Hydraulic Calculations
for

Project: Homewood Suites
3500 South Meridian
Puyallup, WA. 98373
Drawing no.: FS-4
Date: 3/3/2024

Design

Remote area number:	Area 6
Remote area location:	1st Floor Remote
Occupancy classification:	Light Hazard
Density:	0.10 gpm./ft.2
Area of application:	950 sq.ft.
Coverage per sprinkler:	148 sq.ft. maximum
Type of sprinklers calculated:	Concealed Pendent
No. of sprinklers calculated:	9
In rack demand:	0 gpm.
Hose streams:	100 gpm. outside + 0 gpm. inside
Total water required (including hose streams):	262.29 gpm at -25.16 psi [77.02 psi safety margin]
Type of system:	wet pipe
Volume of dry or preaction system:	

Water Supply Information

Date: 01-26-2024
Location: 3601 9th Street Southwest
Source: Fruitland Mutual Water Company

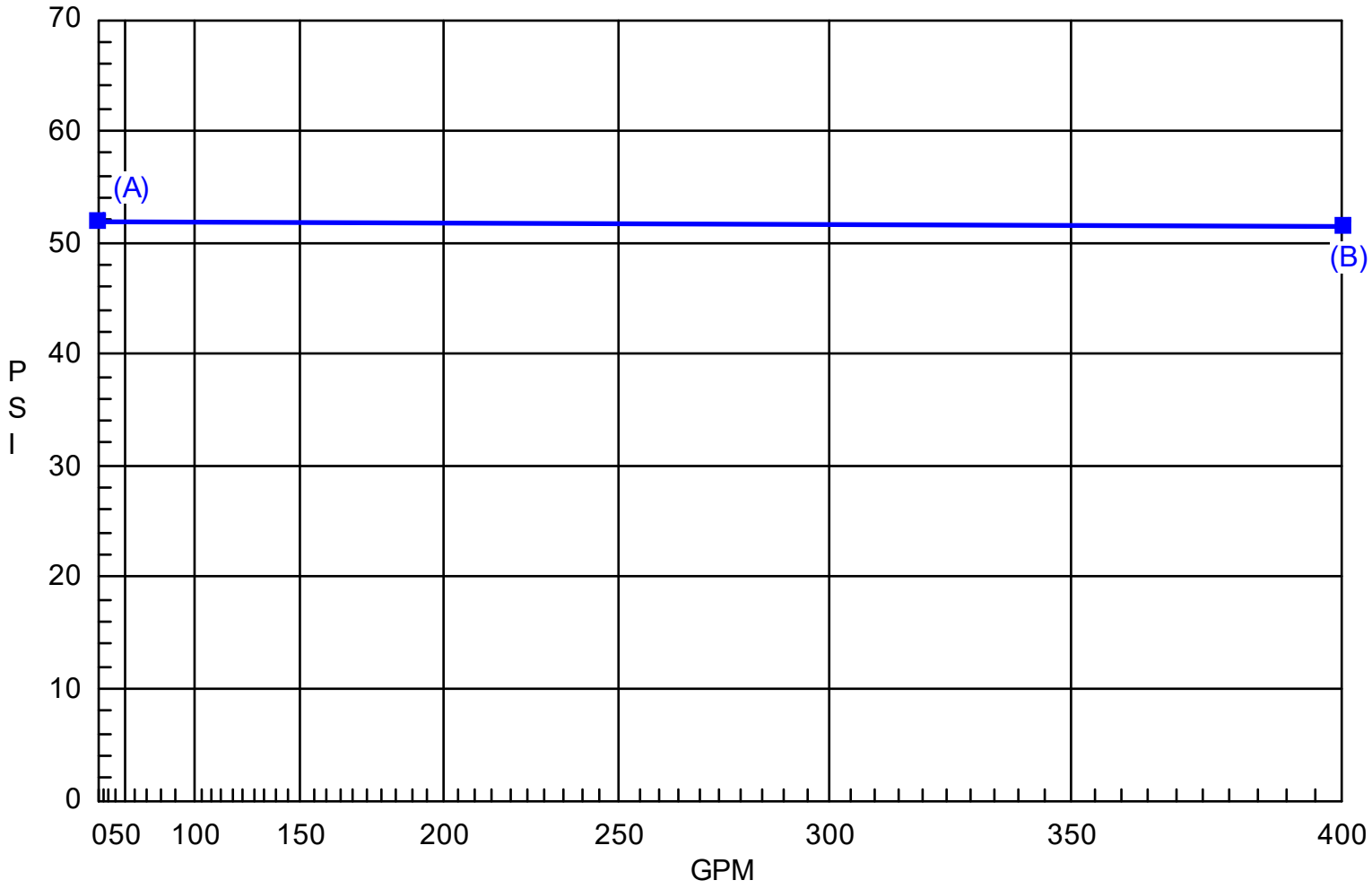
Contractor: Discount Fire Protection, LLC.
4 Red Bluff Court
Mansfield, TX. 76063

Name of designer: Timothy McBride
Authority having jurisdiction:

Notes

Pdev at node BOR to SOP - 3" AMEs 3000SS Backflow Preventer

Hydraulic Demand Graph



Water Source:
A) 52 psi Static
B) 400 gpm at 51.69 psi

Demand at Source:
C) 262.3 gpm at -25.16 psi

report created by the "Simple Hydraulic Calculator" version 2.3.3 from www.igneusinc.com

(C)

Supply Analysis

Node at	Static Pressure [psi]	Residual Pressure [psi]	Flow [gpm]	Available Pressure [psi]	Total Demand [gpm]	Required Pressure [psi]
CTY	52.0	51.0	754.0	51.86	262.29	-25.16

Node Analysis

Node Tag	Elev [ft]	Type	Pressure [psi]	Discharge [gpm]
CTY	1.000	source	-25.160	-262.287
F01	13.000	ref	12.065	0.000
F02	13.000	ref	12.798	0.000
FP1	13.000	ref	17.537	0.000
F03	13.000	ref	9.963	0.000
F04	13.000	ref	10.596	0.000
FP2	13.000	ref	12.846	0.000
FP3	13.000	ref	17.708	0.000
F05	13.000	ref	12.112	0.000
F06	13.000	ref	5.982	0.000
F07	13.000	ref	6.430	0.000
F08	13.000	ref	8.102	0.000
FP4	13.000	ref	11.936	0.000
FP5	13.000	ref	18.731	0.000
F09	13.000	ref	11.157	0.000
GP2	13.000	ref	35.475	0.000
GP3	13.000	ref	37.768	0.000
GP6	13.000	ref	39.188	0.000
GP8	13.000	ref	41.673	0.000
HP5	13.000	ref	43.049	0.000
HP6	13.000	ref	47.501	0.000
TR1	13.000	ref	53.412	0.000
BR1	2.000	ref	71.954	0.000
SOP	2.000	ref	-28.308	0.000
BOR	2.000	ref	-25.947	0.000
M01	-4.000	ref	-23.320	100.000
601	8.500	K=5.60	12.793	20.030
602	8.500	K=5.60	13.723	20.745
603	12.167	K=5.60	9.771	17.505
604	12.167	K=5.60	10.373	18.036
605	9.750	K=5.60	12.415	19.732
606	9.000	K=5.60	7.032	14.850
607	9.000	K=5.60	7.591	15.429
608	9.000	K=5.60	9.155	16.944
609	9.750	K=5.60	11.533	19.017

Pipe Information

negative pipe flow (Q) indicates flow is from node 2 towards node 1

Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	C factor psi/ft	total (Pt) elev (Pe) frict (Pf)	Notes
601	8.500	5.6	q= 20.030	1	1PE=13.388	4.500		Pt= 12.793	Mat="1-CPVC"
			Q= -20.030	1.101		13.388	C=150	Pe= 1.948	
F01	13.000					17.888	0.068	Pf= -1.220	
F01	13.000		q= 0.000	1	1PTS=1.913	8.833		Pt= 12.065	Mat="1-CPVC"
			Q= -20.030	1.101		1.913	C=150	Pe= 0.000	
F02	13.000					10.746	0.068	Pf= -0.733	
F02	13.000		q= 0.000	1	1PTR=9.563	9.083		Pt= 12.798	Mat="1-CPVC"
			Q= -40.774	1.101		9.563	C=150	Pe= 0.000	
FP1	13.000					18.646	0.254	Pf= -4.739	
602	8.500	5.6	q= 20.745	1	1PTR=9.563	4.500		Pt= 13.723	Mat="1-CPVC"
			Q= -20.745	1.101		9.563	C=150	Pe= 1.948	
F02	13.000					14.063	0.073	Pf= -1.024	
603	12.167	5.6	q= 17.505	1	1PTR=9.563	0.833		Pt= 9.771	Mat="1-CPVC"
			Q= -17.505	1.101		9.563	C=150	Pe= 0.361	
F03	13.000					10.396	0.053	Pf= -0.553	
F03	13.000		q= 0.000	1	1PTS=1.913	10.000		Pt= 9.963	Mat="1-CPVC"
			Q= -17.505	1.101		1.913	C=150	Pe= 0.000	
F04	13.000					11.913	0.053	Pf= -0.633	
F04	13.000		q= 0.000	1	1PTS=1.913	9.500		Pt= 10.596	Mat="1-CPVC"
			Q= -35.541	1.101		1.913	C=150	Pe= 0.000	
FP2	13.000					11.413	0.197	Pf= -2.250	
FP2	13.000		q= 0.000	1	1PTR=9.563	1.333		Pt= 12.846	Mat="1-CPVC"
			Q= -55.272	1.101		9.563	C=150	Pe= 0.000	
FP3	13.000					10.896	0.446	Pf= -4.862	
604	12.167	5.6	q= 18.036	1	1PTR=9.563	0.833		Pt= 10.373	Mat="1-CPVC"
			Q= -18.036	1.101		9.563	C=150	Pe= 0.361	
F04	13.000					10.396	0.056	Pf= -0.584	
605	9.750	5.6	q= 19.732	1	1PE=13.388	3.250		Pt= 12.415	Mat="1-CPVC"
			Q= -19.732	1.101		13.388	C=150	Pe= 1.407	
F05	13.000					16.638	0.066	Pf= -1.104	
F05	13.000		q= 0.000	1	1PTR=9.563	1.500		Pt= 12.112	Mat="1-CPVC"
			Q= -19.732	1.101		9.563	C=150	Pe= 0.000	
FP2	13.000					11.063	0.066	Pf= -0.734	
606	9.000	5.6	q= 14.850	1	1PE=13.388	4.000		Pt= 7.032	Mat="1-CPVC"
			Q= -14.850	1.101		13.388	C=150	Pe= 1.732	
F06	13.000					17.388	0.039	Pf= -0.682	
F06	13.000		q= 0.000	1	1PTS=1.913	9.500		Pt= 5.982	Mat="1-CPVC"
			Q= -14.850	1.101		1.913	C=150	Pe= 0.000	
F07	13.000					11.413	0.039	Pf= -0.448	
F07	13.000		q= 0.000	1	1PTS=1.913	9.500		Pt= 6.430	Mat="1-CPVC"
			Q= -30.279	1.101		1.913	C=150	Pe= 0.000	
F08	13.000					11.413	0.147	Pf= -1.672	
F08	13.000		q= 0.000	1	1PTS=1.913	9.583		Pt= 8.102	Mat="1-CPVC"
			Q= -47.223	1.101		1.913	C=150	Pe= 0.000	
FP4	13.000					11.496	0.333	Pf= -3.833	

Pipe Information, cont.

Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	C factor psi/ft	total (Pt) elev (Pe) frict (Pf)	Notes
FP4	13.000		q= 0.000	1	1PTR=9.563	1.333		Pt= 11.936	Mat="1-CPVC"
			Q= -66.240	1.101		9.563	C=150	Pe= 0.000	
FP5	13.000					10.896	0.624	Pf= -6.795	
607	9.000	5.6	q= 15.429	1	1PTR=9.563	4.000		Pt= 7.591	Mat="1-CPVC"
			Q= -15.429	1.101		9.563	C=150	Pe= 1.732	
F07	13.000					13.563	0.042	Pf= -0.571	
608	9.000	5.6	q= 16.944	1	1PTR=9.563	4.000		Pt= 9.155	Mat="1-CPVC"
			Q= -16.944	1.101		9.563	C=150	Pe= 1.732	
F08	13.000					13.563	0.05	Pf= -0.679	
609	9.750	5.6	q= 19.017	1	1PE=13.388	3.250		Pt= 11.533	Mat="1-CPVC"
			Q= -19.017	1.101		13.388	C=150	Pe= 1.407	
F09	13.000					16.638	0.062	Pf= -1.031	
F09	13.000		q= 0.000	1	1PTR=9.563	3.000		Pt= 11.157	Mat="1-CPVC"
			Q= -19.017	1.101		9.563	C=150	Pe= 0.000	
FP4	13.000					12.563	0.062	Pf= -0.779	
FP1	13.000		q= 0.000	2	1PTS=1.296	11.083		Pt= 17.537	Mat="1-CPVC"
			Q= -40.774	2.003		1.296	C=150	Pe= 0.000	
FP3	13.000					12.380	0.014	Pf= -0.171	
FP3	13.000		q= 0.000	2	1PTS=1.296	13.917		Pt= 17.708	Mat="1-CPVC"
			Q= -96.047	2.003		1.296	C=150	Pe= 0.000	
FP5	13.000					15.213	0.067	Pf= -1.023	
FP5	13.000		q= 0.000	2		94.333		Pt= 18.731	Mat="1-CPVC"
			Q=-162.287	2.003		0.000	C=150	Pe= 0.000	
GP2	13.000					94.333	0.178	Pf=-16.745	
GP2	13.000		q= 0.000	2		12.917		Pt= 35.475	Mat="1-CPVC"
			Q=-162.287	2.003		0.000	C=150	Pe= 0.000	
GP3	13.000					12.917	0.178	Pf= -2.293	
GP3	13.000		q= 0.000	2		8.000		Pt= 37.768	Mat="1-CPVC"
			Q=-162.287	2.003		0.000	C=150	Pe= 0.000	
GP6	13.000					8.000	0.178	Pf= -1.420	
GP6	13.000		q= 0.000	2		14.000		Pt= 39.188	Mat="1-CPVC"
			Q=-162.287	2.003		0.000	C=150	Pe= 0.000	
GP8	13.000					14.000	0.178	Pf= -2.485	
GP8	13.000		q= 0.000	2		7.750		Pt= 41.673	Mat="1-CPVC"
			Q=-162.287	2.003		0.000	C=150	Pe= 0.000	
HP5	13.000					7.750	0.178	Pf= -1.376	
HP5	13.000		q= 0.000	2		25.083		Pt= 43.049	Mat="1-CPVC"
			Q=-162.287	2.003		0.000	C=150	Pe= 0.000	
HP6	13.000					25.083	0.178	Pf= -4.452	
HP6	13.000		q= 0.000	2	1PTR=12.965	20.333		Pt= 47.501	Mat="1-CPVC"
			Q=-162.287	2.003		12.965	C=150	Pe= 0.000	
TR1	13.000					33.298	0.178	Pf= -5.911	
TR1	13.000		q= 0.000	2	1C=13.416	12.000		Pt= 53.412	Mat="1-WLML"
			Q=-162.287	2.153	1B=7.318	45.125	C=120	Pe= -4.763	Pdev=-3.0 psi
BR1	2.000				2T=24.392	57.125	0.189	Pf=-10.779	

Pipe Information, cont.

Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	C factor psi/ft	total (Pt) elev (Pe) frict (Pf)	Notes
BR1	2.000		q= 0.000	3	2G=2.688	6.500		Pt= 71.954	Mat="1-WL10"
			Q=-162.287	3.26	1C=21.503	33.599	C=120	Pe= 0.000	Pdev=101.26 psi
SOP	2.000				1E=9.408	40.099	0.025	Pf= -1.003	
SOP	2.000		q= 0.000	3	1E=9.408	5.000		Pt=-28.308	Mat="1-WL10"
			Q=-162.287	3.26		9.408	C=120	Pe= 0.000	Pdev=-2.0 psi
BOR	2.000					14.408	0.025	Pf= -0.360	
BOR	2.000		q= 0.000	6	1E=14.000	10.000		Pt=-25.947	Mat="S40"
			Q=-162.287	6.065		14.000	C=120	Pe= -2.598	
M01	-4.000					24.000	0.001	Pf= -0.029	
M01	-4.000		q= 100.000	6	1G=4.588	96.000		Pt=-23.320	Mat="1-PVC"
			Q=-262.287	6.08	1E=21.411	71.880	C=150	Pe= 2.165	
CTY	1.000				1T=45.881	167.880	0.002	Pf= -0.325	

Material Codes

Pipe Material

S40 - Schedule 40 Steel
1-PVC - PVC C900 Underround Pipe
1-CPVC - Blazemaster
1-WL10 - Wheatland's schedule 10
1-WLML - Wheatland's MLT

Fittings

B - Butterfly Valve
C - Check Valve
E - Standard 90 degree elbow
G - Gate Valve
T - Tee - Flow turn 90 degrees
PE - CPVC 90 degree elbow
PTR - CPVC Tee - Flow turn 90 degree
PTS - CPVC Tee - Flow straight thru path