CALCULATION SUMMARY

Project Name : Westdell - CRU #1B

Project Location: 1300 Fanshawe Pk Rd East

Contract No. : 062-040424

City: London, Ontario

Design Areas

Design Area Name	Calc. Mode (Model)	Occupancy	Area of Application	Total Water	Pressure @ Source	Min. Density	Min. Pressure	Min. Flow	Calculated Heads	Hose Streams	Margin To Source
			(ft²)	(gpm)	(psi)	(gpm/ft²)	(psi)	(gpm)	#	(gpm)	(psi)
1	Demand (HW)	Ord. Grp. 2	1500	561	Required 35.8	0.2	13.5	20.6	15	250	31.5

HYDRAULIC CALCULATIONS
for

Job Information

Project Name : Westdell - CRU #1B

Contract No. : 062-040424 — City: London, Ontario

Project Location: 1300 Fanshawe Pk Rd East — Date: 4/4/2024

Contractor Information

Name of Contractor: SDC

Address: 23 Turnbull Drive — City: Brantford, Ontario N3T 0K4

Phone Number: 226-388-1503 — E-mail: jhayhurst@hotmail.ca

Name of Designer: JSH

Authority Having Jurisdiction: Local Bldg Dept.

Design

Remote Area Name	1
Remote Area Location	Retail Area
Occupancy Classification	Ord. Grp. 2
Density (gpm/ft²)	0.2
Area of Application (ft²)	1500
Coverage per Sprinkler (ft²)	103
Number of Calculated Sprinklers	15
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	250
Total Water Required (incl. Hose Streams) (gpm)	561
Required Pressure at Source (psi)	35.8
Type of System	Wet
Volume - Entire System (gal)	1962.3 gal

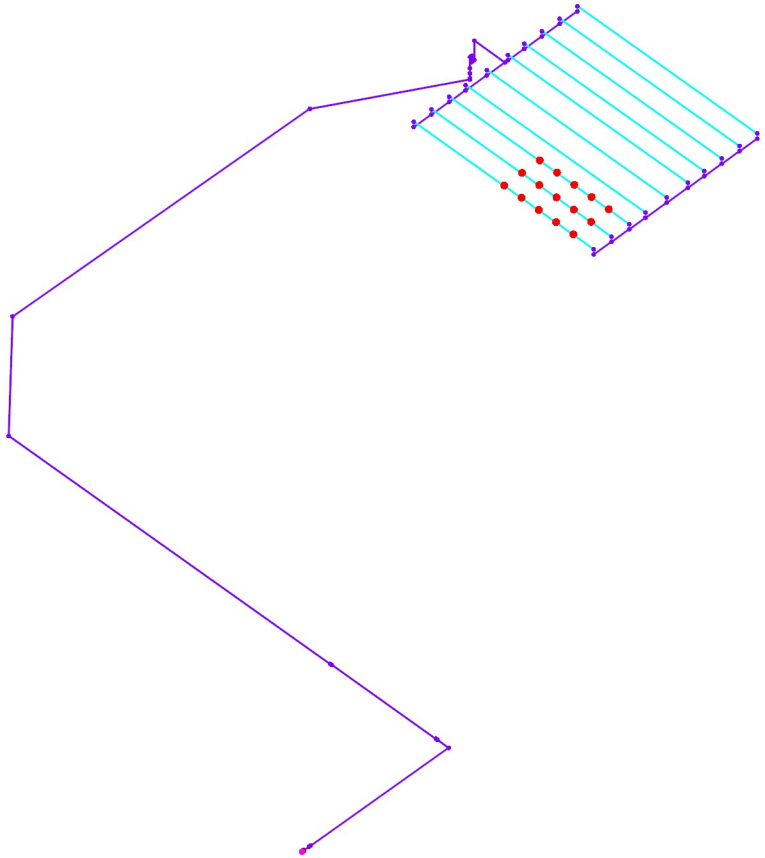
Water Supply Information

Date	Nov.2015
Location	1300 Fanshawe Pk Rd E
Source	W1

Notes

Node Labels: Off
Pipe Labels: Off

Diagram for Design Area : 1
(Optimized Hydraulic Simplified)



Hydraulic Analysis for : 1

Calculation Info

Calculation Mode	Demand
Hydraulic Model	Hazen-Williams
Fluid Name	Water @ 60F (15.6C)
Fluid Weight, (lb/ft³)	N/A for Hazen-Williams calculation.
Fluid Dynamic Viscosity, (lb·s/ft²)	N/A for Hazen-Williams calculation.

Water Supply Parameters

Supply 1 : W1

Flow (gpm)	Pressure (psi)
0	68
1160	65
1840	64

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	68	65	1160	67.2	561	35.8

Hoses

Inside Hose Flow / Standpipe Demand (gpm)	100
Outside Hose Flow (gpm)	0
Additional Outside Hose Flow (gpm)	150
Other (custom defined) Hose Flow (gpm)	0
Total Hose Flow (gpm)	250

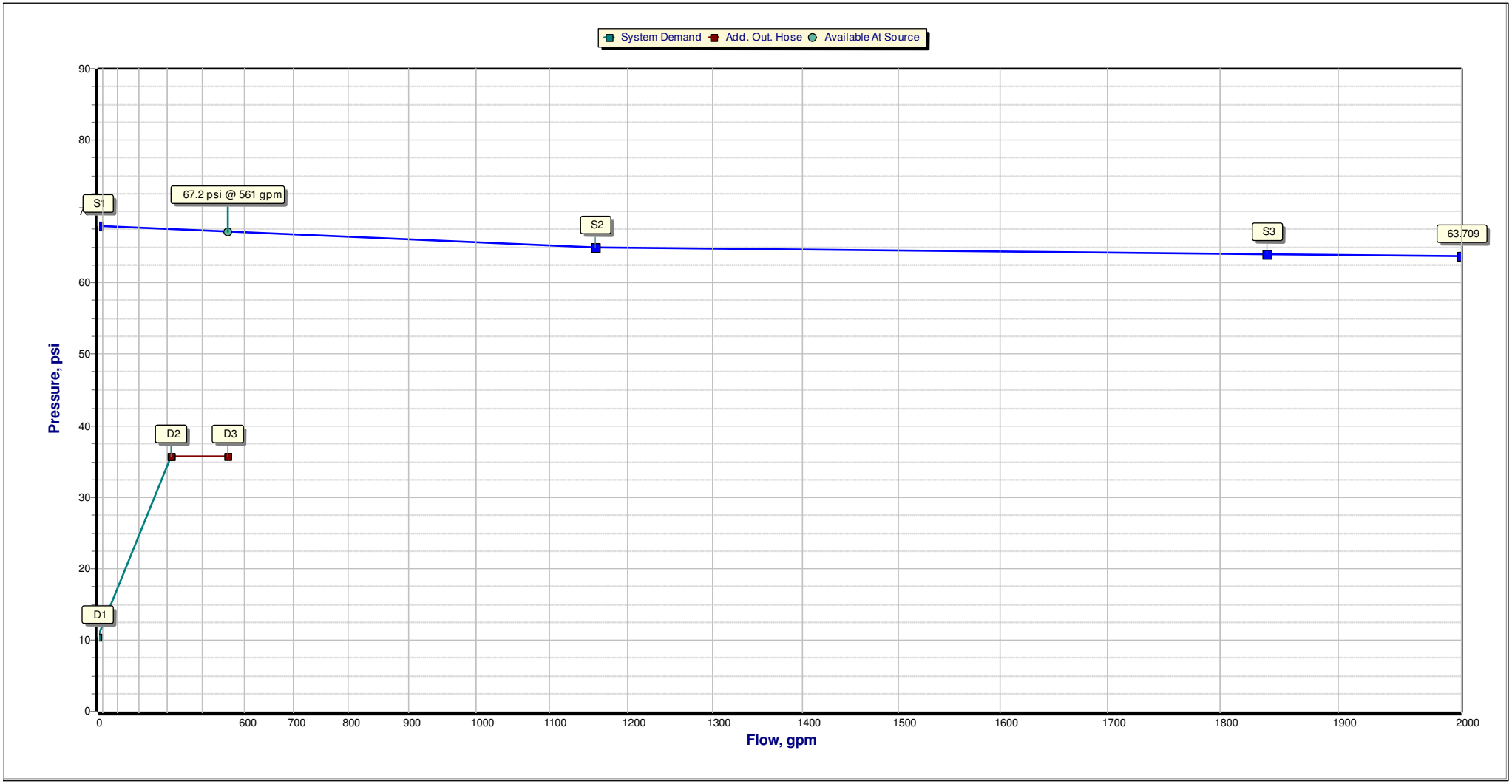
Sprinklers

Ovehead Sprinkler Flow (gpm)	311
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	311

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	35.8
W1 - Flow (gpm)	411
Demand w/o System Pump(s)	N/A

Hydraulic Analysis for : 1



Hydraulic Analysis for : 1

Graph Labels

Label	Description	Values	
		Flow (gpm)	Pressure (psi)
S1	Supply point #1 - Static	0	68
S2	Supply point #2	1160	65
S3	Supply point #3	1840	64
D1	Elevation Pressure	0	10.4
D2	System Demand	411	35.8
D3	System Demand + Add.Out.Hose	561	35.8

Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	67	634.3	31.5	561

Open Heads

Head Ref.	Head Type	Coverage	K-Factor	Required			Calculated		
				Density	Flow	Pressure	Density	Flow	Pressure
		(ft²)	(gpm/psi½)	(gpm/ft²)	(gpm)	(psi)	(gpm/ft²)	(gpm)	(psi)
A1	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.202	20.9	13.9
A10	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.202	20.8	13.8
A11	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.203	20.9	14
A12	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.201	20.7	13.7
A13	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.201	20.7	13.6
A14	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.201	20.7	13.6
A15	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.203	20.9	13.9
A2	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.2	20.6	13.6
A3	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.2	20.6	13.5
A4	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.2	20.6	13.6
A5	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.202	20.8	13.8
A6	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.203	20.9	13.9

A7	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.2	20.6	13.6
A8	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.2	20.6	13.5
A9	Overhead Sprinkler	103	5.6	0.2	20.6	13.5	0.2	20.6	13.6

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi½	gpm gpm	ft² gpm/ft²	psi psi	psi gpm
A3 17.92	Overhead Sprinkler HEAD	5.6 Open	20.6 0	103 0.2	13.5 -10.4	13.5 20.6
A8 17.92	Overhead Sprinkler HEAD	5.6 Open	20.6 0.0	103 0.2	13.5 -10.4	13.5 20.6
A4 17.92	Overhead Sprinkler HEAD	5.6 Open	20.6 0.0	103 0.2	13.6 -10.4	13.5 20.6
A2 17.92	Overhead Sprinkler HEAD	5.6 Open	20.6 0.0	103 0.2	13.6 -10.4	13.5 20.6
A9 17.92	Overhead Sprinkler HEAD	5.6 Open	20.6 0.0	103 0.2	13.6 -10.4	13.5 20.6
A7 17.92	Overhead Sprinkler HEAD	5.6 Open	20.6 0.0	103 0.2	13.6 -10.4	13.5 20.6
A13 17.92	Overhead Sprinkler HEAD	5.6 Open	20.7 0.1	103 0.201	13.6 -10.4	13.5 20.6
A14 17.92	Overhead Sprinkler HEAD	5.6 Open	20.7 0.1	103 0.201	13.6 -10.4	13.5 20.6
A12 17.92	Overhead Sprinkler HEAD	5.6 Open	20.7 0.1	103 0.201	13.7 -10.4	13.5 20.6
A5 17.92	Overhead Sprinkler HEAD	5.6 Open	20.8 0.2	103 0.202	13.8 -10.4	13.5 20.6
A10 17.92	Overhead Sprinkler HEAD	5.6 Open	20.8 0.2	103 0.202	13.8 -10.4	13.5 20.6
A1 17.92	Overhead Sprinkler HEAD	5.6 Open	20.9 0.3	103 0.202	13.9 -10.4	13.5 20.6
A6 17.92	Overhead Sprinkler HEAD	5.6 Open	20.9 0.3	103 0.203	13.9 -10.4	13.5 20.6
A15 17.92	Overhead Sprinkler HEAD	5.6 Open	20.9 0.3	103 0.203	13.9 -10.4	13.5 20.6
A11 17.92	Overhead Sprinkler HEAD	5.6 Open	20.9 0.3	103 0.203	14 -10.4	13.5 20.6
057 17.67	Node NODE				14.4 -10.3	
066 17.67	Node NODE				14.4 -10.3	
056 17.67	Node NODE				14.4 -10.3	
058 17.67	Node NODE				14.4 -10.3	
065 17.67	Node NODE				14.4 -10.3	
067 17.67	Node NODE				14.4 -10.3	
080 17.67	Node NODE				14.4 -10.3	
079 17.67	Node NODE				14.5 -10.3	
081 17.67	Node NODE				14.5 -10.3	
055 17.67	Node NODE				14.7 -10.3	

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi½	gpm gpm	ft² gpm/ft²	psi psi	psi gpm
064 17.67	Node NODE				14.7 -10.3	
001 17.67	Node NODE				14.7 -10.3	
068 17.67	Node NODE				14.7 -10.3	
078 17.67	Node NODE				14.8 -10.3	
082 17.67	Node NODE				14.8 -10.3	
006 14.67	Node NODE				18.7 -9	
008 14.67	Node NODE				18.7 -9	
009 14.67	Node NODE				18.9 -9	
010 14.67	Node NODE				19.1 -9	
011 14.67	Node NODE				19.3 -9	
012 14.67	Node NODE				19.5 -9	
013 14.67	Node NODE				19.5 -9	
014 14.67	Node NODE				19.6 -9	
015 14.67	Node NODE				19.6 -9	
016 14.67	Node NODE				19.6 -9	
040 14.67	Node NODE				21.5 -9	
039 14.67	Node NODE				21.5 -9	
038 14.67	Node NODE				21.6 -9	
037 14.67	Node NODE				21.6 -9	
036 14.67	Node NODE				21.7 -9	
030 14.67	Node NODE				22 -9	
031 14.67	Node NODE				22 -9	
032 14.67	Node NODE				22 -9	
033 14.67	Node NODE				22 -9	
034 14.67	Node NODE				22 -9	

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi½	gpm gpm	ft² gpm/ft²	psi psi	psi gpm
035 14.67	Node NODE				22.1 -9	
117 3.5	Node NODE				28.5 -4.1	
121-O 0.54	Node NODE				30 -2.8	
121-I -2.5	Node NODE				33.7 -1.5	
122 -5.33	Node NODE				34.9 -0.3	
127-O -6	Node NODE				35.6 0	
127-I -6	Node NODE				35.6 0	
128-O -6	Node NODE				35.7 0	
128-I -6	Node NODE				35.7 0	
130-O -6	Node NODE				35.7 0	
130-I -6	Node NODE				35.7 0	
H1 -6	Inside Hose HOSE		100		35.8 0	100
W1 -6	Supply SUPPLY		-411		35.8 0	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 1									
A3	17.92	5.6	20.6	1	1x(us.Tee-Br)=5	0.25	120	13.5	
057	17.67		20.6	1.049		5	0.137	0.1	
						5.25		0.7	
057	17.67		-9.6	1.5		10	120	14.4	
058	17.67		11	1.68		0	0.0044	0	
						10		0.0	
058	17.67		20.6	1.5		10	120	14.4	
001	17.67		31.7	1.68		0	0.0307	0	
						10		0.3	
001	17.67		20.9	1.5	2x(us.Tee-Br)=19.68	14.79	120	14.7	
006	14.67		52.5	1.68		19.68	0.0782	1.3	
						34.47		2.7	
006	14.67		0	3		10.27	120	18.7	
008	14.67		52.5	3.26		0	0.0031	0	
						10.27		0.0	
008	14.67		52.6	3		10.27	120	18.7	
009	14.67		105.2	3.26		0	0.0112	0	
						10.27		0.1	
009	14.67		53	3		9.51	120	18.9	
010	14.67		158.2	3.26		0	0.0239	0	
						9.51		0.2	
010	14.67		-23.1	3		12.25	120	19.1	
011	14.67		135.1	3.26		0	0.0178	0	
						12.25		0.2	
011	14.67		-22.5	3		12.25	120	19.3	
012	14.67		112.6	3.26		0	0.0127	0	
						12.25		0.2	
012	14.67		-23	3		9.44	120	19.5	
013	14.67		89.6	3.26		0	0.0083	0	
						9.44		0.1	
013	14.67		-22.5	3		10.23	120	19.5	
014	14.67		67.1	3.26		0	0.0049	0	
						10.23		0.0	
014	14.67		-22.2	3		10.23	120	19.6	
015	14.67		44.8	3.26		0	0.0023	0	
						10.23		0.0	
015	14.67		-22.1	3	1x(us.Tee-Br)=20.16	10.23	120	19.6	
016	14.67		22.8	3.26		20.16	0.0007	0	
						30.39		0.0	
016	14.67		0	1.5	3x(us.Tee-Br)=29.53	110.2	120	19.6	
030	14.67		22.8	1.68		29.53	0.0167	0	
						139.73		2.3	
030	14.67		0	4		10.23	120	22	
031	14.67		22.8	4.26		0	0.0002	0	
						10.23		0	
031	14.67		22.1	4		10.23	120	22	
032	14.67		44.8	4.26		0	0.0006	0	
						10.23		0	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 1									
032	14.67		22.2	4		10.23	120	22	
033	14.67		67.1	4.26		0	0.0013	0	
						10.23		0.0	
033	14.67		22.5	4		9.44	120	22	
034	14.67		89.6	4.26		0	0.0023	0	
						9.44		0.0	
034	14.67		23	4	1x(us.Tee-Br)=26.33	1.69	120	22	
035	14.67		112.6	4.26		26.33	0.0035	0	
						28.02		0.1	
035	14.67		198.3	4	1x(us.Tee-Br)=26.33	28.92	120	22.1	
117	3.5		311	4.26	1x(us.90)=13.17	39.5	0.0227	4.8	
						68.42		1.6	
117	3.5		0	6	1x(us.Tee-Br)=37.72	12.46	120	28.5	
121-O	0.54		311	6.357	2x(us.90)=35.21	72.93	0.0032	1.3	
						85.38		0.3	
121-O	0.54		0	6		3.04		30	AmesC300N
121-I	-2.5		311	0		0	0.7686	1.3	***
						3.04		2.3	
121-I	-2.5		0	6		2.83	120	33.7	
122	-5.33		311	6.357		0	0.0032	1.2	
						2.83		0	
122	-5.33		0	8	3x(us.45)=38.58	494.84	150	34.9	
127-O	-6		311	7.98	1x(us.90)=25.72	64.3	0.0007	0.3	
						559.14		0.4	
127-O	-6		0	8		0.96		35.6	Gate A2360
127-I	-6		311	0		0	0.0023	0	***
						0.96		0	
127-I	-6		0	8		60.29	150	35.6	
128-O	-6		311	7.98		0	0.0007	0	
						60.29		0.0	
128-O	-6		0	8		0.96		35.7	Gate A2360
128-I	-6		311	0		0	0.0023	0	***
						0.96		0	
128-I	-6		0	8	1x(us.90)=25.72	86.51	150	35.7	
130-O	-6		311	7.98		25.72	0.0007	0	
						112.23		0.1	
130-O	-6		0	8		0.96		35.7	Gate A2360
130-I	-6		311	0		0	0.0023	0	***
						0.96		0	
130-I	-6		0	8		3.33	150	35.7	
H1	-6		311	7.98		0	0.0007	0	
						3.33		0	
H1	-6		100	8		0.67	150	35.8	
W1	-6		411	7.98		0	0.0012	0	
						0.67		0	
W1								**35.8**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 2									
A8	17.92	5.6	20.6	1	1x(us.Tee-Br)=5	0.25	120	13.5	
066	17.67		20.6	1.049		5	0.1371	0.1	
						5.25		0.7	
066	17.67		-9.5	1.5		10	120	14.4	
067	17.67		11.1	1.68		0	0.0044	0	
						10		0.0	
067	17.67		20.6	1.5		10	120	14.4	
068	17.67		31.8	1.68		0	0.0308	0	
						10		0.3	
068	17.67		20.9	1.5	2x(us.Tee-Br)=19.68	14.79	120	14.7	
008	14.67		52.6	1.68		19.68	0.0785	1.3	
						34.47		2.7	
008								**18.7**	
Path No: 3									
A4	17.92	5.6	20.6	1	1x(us.Tee-Br)=5	0.25	120	13.6	
056	17.67		20.6	1.049		5	0.1373	0.1	
						5.25		0.7	
056	17.67		9.6	1.5		10	120	14.4	
055	17.67		30.2	1.68		0	0.028	0	
						10		0.3	
055	17.67		20.8	1.5	2x(us.Tee-Br)=19.68	55.41	120	14.7	
040	14.67		51	1.68		19.68	0.0741	1.3	
						75.1		5.6	
040	14.67		0	4		10.27	120	21.5	
039	14.67		51	4.26		0	0.0008	0	
						10.27		0	
039	14.67		51	4		10.27	120	21.5	
038	14.67		102	4.26		0	0.0029	0	
						10.27		0.0	
038	14.67		50.8	4		9.51	120	21.6	
037	14.67		152.8	4.26		0	0.0061	0	
						9.51		0.1	
037	14.67		23.1	4		12.25	120	21.6	
036	14.67		175.9	4.26		0	0.0079	0	
						12.25		0.1	
036	14.67		22.5	4	1x(us.Tee-Br)=26.33	10.56	120	21.7	
035	14.67		198.3	4.26		26.33	0.0099	0	
						36.89		0.4	
035								**22.1**	
Path No: 4									
A2	17.92	5.6	20.6	1	1x(us.Tee-Br)=5	0.25	120	13.6	
058	17.67		20.6	1.049		5	0.1374	0.1	
						5.25		0.7	
058								**14.4**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 5									
A9	17.92	5.6	20.6	1	1x(us.Tee-Br)=5	0.25	120	13.6	
065	17.67		20.6	1.049		5	0.1374	0.1	
						5.25		0.7	
065	17.67		9.5	1.5		10	120	14.4	
064	17.67		30.1	1.68		0	0.0279	0	
						10		0.3	
064	17.67		20.8	1.5	2x(us.Tee-Br)=19.68	55.41	120	14.7	
039	14.67		51	1.68		19.68	0.074	1.3	
						75.1		5.6	
039								**21.5**	
Path No: 6									
A7	17.92	5.6	20.6	1	1x(us.Tee-Br)=5	0.25	120	13.6	
067	17.67		20.6	1.049		5	0.1375	0.1	
						5.25		0.7	
067								**14.4**	
Path No: 7									
A13	17.92	5.6	20.7	1	1x(us.Tee-Br)=5	0.25	120	13.6	
080	17.67		20.7	1.049		5	0.1377	0.1	
						5.25		0.7	
080	17.67		-9.2	1.5		10	120	14.4	
081	17.67		11.4	1.68		0	0.0046	0	
						10		0.0	
081	17.67		20.7	1.5		10	120	14.5	
082	17.67		32.1	1.68		0	0.0315	0	
						10		0.3	
082	17.67		20.9	1.5	2x(us.Tee-Br)=19.68	14.79	120	14.8	
009	14.67		53	1.68		19.68	0.0797	1.3	
						34.47		2.7	
009								**18.9**	
Path No: 8									
A14	17.92	5.6	20.7	1	1x(us.Tee-Br)=5	0.25	120	13.6	
079	17.67		20.7	1.049		5	0.138	0.1	
						5.25		0.7	
079	17.67		9.2	1.5		10	120	14.5	
078	17.67		29.9	1.68		0	0.0276	0	
						10		0.3	
078	17.67		20.9	1.5	2x(us.Tee-Br)=19.68	55.41	120	14.8	
038	14.67		50.8	1.68		19.68	0.0735	1.3	
						75.1		5.5	
038								**21.6**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 9									
A12	17.92	5.6	20.7	1	1x(us.Tee-Br)=5	0.25	120	13.7	
081	17.67		20.7	1.049		5	0.1381	0.1	
						5.25		0.7	
081								**14.5**	
Path No: 10									
A5	17.92	5.6	20.8	1	1x(us.Tee-Br)=5	0.25	120	13.8	
055	17.67		20.8	1.049		5	0.1398	0.1	
						5.25		0.7	
055								**14.7**	
Path No: 11									
A10	17.92	5.6	20.8	1	1x(us.Tee-Br)=5	0.25	120	13.8	
064	17.67		20.8	1.049		5	0.1399	0.1	
						5.25		0.7	
064								**14.7**	
Path No: 12									
A1	17.92	5.6	20.9	1	1x(us.Tee-Br)=5	0.25	120	13.9	
001	17.67		20.9	1.049		5	0.1401	0.1	
						5.25		0.7	
001								**14.7**	
Path No: 13									
A6	17.92	5.6	20.9	1	1x(us.Tee-Br)=5	0.25	120	13.9	
068	17.67		20.9	1.049		5	0.1403	0.1	
						5.25		0.7	
068								**14.7**	
Path No: 14									
A15	17.92	5.6	20.9	1	1x(us.Tee-Br)=5	0.25	120	13.9	
078	17.67		20.9	1.049		5	0.1405	0.1	
						5.25		0.7	
078								**14.8**	
Path No: 15									
A11	17.92	5.6	20.9	1	1x(us.Tee-Br)=5	0.25	120	14	
082	17.67		20.9	1.049		5	0.141	0.1	
						5.25		0.7	
082								**14.8**	
Path No: 16									
057	17.67		0	1.5		10	120	14.4	
056	17.67		9.6	1.68		0	0.0033	0	
						10		0.0	
056								**14.4**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 17									
010	14.67		0	1.5	4x(us.Tee-Br)=39.37	110.2	120	19.1	
037	14.67		23.1	1.68		39.37	0.0171	0	
						149.57		2.6	
037								**21.6**	
Path No: 18									
011	14.67		0	1.5	4x(us.Tee-Br)=39.37	110.2	120	19.3	
036	14.67		22.5	1.68		39.37	0.0163	0	
						149.57		2.4	
036								**21.7**	
Path No: 19									
012	14.67		0	1.5	4x(us.Tee-Br)=39.37	110.2	120	19.5	
034	14.67		23	1.68		39.37	0.017	0	
						149.57		2.5	
034								**22**	
Path No: 20									
013	14.67		0	1.5	4x(us.Tee-Br)=39.37	110.2	120	19.5	
033	14.67		22.5	1.68		39.37	0.0163	0	
						149.57		2.4	
033								**22**	
Path No: 21									
014	14.67		0	1.5	4x(us.Tee-Br)=39.37	110.2	120	19.6	
032	14.67		22.2	1.68		39.37	0.0159	0	
						149.57		2.4	
032								**22**	
Path No: 22									
015	14.67		0	1.5	4x(us.Tee-Br)=39.37	110.2	120	19.6	
031	14.67		22.1	1.68		39.37	0.0157	0	
						149.57		2.3	
031								**22**	
Path No: 23									
066	17.67		0	1.5		10	120	14.4	
065	17.67		9.5	1.68		0	0.0033	0	
						10		0.0	
065								**14.4**	
Path No: 24									
080	17.67		0	1.5		10	120	14.4	
079	17.67		9.2	1.68		0	0.0031	0	
						10		0.0	
079								**14.5**	

PIPE INFORMATION

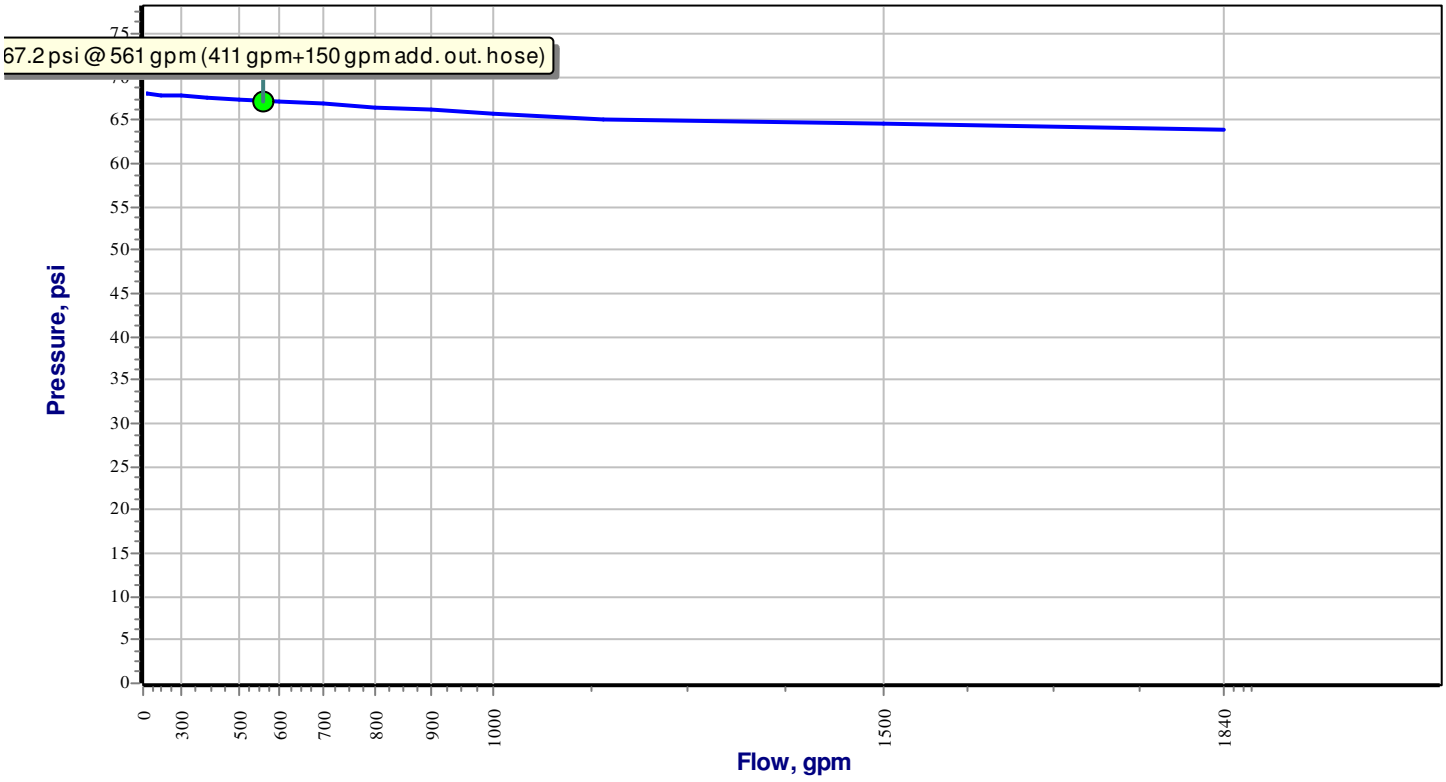
Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.

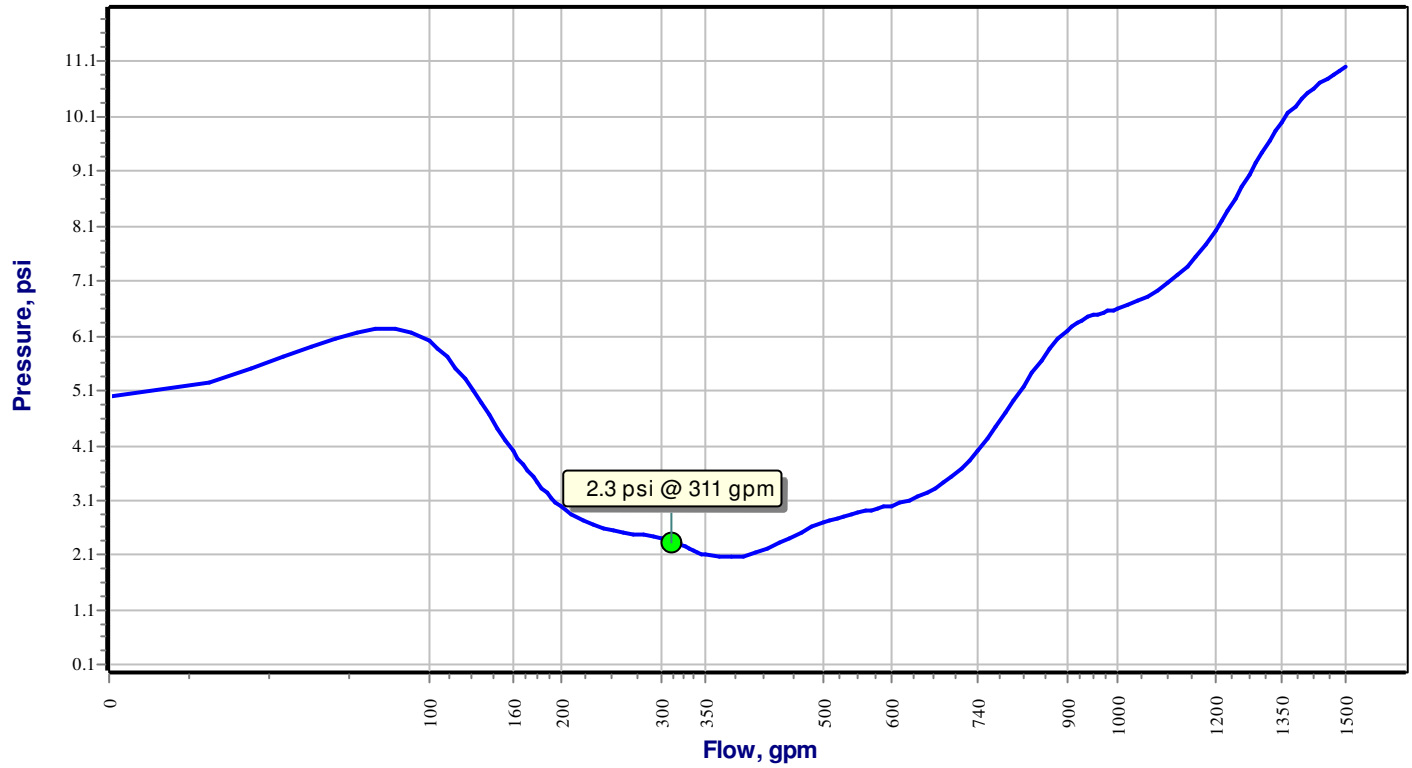
* Maximum Velocity of 7.77 ft/s occurs in the following pipe(s): (082-A11)

*** Device pressure loss (gain in the case of pumps) is calculated from the device's curve. If the device curve is printed with this report, it will appear below. The length of the device as shown in the table above comes from the CAD drawing. The friction loss per unit of length is calculated based upon the length and the curve-based loss/gain value. Internal ID and C Factor values are irrelevant as the device is not represented as an addition to any pipe, but is an individual item whose loss/gain is based solely on the curve data.

Pressure vs. Flow Function
Design Area: 1; Supply Ref.: W1; Supply Name:W1



Pressure Loss Function
Design Area: 1; BFP Ref.: 383 (AmesC300N, Size = 6); Inlet Node: 121-I; Outlet Node: 121-O



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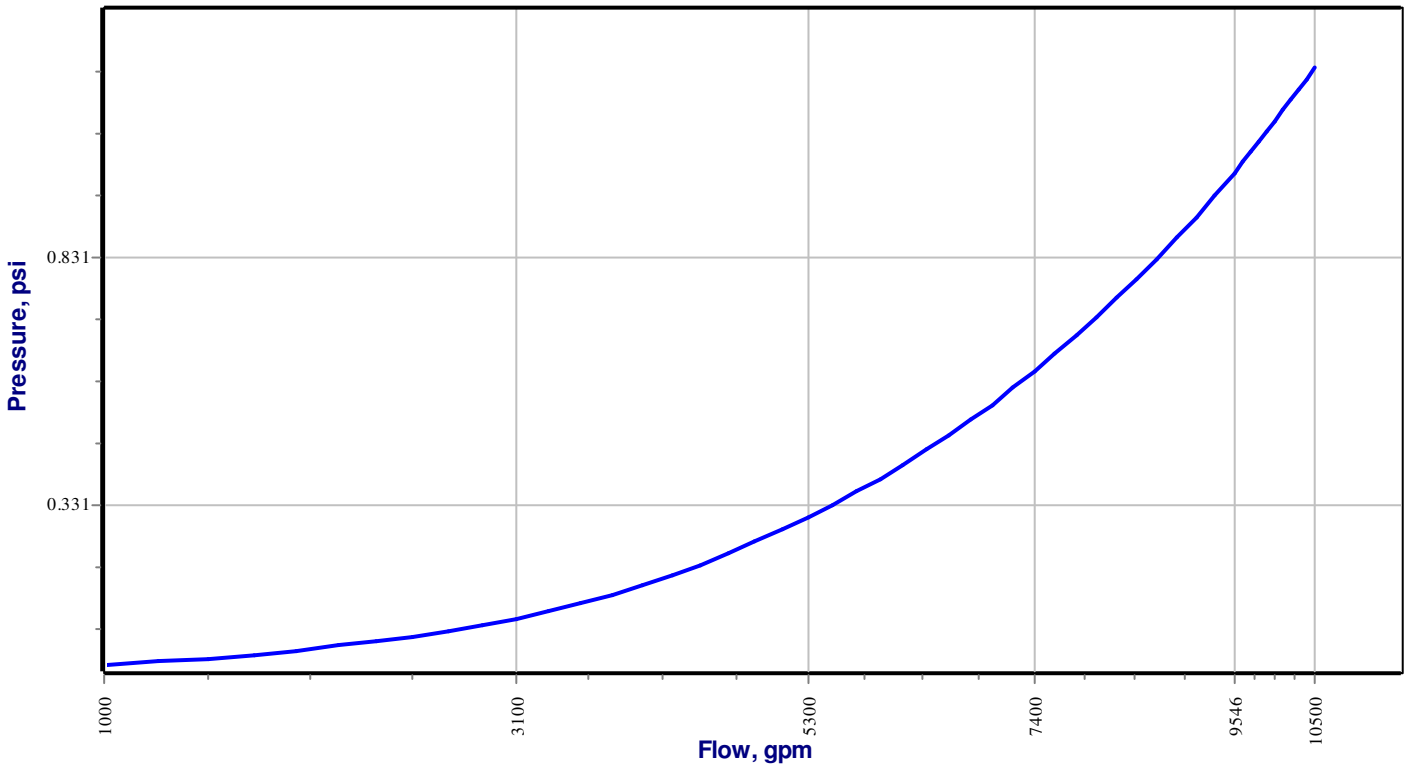
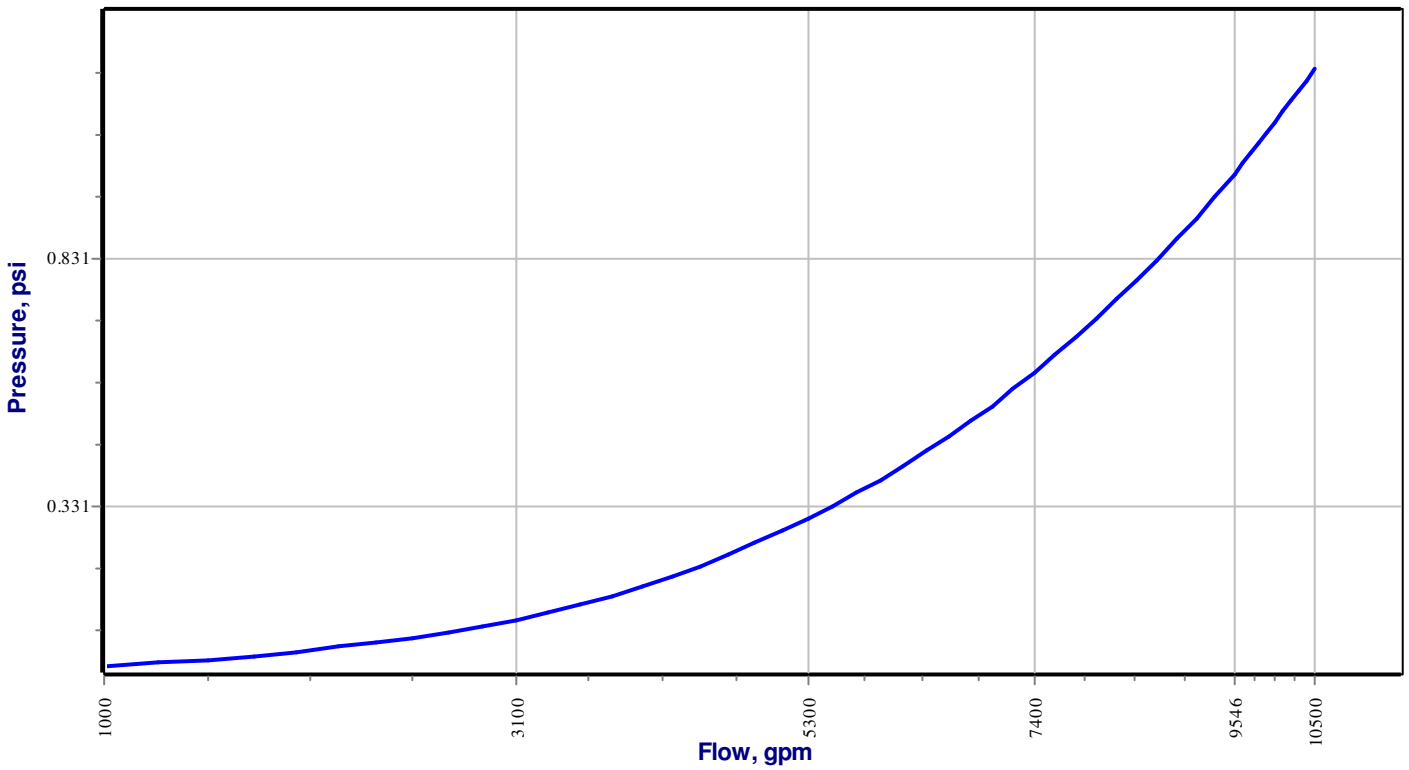
Pressure Loss Function
Design Area: 1; Valve Ref.: 384 (Gate A2360, Size = 8); Inlet Node: 128-I; Outlet Node: 128-O



Pressure Loss Function
Design Area: 1; Valve Ref.: 385 (Gate A2360, Size = 8); Inlet Node: 127-I; Outlet Node: 127-O



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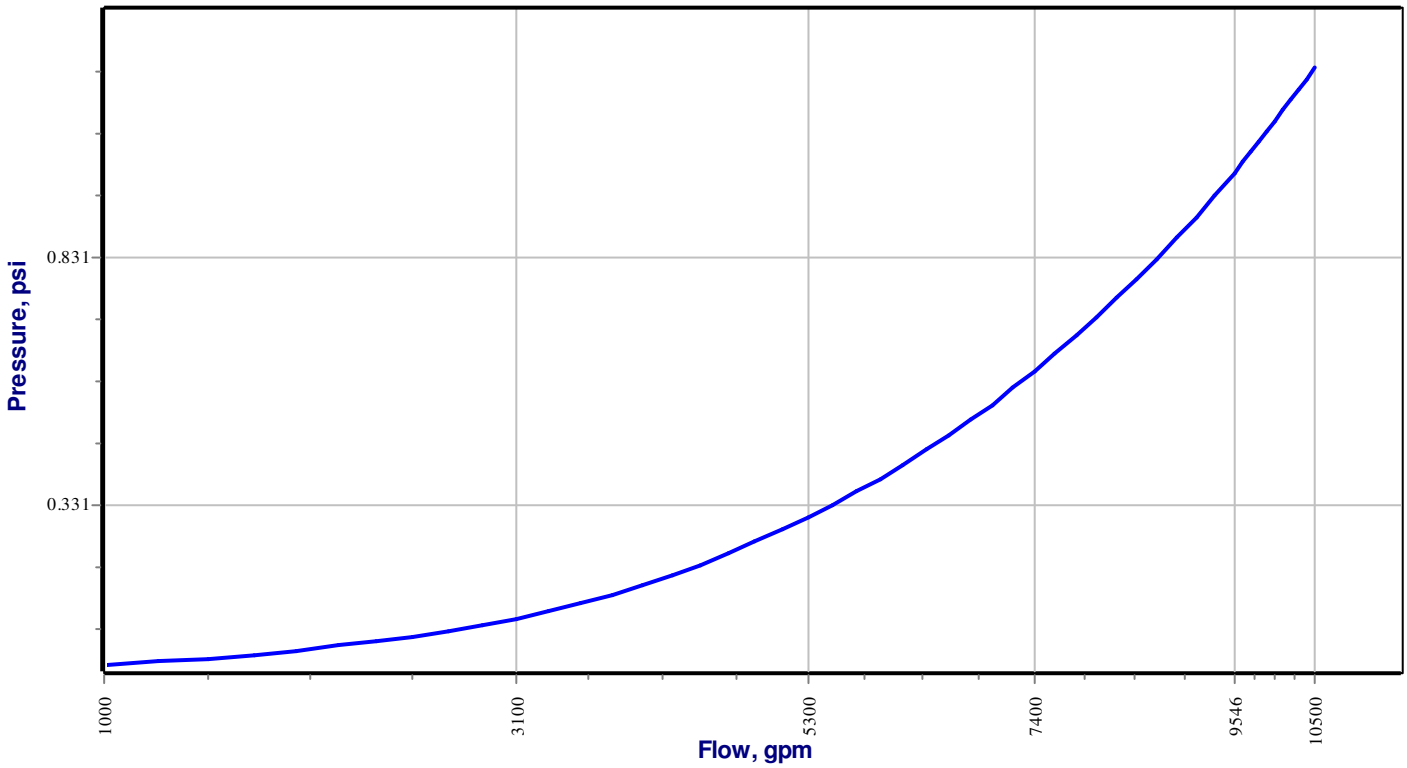
Pressure Loss Function

Design Area: 1; Valve Ref.: 386 (Gate A2360, Size = 8); Inlet Node: 130-I; Outlet Node: 130-O



CALCULATION SUMMARY

Project Name : Westdell - CRU #1B

Project Location: 1300 Fanshawe Pk Rd East

Contract No. : 062-040424

City: London, Ontario

Design Areas

Design Area Name	Calc. Mode (Model)	Occupancy	Area of Application	Total Water	Pressure @ Source	Min. Density	Min. Pressure	Min. Flow	Calculated Heads	Hose Streams	Margin To Source
			(ft²)	(gpm)	(psi)	(gpm/ft²)	(psi)	(gpm)	#	(gpm)	(psi)
2	Demand (HW)	Storage To 17ft	2000	1556.8	Required 43.6	0.28	11.8	27.4	27	800	20.9

HYDRAULIC CALCULATIONS
for

Job Information

Project Name : Westdell - CRU #1B

Contract No. : 062-040424 — City: London, Ontario

Project Location: 1300 Fanshawe Pk Rd East — Date: 4/4/2024

Contractor Information

Name of Contractor: SDC

Address: 23 Turnbull Drive — City: Brantford, Ontario N3T 0K4

Phone Number: 226-388-1503 — E-mail: jhayhurst@hotmail.ca

Name of Designer: JSH

Authority Having Jurisdiction: Local Bldg Dept.

Design

Remote Area Name	2
Remote Area Location	Back Rm/Loading Dock Area
Occupancy Classification	Storage To 17ft
Density (gpm/ft²)	0.28
Area of Application (ft²)	2000
Coverage per Sprinkler (ft²)	98
Number of Calculated Sprinklers	27
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	800
Total Water Required (incl. Hose Streams) (gpm)	1556.8
Required Pressure at Source (psi)	43.6
Type of System	Wet
Volume - Entire System (gal)	1974.1 gal

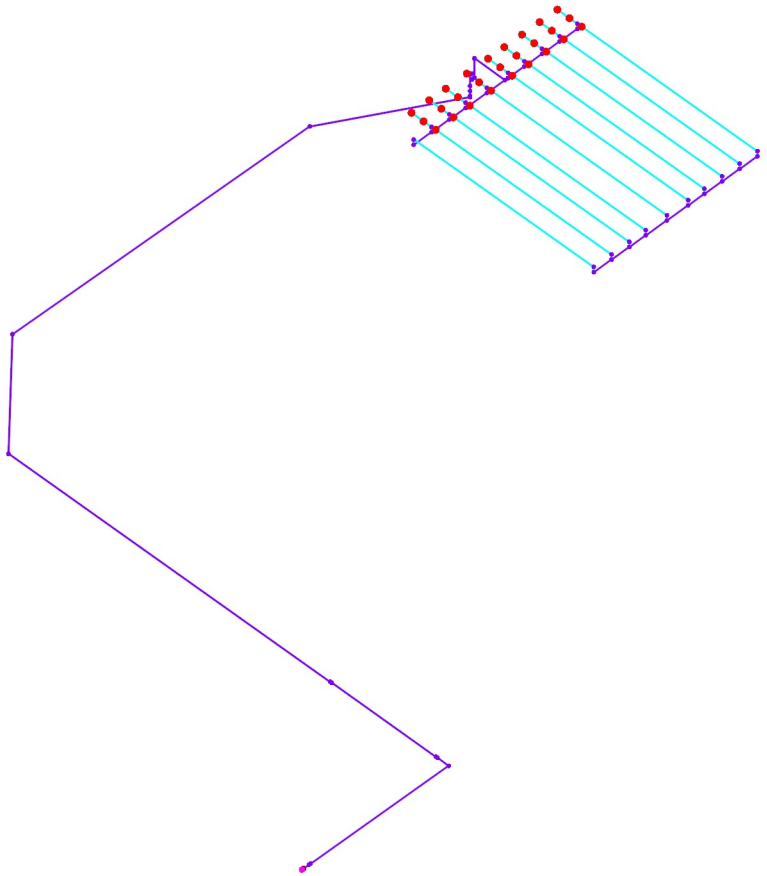
Water Supply Information

Date	Nov.2015
Location	1300 Fanshawe Pk Rd E
Source	W1

Notes

Node Labels: Off
Pipe Labels: Off

Diagram for Design Area : 2
(Optimized Hydraulic Simplified)



File: C:\Users\CRC\Documents\Dwg\Creative Structures\1300 Fanshawe CRU 1B & CRU 1C\CRU 1B (Shoppers)\FP-CRU 1B-Shoppers.dwg

Hydraulic Analysis for : 2

Calculation Info

Calculation Mode	Demand
Hydraulic Model	Hazen-Williams
Fluid Name	Water @ 60F (15.6C)
Fluid Weight, (lb/ft³)	N/A for Hazen-Williams calculation.
Fluid Dynamic Viscosity, (lb·s/ft²)	N/A for Hazen-Williams calculation.

Water Supply Parameters

Supply 1 : W1

Flow (gpm)	Pressure (psi)
0	68
1160	65
1840	64

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	68	65	1160	64.5	1556.8	43.6

Hoses

Inside Hose Flow / Standpipe Demand (gpm)	400
Outside Hose Flow (gpm)	0
Additional Outside Hose Flow (gpm)	400
Other (custom defined) Hose Flow (gpm)	0
Total Hose Flow (gpm)	800

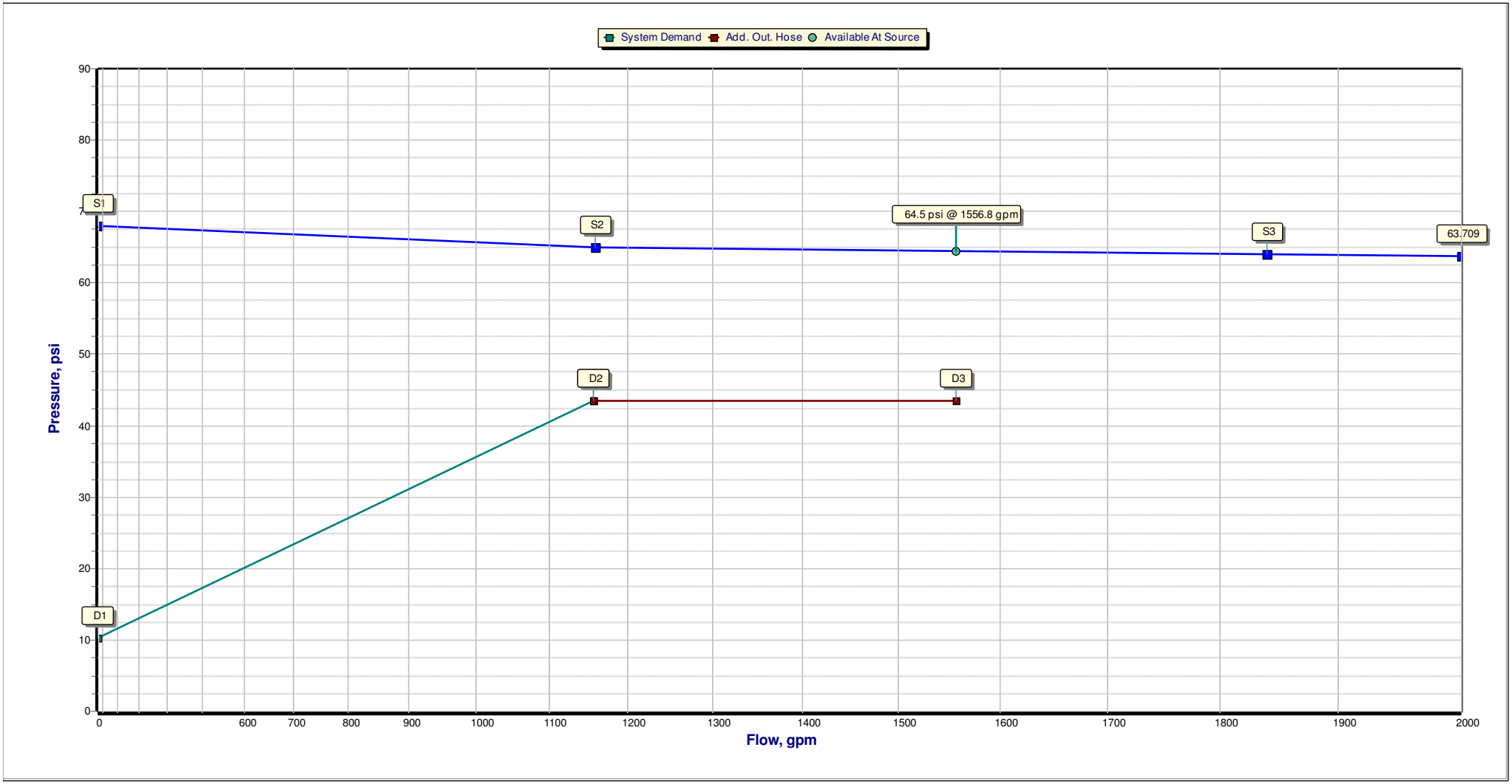
Sprinklers

Ovehead Sprinkler Flow (gpm)	756.8
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	756.8

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	43.6
W1 - Flow (gpm)	1156.8
Demand w/o System Pump(s)	N/A

Hydraulic Analysis for : 2



Hydraulic Analysis for : 2

Graph Labels

Label	Description	Values	
		Flow (gpm)	Pressure (psi)
S1	Supply point #1 - Static	0	68
S2	Supply point #2	1160	65
S3	Supply point #3	1840	64
D1	Elevation Pressure	0	10.3
D2	System Demand	1156.8	43.6
D3	System Demand + Add.Out.Hose	1556.8	43.6

Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	64.5	1506.4	20.9	1556.8

Open Heads

Head Ref.	Head Type	Coverage	K-Factor	Required			Calculated		
				Density	Flow	Pressure	Density	Flow	Pressure
		(ft²)	(gpm/psi½)	(gpm/ft²)	(gpm)	(psi)	(gpm/ft²)	(gpm)	(psi)
B1	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.281	27.5	11.8
B10	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.282	27.6	11.9
B11	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.284	27.8	12.1
B12	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.295	28.9	13
B13	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.28	27.4	11.8
B14	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.282	27.6	11.9
B15	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.293	28.8	12.9
B16	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.28	27.4	11.8
B17	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.282	27.6	11.9
B18	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.294	28.8	12.9
B19	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.28	27.5	11.8
B2	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.283	27.7	12

B20	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.282	27.7	12
B21	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.294	28.8	13
B22	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.281	27.6	11.9
B23	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.283	27.7	12
B24	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.294	28.8	13
B25	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.282	27.6	11.9
B26	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.284	27.8	12.1
B27	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.295	28.9	13
B3	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.294	28.8	13
B4	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.281	27.5	11.8
B5	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.283	27.7	12
B6	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.294	28.8	13
B7	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.281	27.6	11.9
B8	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.283	27.8	12
B9	Overhead Sprinkler	98	8	0.28	27.4	11.8	0.294	28.9	13

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi½	gpm gpm	ft² gpm/ft²	psi psi	psi gpm
B13 17.67	Overhead Sprinkler HEAD	8 Open	27.4 0	98 0.28	11.8 -10.3	11.8 27.4
B16 17.67	Overhead Sprinkler HEAD	8 Open	27.4 0	98 0.28	11.8 -10.3	11.8 27.4
B19 17.67	Overhead Sprinkler HEAD	8 Open	27.5 0.0	98 0.28	11.8 -10.3	11.8 27.4
B1 17.67	Overhead Sprinkler HEAD	8 Open	27.5 0.1	98 0.281	11.8 -10.3	11.8 27.4
B4 17.67	Overhead Sprinkler HEAD	8 Open	27.5 0.1	98 0.281	11.8 -10.3	11.8 27.4
B22 17.67	Overhead Sprinkler HEAD	8 Open	27.6 0.1	98 0.281	11.9 -10.3	11.8 27.4
B7 17.67	Overhead Sprinkler HEAD	8 Open	27.6 0.1	98 0.281	11.9 -10.3	11.8 27.4
B14 17.67	Overhead Sprinkler HEAD	8 Open	27.6 0.2	98 0.282	11.9 -10.3	11.8 27.4
B25 17.67	Overhead Sprinkler HEAD	8 Open	27.6 0.2	98 0.282	11.9 -10.3	11.8 27.4
B17 17.67	Overhead Sprinkler HEAD	8 Open	27.6 0.2	98 0.282	11.9 -10.3	11.8 27.4
B10 17.67	Overhead Sprinkler HEAD	8 Open	27.6 0.2	98 0.282	11.9 -10.3	11.8 27.4
B20 17.67	Overhead Sprinkler HEAD	8 Open	27.7 0.2	98 0.282	12 -10.3	11.8 27.4
B2 17.67	Overhead Sprinkler HEAD	8 Open	27.7 0.3	98 0.283	12 -10.3	11.8 27.4
B5 17.67	Overhead Sprinkler HEAD	8 Open	27.7 0.3	98 0.283	12 -10.3	11.8 27.4
B23 17.67	Overhead Sprinkler HEAD	8 Open	27.7 0.3	98 0.283	12 -10.3	11.8 27.4
B8 17.67	Overhead Sprinkler HEAD	8 Open	27.8 0.3	98 0.283	12 -10.3	11.8 27.4
B26 17.67	Overhead Sprinkler HEAD	8 Open	27.8 0.4	98 0.284	12.1 -10.3	11.8 27.4
B11 17.67	Overhead Sprinkler HEAD	8 Open	27.8 0.4	98 0.284	12.1 -10.3	11.8 27.4
B15 17.67	Overhead Sprinkler HEAD	8 Open	28.8 1.3	98 0.293	12.9 -10.3	11.8 27.4
B18 17.67	Overhead Sprinkler HEAD	8 Open	28.8 1.3	98 0.294	12.9 -10.3	11.8 27.4
B21 17.67	Overhead Sprinkler HEAD	8 Open	28.8 1.4	98 0.294	13 -10.3	11.8 27.4
B3 17.67	Overhead Sprinkler HEAD	8 Open	28.8 1.4	98 0.294	13 -10.3	11.8 27.4
B6 17.67	Overhead Sprinkler HEAD	8 Open	28.8 1.4	98 0.294	13 -10.3	11.8 27.4
B24 17.67	Overhead Sprinkler HEAD	8 Open	28.8 1.4	98 0.294	13 -10.3	11.8 27.4
B9 17.67	Overhead Sprinkler HEAD	8 Open	28.9 1.4	98 0.294	13 -10.3	11.8 27.4

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi½	gpm gpm	ft² gpm/ft²	psi psi	psi gpm
B27 17.67	Overhead Sprinkler HEAD	8 Open	28.9 1.4	98 0.295	13 -10.3	11.8 27.4
B12 17.67	Overhead Sprinkler HEAD	8 Open	28.9 1.4	98 0.295	13 -10.3	11.8 27.4
029 17.67	Node NODE				13.2 -10.3	
207 17.67	Node NODE				13.2 -10.3	
193 17.67	Node NODE				13.2 -10.3	
059 17.67	Node NODE				13.2 -10.3	
073 17.67	Node NODE				13.2 -10.3	
177 17.67	Node NODE				13.3 -10.3	
087 17.67	Node NODE				13.3 -10.3	
161 17.67	Node NODE				13.3 -10.3	
101 17.67	Node NODE				13.4 -10.3	
016 14.67	Node NODE				14.3 -9	
015 14.67	Node NODE				14.3 -9	
014 14.67	Node NODE				14.3 -9	
013 14.67	Node NODE				14.3 -9	
012 14.67	Node NODE				14.3 -9	
011 14.67	Node NODE				14.3 -9	
010 14.67	Node NODE				14.3 -9	
009 14.67	Node NODE				14.3 -9	
008 14.67	Node NODE				14.4 -9	
006 14.67	Node NODE				14.4 -9	
030 14.67	Node NODE				16.6 -9	
031 14.67	Node NODE				16.6 -9	
032 14.67	Node NODE				16.7 -9	
040 14.67	Node NODE				16.8 -9	

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi½	gpm gpm	ft² gpm/ft²	psi psi	psi gpm
039 14.67	Node NODE				16.8 -9	
038 14.67	Node NODE				16.8 -9	
033 14.67	Node NODE				16.9 -9	
037 14.67	Node NODE				16.9 -9	
036 14.67	Node NODE				17.1 -9	
034 14.67	Node NODE				17.1 -9	
035 14.67	Node NODE				18.1 -9	
117 3.5	Node NODE				31 -4.1	
121-O 0.54	Node NODE				33.7 -2.8	
121-I -2.5	Node NODE				39.3 -1.5	
122 -5.33	Node NODE				40.6 -0.3	
127-O -6	Node NODE				42.9 0	
127-I -6	Node NODE				42.9 0	
128-O -6	Node NODE				43.1 0	
128-I -6	Node NODE				43.1 0	
130-O -6	Node NODE				43.5 0	
130-I -6	Node NODE				43.5 0	
H1 -6	Inside Hose HOSE		400		43.6 0	400
W1 -6	Supply SUPPLY		-1156.8		43.6 0	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 1									
B13	17.67	8	27.4	1.5		7.02	120	11.8	
B14	17.67	8	27.4	1.68		0	0.0235	0	
						7.02		0.2	
B14	17.67	8	27.6	1.5	1x(us.Tee-Br)=9.84	4.53	120	11.9	
029	17.67		55.1	1.68		9.84	0.0854	0	
						14.37		1.2	
029	17.67		24.4	1.5	1x(us.Tee-Br)=9.84	3	120	13.2	
030	14.67		79.5	1.68		9.84	0.1686	1.3	
						12.84		2.2	
030	14.67		0	4		10.23	120	16.6	
031	14.67		79.5	4.26		0	0.0018	0	
						10.23		0.0	
031	14.67		79.7	4		10.23	120	16.6	
032	14.67		159.2	4.26		0	0.0066	0	
						10.23		0.1	
032	14.67		80.4	4		10.23	120	16.7	
033	14.67		239.6	4.26		0	0.014	0	
						10.23		0.1	
033	14.67		81.9	4		9.44	120	16.9	
034	14.67		321.4	4.26		0	0.0241	0	
						9.44		0.2	
034	14.67		84.6	4	1x(us.Tee-Br)=26.33	1.69	120	17.1	
035	14.67		406	4.26		26.33	0.0372	0	
						28.02		1	
035	14.67		350.8	4	1x(us.Tee-Br)=26.33	28.92	120	18.1	
117	3.5		756.8	4.26	1x(us.90)=13.17	39.5	0.1178	4.8	
						68.42		8.1	
117	3.5		0	6	1x(us.Tee-Br)=37.72	12.46	120	31	
121-O	0.54		756.8	6.357	2x(us.90)=35.21	72.93	0.0168	1.3	
						85.38		1.4	
121-O	0.54		0	6		3.04		33.7	AmesC300N
121-I	-2.5		756.8	0		0	1.3888	1.3	***
						3.04		4.2	
121-I	-2.5		0	6		2.83	120	39.3	
122	-5.33		756.8	6.357		0	0.0168	1.2	
						2.83		0.0	
122	-5.33		0	8	3x(us.45)=38.58	494.84	150	40.6	
127-O	-6		756.8	7.98	1x(us.90)=25.72	64.3	0.0037	0.3	
						559.14		2	
127-O	-6		0	8		0.96		42.9	Gate A2360
127-I	-6		756.8	0		0	0.0072	0	***
						0.96		0	
127-I	-6		0	8		60.29	150	42.9	
128-O	-6		756.8	7.98		0	0.0037	0	
						60.29		0.2	
128-O	-6		0	8		0.96		43.1	Gate A2360
128-I	-6		756.8	0		0	0.0072	0	***
						0.96		0	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 1									
128-I	-6		0	8	1x(us.90)=25.72	86.51	150	43.1	
130-O	-6		756.8	7.98		25.72	0.0037	0	
						112.23		0.4	
130-O	-6		0	8		0.96		43.5	Gate A2360
130-I	-6		756.8	0		0	0.0072	0	***
						0.96		0	
130-I	-6		0	8		3.33	150	43.5	
H1	-6		756.8	7.98		0	0.0037	0	
						3.33		0.0	
H1	-6		400	8		0.67	150	43.6	
W1	-6		1156.8	7.98		0	0.008	0	
						0.67		0	
W1								**43.6**	
Path No: 2									
B16	17.67	8	27.4	1.5		7.01	120	11.8	
B17	17.67	8	27.4	1.68		0	0.0235	0	
						7.01		0.2	
B17	17.67	8	27.6	1.5	1x(us.Tee-Br)=9.84	4.54	120	11.9	
207	17.67		55.1	1.68		9.84	0.0854	0	
						14.39		1.2	
207	17.67		24.6	1.5	1x(us.Tee-Br)=9.84	3	120	13.2	
031	14.67		79.7	1.68		9.84	0.1693	1.3	
						12.84		2.2	
031								**16.6**	
Path No: 3									
B19	17.67	8	27.5	1.5		7	120	11.8	
B20	17.67	8	27.5	1.68		0	0.0236	0	
						7		0.2	
B20	17.67	8	27.7	1.5	1x(us.Tee-Br)=9.84	4.55	120	12	
193	17.67		55.2	1.68		9.84	0.0856	0	
						14.4		1.2	
193	17.67		25.2	1.5	1x(us.Tee-Br)=9.84	3	120	13.2	
032	14.67		80.4	1.68		9.84	0.1719	1.3	
						12.84		2.2	
032								**16.7**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 4									
B1	17.67	8	27.5	1.5		7	120	11.8	
B2	17.67	8	27.5	1.68		0	0.0236	0	
						7		0.2	
B2	17.67	8	27.7	1.5	1x(us.Tee-Br)=9.84	4.55	120	12	
059	17.67		55.2	1.68		9.84	0.0859	0	
						14.4		1.2	
059	17.67		25.3	1.5	1x(us.Tee-Br)=9.84	3	120	13.2	
039	14.67		80.6	1.68		9.84	0.1727	1.3	
						12.84		2.2	
039	14.67		23.1	4		10.27	120	16.8	
038	14.67		103.6	4.26		0	0.003	0	
						10.27		0.0	
038	14.67		80.9	4		9.51	120	16.8	
037	14.67		184.5	4.26		0	0.0086	0	
						9.51		0.1	
037	14.67		81.8	4		12.25	120	16.9	
036	14.67		266.3	4.26		0	0.017	0	
						12.25		0.2	
036	14.67		84.5	4	1x(us.Tee-Br)=26.33	10.56	120	17.1	
035	14.67		350.8	4.26		26.33	0.0284	0	
						36.89		1	
035								**18.1**	
Path No: 5									
B4	17.67	8	27.5	1.5		7	120	11.8	
B5	17.67	8	27.5	1.68		0	0.0237	0	
						7		0.2	
B5	17.67	8	27.7	1.5	1x(us.Tee-Br)=9.84	4.55	120	12	
073	17.67		55.3	1.68		9.84	0.0859	0	
						14.4		1.2	
073	17.67		25.7	1.5	1x(us.Tee-Br)=9.84	3	120	13.2	
038	14.67		80.9	1.68		9.84	0.1741	1.3	
						12.84		2.2	
038								**16.8**	
Path No: 6									
B22	17.67	8	27.6	1.5		7.01	120	11.9	
B23	17.67	8	27.6	1.68		0	0.0237	0	
						7.01		0.2	
B23	17.67	8	27.7	1.5	1x(us.Tee-Br)=9.84	4.54	120	12	
177	17.67		55.3	1.68		9.84	0.086	0	
						14.39		1.2	
177	17.67		26.6	1.5	1x(us.Tee-Br)=9.84	3	120	13.3	
033	14.67		81.9	1.68		9.84	0.1779	1.3	
						12.84		2.3	
033								**16.9**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 7									
B7	17.67	8	27.6	1.5		7	120	11.9	
B8	17.67	8	27.6	1.68		0	0.0237	0	
						7		0.2	
B8	17.67	8	27.8	1.5	1x(us.Tee-Br)=9.84	4.55	120	12	
087	17.67		55.3	1.68		9.84	0.0861	0	
						14.4		1.2	
087	17.67		26.5	1.5	1x(us.Tee-Br)=9.84	3	120	13.3	
037	14.67		81.8	1.68		9.84	0.1778	1.3	
						12.84		2.3	
037								**16.9**	
Path No: 8									
B25	17.67	8	27.6	1.5		7	120	11.9	
B26	17.67	8	27.6	1.68		0	0.0238	0	
						7		0.2	
B26	17.67	8	27.8	1.5	1x(us.Tee-Br)=9.84	4.55	120	12.1	
161	17.67		55.5	1.68		9.84	0.0865	0	
						14.4		1.2	
161	17.67		29.1	1.5	1x(us.Tee-Br)=9.84	3	120	13.3	
034	14.67		84.6	1.68		9.84	0.1892	1.3	
						12.84		2.4	
034								**17.1**	
Path No: 9									
B10	17.67	8	27.6	1.5		7	120	11.9	
B11	17.67	8	27.6	1.68		0	0.0238	0	
						7		0.2	
B11	17.67	8	27.8	1.5	1x(us.Tee-Br)=9.84	4.55	120	12.1	
101	17.67		55.5	1.68		9.84	0.0866	0	
						14.4		1.2	
101	17.67		29	1.5	1x(us.Tee-Br)=9.84	3	120	13.4	
036	14.67		84.5	1.68		9.84	0.1885	1.3	
						12.84		2.4	
036								**17.1**	
Path No: 10									
B15	17.67	8	28.8	1.5	1x(us.Tee-Br)=9.84	2.45	120	12.9	
029	17.67		24.4	1.68		9.84	0.019	0	
						12.29		0.2	
029								**13.2**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 11									
B15	17.67	8	28.8	1.5	2x(us.Tee-Br)=19.68	104.76	120	12.9	
016	14.67		4.3	1.68		19.68	0.0008	1.3	
						124.44		0.1	
016	14.67		0	3		10.23	120	14.3	
015	14.67		4.3	3.26		0	0.0000	0	
						10.23		0	
015	14.67		4.2	3		10.23	120	14.3	
014	14.67		8.5	3.26		0	0.0001	0	
						10.23		0	
014	14.67		3.6	3		10.23	120	14.3	
013	14.67		12.1	3.26		0	0.0002	0	
						10.23		0	
013	14.67		2.3	3		9.44	120	14.3	
012	14.67		14.4	3.26		0	0.0003	0	
						9.44		0	
012	14.67		-0.3	3	1x(us.Tee-Br)=20.16	12.25	120	14.3	
011	14.67		14.1	3.26		20.16	0.0003	0	
						32.41		0	
011	14.67		-0.1	3	1x(us.Tee-Br)=20.16	12.25	120	14.3	
010	14.67		14	3.26		20.16	0.0003	0	
						32.41		0	
010	14.67		2.4	3		9.51	120	14.3	
009	14.67		16.4	3.26		0	0.0004	0	
						9.51		0	
009	14.67		3.2	3		10.27	120	14.3	
008	14.67		19.5	3.26		0	0.0005	0	
						10.27		0	
008	14.67		3.5	3	1x(us.Tee-Br)=20.16	10.27	120	14.4	
006	14.67		23.1	3.26		20.16	0.0007	0	
						30.43		0.0	
006	14.67		0	1.5	3x(us.Tee-Br)=29.53	110.2	120	14.4	
040	14.67		23.1	1.68		29.53	0.017	0	
						139.73		2.4	
040	14.67		0	4		10.27	120	16.8	
039	14.67		23.1	4.26		0	0.0002	0	
						10.27		0	
039								**16.8**	
Path No: 12									
B18	17.67	8	28.8	1.5	1x(us.Tee-Br)=9.84	2.44	120	12.9	
207	17.67		24.6	1.68		9.84	0.0192	0	
						12.28		0.2	
207								**13.2**	
Path No: 13									
B18	17.67	8	28.8	1.5	2x(us.Tee-Br)=19.68	104.77	120	12.9	
015	14.67		4.2	1.68		19.68	0.0007	1.3	
						124.45		0.1	
015								**14.3**	

PIPE INFORMATION

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 14									
B21	17.67	8	28.8	1.5	1x(us.Tee-Br)=9.84	2.42	120	13	
193	17.67		25.2	1.68		9.84	0.0201	0	
						12.27		0.2	
193								**13.2**	
Path No: 15									
B21	17.67	8	28.8	1.5	2x(us.Tee-Br)=19.68	104.78	120	13	
014	14.67		3.6	1.68		19.68	0.0005	1.3	
						124.46		0.1	
014								**14.3**	
Path No: 16									
B3	17.67	8	28.8	1.5	1x(us.Tee-Br)=9.84	2.41	120	13	
059	17.67		25.3	1.68		9.84	0.0203	0	
						12.26		0.2	
059								**13.2**	
Path No: 17									
B3	17.67	8	28.8	1.5	2x(us.Tee-Br)=19.68	104.79	120	13	
008	14.67		3.5	1.68		19.68	0.0005	1.3	
						124.47		0.1	
008								**14.4**	
Path No: 18									
B6	17.67	8	28.8	1.5	1x(us.Tee-Br)=9.84	2.41	120	13	
073	17.67		25.7	1.68		9.84	0.0208	0	
						12.26		0.3	
073								**13.2**	
Path No: 19									
B6	17.67	8	28.8	1.5	2x(us.Tee-Br)=19.68	104.79	120	13	
009	14.67		3.2	1.68		19.68	0.0004	1.3	
						124.47		0.1	
009								**14.3**	
Path No: 20									
B24	17.67	8	28.8	1.5	1x(us.Tee-Br)=9.84	2.42	120	13	
177	17.67		26.6	1.68		9.84	0.0221	0	
						12.27		0.3	
177								**13.3**	
Path No: 21									
B24	17.67	8	28.8	1.5	2x(us.Tee-Br)=19.68	104.78	120	13	
013	14.67		2.3	1.68		19.68	0.0002	1.3	
						124.46		0.0	
013								**14.3**	

PIPE INFORMATION

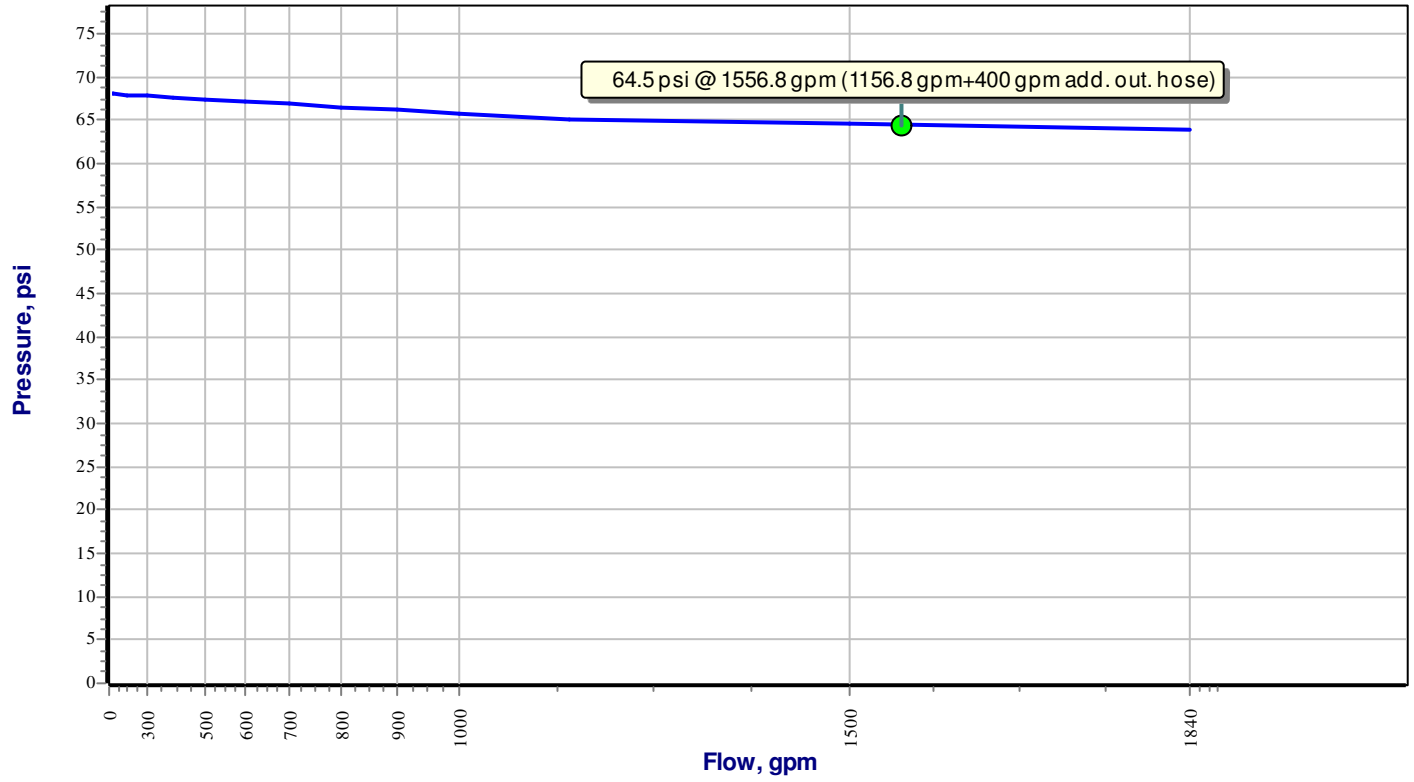
Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	
Path No: 22									
B9	17.67	8	28.9	1.5	1x(us.Tee-Br)=9.84	2.42	120	13	
087	17.67		26.5	1.68		9.84	0.022	0	
						12.26		0.3	
087								**13.3**	
Path No: 23									
B9	17.67	8	28.9	1.5	2x(us.Tee-Br)=19.68	104.79	120	13	
010	14.67		2.4	1.68		19.68	0.0003	1.3	
						124.47		0.0	
010								**14.3**	
Path No: 24									
B27	17.67	8	28.9	1.5	1x(us.Tee-Br)=9.84	2.42	120	13	
161	17.67		29.1	1.68		9.84	0.0263	0	
						12.26		0.3	
161								**13.3**	
Path No: 25									
B12	17.67	8	28.9	1.5	1x(us.Tee-Br)=9.84	2.42	120	13	
101	17.67		29	1.68		9.84	0.026	0	
						12.26		0.3	
101								**13.4**	
Path No: 26									
012	14.67		0	1.5	2x(us.Tee-Br)=19.68	104.79	120	14.3	
B27	17.67	8	0.3	1.68		19.68	0	-1.3	
						124.47		0	
B27								**13**	
Path No: 27									
011	14.67		0	1.5	1x(us.Tee-Br)=9.84	104.79	120	14.3	
B12	17.67	8	0.1	1.68		9.84	0	-1.3	
						114.63		0	
B12								**13**	

* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.

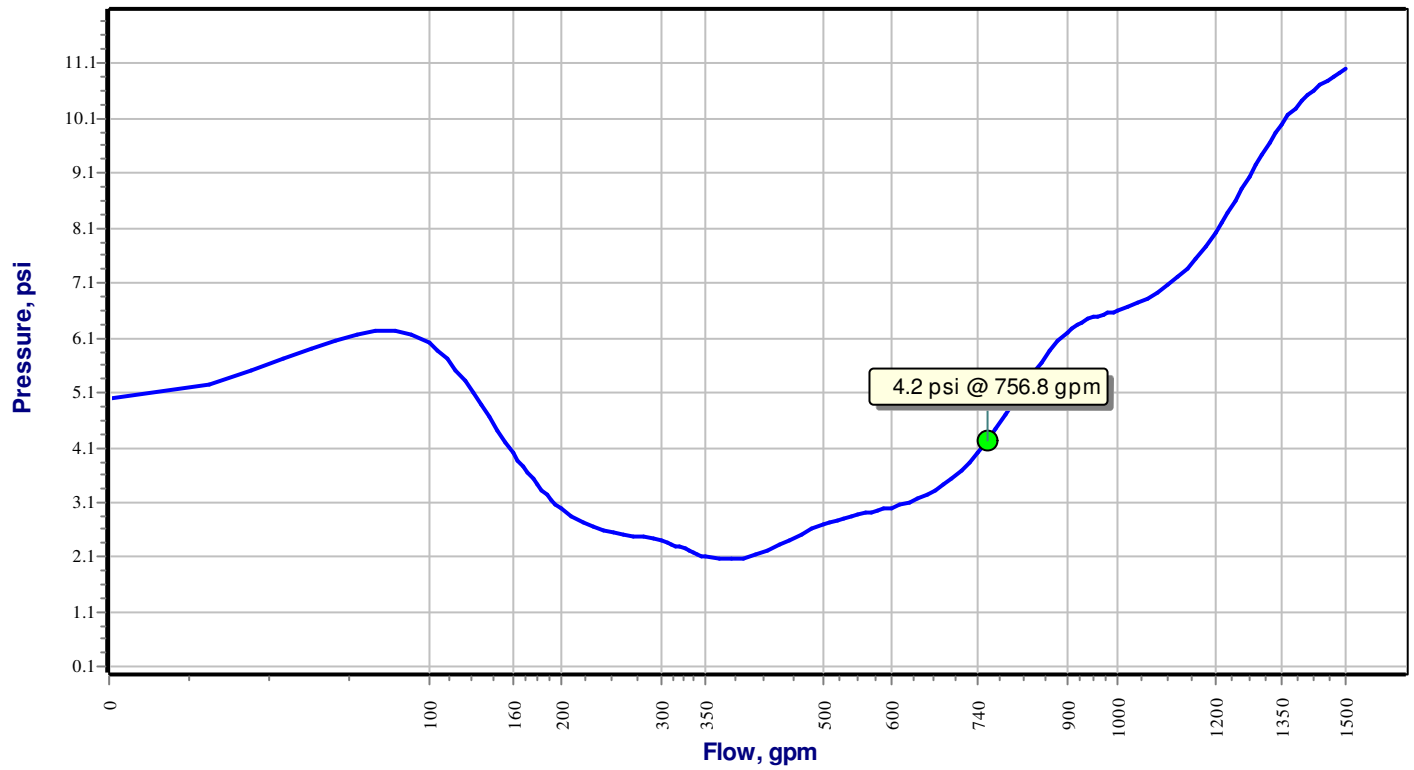
* Maximum Velocity of 17.04 ft/s occurs in the following pipe(s): (117-035)

*** Device pressure loss (gain in the case of pumps) is calculated from the device's curve. If the device curve is printed with this report, it will appear below. The length of the device as shown in the table above comes from the CAD drawing. The friction loss per unit of length is calculated based upon the length and the curve-based loss/gain value. Internal ID and C Factor values are irrelevant as the device is not represented as an addition to any pipe, but is an individual item whose loss/gain is based solely on the curve data.

Pressure vs. Flow Function
Design Area: 2; Supply Ref.: W1; Supply Name:W1



Pressure Loss Function
Design Area: 2; BFP Ref.: 383 (AmesC300N, Size = 6); Inlet Node: 121-I; Outlet Node: 121-O



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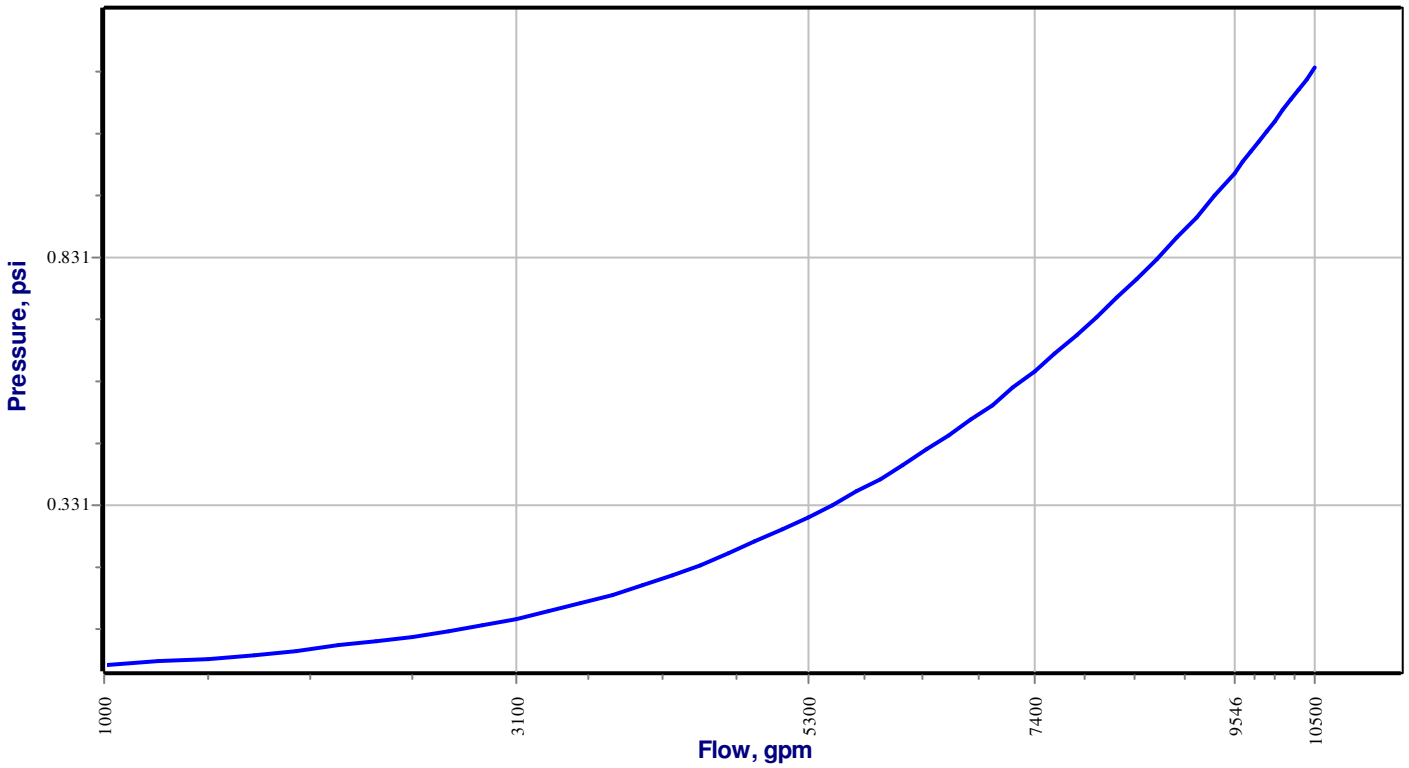
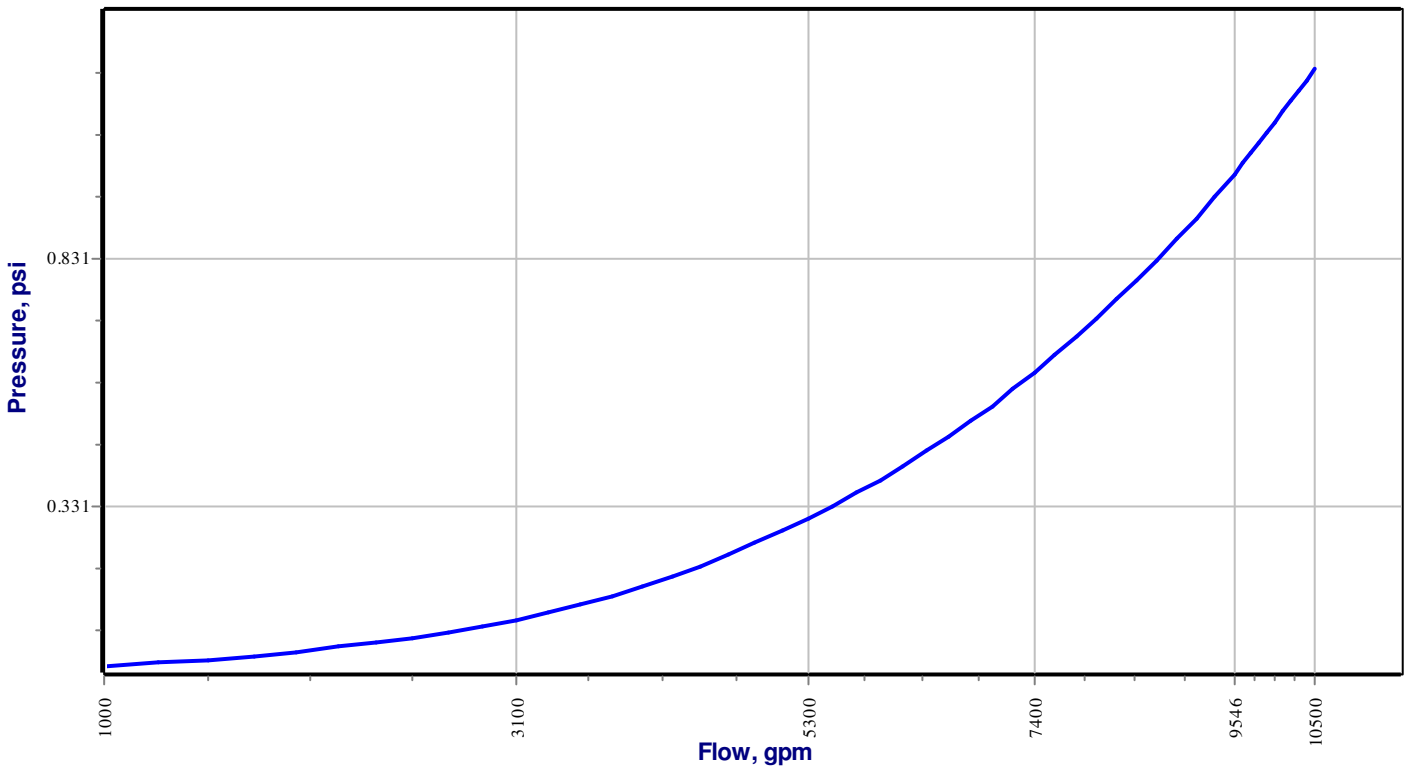
Pressure Loss Function
Design Area: 2; Valve Ref.: 384 (Gate A2360, Size = 8); Inlet Node: 128-I; Outlet Node: 128-O



Pressure Loss Function
Design Area: 2; Valve Ref.: 385 (Gate A2360, Size = 8); Inlet Node: 127-I; Outlet Node: 127-O



File: C:\Users\CRC\Documents\Dwg\Creative Structures\1300 Fanshawe CRU 1B & CRU 1C\CRU 1B (Shoppers)\FP-CRU 1B-Shoppers.dwg

Pressure Loss Function

Design Area: 2; Valve Ref.: 386 (Gate A2360, Size = 8); Inlet Node: 130-I; Outlet Node: 130-O