

Pipe Pressure Loss Report

Project Name	Thesis
Project Issue Date	25 April 2015
Project Status	Active Cooling
Client Name	Artambo
Project Address	JL. Raya Medan Tenggara Medan, 20228 North Sumatera, Indonesia
Project Number	1
Organization Name	FAI-UTB
Organization Description	Education
Building Name	Residential Family In Indonesia
Author	Artambo Pangaribuan
Phone	
Fax	
Email	
Address	
Test Data	
Specification	
Sales Information	
Product Data	
Installation_Fabrication	
Construction Details	
Green Building-LEED	
Product Properties	
LEED_Green Building	
Copyright	Artambo
Warranty Duration (Years)	
Maintenance Schedule (months)	
Installation Phase	
Expected Lifespan (Years)	
Run Time	7/1/2015 8:05:20 PM

Domestic Cold Water 1

System Information	
System Classification	Domestic Cold Water
System Type	Domestic Cold Water
System Name	Domestic Cold Water 1
Abbreviation	
Fluid Type	Water
Fluid Temperature	21 °C
Fluid Dynamic Viscosity	0.0 Pa-s
Fluid Density	997.9503 kg/m ³

Total Pressure Loss Calculations by Sections

Section	Element	Flow	Size	Velocity	Velocity Pressure	Length	Friction	Reynolds Number	Roughness	Relative Roughness	Total Pressure Loss	Section Pressure Loss
1	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	7.96	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	0.0 Pa

	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
2	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
3	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	0.23	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
4	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	0.48	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
5	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	3.49	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
6	Pipe	3.1 L/s	40 mmø	2.4 m/s	-	16.31	15847.88 Pa/m	98774.513891	13.935 mm	0.34077	258498.7 Pa	261809.3 Pa
	Fittings	3.1 L/s	-	2.4 m/s	2779.6 Pa	-	-	-	-	-	3310.6 Pa	
	Equipment	3.1 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
7	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	6.01	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
8	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
9	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	0.25	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
10	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	0.43	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
11	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	5.35	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
12	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	0.43	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
13	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	1.66	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
14	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	0.30	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
15	Pipe	0.0 L/s	40 mmø	0.0 m/s	-	7.48	0.00 Pa/m	0	13.935 mm	0.34077	0.0 Pa	0.0 Pa
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
16	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	9.07	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
17	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa

18	Pipe	0.3 L/s	15 mmø	1.5 m/s	-	8.31	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.3 L/s	-	1.5 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.3 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
19	Fittings	0.6 L/s	-	0.5 m/s	104.1 Pa	-	-	-	-	-	92.8 Pa	92.8 Pa
20	Pipe	0.9 L/s	15 mmø	4.6 m/s	-	4.53	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.9 L/s	-	4.6 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.9 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
21	Fittings	0.9 L/s	-	0.7 m/s	234.3 Pa	-	-	-	-	-	52.8 Pa	52.8 Pa
22	Pipe	0.3 L/s	15 mmø	1.5 m/s	-	5.53	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.3 L/s	-	1.5 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.3 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
23	Fittings	0.3 L/s	-	0.2 m/s	26.0 Pa	-	-	-	-	-	5.9 Pa	5.9 Pa
24	Pipe	0.0 L/s	25 mmø	0.0 m/s	-	7.78	0.00 Pa/m	0	13.935 mm	0.523012	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
25	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
26	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	8.59	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
27	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
28	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	8.59	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
29	Fittings	0.2 L/s	-	0.2 m/s	11.6 Pa	-	-	-	-	-	10.3 Pa	10.3 Pa
30	Pipe	0.4 L/s	15 mmø	2.0 m/s	-	6.18	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.4 L/s	-	2.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.4 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
31	Fittings	0.4 L/s	-	0.3 m/s	46.3 Pa	-	-	-	-	-	41.2 Pa	41.2 Pa
32	Pipe	0.4 L/s	15 mmø	2.0 m/s	-	4.97	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.4 L/s	-	2.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.4 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
33	Fittings	0.4 L/s	-	0.3 m/s	46.3 Pa	-	-	-	-	-	41.2 Pa	41.2 Pa
34	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	5.46	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	0.0 Pa

	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	0.0 Pa	
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	0.0 Pa	
35	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	0.0 Pa	0.0 Pa
Critical Path : 6 ; Total Pressure Loss : 261809.3 Pa											

Detail Information of Straight Segment by Sections								
Section	Element ID	Flow	Size	Velocity	Velocity Pressure	Length	Pressure Loss	Total Pressure Loss
1	647519	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	0.0 Pa
	647521	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.64	0.0 Pa	
	647523	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	3.26	0.0 Pa	
3	1797509	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	0.23	0.0 Pa	0.0 Pa
4	1796238	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	0.48	0.0 Pa	0.0 Pa
5	1795550	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	3.49	0.0 Pa	0.0 Pa
6	647429	3.1 L/s	40 mmø	2.4 m/s	2779.6 Pa	0.26	4104.4 Pa	258498.7 Pa
	647431	3.1 L/s	40 mmø	2.4 m/s	2779.6 Pa	0.57	8972.6 Pa	
	647433	3.1 L/s	40 mmø	2.4 m/s	2779.6 Pa	10.67	169068.7 Pa	
	651859	3.1 L/s	40 mmø	2.4 m/s	2779.6 Pa	4.20	66593.4 Pa	
	653898	3.1 L/s	40 mmø	2.4 m/s	2779.6 Pa	0.62	9759.6 Pa	
7	647757	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	0.0 Pa
	647759	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.64	0.0 Pa	
	647761	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	1.31	0.0 Pa	
9	1796969	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	0.25	0.0 Pa	0.0 Pa
10	1798749	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	0.43	0.0 Pa	0.0 Pa
11	1796954	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	5.35	0.0 Pa	0.0 Pa
12	1797206	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	0.43	0.0 Pa	0.0 Pa
13	1797372	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	1.66	0.0 Pa	0.0 Pa
14	1797354	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	0.30	0.0 Pa	0.0 Pa
15	647867	0.0 L/s	40 mmø	0.0 m/s	0.0 Pa	7.48	0.0 Pa	0.0 Pa
16	647631	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	0.0 Pa
	647633	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.64	0.0 Pa	
	647635	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.36	0.0 Pa	
18	647603	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.40	0.0 Pa	0.0 Pa
	647605	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	4.20	0.0 Pa	
	647607	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	3.71	0.0 Pa	
20	647743	0.9 L/s	15 mmø	4.6 m/s	0.0 Pa	0.05	0.0 Pa	0.0 Pa
	647745	0.9 L/s	15 mmø	4.6 m/s	0.0 Pa	4.20	0.0 Pa	
	647749	0.9 L/s	15 mmø	4.6 m/s	0.0 Pa	0.28	0.0 Pa	
22	647455	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.06	0.0 Pa	0.0 Pa
	647457	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	4.20	0.0 Pa	
	647459	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.74	0.0 Pa	
	647461	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.53	0.0 Pa	
24	647547	0.0 L/s	25 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	0.0 Pa
	647549	0.0 L/s	25 mmø	0.0 m/s	0.0 Pa	4.52	0.0 Pa	
	647551	0.0 L/s	25 mmø	0.0 m/s	0.0 Pa	3.20	0.0 Pa	

26	647687	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	0.0 Pa
	647689	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.18	0.0 Pa	
	647691	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.35	0.0 Pa	
28	647659	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	
	647661	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.23	0.0 Pa	0.0 Pa
	647663	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.30	0.0 Pa	
30	647575	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	0.04	0.0 Pa	
	647577	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	4.43	0.0 Pa	0.0 Pa
	647579	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	1.71	0.0 Pa	
32	647715	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	0.06	0.0 Pa	
	647717	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	4.43	0.0 Pa	0.0 Pa
	647719	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	0.48	0.0 Pa	
34	647491	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.25	0.0 Pa	
	647493	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.43	0.0 Pa	0.0 Pa
	647495	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.79	0.0 Pa	

Fitting and Accessory Loss Coefficient Summary by Sections

Section	Element ID	Loss Method	K Coefficient Table	K Coefficient	Pressure Loss	Total Pressure Loss
1	1796189	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.04667	0.0 Pa	0.0 Pa
	1796192	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1820594	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
2	647815	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1796189	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.04667	0.0 Pa	
3	647815	K Coefficient from Table	Flanged Tee	0	0.0 Pa	0.0 Pa
	1797508	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	
4	1796237	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	0.0 Pa
	1797508	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
5	1795549	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1796237	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
6	1768294	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.397008	1103.5 Pa	3310.6 Pa
	1795544	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.397008	1103.5 Pa	
	1795549	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
	1798030	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.397008	1103.5 Pa	
	1798036	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	

7	1767855	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1799680	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1799685	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.406667	0.0 Pa	
8	647800	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1799685	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.406667	0.0 Pa	
9	647800	K Coefficient from Table	Flanged Tee	0	0.0 Pa	0.0 Pa
	1796968	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	
10	1796968	K Coefficient from Table	Flanged Tee	0	0.0 Pa	0.0 Pa
	1798748	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	
11	1797155	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	0.0 Pa
	1798748	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
12	1797155	K Coefficient from Table	Flanged Tee	0	0.0 Pa	0.0 Pa
	1797205	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	
13	1797205	K Coefficient from Table	Flanged Tee	0	0.0 Pa	0.0 Pa
	1797371	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	
14	1797308	K Coefficient from Table	Flanged Tee	0.225512	0.0 Pa	0.0 Pa
	1797371	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
15	1795549	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1797308	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
16	1767528	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1797317	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.406667	0.0 Pa	0.0 Pa
	1797320	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
17	1797308	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1797317	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.406667	0.0 Pa	
18	1797215	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.406667	0.0 Pa	0.0 Pa
	1797218	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798670			0	0.0 Pa	

		K Coefficient from Table	Regular Flanged 90 and 180 Elbow			
19	1797205	K Coefficient from Table	Flanged Tee	0.891024	92.8 Pa	92.8 Pa
	1797215	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0	0.0 Pa	
20	1768106	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1799605	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1799609	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.046667	0.0 Pa	
21	647800	K Coefficient from Table	Flanged Tee	0.225512	52.8 Pa	52.8 Pa
	1799609	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0	0.0 Pa	
22	1767316	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1796584	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1799946	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1799949	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.046667	0.0 Pa	
23	647815	K Coefficient from Table	Flanged Tee	0.225512	5.9 Pa	5.9 Pa
	1799949	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0	0.0 Pa	
24	1767459	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1796247	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.03	0.0 Pa	
	1796251	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
25	1796237	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1796247	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0	0.0 Pa	
26	1767692	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1796963	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1796976	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.046667	0.0 Pa	
27	1796968	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1796976	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0	0.0 Pa	
28	1767660	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1797164	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.046667	0.0 Pa	
	1797167	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	

29	1797155	K Coefficient from Table	Flanged Tee	0.891024	10.3 Pa	10.3 Pa
	1797164	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0	0.0 Pa	
30	1767560	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1797366	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1797381	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0.046667	0.0 Pa	
31	1797371	K Coefficient from Table	Flanged Tee	0.891024	41.2 Pa	41.2 Pa
	1797381	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0	0.0 Pa	
32	1767796	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1798758	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0.046667	0.0 Pa	
	1798761	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
33	1798748	K Coefficient from Table	Flanged Tee	0.891024	41.2 Pa	41.2 Pa
	1798758	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0	0.0 Pa	
34	1768039	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1797518	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0.046667	0.0 Pa	
	1797521	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
35	1797508	K Coefficient from Table	Flanged Tee	0.891024	0.0 Pa	0.0 Pa
	1797518	K Coefficient from Table	Reducer/Coupling/Union/Inserter	0	0.0 Pa	

Domestic Hot Water 1

System Information	
System Classification	Domestic Hot Water
System Type	Domestic Hot Water
System Name	Domestic Hot Water 1
Abbreviation	
Fluid Type	Water
Fluid Temperature	60 °C
Fluid Dynamic Viscosity	0.0 Pa-s
Fluid Density	983.2133 kg/m ³

Total Pressure Loss Calculations by Sections

Section	Element	Flow	Size	Velocity	Velocity Pressure	Length	Friction	Reynolds Number	Roughness	Relative Roughness	Total Pressure Loss	Section Pressure Loss
1	Pipe	0.3 L/s	15 mmø	1.5 m/s	-	8.32	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	0.0 Pa
	Fittings	0.3 L/s	-	1.5 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	

	Plumbing Fixture	0.3 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
2	Fittings	0.6 L/s	-	0.6 m/s	190.1 Pa	-	-	-	-	-	180.2 Pa	180.2 Pa
3	Pipe	0.9 L/s	32 mmø	0.9 m/s	-	1.13	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	106.6 Pa
	Fittings	0.9 L/s	-	0.9 m/s	427.6 Pa	-	-	-	-	-	106.6 Pa	
4	Pipe	1.3 L/s	32 mmø	1.3 m/s	-	7.97	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	845.9 Pa
	Fittings	1.3 L/s	-	1.3 m/s	892.2 Pa	-	-	-	-	-	845.9 Pa	
5	Pipe	2.2 L/s	32 mmø	2.3 m/s	-	10.52	19422.34 Pa/m	168504.054928	13.935 mm	0.397565	204275.4 Pa	205833.0 Pa
	Fittings	2.2 L/s	-	2.3 m/s	2555.2 Pa	-	-	-	-	-	1557.7 Pa	
6	Pipe	2.2 L/s	40 mmø	1.7 m/s	-	4.74	7862.60 Pa/m	144432.047081	13.935 mm	0.34077	37297.7 Pa	40230.9 Pa
	Fittings	2.2 L/s	-	1.7 m/s	1379.3 Pa	-	-	-	-	-	2933.2 Pa	
7	Pipe	2.2 L/s	32 mmø	2.3 m/s	-	0.07	19422.34 Pa/m	168504.054928	13.935 mm	0.397565	1413.9 Pa	2460.6 Pa
	Fittings	2.2 L/s	-	2.3 m/s	2555.2 Pa	-	-	-	-	-	1046.6 Pa	
	Equipment	2.2 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
8	Pipe	1.2 L/s	15 mmø	6.1 m/s	-	5.50	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	0.0 Pa
	Fittings	1.2 L/s	-	6.1 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	1.2 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
9	Fittings	1.2 L/s	-	1.2 m/s	760.2 Pa	-	-	-	-	-	189.5 Pa	189.5 Pa
10	Pipe	-0.3 L/s	32 mmø	0.3 m/s	-	0.44	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	11.8 Pa
	Fittings	-0.3 L/s	-	0.3 m/s	47.5 Pa	-	-	-	-	-	11.8 Pa	
11	Pipe	0.1 L/s	32 mmø	0.1 m/s	-	5.37	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	1.3 Pa
	Fittings	0.1 L/s	-	0.1 m/s	5.3 Pa	-	-	-	-	-	1.3 Pa	
12	Pipe	0.3 L/s	32 mmø	0.3 m/s	-	0.59	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	11.8 Pa
	Fittings	0.3 L/s	-	0.3 m/s	47.5 Pa	-	-	-	-	-	11.8 Pa	
13	Pipe	0.3 L/s	15 mmø	1.5 m/s	-	5.69	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	0.0 Pa
	Fittings	0.3 L/s	-	1.5 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.3 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
14	Fittings	0.3 L/s	-	0.3 m/s	47.5 Pa	-	-	-	-	-	11.8 Pa	11.8 Pa
15	Pipe	0.3 L/s	32 mmø	0.3 m/s	-	0.90	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	11.8 Pa
	Fittings	0.3 L/s	-	0.3 m/s	47.5 Pa	-	-	-	-	-	11.8 Pa	
16	Pipe	1.9 L/s	32 mmø	2.0 m/s	-	3.53	0.00 Pa/m	0	13.935 mm	0.397565	0.0 Pa	1806.8 Pa
	Fittings	1.9 L/s	-	2.0 m/s	1905.9 Pa	-	-	-	-	-	1806.8 Pa	
17	Pipe	0.0 L/s	25 mmø	0.0 m/s	-	7.48	-	0	-	0.523012	0.0 Pa	0.0 Pa

								0.00 Pa/m		13.935 mm		
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
18	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
19	Pipe	-1.3 L/s	15 mmø	6.6 m/s	-	8.71	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	-1.3 L/s	-	6.6 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	-1.3 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
20	Fittings	-1.5 L/s	-	1.6 m/s	1187.9 Pa	-	-	-	-	-	1126.1 Pa	1126.1 Pa
21	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	8.70	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
22	Fittings	0.2 L/s	-	0.2 m/s	21.1 Pa	-	-	-	-	-	20.0 Pa	20.0 Pa
23	Pipe	0.4 L/s	15 mmø	2.0 m/s	-	6.29	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.4 L/s	-	2.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.4 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
24	Fittings	0.4 L/s	-	0.4 m/s	84.5 Pa	-	-	-	-	-	80.1 Pa	80.1 Pa
25	Pipe	0.4 L/s	15 mmø	2.0 m/s	-	5.09	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.4 L/s	-	2.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.4 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
26	Fittings	0.4 L/s	-	0.4 m/s	84.5 Pa	-	-	-	-	-	80.1 Pa	80.1 Pa
27	Pipe	0.0 L/s	15 mmø	0.0 m/s	-	5.16	0.00 Pa/m	0	13.935 mm	0.882058	0.0 Pa	
	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
	Plumbing Fixture	0.0 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
28	Fittings	0.0 L/s	-	0.0 m/s	0.0 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa

Critical Path : 7-6-5 ; Total Pressure Loss : 248524.6 Pa

Detail Information of Straight Segment by Sections

Section	Element ID	Flow	Size	Velocity	Velocity Pressure	Length	Pressure Loss	Total Pressure Loss
1	646756	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.06	0.0 Pa	
	646758	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	4.10	0.0 Pa	0.0 Pa
	646760	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	4.16	0.0 Pa	
3	1798900	0.9 L/s	32 mmø	0.9 m/s	427.6 Pa	1.13	0.0 Pa	0.0 Pa
4	647025	1.3 L/s	32 mmø	1.3 m/s	892.2 Pa	7.97	0.0 Pa	0.0 Pa
5	646624	2.2 L/s	32 mmø	2.3 m/s	2555.2 Pa	10.52	204275.4 Pa	204275.4 Pa
6	654110	2.2 L/s	40 mmø	1.7 m/s	1379.3 Pa	0.45	3519.9 Pa	37297.7 Pa

	654857	2.2 L/s	40 mmø	1.7 m/s	1379.3 Pa	3.14	24654.4 Pa	
	654961	2.2 L/s	40 mmø	1.7 m/s	1379.3 Pa	0.58	4574.8 Pa	
	655052	2.2 L/s	40 mmø	1.7 m/s	1379.3 Pa	0.58	4548.7 Pa	
7	646632	2.2 L/s	32 mmø	2.3 m/s	2555.2 Pa	0.07	1413.9 Pa	1413.9 Pa
8	646840	1.2 L/s	15 mmø	6.1 m/s	0.0 Pa	0.06	0.0 Pa	
	646842	1.2 L/s	15 mmø	6.1 m/s	0.0 Pa	4.10	0.0 Pa	0.0 Pa
	646844	1.2 L/s	15 mmø	6.1 m/s	0.0 Pa	0.32	0.0 Pa	
	646846	1.2 L/s	15 mmø	6.1 m/s	0.0 Pa	1.02	0.0 Pa	
10	1798801	-0.3 L/s	32 mmø	0.3 m/s	47.5 Pa	0.44	0.0 Pa	0.0 Pa
11	646622	0.1 L/s	32 mmø	0.1 m/s	5.3 Pa	5.37	0.0 Pa	0.0 Pa
12	1797259	0.3 L/s	32 mmø	0.3 m/s	47.5 Pa	0.59	0.0 Pa	0.0 Pa
13	646636	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.06	0.0 Pa	
	646638	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	4.10	0.0 Pa	0.0 Pa
	646640	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	0.53	0.0 Pa	
	646642	0.3 L/s	15 mmø	1.5 m/s	0.0 Pa	1.00	0.0 Pa	
15	1796296	0.3 L/s	32 mmø	0.3 m/s	47.5 Pa	0.90	0.0 Pa	0.0 Pa
16	1796694	1.9 L/s	32 mmø	2.0 m/s	1905.9 Pa	3.53	0.0 Pa	0.0 Pa
17	646672	0.0 L/s	25 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	
	646674	0.0 L/s	25 mmø	0.0 m/s	0.0 Pa	4.42	0.0 Pa	0.0 Pa
	646676	0.0 L/s	25 mmø	0.0 m/s	0.0 Pa	3.00	0.0 Pa	
19	646812	-1.3 L/s	15 mmø	6.6 m/s	0.0 Pa	0.06	0.0 Pa	
	646814	-1.3 L/s	15 mmø	6.6 m/s	0.0 Pa	4.08	0.0 Pa	0.0 Pa
	646816	-1.3 L/s	15 mmø	6.6 m/s	0.0 Pa	4.57	0.0 Pa	
21	646784	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.06	0.0 Pa	
	646786	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.13	0.0 Pa	0.0 Pa
	646788	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.52	0.0 Pa	
23	646728	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	0.04	0.0 Pa	
	646730	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	4.33	0.0 Pa	0.0 Pa
	646732	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	1.93	0.0 Pa	
25	646876	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	0.06	0.0 Pa	
	646878	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	4.33	0.0 Pa	0.0 Pa
	646880	0.4 L/s	15 mmø	2.0 m/s	0.0 Pa	0.70	0.0 Pa	
27	646700	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.25	0.0 Pa	
	646702	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	4.33	0.0 Pa	0.0 Pa
	646704	0.0 L/s	15 mmø	0.0 m/s	0.0 Pa	0.58	0.0 Pa	

Fitting and Accessory Loss Coefficient Summary by Sections						
Section	Element ID	Loss Method	K Coefficient Table	K Coefficient	Pressure Loss	Total Pressure Loss
1	1797268	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.39067	0.0 Pa	
	1797271	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1798627	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
2	1797258	K Coefficient from Table	Flanged Tee	0.948031	180.2 Pa	180.2 Pa
	1797268		Reducer/Coupling/Union/Reducer	0.39067	0.0 Pa	

		K Coefficient from Table				
3	1797258	K Coefficient from Table	Flanged Tee	0	0.0 Pa	106.6 Pa
	1798899	K Coefficient from Table	Flanged Tee	0.249213	106.6 Pa	
4	1796707	K Coefficient from Table	Flanged Tee	0.948031	845.9 Pa	845.9 Pa
	1798899	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
5	1796707	K Coefficient from Table	Flanged Tee	0	0.0 Pa	1557.7 Pa
	1823244	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.409606	1046.6 Pa	
	1823246	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.0	511.0 Pa	
6	1797762	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.397008	547.6 Pa	2933.2 Pa
	1798572	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.0	1290.5 Pa	
	1798575	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.397008	547.6 Pa	
	1823239	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.397008	547.6 Pa	
	1823246	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.0	0.0 Pa	
7	1798570	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0.409606	1046.6 Pa	1046.6 Pa
	1798572	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.0	0.0 Pa	
8	1768073	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1797015	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798709	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798712	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.0	0.0 Pa	
9	646919	K Coefficient from Table	Flanged Tee	0.249213	189.5 Pa	189.5 Pa
	1798712	K Coefficient from Table	Reducer/Coupling/Union/Incraser	0.0	0.0 Pa	
10	646919	K Coefficient from Table	Flanged Tee	0	0.0 Pa	11.8 Pa
	1798800	K Coefficient from Table	Flanged Tee	0.249213	11.8 Pa	
11	1797104	K Coefficient from Table	Flanged Tee	0.249213	1.3 Pa	1.3 Pa
	1798800	K Coefficient from Table	Flanged Tee	0	0.0 Pa	
12	1797104	K Coefficient from Table	Flanged Tee	0	0.0 Pa	11.8 Pa
	1797258	K Coefficient from Table	Flanged Tee	0.249213	11.8 Pa	

13	1767274	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1796627	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1800029	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1800032	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
14	646904	K Coefficient from Table	Flanged Tee	0.249213	11.8 Pa	11.8 Pa
	1800032	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
15	646904	K Coefficient from Table	Flanged Tee	0	0.0 Pa	11.8 Pa
	1796295	K Coefficient from Table	Flanged Tee	0.249213	11.8 Pa	
16	1796295	K Coefficient from Table	Flanged Tee	0	0.0 Pa	1806.8 Pa
	1796707	K Coefficient from Table	Flanged Tee	0.948031	1806.8 Pa	
17	1767496	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1796305	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.2796	0.0 Pa	
	1796309	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
18	1796295	K Coefficient from Table	Flanged Tee	0.948031	0.0 Pa	0.0 Pa
	1796305	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
19	1767732	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1798854	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
	1798857	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
20	646919	K Coefficient from Table	Flanged Tee	0.948031	1126.1 Pa	1126.1 Pa
	1798854	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
21	1767628	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1797114	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
	1797117	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
22	1797104	K Coefficient from Table	Flanged Tee	0.948031	20.0 Pa	20.0 Pa
	1797114	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	
23	1767592	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1798909	K Coefficient from Table	Reducer/Coupling/Union/Reducer	0.390667	0.0 Pa	

		K Coefficient from Table				
	1798912	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
24	1798899	K Coefficient from Table	Flanged Tee	0.948031	80.1 Pa	80.1 Pa
	1798909	K Coefficient from Table	Reducer/Coupling/Union/Reducer/Incraser	0	0.0 Pa	
	1767764	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
25	1798810	K Coefficient from Table	Reducer/Coupling/Union/Reducer/Incraser	0.390667	0.0 Pa	0.0 Pa
	1798813	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798800	K Coefficient from Table	Flanged Tee	0.948031	80.1 Pa	
26	1798810	K Coefficient from Table	Reducer/Coupling/Union/Reducer/Incraser	0	0.0 Pa	80.1 Pa
	1767227	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
27	1799891	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1799896	K Coefficient from Table	Reducer/Coupling/Union/Reducer/Incraser	0.390667	0.0 Pa	
	646904	K Coefficient from Table	Flanged Tee	0.948031	0.0 Pa	
28	1799896	K Coefficient from Table	Reducer/Coupling/Union/Reducer/Incraser	0	0.0 Pa	0.0 Pa

Return Cold Water

System Information	
System Classification	Domestic Cold Water
System Type	Domestic Cold Water
System Name	Return Cold Water
Abbreviation	
Fluid Type	Water
Fluid Temperature	21 °C
Fluid Dynamic Viscosity	0.0 Pa-s
Fluid Density	997.9503 kg/m ³

Total Pressure Loss Calculations by Sections

Section	Element	Flow	Size	Velocity	Velocity Pressure	Length	Friction	Reynolds Number	Roughness	Relative Roughness	Total Pressure Loss	Section Pressure Loss
1	Pipe	0.1 L/s	20 mm \emptyset	0.3 m/s	-	0.14	911.16 Pa/m	6225.609433	13.935 mm	0.665825	128.1 Pa	128.1 Pa
	Fittings	0.1 L/s	-	0.3 m/s	42.2 Pa	-	-	-	-	-	0.0 Pa	
	Equipment	0.1 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
2	Pipe	0.2 L/s	20 mm \emptyset	0.6 m/s	-	1.69	3637.57 Pa/m	12451.218867	13.935 mm	0.665825	6149.8 Pa	6149.8 Pa
	Fittings	0.2 L/s	-	0.6 m/s	168.6 Pa	-	-	-	-	-	0.0 Pa	
	Equipment	0.2 L/s	-	-	-	-	-	-	-	-	0.0 Pa	

Critical Path : 1-2 ; Total Pressure Loss : 6277.9 Pa

Detail Information of Straight Segment by Sections

Section	Element ID	Flow	Size	Velocity	Velocity Pressure	Length	Pressure Loss	Total Pressure Loss
1	609927	0.1 L/s	20 mm \emptyset	0.3 m/s	42.2 Pa	0.04	33.3 Pa	128.1 Pa
	609929	0.1 L/s	20 mm \emptyset	0.3 m/s	42.2 Pa	0.10	94.8 Pa	
2	609931	0.2 L/s	20 mm \emptyset	0.6 m/s	168.6 Pa	0.89	3224.4 Pa	6149.8 Pa
	609933	0.2 L/s	20 mm \emptyset	0.6 m/s	168.6 Pa	0.45	1654.1 Pa	
	609959	0.2 L/s	20 mm \emptyset	0.6 m/s	168.6 Pa	0.06	200.2 Pa	
	609961	0.2 L/s	20 mm \emptyset	0.6 m/s	168.6 Pa	0.29	1071.1 Pa	

Fitting and Accessory Loss Coefficient Summary by Sections

Section	Element ID	Loss Method	K Coefficient Table	K Coefficient	Pressure Loss	Total Pressure Loss
1	1768352	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1798528	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
2	1768718	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1798177	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798525	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798528	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	

Supply Hot Water 1

System Information

System Classification	Domestic Hot Water
System Type	Domestic Hot Water
System Name	Supply Hot Water 1
Abbreviation	
Fluid Type	Water
Fluid Temperature	60 °C
Fluid Dynamic Viscosity	0.0 Pa-s
Fluid Density	983.2133 kg/m ³

Total Pressure Loss Calculations by Sections

Section	Element	Flow	Size	Velocity	Velocity Pressure	Length	Friction	Reynolds Number	Roughness	Relative Roughness	Total Pressure Loss	Section Pressure Loss
1	Pipe	0.1 L/s	32 mm \emptyset	0.1 m/s	-	0.17	40.33 Pa/m	7659.275	13.935 mm	0.397565	6.7 Pa	12.6 Pa
	Fittings	0.1 L/s	-	0.1 m/s	5.3 Pa	-	-	-	-	-	5.9 Pa	
	Equipment	0.1 L/s	-	-	-	-	-	-	-	-	0.0 Pa	
2	Fittings	0.1 L/s	-	0.3 m/s	41.5 Pa	-	-	-	-	-	0.0 Pa	0.0 Pa
3	Pipe	0.2 L/s	20 mm \emptyset	0.6 m/s	-	2.63	3580.27 Pa/m	25654.853	13.935 mm	0.665825	9398.5 Pa	9398.5 Pa
	Fittings	0.2 L/s	-	0.6 m/s	166.1 Pa	-	-	-	-	-	0.0 Pa	

Equipment	0.2 L/s	-	-	-	0.0 Pa
Critical Path : 3-2-1 ; Total Pressure Loss : 9411.2 Pa					

Detail Information of Straight Segment by Sections								
Section	Element ID	Flow	Size	Velocity	Velocity Pressure	Length	Pressure Loss	Total Pressure Loss
1	659257	0.1 L/s	32 mmø	0.1 m/s	5.3 Pa	0.17	6.7 Pa	6.7 Pa
3	608511	0.2 L/s	20 mmø	0.6 m/s	166.1 Pa	0.46	1631.4 Pa	9398.5 Pa
	608513	0.2 L/s	20 mmø	0.6 m/s	166.1 Pa	0.52	1861.4 Pa	
	608531	0.2 L/s	20 mmø	0.6 m/s	166.1 Pa	0.06	197.0 Pa	
	608533	0.2 L/s	20 mmø	0.6 m/s	166.1 Pa	1.59	5708.6 Pa	

Fitting and Accessory Loss Coefficient Summary by Sections						
Section	Element ID	Loss Method	K Coefficient Table	K Coefficient	Pressure Loss	Total Pressure Loss
1	1767112	K Coefficient from Table	Reducer/Coupling/Union/Reducer	1.0/1.482	5.9 Pa	5.9 Pa
2	1767110	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1767112	K Coefficient from Table	Reducer/Coupling/Union/Reducer	1.0/1.482	0.0 Pa	
3	1767110	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	0.0 Pa
	1768754	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798142	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	
	1798147	K Coefficient from Table	Regular Flanged 90 and 180 Elbow	0	0.0 Pa	