



SMITH FIRE SYSTEMS, INC.

1106 54th Avenue East • Tacoma, Washington 98424

(253) 926-1880 • FAX (253) 926-2350

CONTR. REG. NO. SMITHFS1360T



HYDRAULIC CALCULATION INFORMATION SHEET

PROJECT NAME COSCTCO PUYALLUP BREAKROOM MEZZANINE JOB NO. TI22062	
DATE 8-4-22	
ADDRESS 1201 39TH AVE SW	BY ISRAEL PEREZ
PUYALLUP, WA 98373	

SYSTEM DESIGNATION: 2	
HAZARD DESCRIPTION: ORDINARY HAZARD GROUP II	
HAZARD CLASS PER NRG SPECIFICATIONS	
SPECIFIC RULING:	
RULING MADE BY: OF	
DENSITY: .20 GPM OVER THE MOST HYDRAULICALLY REMOTE 1,143.06 SQ. FT.	
ALLOWANCES INCLUDED IN CALCULATIONS:	ADDED AT:
INSIDE HOSE 100 GPM	BR
OUTSIDE HOSE 150 GPM	U3
IN-RACK SPRINKLER DEMAND --- GPM	---
SYSTEM TYPE: WET	TOTAL NUMBER OF SPRINKLERS THIS SYSTEM 23
"C" FACTOR OVERHEAD: 120	"C" FACTOR UNDERGROUND: 140
MAXIMUM ACTUAL AREA OF COVERAGE PER SPRINKLER: 113.60	SQUARE FEET
SPRINKLER MANUFACTURER: VIKING	MODEL: VK3021 TEMPERATURE: 155 ° F
K-FACTOR: 5.6	ORIFICE SIZE: 1/2"

WATER SUPPLY:	ELEVATION OF TEST: SAME AS SITE
STATIC 65.7 PSI	DATE OF TEST: 8-19-21
RESIDUAL 62.7 PSI	DATA PROVIDED BY: NRG
FLOW 1,743 GPM	LOCATION OF TEST: HYDRANT LOCATED AT 38TH AVE SW & 12 ST SW

BASE OF RISER DEMAND

471.4 GPM REQUIRED AT **40.0** PSI

(INCLUDING **100** GPM FOR HOSE STREAMS)

SUMMARY

621.4 GPM REQUIRED AT **52.4** PSI

AT CONNECTION TO **U4**

(INCLUDING **250** GPM FOR TOTAL HOSE STREAMS)

WASHINGTON STATE
CERTIFICATE OF COMPETENCY
FIRE PROTECTION SPRINKLER SYSTEMS

Jim Pommert
6749-0192-C Level 3
Smith Fire Systems, Inc.
SMITHFS1360T

Signature

8-4-22
Date

Expires
12/31/22

CERTIFICATE OF COMPETENCY STAMP



SMITH FIRE SYSTEMS, INC.

WATER SUPPLY DATA

STATIC 65.7 PSI
RESIDUAL 62.7 PSI
FLOWING 1,743 GPM

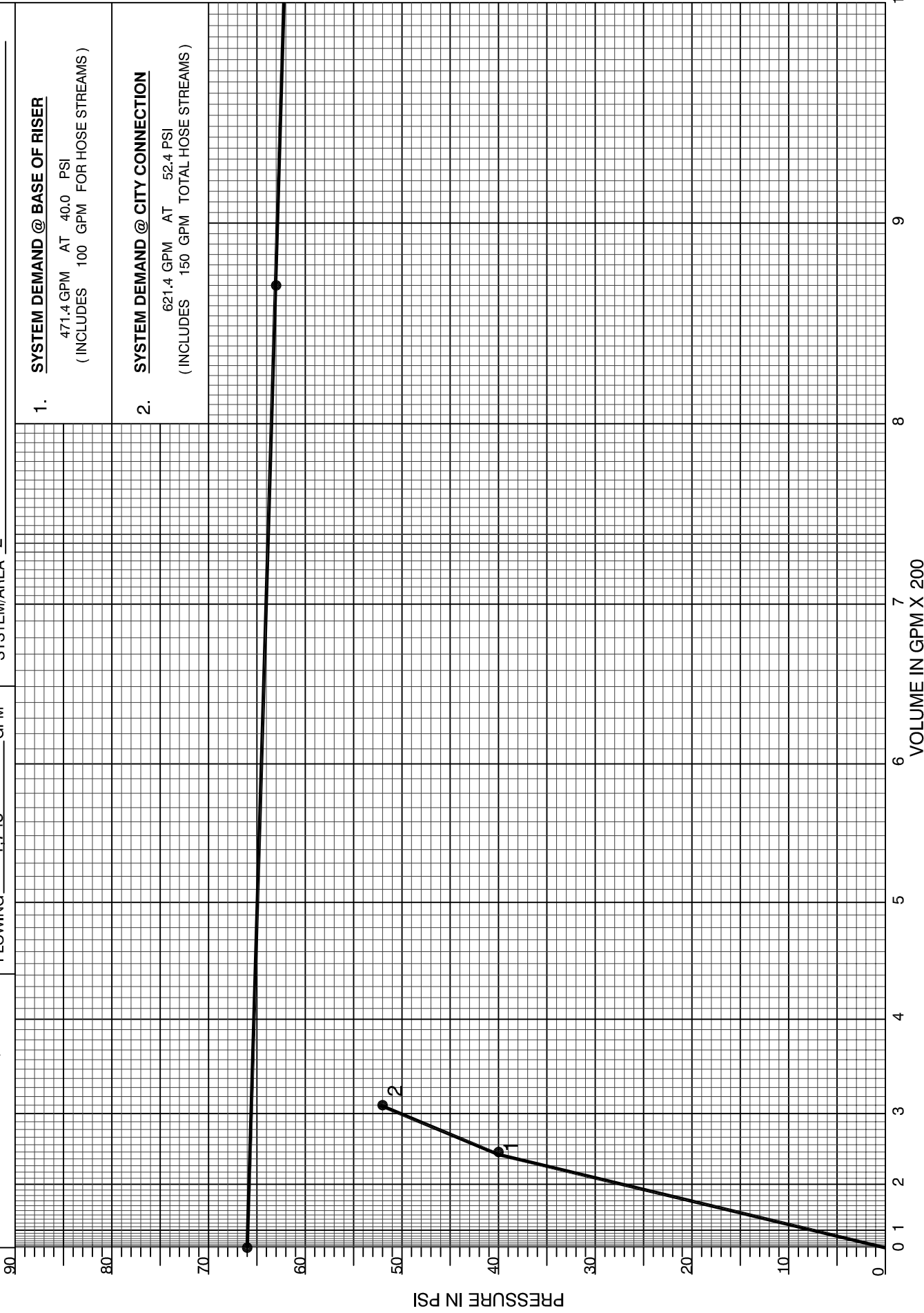
JOB NAME COSTCO PUYALLUP BREAKROOM MEZZANINE
ADDRESS 1201 39TH AVE SW
DATE 7-19-22
JOB NO. T122062
SYSTEM/AREA 2

1. SYSTEM DEMAND @ BASE OF RISER

471.4 GPM AT 40.0 PSI
(INCLUDES 100 GPM FOR HOSE STREAMS)

2. SYSTEM DEMAND @ CITY CONNECTION

621.4 GPM AT 52.4 PSI
(INCLUDES 150 GPM TOTAL HOSE STREAMS)



PRESSURE IN PSI

VOLUME IN GPM X 200

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JOB TITLE:

WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL @ DEMAND (GPM)	REQ'D PRESS. (PSI)
U4	65.7	62.7	1743.0	65.3	621.4	52.4

Available pressure is 12.8 psi (20%) greater than required pressure.

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	621.4 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	250.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	371.4 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)	AREA (FT^2)	DENSITY	
						REQ.	ACT.
						(GPM/FT^2)	(GPM/FT^2)
1	8.6	K= 5.60	13.8	20.8	104.0	0.200	0.200
2	8.6	K= 5.60	13.9	20.9	72.0	0.200	0.290
3	8.6	K= 5.60	14.3	21.2	72.0	0.200	0.294
4	8.6	K= 5.60	15.5	22.0	72.0	0.200	0.306
5	2.0	K= 5.60	9.0	16.8	50.0	0.200	0.337
6	5.0	K= 5.60	8.9	16.7	50.0	0.200	0.334
7	8.6	K= 5.60	20.8	25.5	87.8	0.200	0.291
8	8.6	K= 5.60	20.5	25.4	117.0	0.200	0.217
9	8.6	K= 5.60	19.0	24.4	113.6	0.200	0.215
10	8.6	K= 5.60	19.3	24.6	112.9	0.200	0.218
11	8.6	K= 5.60	20.2	25.1	95.2	0.200	0.264
12	8.6	K= 5.60	21.5	26.0	94.5	0.200	0.275
13	8.6	K= 5.60	19.7	24.9	95.2	0.200	0.261
14	8.6	K= 5.60	20.0	25.0	95.2	0.200	0.263
15	8.6	K= 5.60	20.9	25.6	95.2	0.200	0.269
16	8.6	K= 5.60	22.3	26.4	95.2	0.200	0.278
100	8.6	- - - -	14.8	- - -	- - -	- - -	- - -
101	8.6	- - - -	21.7	- - -	- - -	- - -	- - -
102	8.6	- - - -	21.7	- - -	- - -	- - -	- - -
103	8.6	- - - -	22.0	- - -	- - -	- - -	- - -
104	8.6	- - - -	22.8	- - -	- - -	- - -	- - -
105	8.6	- - - -	26.0	- - -	- - -	- - -	- - -
106	22.1	- - - -	23.0	- - -	- - -	- - -	- - -
107	22.1	- - - -	28.5	- - -	- - -	- - -	- - -
201	23.9	- - - -	28.7	- - -	- - -	- - -	- - -
202	22.1	- - - -	29.4	- - -	- - -	- - -	- - -
203	23.9	- - - -	28.7	- - -	- - -	- - -	- - -
204	22.1	- - - -	29.4	- - -	- - -	- - -	- - -
205	23.9	- - - -	28.7	- - -	- - -	- - -	- - -
206	22.1	- - - -	29.4	- - -	- - -	- - -	- - -
207	23.9	- - - -	28.6	- - -	- - -	- - -	- - -

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JOB TITLE:

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)	AREA (FT^2)	DENSITY	
						REQ. (GPM/FT^2)	ACT.
208	22.1	- - - -	29.3	- - -	- - -	- - -	- - -
209	23.9	- - - -	28.4	- - -	- - -	- - -	- - -
210	22.1	- - - -	29.1	- - -	- - -	- - -	- - -
211	23.9	- - - -	28.1	- - -	- - -	- - -	- - -
212	22.1	- - - -	28.7	- - -	- - -	- - -	- - -
213	23.9	- - - -	28.1	- - -	- - -	- - -	- - -
214	22.1	- - - -	28.7	- - -	- - -	- - -	- - -
215	23.9	- - - -	28.4	- - -	- - -	- - -	- - -
216	22.1	- - - -	29.1	- - -	- - -	- - -	- - -
217	23.9	- - - -	28.6	- - -	- - -	- - -	- - -
218	22.1	- - - -	29.3	- - -	- - -	- - -	- - -
219	23.9	- - - -	28.8	- - -	- - -	- - -	- - -
220	22.1	- - - -	29.5	- - -	- - -	- - -	- - -
221	23.9	- - - -	28.8	- - -	- - -	- - -	- - -
222	22.1	- - - -	29.6	- - -	- - -	- - -	- - -
223	23.9	- - - -	28.9	- - -	- - -	- - -	- - -
224	22.1	- - - -	29.6	- - -	- - -	- - -	- - -
225	23.9	- - - -	28.9	- - -	- - -	- - -	- - -
226	22.1	- - - -	29.7	- - -	- - -	- - -	- - -
227	23.9	- - - -	28.9	- - -	- - -	- - -	- - -
228	22.1	- - - -	29.7	- - -	- - -	- - -	- - -
229	23.9	- - - -	28.9	- - -	- - -	- - -	- - -
230	22.1	- - - -	29.7	- - -	- - -	- - -	- - -
301	23.9	- - - -	29.4	- - -	- - -	- - -	- - -
302	22.1	- - - -	30.3	- - -	- - -	- - -	- - -
303	23.9	- - - -	29.4	- - -	- - -	- - -	- - -
304	22.1	- - - -	30.3	- - -	- - -	- - -	- - -
305	23.9	- - - -	29.4	- - -	- - -	- - -	- - -
306	22.1	- - - -	30.3	- - -	- - -	- - -	- - -
307	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
308	22.1	- - - -	30.2	- - -	- - -	- - -	- - -
309	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
310	22.1	- - - -	30.2	- - -	- - -	- - -	- - -
311	23.9	- - - -	29.2	- - -	- - -	- - -	- - -
312	22.1	- - - -	30.2	- - -	- - -	- - -	- - -
313	23.9	- - - -	29.2	- - -	- - -	- - -	- - -
314	22.1	- - - -	30.2	- - -	- - -	- - -	- - -
315	23.9	- - - -	29.2	- - -	- - -	- - -	- - -
316	22.1	- - - -	30.2	- - -	- - -	- - -	- - -
317	23.9	- - - -	29.2	- - -	- - -	- - -	- - -
318	22.1	- - - -	30.1	- - -	- - -	- - -	- - -
319	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
320	22.1	- - - -	30.1	- - -	- - -	- - -	- - -
321	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
322	22.1	- - - -	30.1	- - -	- - -	- - -	- - -
323	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
324	22.1	- - - -	30.1	- - -	- - -	- - -	- - -
325	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
326	22.1	- - - -	30.1	- - -	- - -	- - -	- - -
327	23.9	- - - -	29.3	- - -	- - -	- - -	- - -
328	22.1	- - - -	30.1	- - -	- - -	- - -	- - -

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)	AREA (FT^2)	DENSITY	
						REQ. (GPM/FT^2)	ACT.
329	23.9	- - - -	28.9	- - -	- - -	- - -	- - -
330	22.1	- - - -	29.7	- - -	- - -	- - -	- - -
400	22.1	- - - -	30.3	- - -	- - -	- - -	- - -
TR	22.1	- - - -	31.9	- - -	- - -	- - -	- - -
BR	4.0	HOSE STREAM	40.0	100.0	- - -	- - -	- - -
401	4.0	- - - -	40.4	- - -	- - -	- - -	- - -
FLG	1.0	- - - -	41.7	- - -	- - -	- - -	- - -
U1	-4.0	- - - -	44.0	- - -	- - -	- - -	- - -
BF1	-4.0	- - - -	44.0	- - -	- - -	- - -	- - -
BF2	-4.0	- - - -	52.0	- - -	- - -	- - -	- - -
U2	-4.0	- - - -	52.1	- - -	- - -	- - -	- - -
U3	-4.0	HOSE STREAM	52.2	150.0	- - -	- - -	- - -
U4	-4.0	SOURCE	52.4	621.4	- - -	- - -	- - -

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF
 JOB TITLE:

PIPE DATA

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
	NODES	(FT)	(K)	(PSI)	(GPM)	VEL (FPS)	HW (C)	(FT)	SUM.	
							FL/FT		(PSI)	
	Pipe: 1					-20.8	1.610	PL	6.00	PF 0.1
1		8.6	5.6	13.8	20.8	3.3	120	FTG	----	PE 0.0
2		8.6	5.6	13.9	20.9		0.017	TL	6.00	PV
	Pipe: 2					-41.7	1.610	PL	6.00	PF 0.4
2		8.6	5.6	13.9	20.9	6.6	120	FTG	----	PE 0.0
3		8.6	5.6	14.3	21.2		0.063	TL	6.00	PV
	Pipe: 3					-62.9	1.610	PL	3.58	PF 0.5
3		8.6	5.6	14.3	21.2	9.9	120	FTG	----	PE 0.0
100		8.6	0.0	14.8	0.0		0.134	TL	3.58	PV
	Pipe: 4					-16.8	1.049	PL	12.00	PF 1.1
5		2.0	5.6	9.0	16.8	6.3	120	FTG	----	PE -1.3
6		5.0	5.6	8.9	16.7		0.095	TL	12.00	PV
	Pipe: 5					-33.5	1.049	PL	11.00	PF 7.4
6		5.0	5.6	8.9	16.7	12.4	120	FTG	3ET	PE -1.6
100		8.6	0.0	14.8	0.0		0.338	TL	22.00	PV
	Pipe: 6					-96.4	1.610	PL	2.42	PF 0.7
100		8.6	0.0	14.8	0.0	15.2	120	FTG	----	PE 0.0
4		8.6	5.6	15.5	22.0		0.296	TL	2.42	PV
	Pipe: 7					-118.4	1.610	PL	5.08	PF 6.2
4		8.6	5.6	15.5	22.0	18.7	120	FTG	T	PE 0.0
102		8.6	0.0	21.7	0.0		0.434	TL	14.38	PV
	Pipe: 8					-25.4	1.610	PL	9.75	PF 0.2
8		8.6	5.6	20.5	25.4	4.0	120	FTG	----	PE 0.0
7		8.6	5.6	20.8	25.5		0.025	TL	9.75	PV
	Pipe: 9					-50.9	1.610	PL	0.92	PF 0.9
7		8.6	5.6	20.8	25.5	8.0	120	FTG	T	PE 0.0
101		8.6	0.0	21.7	0.0		0.091	TL	10.22	PV
	Pipe: 10					-24.4	1.610	PL	10.58	PF 0.2
9		8.6	5.6	19.0	24.4	3.8	120	FTG	----	PE 0.0
10		8.6	5.6	19.3	24.6		0.023	TL	10.58	PV
	Pipe: 11					-49.0	1.610	PL	10.58	PF 0.9
10		8.6	5.6	19.3	24.6	7.7	120	FTG	----	PE 0.0
11		8.6	5.6	20.2	25.1		0.085	TL	10.58	PV
	Pipe: 12					-74.2	1.610	PL	0.92	PF 1.9
11		8.6	5.6	20.2	25.1	11.7	120	FTG	T	PE 0.0
103		8.6	0.0	22.0	0.0		0.182	TL	10.22	PV

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
NODES	(FT)	(K)	(PSI)	(GPM)	VEL (FPS)	HW (C)	FL/FT	(FT)	SUM.	(PSI)
Pipe: 13						-26.0	1.610	PL	9.67	PF 0.5
12	8.6	5.6	21.5	26.0	4.1	120	FTG	T	PE	0.0
103	8.6	0.0	22.0	0.0		0.026	TL	18.97	PV	
Pipe: 14						-24.9	1.610	PL	10.58	PF 0.3
13	8.6	5.6	19.7	24.9	3.9	120	FTG	----	PE	0.0
14	8.6	5.6	20.0	25.0		0.024	TL	10.58	PV	
Pipe: 15						-49.9	1.610	PL	10.58	PF 0.9
14	8.6	5.6	20.0	25.0	7.9	120	FTG	----	PE	0.0
15	8.6	5.6	20.9	25.6		0.088	TL	10.58	PV	
Pipe: 16						-75.5	1.610	PL	0.92	PF 1.9
15	8.6	5.6	20.9	25.6	11.9	120	FTG	T	PE	0.0
104	8.6	0.0	22.8	0.0		0.188	TL	10.22	PV	
Pipe: 17						-26.4	1.610	PL	9.67	PF 0.5
16	8.6	5.6	22.3	26.4	4.2	120	FTG	T	PE	0.0
104	8.6	0.0	22.8	0.0		0.027	TL	18.97	PV	
Pipe: 18						-50.9	3.068	PL	0.50	PF 0.0
101	8.6	0.0	21.7	0.0	2.2	120	FTG	----	PE	0.0
102	8.6	0.0	21.7	0.0		0.004	TL	0.50	PV	
Pipe: 19						-169.3	3.068	PL	8.50	PF 0.3
102	8.6	0.0	21.7	0.0	7.3	120	FTG	----	PE	0.0
103	8.6	0.0	22.0	0.0		0.036	TL	8.50	PV	
Pipe: 20						-269.5	3.068	PL	9.00	PF 0.8
103	8.6	0.0	22.0	0.0	11.7	120	FTG	----	PE	0.0
104	8.6	0.0	22.8	0.0		0.086	TL	9.00	PV	
Pipe: 21						-371.4	3.068	PL	5.50	PF 3.2
104	8.6	0.0	22.8	0.0	16.1	120	FTG	3E	PE	0.0
105	8.6	0.0	26.0	0.0		0.156	TL	20.50	PV	
Pipe: 22						-371.4	3.068	PL	13.50	PF 2.9
105	8.6	0.0	26.0	0.0	16.1	120	FTG	E	PE	-5.8
106	22.1	0.0	23.0	0.0		0.156	TL	18.50	PV	
Pipe: 23						-371.4	3.068	PL	17.58	PF 5.4
106	22.1	0.0	23.0	0.0	16.1	120	FTG	T	PE	0.0
107	22.1	0.0	28.5	0.0		0.156	TL	34.98	PV	
Pipe: 24						27.6	2.469	PL	1.84	PF 0.1
201	23.9	0.0	28.7	0.0	1.8	120	FTG	2T	PE	0.8
202	22.1	0.0	29.4	0.0		0.004	TL	29.84	PV	
Pipe: 25						27.5	2.469	PL	1.84	PF 0.1
203	23.9	0.0	28.7	0.0	1.8	120	FTG	2T	PE	0.8
204	22.1	0.0	29.4	0.0		0.004	TL	29.84	PV	

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
	NODES	(FT)	(K)	(PSI)	(GPM)	VEL (FPS)	HW (C)	(FT)	SUM.	
							FL/FT		(PSI)	
	Pipe: 26					27.6	2.469	PL	1.84	PF 0.1
205		23.9	0.0	28.7	0.0	1.8	120	FTG	2T	PE 0.8
206		22.1	0.0	29.4	0.0		0.004	TL	29.84	PV
	Pipe: 27					28.6	2.469	PL	1.84	PF 0.1
207		23.9	0.0	28.6	0.0	1.9	120	FTG	2T	PE 0.8
208		22.1	0.0	29.3	0.0		0.004	TL	29.84	PV
	Pipe: 28					31.1	2.469	PL	1.84	PF 0.1
209		23.9	0.0	28.4	0.0	2.1	120	FTG	2T	PE 0.8
210		22.1	0.0	29.1	0.0		0.005	TL	29.84	PV
	Pipe: 29					35.3	2.469	PL	1.84	PF 0.2
211		23.9	0.0	28.1	0.0	2.4	120	FTG	2T	PE 0.8
212		22.1	0.0	28.7	0.0		0.006	TL	29.84	PV
	Pipe: 30					35.8	2.469	PL	1.84	PF 0.2
213		23.9	0.0	28.1	0.0	2.4	120	FTG	2T	PE 0.8
214		22.1	0.0	28.7	0.0		0.006	TL	29.84	PV
	Pipe: 31					30.4	2.469	PL	1.84	PF 0.1
215		23.9	0.0	28.4	0.0	2.0	120	FTG	2T	PE 0.8
216		22.1	0.0	29.1	0.0		0.004	TL	29.84	PV
	Pipe: 32					26.1	2.469	PL	1.84	PF 0.1
217		23.9	0.0	28.6	0.0	1.8	120	FTG	2T	PE 0.8
218		22.1	0.0	29.3	0.0		0.003	TL	29.84	PV
	Pipe: 33					23.0	2.469	PL	1.84	PF 0.1
219		23.9	0.0	28.8	0.0	1.5	120	FTG	2T	PE 0.8
220		22.1	0.0	29.5	0.0		0.003	TL	29.84	PV
	Pipe: 34					20.9	2.469	PL	1.84	PF 0.1
221		23.9	0.0	28.8	0.0	1.4	120	FTG	2T	PE 0.8
222		22.1	0.0	29.6	0.0		0.002	TL	29.84	PV
	Pipe: 35					19.6	2.469	PL	1.84	PF 0.1
223		23.9	0.0	28.9	0.0	1.3	120	FTG	2T	PE 0.8
224		22.1	0.0	29.6	0.0		0.002	TL	29.84	PV
	Pipe: 36					19.0	2.469	PL	1.84	PF 0.1
225		23.9	0.0	28.9	0.0	1.3	120	FTG	2T	PE 0.8
226		22.1	0.0	29.7	0.0		0.002	TL	29.84	PV
	Pipe: 37					18.8	2.469	PL	1.84	PF 0.1
227		23.9	0.0	28.9	0.0	1.3	120	FTG	2T	PE 0.8
228		22.1	0.0	29.7	0.0		0.002	TL	29.84	PV
	Pipe: 38					0.0	2.469	PL	1.84	PF 0.0
229		23.9	0.0	28.9	0.0	0.0	120	FTG	2T	PE 0.8
230		22.1	0.0	29.7	0.0		0.000	TL	29.84	PV

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	Q (GPM)	DIA (IN)	LENGTH	PRESS.
END ELEV. NOZ. PT DISC. VEL (FPS) HW (C) (FT) SUM.				
NODES (FT) (K) (PSI) (GPM) FL/FT (PSI)				
Pipe: 39	-27.6	2.469	PL 1.84	PF 0.1
301 23.9 0.0 29.4 0.0 1.8 120	1.8	120	FTG 2T	PE 0.8
302 22.1 0.0 30.3 0.0	0.004	TL	29.84	PV
Pipe: 40	-27.5	2.469	PL 1.84	PF 0.1
303 23.9 0.0 29.4 0.0 1.8 120	1.8	120	FTG 2T	PE 0.8
304 22.1 0.0 30.3 0.0	0.004	TL	29.84	PV
Pipe: 41	-27.6	2.469	PL 1.84	PF 0.1
305 23.9 0.0 29.4 0.0 1.8 120	1.8	120	FTG 2T	PE 0.8
306 22.1 0.0 30.3 0.0	0.004	TL	29.84	PV
Pipe: 42	-28.6	2.469	PL 1.84	PF 0.1
307 23.9 0.0 29.3 0.0 1.9 120	1.9	120	FTG 2T	PE 0.8
308 22.1 0.0 30.2 0.0	0.004	TL	29.84	PV
Pipe: 43	-31.1	2.469	PL 1.84	PF 0.1
309 23.9 0.0 29.3 0.0 2.1 120	2.1	120	FTG 2T	PE 0.8
310 22.1 0.0 30.2 0.0	0.005	TL	29.84	PV
Pipe: 44	-35.3	2.469	PL 1.84	PF 0.2
311 23.9 0.0 29.2 0.0 2.4 120	2.4	120	FTG 2T	PE 0.8
312 22.1 0.0 30.2 0.0	0.006	TL	29.84	PV
Pipe: 45	-35.8	2.469	PL 1.84	PF 0.2
313 23.9 0.0 29.2 0.0 2.4 120	2.4	120	FTG 2T	PE 0.8
314 22.1 0.0 30.2 0.0	0.006	TL	29.84	PV
Pipe: 46	-30.4	2.469	PL 1.84	PF 0.1
315 23.9 0.0 29.2 0.0 2.0 120	2.0	120	FTG 2T	PE 0.8
316 22.1 0.0 30.2 0.0	0.004	TL	29.84	PV
Pipe: 47	-26.1	2.469	PL 1.84	PF 0.1
317 23.9 0.0 29.2 0.0 1.8 120	1.8	120	FTG 2T	PE 0.8
318 22.1 0.0 30.1 0.0	0.003	TL	29.84	PV
Pipe: 48	-23.0	2.469	PL 1.84	PF 0.1
319 23.9 0.0 29.3 0.0 1.5 120	1.5	120	FTG 2T	PE 0.8
320 22.1 0.0 30.1 0.0	0.003	TL	29.84	PV
Pipe: 49	-20.9	2.469	PL 1.84	PF 0.1
321 23.9 0.0 29.3 0.0 1.4 120	1.4	120	FTG 2T	PE 0.8
322 22.1 0.0 30.1 0.0	0.002	TL	29.84	PV
Pipe: 50	-19.6	2.469	PL 1.84	PF 0.1
323 23.9 0.0 29.3 0.0 1.3 120	1.3	120	FTG 2T	PE 0.8
324 22.1 0.0 30.1 0.0	0.002	TL	29.84	PV
Pipe: 51	-19.0	2.469	PL 1.84	PF 0.1
325 23.9 0.0 29.3 0.0 1.3 120	1.3	120	FTG 2T	PE 0.8
326 22.1 0.0 30.1 0.0	0.002	TL	29.84	PV

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	END	ELEV.	NOZ.	PT	DISC.	Q (GPM)	DIA (IN)	LENGTH	PRESS.	
NODES	(FT)	(K)	(PSI)	(GPM)	VEL (FPS)	HW (C)	FL/FT	(FT)	SUM.	(PSI)
Pipe: 52						-18.8	2.469	PL	1.84	PF 0.1
327	23.9	0.0	29.3	0.0	1.3	120	FTG	2T	PE	0.8
328	22.1	0.0	30.1	0.0		0.002	TL	29.84	PV	
Pipe: 53						0.0	2.469	PL	1.84	PF 0.0
329	23.9	0.0	28.9	0.0	0.0	120	FTG	2T	PE	0.8
330	22.1	0.0	29.7	0.0		0.000	TL	29.84	PV	
Pipe: 54						27.6	3.068	PL	10.83	PF 0.0
202	22.1	0.0	29.4	0.0	1.2	120	FTG	----	PE	0.0
204	22.1	0.0	29.4	0.0		0.001	TL	10.83	PV	
Pipe: 55						55.1	3.068	PL	9.75	PF 0.0
204	22.1	0.0	29.4	0.0	2.4	120	FTG	----	PE	0.0
206	22.1	0.0	29.4	0.0		0.005	TL	9.75	PV	
Pipe: 56						82.6	3.068	PL	11.17	PF 0.1
206	22.1	0.0	29.4	0.0	3.6	120	FTG	----	PE	0.0
208	22.1	0.0	29.3	0.0		0.010	TL	11.17	PV	
Pipe: 57						111.3	3.068	PL	11.83	PF 0.2
208	22.1	0.0	29.3	0.0	4.8	120	FTG	----	PE	0.0
210	22.1	0.0	29.1	0.0		0.017	TL	11.83	PV	
Pipe: 58						142.4	3.068	PL	12.50	PF 0.3
210	22.1	0.0	29.1	0.0	6.2	120	FTG	----	PE	0.0
212	22.1	0.0	28.7	0.0		0.026	TL	12.50	PV	
Pipe: 59						177.7	3.068	PL	6.83	PF 0.3
212	22.1	0.0	28.7	0.0	7.7	120	FTG	----	PE	0.0
107	22.1	0.0	28.5	0.0		0.040	TL	6.83	PV	
Pipe: 60						-193.7	3.068	PL	4.50	PF 0.2
107	22.1	0.0	28.5	0.0	8.4	120	FTG	----	PE	0.0
214	22.1	0.0	28.7	0.0		0.047	TL	4.50	PV	
Pipe: 61						-157.9	3.068	PL	11.92	PF 0.4
214	22.1	0.0	28.7	0.0	6.9	120	FTG	----	PE	0.0
216	22.1	0.0	29.1	0.0		0.032	TL	11.92	PV	
Pipe: 62						-127.5	3.068	PL	11.92	PF 0.3
216	22.1	0.0	29.1	0.0	5.5	120	FTG	----	PE	0.0
218	22.1	0.0	29.3	0.0		0.022	TL	11.92	PV	
Pipe: 63						-101.4	3.068	PL	11.92	PF 0.2
218	22.1	0.0	29.3	0.0	4.4	120	FTG	----	PE	0.0
220	22.1	0.0	29.5	0.0		0.014	TL	11.92	PV	
Pipe: 64						-78.4	3.068	PL	11.92	PF 0.1
220	22.1	0.0	29.5	0.0	3.4	120	FTG	----	PE	0.0
222	22.1	0.0	29.6	0.0		0.009	TL	11.92	PV	

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	Q (GPM)	DIA (IN)	LENGTH	PRESS.
END ELEV. NOZ. PT DISC. VEL (FPS) HW (C) (FT) SUM. (PSI)				
NODES (FT) (K) (PSI) (GPM) FL/FT				
Pipe: 65	-57.5	3.068	PL 11.92	PF 0.1
222 22.1 0.0 29.6 0.0 2.5 120 FTG			----	PE 0.0
224 22.1 0.0 29.6 0.0 0.005 TL			11.92	PV
Pipe: 66	-37.8	3.068	PL 11.92	PF 0.0
224 22.1 0.0 29.6 0.0 1.6 120 FTG			----	PE 0.0
226 22.1 0.0 29.7 0.0 0.002 TL			11.92	PV
Pipe: 67	-18.8	3.068	PL 11.92	PF 0.0
226 22.1 0.0 29.7 0.0 0.8 120 FTG			----	PE 0.0
228 22.1 0.0 29.7 0.0 0.001 TL			11.92	PV
Pipe: 68	0.0	3.068	PL 11.92	PF 0.0
228 22.1 0.0 29.7 0.0 0.0 120 FTG			----	PE 0.0
230 22.1 0.0 29.7 0.0 0.000 TL			11.92	PV
Pipe: 69	-27.6	6.065	PL 7.00	PF 0.0
302 22.1 0.0 30.3 0.0 0.3 120 FTG			----	PE 0.0
400 22.1 0.0 30.3 0.0 0.000 TL			7.00	PV
Pipe: 70	343.8	6.065	PL 3.83	PF 0.0
400 22.1 0.0 30.3 0.0 3.8 120 FTG			----	PE 0.0
304 22.1 0.0 30.3 0.0 0.005 TL			3.83	PV
Pipe: 71	316.3	6.065	PL 9.75	PF 0.0
304 22.1 0.0 30.3 0.0 3.5 120 FTG			----	PE 0.0
306 22.1 0.0 30.3 0.0 0.004 TL			9.75	PV
Pipe: 72	288.8	6.065	PL 11.17	PF 0.0
306 22.1 0.0 30.3 0.0 3.2 120 FTG			----	PE 0.0
308 22.1 0.0 30.2 0.0 0.004 TL			11.17	PV
Pipe: 73	260.1	6.065	PL 11.83	PF 0.0
308 22.1 0.0 30.2 0.0 2.9 120 FTG			----	PE 0.0
310 22.1 0.0 30.2 0.0 0.003 TL			11.83	PV
Pipe: 74	229.0	6.065	PL 12.50	PF 0.0
310 22.1 0.0 30.2 0.0 2.5 120 FTG			----	PE 0.0
312 22.1 0.0 30.2 0.0 0.002 TL			12.50	PV
Pipe: 75	193.7	6.065	PL 11.33	PF 0.0
312 22.1 0.0 30.2 0.0 2.2 120 FTG			----	PE 0.0
314 22.1 0.0 30.2 0.0 0.002 TL			11.33	PV
Pipe: 76	157.9	6.065	PL 11.92	PF 0.0
314 22.1 0.0 30.2 0.0 1.8 120 FTG			----	PE 0.0
316 22.1 0.0 30.2 0.0 0.001 TL			11.92	PV
Pipe: 77	127.5	6.065	PL 11.92	PF 0.0
316 22.1 0.0 30.2 0.0 1.4 120 FTG			----	PE 0.0
318 22.1 0.0 30.1 0.0 0.001 TL			11.92	PV

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	Q (GPM)	DIA (IN)	LENGTH	PRESS.
END ELEV. NOZ. PT DISC. VEL (FPS) HW (C) (FT) SUM. (PSI)				
NODES (FT) (K) (PSI) (GPM) FL/FT				
Pipe: 78	101.4	6.065	PL 11.92	PF 0.0
318 22.1 0.0 30.1 0.0 1.1 120 FTG ----				PE 0.0
320 22.1 0.0 30.1 0.0 0.001 TL 11.92				PV
Pipe: 79	78.4	6.065	PL 11.92	PF 0.0
320 22.1 0.0 30.1 0.0 0.9 120 FTG ----				PE 0.0
322 22.1 0.0 30.1 0.0 0.000 TL 11.92				PV
Pipe: 80	57.5	6.065	PL 11.92	PF 0.0
322 22.1 0.0 30.1 0.0 0.6 120 FTG ----				PE 0.0
324 22.1 0.0 30.1 0.0 0.000 TL 11.92				PV
Pipe: 81	37.8	6.065	PL 11.92	PF 0.0
324 22.1 0.0 30.1 0.0 0.4 120 FTG ----				PE 0.0
326 22.1 0.0 30.1 0.0 0.000 TL 11.92				PV
Pipe: 82	18.8	6.065	PL 11.92	PF 0.0
326 22.1 0.0 30.1 0.0 0.2 120 FTG ----				PE 0.0
328 22.1 0.0 30.1 0.0 0.000 TL 11.92				PV
Pipe: 83	0.0	6.065	PL 11.92	PF 0.0
329 23.9 0.0 28.9 0.0 0.0 120 FTG ----				PE 0.8
330 22.1 0.0 29.7 0.0 0.000 TL 11.92				PV
Pipe: 84	-27.6	2.469	PL 192.50	PF 0.7
201 23.9 0.0 28.7 0.0 1.8 120 FTG ----				PE 0.0
301 23.9 0.0 29.4 0.0 0.004 TL 192.50				PV
Pipe: 85	-27.5	2.469	PL 192.50	PF 0.7
203 23.9 0.0 28.7 0.0 1.8 120 FTG ----				PE 0.0
303 23.9 0.0 29.4 0.0 0.004 TL 192.50				PV
Pipe: 86	-27.6	2.469	PL 192.50	PF 0.7
205 23.9 0.0 28.7 0.0 1.8 120 FTG ----				PE 0.0
305 23.9 0.0 29.4 0.0 0.004 TL 192.50				PV
Pipe: 87	-28.6	2.469	PL 192.50	PF 0.8
207 23.9 0.0 28.6 0.0 1.9 120 FTG ----				PE 0.0
307 23.9 0.0 29.3 0.0 0.004 TL 192.50				PV
Pipe: 88	-31.1	2.469	PL 192.50	PF 0.9
209 23.9 0.0 28.4 0.0 2.1 120 FTG ----				PE 0.0
309 23.9 0.0 29.3 0.0 0.005 TL 192.50				PV
Pipe: 89	-35.3	2.469	PL 192.50	PF 1.1
211 23.9 0.0 28.1 0.0 2.4 120 FTG ----				PE 0.0
311 23.9 0.0 29.2 0.0 0.006 TL 192.50				PV
Pipe: 90	-35.8	2.469	PL 192.50	PF 1.1
213 23.9 0.0 28.1 0.0 2.4 120 FTG ----				PE 0.0
313 23.9 0.0 29.2 0.0 0.006 TL 192.50				PV

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	Q (GPM)	DIA (IN)	LENGTH	PRESS.
END ELEV. NOZ. PT DISC. VEL (FPS) HW (C) (FT) SUM. (PSI)				
NODES (FT) (K) (PSI) (GPM) FL/FT				
Pipe: 91	-30.4	2.469	PL 192.50	PF 0.8
215 23.9 0.0 28.4 0.0 2.0 120 FTG ----				PE 0.0
315 23.9 0.0 29.2 0.0 0.004 TL 192.50				PV
Pipe: 92	-26.1	2.469	PL 192.50	PF 0.6
217 23.9 0.0 28.6 0.0 1.8 120 FTG ----				PE 0.0
317 23.9 0.0 29.2 0.0 0.003 TL 192.50				PV
Pipe: 93	-23.0	2.469	PL 192.50	PF 0.5
219 23.9 0.0 28.8 0.0 1.5 120 FTG ----				PE 0.0
319 23.9 0.0 29.3 0.0 0.003 TL 192.50				PV
Pipe: 94	-20.9	2.469	PL 192.50	PF 0.4
221 23.9 0.0 28.8 0.0 1.4 120 FTG ----				PE 0.0
321 23.9 0.0 29.3 0.0 0.002 TL 192.50				PV
Pipe: 95	-19.6	2.469	PL 192.50	PF 0.4
223 23.9 0.0 28.9 0.0 1.3 120 FTG ----				PE 0.0
323 23.9 0.0 29.3 0.0 0.002 TL 192.50				PV
Pipe: 96	-19.0	2.469	PL 192.50	PF 0.4
225 23.9 0.0 28.9 0.0 1.3 120 FTG ----				PE 0.0
325 23.9 0.0 29.3 0.0 0.002 TL 192.50				PV
Pipe: 97	-18.8	2.469	PL 192.50	PF 0.3
227 23.9 0.0 28.9 0.0 1.3 120 FTG ----				PE 0.0
327 23.9 0.0 29.3 0.0 0.002 TL 192.50				PV
Pipe: 98	0.0	2.469	PL 192.50	PF 0.0
229 23.9 0.0 28.9 0.0 0.0 120 FTG ----				PE 0.0
329 23.9 0.0 28.9 0.0 0.000 TL 192.50				PV
Pipe: 99	-371.4	6.065	PL 233.72	PF 1.5
400 22.1 0.0 30.3 0.0 4.1 120 FTG 4E				PE 0.0
TR 22.1 0.0 31.9 0.0 0.006 TL 273.72				PV
Pipe: 100	-371.4	6.065	PL 18.08	PF 0.3
TR 22.1 0.0 31.9 0.0 4.1 120 FTG TB				PE 7.8
BR 4.0 H.S. 40.0 100.0 0.006 TL 57.78				PV
Pipe: 101	-471.4	6.065	PL 0.50	PF 0.3
BR 4.0 H.S. 40.0 100.0 5.2 120 FTG T				PE 0.0
401 4.0 0.0 40.4 0.0 0.009 TL 35.40				PV
Pipe: 102	-471.4	6.065	PL 3.04	PF 0.0
401 4.0 0.0 40.4 0.0 5.2 120 FTG ----				PE 1.3
FLG 1.0 0.0 41.7 0.0 0.009 TL 3.04				PV
Pipe: 103	-471.4	8.270	PL 20.00	PF 0.1
FLG 1.0 0.0 41.7 0.0 2.8 140 FTG ET				PE 2.1
U1 -4.0 0.0 44.0 0.0 0.001 TL 85.00				PV

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PIPE TAG	Q (GPM)	DIA (IN)	LENGTH	PRESS.
END ELEV. NOZ. PT DISC. VEL (FPS) HW (C) (FT) SUM.				
NODES (FT) (K) (PSI) (GPM) FL/FT (PSI)				
Pipe: 104	-471.4	8.270	PL 2.00	PF 0.0
U1 -4.0 0.0 44.0 0.0 2.8 140 FTG			----	PE 0.0
BF1 -4.0 0.0 44.0 0.0 0.001 TL			2.00	PV
Pipe: 105			FIXED PRESSURE LOSS DEVICE	
BF2 -4.0 0.0 52.0 0.0 8.0 psi, 471.4 gpm				
BF1 -4.0 0.0 44.0 0.0				
Pipe: 106	-471.4	8.270	PL 26.00	PF 0.1
BF2 -4.0 0.0 52.0 0.0 2.8 140 FTG			T	PE 0.0
U2 -4.0 0.0 52.1 0.0 0.001 TL			73.00	PV
Pipe: 107	-471.4	8.270	PL 58.00	PF 0.1
U2 -4.0 0.0 52.1 0.0 2.8 140 FTG			----	PE 0.0
U3 -4.0 H.S. 52.2 150.0 0.001 TL			58.00	PV
Pipe: 108	-621.4	8.270	PL 58.17	PF 0.3
U3 -4.0 H.S. 52.2 150.0 3.7 140 FTG			TG	PE 0.0
U4 -4.0 SRCE 52.4 (N/A) 0.002 TL			111.17	PV

NOTES (HASS):

- (1) Calculations were performed by the HASS 2021 D computer program in accordance with NFPA13 (2020) under license no. 64621553 granted by
 HRS Systems, Inc.
 208 Southside Square
 Petersburg, TN 37144
 (931) 659-9760
- (2) The system has been calculated to provide an average imbalance at each node of 0.001 gpm and a maximum imbalance at any node of 0.063 gpm.
- (3) Total pressure at each node is used in balancing the system. Maximum water velocity is 18.7 ft/sec at pipe 7.
- (4) Items listed in bold print on the cover sheet

 are automatically transferred from the calculation report.
- (5) PIPE FITTINGS TABLE

User Pipe Table Name: Smith

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

PAGE: A MATERIAL: S40 HWC: 120

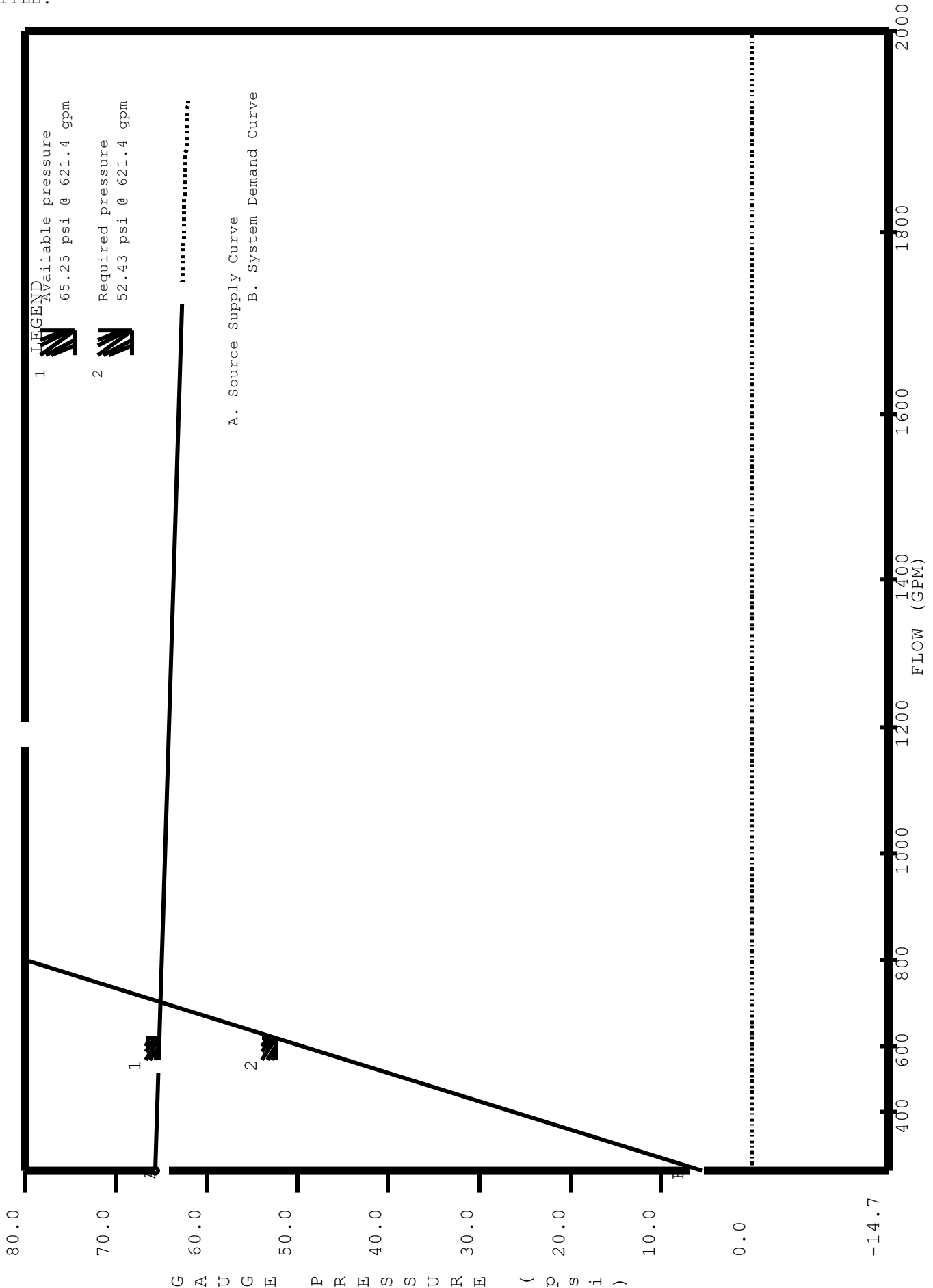
Diameter (in)	Equivalent Fitting Lengths in Feet								
	E	T	F	C	B	G	A	D	X
	Ell	Tee	45 ChkVlv	BfyVlv	GatVlv	AlmChk	DPVlv	flex	
1.049	2.00	5.00	1.00	5.00	6.00	1.00	0.00	0.00	0.00
1.610	2.60	9.30	1.30	9.00	6.00	1.00	3.00	3.00	0.00
2.469	4.30	14.00	2.20	15.00	3.70	1.00	8.00	8.00	0.00
3.068	5.00	17.40	2.60	17.00	7.20	1.00	17.00	17.00	0.00
6.065	10.00	34.90	5.00	26.00	4.80	3.00	22.00	22.00	0.00

PAGE: D MATERIAL: DI HWC: 140

Diameter (in)	Equivalent Fitting Lengths in Feet					
	E	T	F	C	B	G
	Ell	Tee	45 ChkVlv	BfyVlv	GatVlv	
8.270	18.00	47.00	12.00	60.00	20.00	6.00

WATER SUPPLY ANALYSIS

Static: 65.70 psi Resid: 62.70 psi Flow: 1743.0 gpm



LEGEND

1 Available pressure
65.25 psi @ 621.4 gpm

2 Required pressure
52.43 psi @ 621.4 gpm

A. Source Supply Curve
B. System Demand Curve

Note: (1) Dashed Lines indicate extrapolated values from Test Results
(2) On Site pressures are based on hose stream deduction at the source

DATE: 7/19/2022SIGN\HYDRAULIC CALCS\TI22062 COSTCO BREAKROOM HYD CALC.SDF

JOB TITLE:

WATER SUPPLY CURVE

