15,591
P56, f=14,467
P67, f=7,123
P65, f=10,797
N47 1,0m
31,147 m.H2O
0,640 m?/hour
P64, f=7,421
N46 1,0m
31,139 m.H2O
P81, f=1,623
P84, f=10,501
P62, f=3,855
P63, f=14,544
P70, f=13,755
N57 0,0m
31,720 m.H2O
N56 0,0m
31,719 m.H2O
N44 1,0m
30,669 m.H2O
N43 1,0m
30,664 m.H2O
N40 1,0m
31,116 m.H2O
N45 1,0m
31,131 m.H2O
2,660 m?/hour
2,690 m?/hour
2,970 m?/hour
11,100 m?/hour
3,930 m?/hour
P57, f=20,011
P59, f=15,591
P58, f=20,233
P71, f=5,105
N42 1,0m
30,509 m.H2O
N41 1,0m
30,944 m.H2O
N50 0,0m
32,058 m.H2O
5,500 m?/hour
6,580 m?/hour
8,650 m?/hour
P90, f=8,267
N62 1,0m
30,331 m.H2O
0,760 m?/hour
P85, f=7,253
N65 1,0m
30,317 m.H2O
2,680 m?/hour
P91, f=7,332
P86, f=5,585
N63 1,0m
30,178 m.H2O
N60 1,0m
30,919 m.H2O
N59 1,0m
30,906 m.H2O
2,040 m?/hour
0,740 m?/hour
5,030 m?/hour
P95, f=17,386
N64 1,0m
30,023 m.H2O
2,160 m?/hour
P94, f=20,824
P105, f=3,362
P104, f=16,426
N66 1,0m
29,812 m.H2O
P96, f=4,396
N73 10,0m
20,394 m.H2O
3,400 m?/hour
P103, f=3,029
N67 1,0m
29,521 m.H2O
N75, 10,0m
p= 20,394 m.H2O
4,440 m?/hour
P97, f=0,042
P99, f=5,274
N70 1,0m
30,953 m.H2O
3,290 m?/hour
P101, f=11,926
P98, f=6,642
N68 1,0m
29,521 m.H2O
N69 1,0m
30,867 m.H2O
P100, f=6,868
6,600 m?/hour
6,500 m?/hour
P102, f=8,066
P106, f=20,000
N72 1,0m
30,946 m.H2O
N71 1,0m
31,081 m.H2O
N74, 1,0m
0,0 bar.g@ 3,0m
2,994 m.H2O
0,198 m?/hour
0,008 m?/hour

Fluid Data

Zone	Fluid Name	Chemical Formula	Temperature °C	Pressure m.H2O	Density kg/m?	Centistokes	Centipoise	Vapour Pressure m.H2O.a	State
1	Water	H2O	20,000	0,000	998,000000	1,000000	1,002000	0,244732	Liquid

Pump Data

Pipe Id	Pipe Name	Pump Name	Speed rpm	Pref. Op From m?/hour	Pref. Op To m?/hour	Flow In/Out m?/hour	Velocity m/sec	Suction Pressure m.H2O	Discharge Pressure m.H2O	Pump Head (+) m.hd Fluid	Pump NPSHr m.hd (absolute)	Pump NPSHa m.hd (absolute)	Pump Efficiency Percentage	Pump Power Kilowatts
1	P1	Pump	Set Flow Rate			270,000	0,578	10,978	34,576	23,646	Not known	21,107	Not known	Not Known
106	P106	Pump	Set Flow Rate			20,000	0,652	2,994	32,909	29,975	Not known	13,107	Not known	Not Known

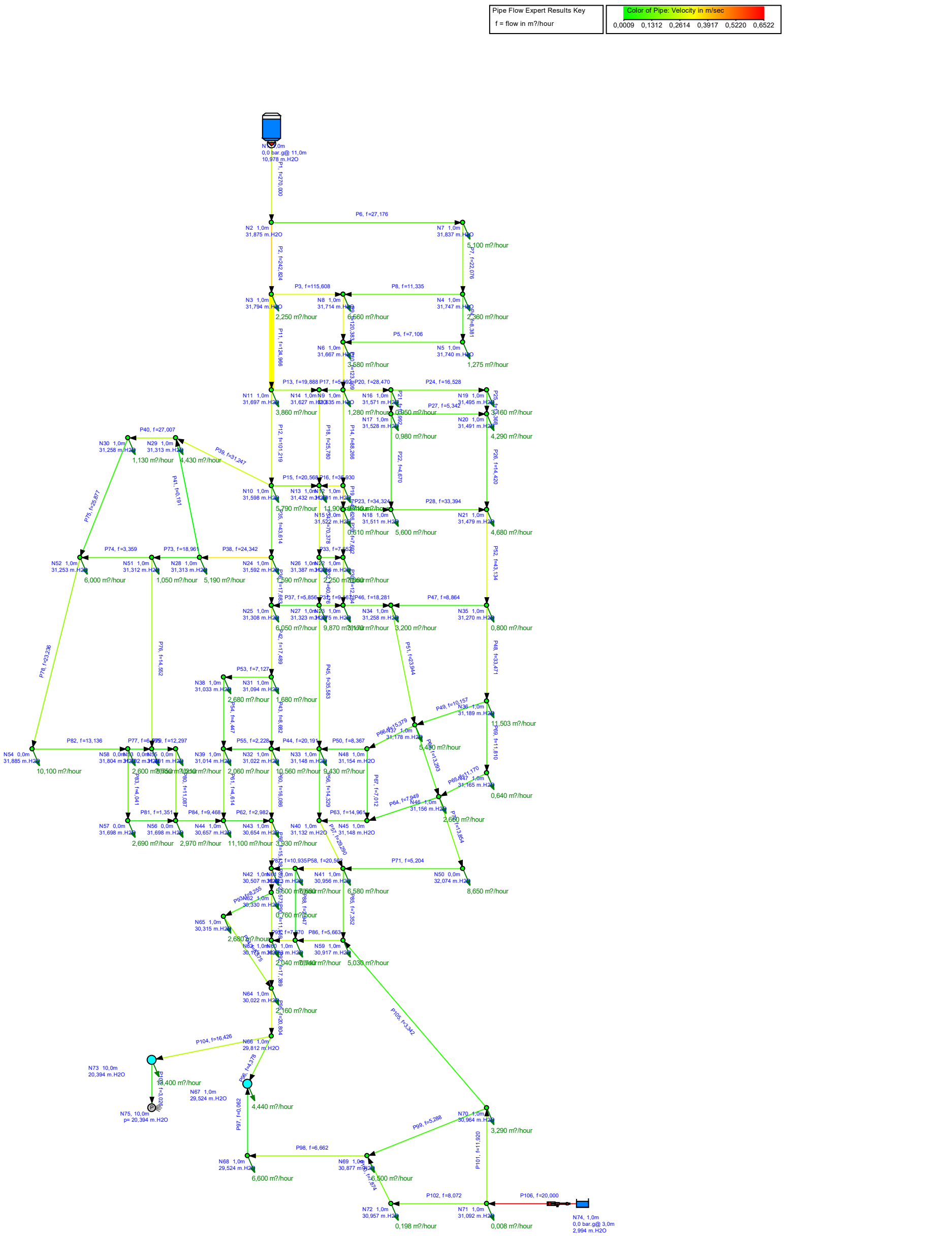
Pipe Data

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
1	P1	406,400	540,000	74,8500	270,000	0,578	-23,024	10,978	34,002
2	P2	304,800	300,000	57,7422	208,289	0,793	0,861	34,002	33,141
3	P3	252,984	385,000	11,1045	40,056	0,221	0,114	33,141	33,027
4	P4	203,962	170,000	6,5069	23,472	0,200	0,055	33,254	33,199
5	P5	155,956	564,000	6,1535	22,197	0,323	0,658	33,199	32,542
6	P6	303,784	680,000	17,1078	61,711	0,237	0,182	34,002	33,821
7	P7	203,962	315,000	15,6940	56,611	0,481	0,567	33,821	33,254
8	P8	181,000	253,500	8,5328	30,780	0,332	0,227	33,254	33,027
9	P9	203,962	210,000	17,8187	64,276	0,546	0,485	33,027	32,542
10	P10	203,962	135,000	22,9798	82,893	0,705	0,516	32,542	32,026
11	P11	303,784	404,000	46,0139	165,982	0,636	0,753	33,141	32,388
12	P12	303,784	606,000	31,1455	112,348	0,431	0,523	32,388	31,865
13	P13	184,683	270,000	13,7984	49,774	0,516	0,361	32,388	32,027
14	P14	155,956	346,000	7,4082	26,723	0,389	0,580	32,026	31,445
15	P15	203,962	665,000	9,2768	33,464	0,284	0,426	31,865	31,439
16	P16	203,962	215,000	1,8665	6,733	0,057	0,006	31,445	31,439
17	P17	184,683	270,000	0,5107	1,842	0,019	0,001	32,027	32,026
18	P18	184,683	470,000	13,2877	47,932	0,497	0,588	32,027	31,439
19	P19	203,962	66,900	2,8498	10,280	0,087	0,004	31,445	31,441
20	P20	203,962	138,000	15,7274	56,732	0,482	0,249	32,026	31,777
21	P21	155,956	144,000	6,6500	23,988	0,349	0,195	31,777	31,581
22	P22	155,956	279,000	3,9976	14,420	0,210	0,140	31,581	31,441
23	P23	406,400	540,000	1,0211	3,683	0,008	0,000	31,441	31,441
24	P24	203,962	460,000	8,8140	31,794	0,270	0,267	31,777	31,510
25	P25	254,508	135,000	7,9380	28,634	0,156	0,019	31,510	31,490
26	P26	254,508	290,000	9,1295	32,932	0,180	0,055	31,490	31,436
27	P27	155,956	490,000	2,3808	8,588	0,125	0,091	31,581	31,490
28	P28	303,784	392,000	3,4663	12,504	0,048	0,005	31,441	31,436
29	P29	102,260	132,000	1,6596	5,987	0,202	0,102	31,441	31,339
30	P30	141,859	205,000	3,4399	12,408	0,218	0,082	31,339	31,257
31	P31	141,859	205,000	2,8023	10,108	0,178	0,057	31,314	31,257
32	P32	303,784	250,000	17,8798	64,496	0,247	0,073	31,387	31,314
33	P33	155,956	214,000	2,6286	9,482	0,138	0,048	31,387	31,339
34	P34	303,784	130,000	21,1321	76,228	0,292	0,052	31,439	31,387
35	P35	155,956	155,000	8,9514	32,290	0,470	0,377	31,865	31,488
36	P36	155,956	380,000	4,1265	14,885	0,216	0,203	31,488	31,285

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
37	P37	203,962	652,000	2,3024	8,305	0,071	0,029	31,314	31,285
38	P38	155,956	200,000	4,3841	15,814	0,230	0,120	31,488	31,368
39	P39	203,962	508,200	11,3121	40,805	0,347	0,480	31,865	31,385
40	P40	203,962	130,000	7,7996	28,135	0,239	0,059	31,385	31,326
41	P41	203,962	394,000	2,2844	8,240	0,070	0,017	31,385	31,368
42	P42	155,956	293,000	4,7517	17,140	0,249	0,206	31,285	31,079
43	P43	155,956	380,000	2,3492	8,474	0,123	0,069	31,079	31,010
44	P44	203,962	527,000	5,5128	19,886	0,169	0,123	31,133	31,010
45	P45	257,454	850,000	10,0389	36,213	0,193	0,181	31,314	31,133
46	P46	230,175	220,000	5,3634	19,347	0,129	0,019	31,257	31,238
47	P47	230,175	524,000	2,0626	7,440	0,050	0,009	31,246	31,238
48	P48	230,175	350,000	9,0140	32,516	0,217	0,076	31,246	31,170
49	P49	230,175	408,000	2,6546	9,576	0,064	0,010	31,170	31,160
50	P50	230,175	276,000	2,0986	7,570	0,051	0,005	31,138	31,133
51	P51	230,175	633,000	6,5388	23,587	0,157	0,078	31,238	31,160
52	P52	230,175	581,000	11,2984	40,756	0,272	0,190	31,436	31,246
53	P53	155,956	465,000	1,9367	6,986	0,102	0,058	31,079	31,020
54	P54	154,051	360,000	1,1938	4,306	0,064	0,019	31,020	31,002
55	P55	135,000	286,000	0,6124	2,209	0,043	0,008	31,010	31,002
56	P56	254,508	420,000	4,0105	14,467	0,079	0,017	31,133	31,116
57	P57	203,962	356,000	8,0424	29,011	0,247	0,173	31,116	30,944
58	P58	154,051	330,000	5,6228	20,283	0,302	0,325	30,944	30,619
59	P59	135,000	143,000	4,3014	15,516	0,301	0,155	30,664	30,509
60	P60	155,956	591,000	4,3222	15,591	0,227	0,346	31,010	30,664
61	P61	104,140	787,000	1,2351	4,455	0,145	0,333	31,002	30,669
62	P62	203,962	425,000	1,0686	3,855	0,033	0,005	30,669	30,664
63	P63	230,175	283,000	4,0320	14,544	0,097	0,015	31,131	31,116
64	P64	230,175	460,000	2,0572	7,421	0,050	0,007	31,139	31,131
65	P65	230,175	280,000	2,9931	10,797	0,072	0,009	31,147	31,139
66	P66	230,175	410,000	4,0733	14,693	0,098	0,022	31,160	31,138
67	P67	230,175	420,000	1,9748	7,123	0,048	0,006	31,138	31,131
68	P68	230,175	480,000	3,6148	13,039	0,087	0,021	31,160	31,139
69	P69	230,175	650,000	3,1705	11,437	0,076	0,022	31,170	31,147
71	P71	141,859	1385,000	1,4153	5,105	0,090	1,114	32,058	30,944
72	P72	184,683	580,000	3,8133	13,755	0,143	-0,919	31,139	32,058
73	P73	406,400	120,000	5,2297	18,865	0,040	0,001	31,368	31,367
74	P74	104,140	240,200	0,8238	2,972	0,097	0,047	31,367	31,320
75	P75	406,400	445,000	7,4863	27,005	0,058	0,006	31,326	31,320
76	P76	155,956	993,000	4,1149	14,843	0,216	-0,470	31,367	31,837

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
77	P77	203,962	97,500	1,9303	6,963	0,059	0,003	31,840	31,837
78	P78	203,962	1159,000	6,6468	23,976	0,204	-0,610	31,320	31,930
79	P79	406,400	139,000	3,6195	13,056	0,028	0,000	31,837	31,836
80	P80	155,956	341,000	3,2840	11,846	0,172	0,117	31,836	31,719
81	P81	203,962	308,000	0,4501	1,623	0,014	0,001	31,720	31,719
82	P82	203,962	767,000	3,8469	13,876	0,118	0,090	31,930	31,840
83	P83	104,140	302,000	1,1958	4,313	0,141	0,120	31,840	31,720
84	P84	203,962	760,000	2,9107	10,500	0,089	1,050	31,719	30,669
85	P85	155,956	283,000	2,0108	7,253	0,105	0,038	30,944	30,906
86	P86	102,260	422,000	1,5484	5,585	0,189	0,287	30,906	30,619
87	P87	155,956	394,070	2,9431	10,616	0,154	0,110	30,619	30,509
88	P88	406,400	540,000	0,8279	2,986	0,006	0,000	30,619	30,619
89	P89	135,000	94,700	5,7197	20,632	0,400	0,178	30,509	30,331
90	P90	135,000	252,000	3,2171	11,605	0,225	0,156	30,331	30,176
91	P91	102,260	340,000	2,1711	7,832	0,265	0,443	30,619	30,176
92	P92	155,956	211,000	4,8227	17,396	0,253	0,153	30,176	30,023
93	P93	203,962	330,000	2,2919	8,267	0,070	0,015	30,331	30,317
94	P94	101,600	395,000	1,5489	5,587	0,191	0,294	30,317	30,023
95	P95	155,956	205,000	5,7728	20,824	0,303	0,211	30,023	29,812
96	P96	104,140	703,000	1,2192	4,398	0,143	0,290	29,812	29,521
97	P97	155,956	309,000	0,0117	0,042	0,001	0,000	29,521	29,521
98	P98	104,140	1470,000	1,8414	6,642	0,217	1,346	30,867	29,521
99	P99	155,956	1170,000	1,4621	5,274	0,077	0,086	30,953	30,867
100	P100	141,859	445,000	2,1812	7,868	0,138	0,080	30,946	30,867
101	P101	155,956	367,000	3,3061	11,926	0,173	0,128	31,081	30,953
102	P102	141,859	720,000	2,2361	8,066	0,142	0,134	31,081	30,946
103	P103	155,956	1,000	0,8389	3,026	0,044	0,000	20,394	20,394
104	P104	155,956	672,000	4,5537	16,426	0,239	9,417	29,812	20,394
105	P105	155,956	1490,000	0,9320	3,362	0,049	0,047	30,953	30,906
106	P106	104,140	230,000	5,5444	20,000	0,652	-28,087	2,994	31,081

Вариант 5 - Гидравлический расчет системы водоснабжения при перспективном уровне водопотребления (на 2030 год) с закрытием водозабора по ул. Садовая и перенос нагрузки на водозабор по ул. Промышленная **(с учетом увеличения диаметров сетей)**


Pipe Flow Expert Results Key
f = flow in m?/hour
Color of Pipe: Velocity in m/sec
0,0009 0,1312 0,2614 0,3917 0,5220 0,6522
N1 0,0m
0,0 bar.g@ 11,0m
10,978 m.H2O
P1, f=270,000
N2 1,0m
31,875 m.H2O
P6, f=27,176
N7 1,0m
31,837 m.H2O
5,100 m?/hour
P7, f=22,076
P2, f=242,824
P3, f=115,608
P8, f=11,335
N3 1,0m
31,794 m.H2O
2,250 m?/hour
N8 1,0m
31,714 m.H2O
6,660 m?/hour
N4 1,0m
31,747 m.H2O
2,360 m?/hour
P9, f=120,383
P5, f=7,106
P11, f=124,966
N6 1,0m
31,667 m.H2O
3,580 m?/hour
N5 1,0m
31,740 m.H2O
1,275 m?/hour
P13, f=19,888
P17, f=5,092
P20, f=28,470
P24, f=16,528
N11 1,0m
31,697 m.H2O
3,860 m?/hour
N14 1,0m
31,627 m.H2O
N9 1,0m
31,635 m.H2O
1,280 m?/hour
N16 1,0m
31,571 m.H2O
P27, f=5,342
N19 1,0m
31,495 m.H2O
3,160 m?/hour
N17 1,0m
31,528 m.H2O
0,980 m?/hour
N20 1,0m
31,491 m.H2O
4,290 m?/hour
P40, f=27,007
P12, f=101,219
P18, f=25,780
P14, f=88,266
P21, f=4,992
P25, f=9,368
P22, f=4,670
P26, f=14,420
N30 1,0m
31,258 m.H2O
N29 1,0m
31,313 m.H2O
1,130 m?/hour
4,430 m?/hour
P39, f=31,247
P41, f=0,191
P15, f=20,568
P16, f=35,930
N10 1,0m
31,598 m.H2O
N13 1,0m
31,432 m.H2O
N12 1,0m
31,391 m.H2O
5,790 m?/hour
11,900 m?/hour
P19, f=28,362
P23, f=34,324
P28, f=33,394
P75, f=25,877
P35, f=43,614
N15 1,0m
31,522 m.H2O
P29, f=70,378
N18 1,0m
31,511 m.H2O
N21 1,0m
31,479 m.H2O
0,610 m?/hour
5,600 m?/hour
4,680 m?/hour
P74, f=3,359
P73, f=18,961
P38, f=24,342
P33, f=7,882
P52, f=43,134
N52 1,0m
31,253 m.H2O
N51 1,0m
31,312 m.H2O
N28 1,0m
31,313 m.H2O
N24 1,0m
31,592 m.H2O
N26 1,0m
31,387 m.H2O
N22 1,0m
31,356 m.H2O
6,000 m?/hour
1,050 m?/hour
5,190 m?/hour
1,590 m?/hour
2,250 m?/hour
P31, f=7,682
P32, f=12,824
P37, f=5,856
P34, f=9,672
P46, f=18,281
P47, f=8,864
N25 1,0m
31,308 m.H2O
N27 1,0m
31,323 m.H2O
N23 1,0m
31,275 m.H2O
N34 1,0m
31,258 m.H2O
N35 1,0m
31,270 m.H2O
6,050 m?/hour
9,870 m?/hour
3,200 m?/hour
0,800 m?/hour
P42, f=17,489
P51, f=23,944
P48, f=33,471
P78, f=23,236
P76, f=14,552
P53, f=7,127
P45, f=35,583
N38 1,0m
31,033 m.H2O
N31 1,0m
31,094 m.H2O
2,680 m?/hour
1,680 m?/hour
P54, f=4,447
P43, f=8,682
P49, f=10,157
N36 1,0m
31,189 m.H2O
11,503 m?/hour
P68, f=11,810
P66, f=15,379
N37 1,0m
31,178 m.H2O
5,490 m?/hour
P82, f=13,136
P77, f=6,979
P12, f=12,297
P55, f=2,228
P44, f=20,191
P50, f=8,367
P67, f=13,293
N54 0,0m
31,885 m.H2O
N58 0,0m
31,804 m.H2O
N53 0,0m
31,802 m.H2O
N36 0,0m
31,801 m.H2O
N39 1,0m
31,014 m.H2O
N32 1,0m
31,022 m.H2O
N33 1,0m
31,148 m.H2O
N48 1,0m
31,154 m.H2O
10,100 m?/hour
2,600 m?/hour
2,750 m?/hour
2,210 m?/hour
2,060 m?/hour
10,560 m?/hour
9,430 m?/hour
P65, f=11,170
N47 1,0m
31,165 m.H2O
0,640 m?/hour
P83, f=4,041
P80, f=11,087
P61, f=14,614
P60, f=16,086
P56, f=14,329
P67, f=7,012
P64, f=7,949
N46 1,0m
31,156 m.H2O
2,660 m?/hour
P81, f=1,351
P84, f=9,468
P62, f=2,982
P63, f=14,961
P69, f=13,854
N57 0,0m
31,698 m.H2O
N56 0,0m
31,698 m.H2O
N44 1,0m
30,657 m.H2O
N43 1,0m
30,654 m.H2O
N40 1,0m
31,132 m.H2O
N45 1,0m
31,148 m.H2O
2,690 m?/hour
2,970 m?/hour
11,100 m?/hour
3,930 m?/hour
P57, f=29,290
P59, f=15,
P87, f=10,935
P58, f=20,562
P71, f=5,204
N42 1,0m
30,507 m.H2O
N41 1,0m
30,956 m.H2O
N50 0,0m
32,074 m.H2O
6,580 m?/hour
8,650 m?/hour
P88, f=8,255
N62 1,0m
30,330 m.H2O
0,760 m?/hour
P85, f=7,352
P89, f=11,
N65 1,0m
30,315 m.H2O
2,680 m?/hour
P86, f=5,663
N63 1,0m
30,175 m.H2O
N60 1,0m
30,783 m.H2O
N59 1,0m
30,917 m.H2O
2,040 m?/hour
0,740 m?/hour
5,030 m?/hour
P105, f=3,342
P90, f=17,389
N64 1,0m
30,022 m.H2O
2,160 m?/hour
P91, f=20,804
P104, f=16,426
N66 1,0m
29,812 m.H2O
N73 10,0m
20,394 m.H2O
P96, f=4,376
P103, f=3,020
12,400 m?/hour
N67 1,0m
29,524 m.H2O
N75, 10,0m
p= 20,394 m.H2O
P97, f=0,062
4,440 m?/hour
P99, f=5,288
N70 1,0m
30,964 m.H2O
3,290 m?/hour
P98, f=6,662
P101, f=11,920
N68 1,0m
29,524 m.H2O
6,600 m?/hour
N69 1,0m
30,877 m.H2O
P100, f=6,674
6,500 m?/hour
P102, f=8,072
P106, f=20,000
N72 1,0m
30,957 m.H2O
N71 1,0m
31,092 m.H2O
0,198 m?/hour
0,008 m?/hour
N74, 1,0m
0,0 bar.g@ 3,0m
2,994 m.H2O

Fluid Data

Zone	Fluid Name	Chemical Formula	Temperature °C	Pressure m.H2O	Density kg/m?	Centistokes	Centipoise	Vapour Pressure m.H2O.a	State
1	Water	H2O	20,000	0,000	998,000000	1,000000	1,002000	0,244732	Liquid

Pump Data

Pipe Id	Pipe Name	Pump Name	Speed rpm	Pref. Op From m?/hour	Pref. Op To m?/hour	Flow In/Out m?/hour	Velocity m/sec	Suction Pressure m.H2O	Discharge Pressure m.H2O	Pump Head (+) m.hd Fluid	Pump NPSHr m.hd (absolute)	Pump NPSHa m.hd (absolute)	Pump Efficiency Percentage	Pump Power Kilowatts
1	P1	Pump	Set Flow Rate			270,000	0,257	10,978	31,928	20,992	Not known	21,107	Not known	Not Known
106	P106	Pump	Set Flow Rate			20,000	0,652	2,994	32,920	29,986	Not known	13,107	Not known	Not Known

Pipe Data

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
1	P1	609,600	540,000	74,8500	270,000	0,257	-20,897	10,978	31,875
2	P2	466,598	300,000	67,3163	242,824	0,394	0,081	31,875	31,794
3	P3	373,278	385,000	32,0491	115,608	0,293	0,080	31,794	31,714
4	P4	203,962	170,000	2,3234	8,381	0,071	0,008	31,747	31,740
5	P5	155,956	564,000	1,9700	7,106	0,103	0,073	31,740	31,667
6	P6	303,784	680,000	7,5337	27,176	0,104	0,037	31,875	31,837
7	P7	203,962	315,000	6,1199	22,076	0,188	0,090	31,837	31,747
8	P8	181,000	253,500	3,1422	11,335	0,122	0,034	31,747	31,714
9	P9	373,278	210,000	33,3727	120,383	0,306	0,047	31,714	31,667
10	P10	373,278	135,000	34,3502	123,909	0,315	0,032	31,667	31,635
11	P11	373,278	404,000	34,6434	124,966	0,317	0,097	31,794	31,697
12	P12	373,278	606,000	28,0601	101,219	0,257	0,099	31,697	31,598
13	P13	184,683	270,000	5,5133	19,888	0,206	0,070	31,697	31,627
14	P14	373,278	346,000	24,4693	88,266	0,224	0,044	31,635	31,591
15	P15	203,962	665,000	5,7018	20,568	0,175	0,166	31,598	31,432
16	P16	203,962	215,000	9,9605	35,930	0,305	0,158	31,591	31,432
17	P17	184,683	270,000	1,6335	5,892	0,061	0,008	31,635	31,627
18	P18	184,683	470,000	7,1468	25,780	0,267	0,194	31,627	31,432
19	P19	203,962	66,900	11,8170	42,626	0,362	0,069	31,591	31,522
20	P20	203,962	138,000	7,8925	28,470	0,242	0,065	31,635	31,571
21	P21	155,956	144,000	3,0472	10,992	0,160	0,043	31,571	31,528
22	P22	155,956	279,000	1,2946	4,670	0,068	0,016	31,528	31,511
23	P23	406,400	540,000	9,5155	34,324	0,074	0,011	31,522	31,511
24	P24	203,962	460,000	4,5820	16,528	0,141	0,075	31,571	31,495
25	P25	254,508	135,000	3,7059	13,368	0,073	0,005	31,495	31,491
26	P26	254,508	290,000	3,9976	14,420	0,079	0,011	31,491	31,479
27	P27	155,956	490,000	1,4809	5,342	0,078	0,037	31,528	31,491
28	P28	303,784	392,000	9,2576	33,394	0,128	0,032	31,511	31,479
29	P29	102,260	132,000	2,1324	7,692	0,260	0,166	31,522	31,356
30	P30	141,859	205,000	3,4053	12,284	0,216	0,080	31,356	31,275
31	P31	141,859	205,000	2,5413	9,167	0,161	0,048	31,323	31,275
32	P32	303,784	250,000	16,7653	60,476	0,232	0,064	31,387	31,323
33	P33	155,956	214,000	2,1212	7,652	0,111	0,032	31,387	31,356
34	P34	303,784	130,000	19,5102	70,378	0,270	0,045	31,432	31,387
35	P35	373,278	155,000	12,0909	43,614	0,111	0,006	31,598	31,592
36	P36	155,956	380,000	4,9021	17,683	0,257	0,284	31,592	31,308

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
37	P37	203,962	652,000	1,6234	5,856	0,050	0,015	31,323	31,308
38	P38	155,956	200,000	6,7480	24,342	0,354	0,279	31,592	31,313
39	P39	203,962	508,200	8,6623	31,247	0,266	0,285	31,598	31,313
40	P40	203,962	130,000	7,4870	27,007	0,230	0,055	31,313	31,258
41	P41	203,962	394,000	0,0528	0,191	0,002	0,000	31,313	31,313
42	P42	155,956	293,000	4,8482	17,489	0,254	0,214	31,308	31,094
43	P43	155,956	380,000	2,4068	8,682	0,126	0,072	31,094	31,022
44	P44	203,962	527,000	5,5975	20,191	0,172	0,127	31,148	31,022
45	P45	257,454	850,000	9,8645	35,583	0,190	0,175	31,323	31,148
46	P46	230,175	220,000	5,0678	18,281	0,122	0,017	31,275	31,258
47	P47	230,175	524,000	2,4572	8,864	0,059	0,012	31,270	31,258
48	P48	230,175	350,000	9,2788	33,471	0,223	0,080	31,270	31,189
49	P49	230,175	408,000	2,8158	10,157	0,068	0,011	31,189	31,178
50	P50	230,175	276,000	2,3194	8,367	0,056	0,006	31,154	31,148
51	P51	230,175	633,000	6,6379	23,944	0,160	0,080	31,258	31,178
52	P52	230,175	581,000	11,9578	43,134	0,288	0,210	31,479	31,270
53	P53	155,956	465,000	1,9757	7,127	0,104	0,060	31,094	31,033
54	P54	154,051	360,000	1,2327	4,447	0,066	0,020	31,033	31,014
55	P55	135,000	286,000	0,6176	2,228	0,043	0,008	31,022	31,014
56	P56	254,508	420,000	3,9722	14,329	0,078	0,016	31,148	31,132
57	P57	203,962	356,000	8,1197	29,290	0,249	0,176	31,132	30,956
58	P58	154,051	330,000	5,7002	20,562	0,306	0,333	30,956	30,623
59	P59	135,000	143,000	4,1966	15,138	0,294	0,147	30,654	30,507
60	P60	155,956	591,000	4,4593	16,086	0,234	0,368	31,022	30,654
61	P61	104,140	787,000	1,2792	4,614	0,150	0,357	31,014	30,657
62	P62	203,962	425,000	0,8268	2,982	0,025	0,003	30,657	30,654
63	P63	230,175	283,000	4,1475	14,961	0,100	0,016	31,148	31,132
64	P64	230,175	460,000	2,2036	7,949	0,053	0,008	31,156	31,148
65	P65	230,175	280,000	3,0967	11,170	0,075	0,009	31,165	31,156
66	P66	230,175	410,000	4,2634	15,379	0,103	0,024	31,178	31,154
67	P67	230,175	420,000	1,9440	7,012	0,047	0,006	31,154	31,148
68	P68	230,175	480,000	3,6850	13,293	0,089	0,022	31,178	31,156
69	P69	230,175	650,000	3,2741	11,810	0,079	0,024	31,189	31,165
71	P71	141,859	1385,000	1,4427	5,204	0,091	1,118	32,074	30,956
72	P72	184,683	580,000	3,8407	13,854	0,144	-0,918	31,156	32,074
73	P73	406,400	120,000	5,2564	18,961	0,041	0,001	31,313	31,312
74	P74	104,140	240,200	0,9311	3,359	0,110	0,059	31,312	31,253
75	P75	406,400	445,000	7,1738	25,877	0,055	0,005	31,258	31,253
76	P76	155,956	993,000	4,0342	14,552	0,212	-0,489	31,312	31,802

Pipe Id	Pipe Name and Notes	Inner Diameter mm	Length m	Mass Flow kg/sec	Vol Flow m?/hour	Velocity m/sec	dP Total Loss m.H2O	Entry Pressure m.H2O	Exit Pressure m.H2O
77	P77	203,962	97,500	1,8006	6,495	0,055	0,003	31,804	31,802
78	P78	203,962	1159,000	6,4415	23,236	0,198	-0,632	31,253	31,885
79	P79	406,400	139,000	3,4091	12,297	0,026	0,000	31,802	31,801
80	P80	155,956	341,000	3,0736	11,087	0,161	0,103	31,801	31,698
81	P81	203,962	308,000	0,3745	1,351	0,011	0,000	31,698	31,698
82	P82	203,962	767,000	3,6416	13,136	0,112	0,081	31,885	31,804
83	P83	104,140	302,000	1,1202	4,041	0,132	0,106	31,804	31,698
84	P84	203,962	760,000	2,6248	9,468	0,080	1,041	31,698	30,657
85	P85	155,956	283,000	2,0381	7,352	0,107	0,039	30,956	30,917
86	P86	102,260	422,000	1,5700	5,663	0,192	0,294	30,917	30,623
87	P87	155,956	394,070	3,0315	10,935	0,159	0,116	30,623	30,507
88	P88	406,400	540,000	0,8169	2,947	0,006	0,000	30,623	30,623
89	P89	135,000	94,700	5,7034	20,573	0,399	0,177	30,507	30,330
90	P90	135,000	252,000	3,2043	11,559	0,224	0,155	30,330	30,175
91	P91	102,260	340,000	2,1818	7,870	0,266	0,448	30,623	30,175
92	P92	155,956	211,000	4,8206	17,389	0,253	0,153	30,175	30,022
93	P93	203,962	330,000	2,2884	8,255	0,070	0,014	30,330	30,315
94	P94	101,600	395,000	1,5455	5,575	0,191	0,293	30,315	30,022
95	P95	155,956	205,000	5,7672	20,804	0,303	0,211	30,022	29,812
96	P96	104,140	703,000	1,2136	4,378	0,143	0,288	29,812	29,524
97	P97	155,956	309,000	0,0173	0,062	0,001	0,000	29,524	29,524
98	P98	104,140	1470,000	1,8470	6,662	0,217	1,353	30,877	29,524
99	P99	155,956	1170,000	1,4660	5,288	0,077	0,087	30,964	30,877
100	P100	141,859	445,000	2,1830	7,874	0,138	0,080	30,957	30,877
101	P101	155,956	367,000	3,3044	11,920	0,173	0,128	31,092	30,964
102	P102	141,859	720,000	2,2378	8,072	0,142	0,135	31,092	30,957
103	P103	155,956	1,000	0,8389	3,026	0,044	0,000	20,394	20,394
104	P104	155,956	672,000	4,5537	16,426	0,239	9,417	29,812	20,394
105	P105	155,956	1490,000	0,9264	3,342	0,049	0,047	30,964	30,917
106	P106	104,140	230,000	5,5444	20,000	0,652	-28,098	2,994	31,092