



Fire Marshal Division

December 7, 2018

VSC Fire & Security
343 Technology Dr., Suite 2110
Garner, NC 27529

Re: Oak Hill Living Center Addition
9767 NC Hwy. 210
Angier, NC 27501

Application Number 17-50042053

To Whom It May Concern,

Thank you for submitting the sprinkler system plans for Oak Hill Living Center Addition. The plans have been carefully reviewed by a qualified code enforcement official to examine for compliance with the North Carolina Fire Prevention Code and all other fire protection regulatory documents. There are some items that were found during the plan review process that need to be addressed before a final inspection of the new facility can be given. These items are outlined and described below.

- **Plan Review Comments to Contractor.**
 - Installation of the sprinkler system shall be per contract specifications and NFPA 20013 edition.
 - Provide an FDC detail on the plans, also, the type and size indicated.
 - Provide hydraulic design data plate, spare sprinklers and wrench cabinet, and approved signage at final inspection per NFPA 13.
- **901.2.1 Statement of Compliance.**
 - Before requesting final approval of the installation, where required by the fire code official, the installing contractor shall furnish a written statement to the fire code official that the subject fire protection system has been installed in accordance with the manufacturer's specifications and the appropriate installation standard. Any deviations from the design standards shall be noted and copies of the approvals for such deviations shall be attached to the written statement.



- **903.4 Sprinkler system monitoring and alarms.**
 - All valves controlling the water supply for automatic sprinkler systems and water-flow switches on all sprinkler systems shall be electrically supervised according to the NC State Fire Code.

- **901.5 Installation acceptance testing.**
 - All piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi or 50 psi in excess of the system working pressure, whichever is greater, and shall maintain that pressure without loss for 2 hours. This test is required to be witnessed by a representative from the Harnett County Fire Marshal's Office.
 - **A contractor's material and test certificate shall be furnished by the trained representative of VSC Fire & Security before approval.**
 - A piping and hanger inspection is required before closure of ceiling system(s).
 - A sprinkler final inspection is required at completion of project.
 - **Schedule all inspections with the Fire Marshal's Office.**
 - **910-893-0741**

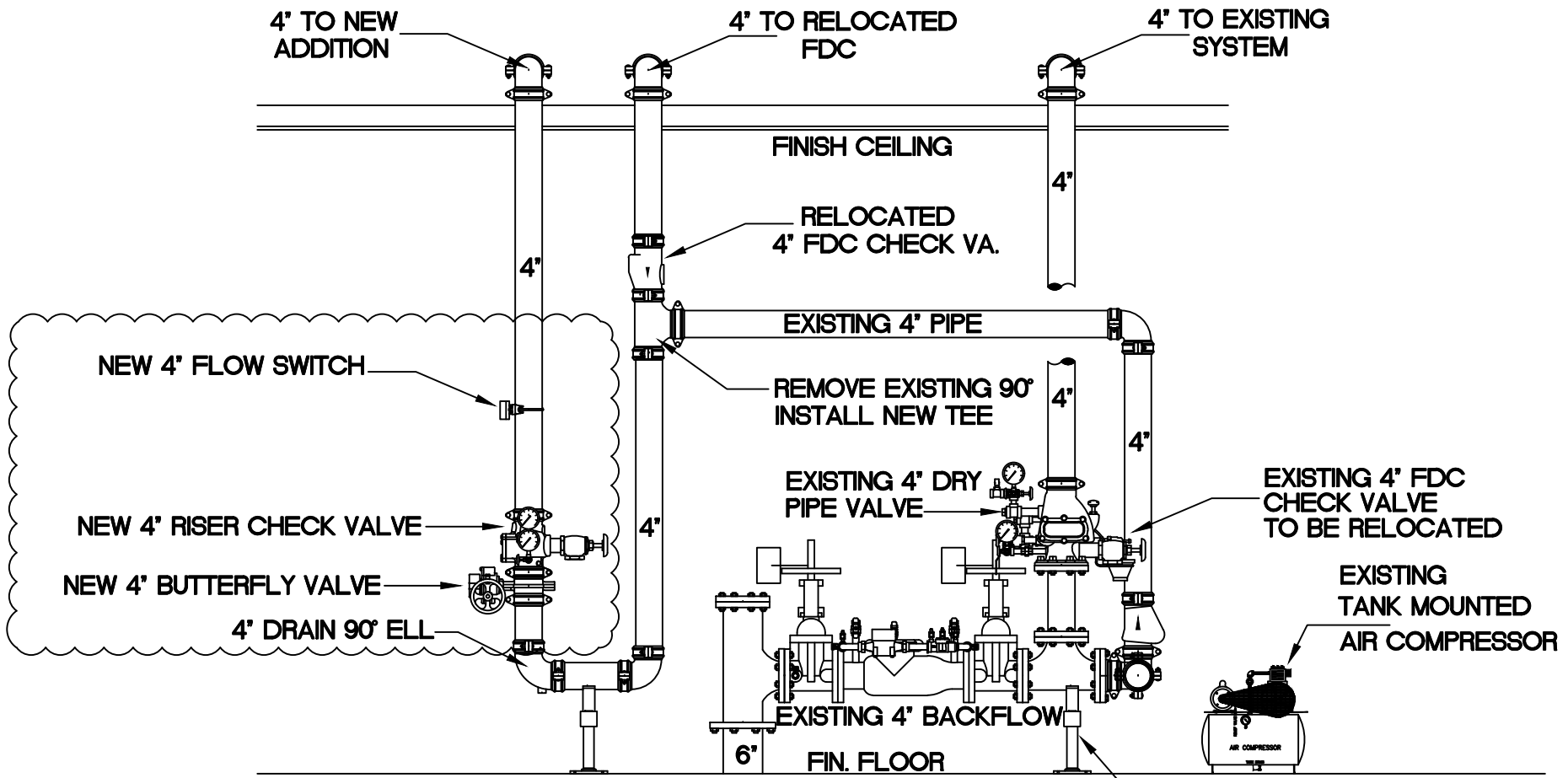
- **912.4 Fire Department Connection Signage.**
 - Automatic sprinkler, test connection and standpipe signs to be properly installed.

Thank you again for submitting the sprinkler plans for this addition. Please review the plans and adhere to any notes and alterations that were made in addition to the original drawings. These remarks are for the plans that were submitted and its original intent. These remarks do not apply if the original intent changes or what was submitted on the above date changes. If you have any questions, please do not hesitate to call this office.

Sincerely,



D. Banks Wallace
Chief Deputy Fire Marshal



RISER DETAIL
N.T.S.

Reviewed For Code Compliance By:
D. Banks Wallace
 Chief Deputy Fire Marshal
 12/07/2018 8:50:01 AM

		VSC FIRE & SECURITY, INC. COMPLETE FIRE PROTECTION AND LIFE SAFETY SYSTEMS SINCE 1958 WEB SITE ADDRESS: http://www.vscfs.com	
		RALEIGH OFFICE 343 TECHNOLOGY DRIVE - SUITE 2110 GARNER, NC 27529 (919) 645-5880 • FAX (919) 645-5881	
JOB No.	PC8965	REVISED WET RISER DETAIL OAKHILL LIVING CENTER ADD. 400 WING 9767 NC HWY. 210 ANGLIER, NC. 27501	
DATE	12-6-18		
DESIGNER	SHG		
SCALE	N.T.S.		
		FILE:	OAKHILL DESIGN(R2) WET.dwg
		SHEET No.	1 OF 1

CALCULATION SUMMARY

Project Name : OAKHILL LIVING CENTER

Project Location: 9767 NC-210

Drawing No. : PC8965

City: ANGIER, NC 27501

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
			(ft ²)	(gpm)	(psi)	(gpm/ft ²)	(psi)	(gpm)	#	(gpm)	(psi)
1	Demand (HW)	LIGHT	3072	540.5	Required 47.3	0.125	7.2	15	26	100	9.7

HYDRAULIC CALCULATIONS for

Job Information

Project Name : OAKHILL LIVING CENTER

Contract No. : PC8965

City: ANGIER, NC 27501

Project Location: 9767 NC-210

Date: 7/10/2017

Contractor Information

Name of Contractor: VSC Fire & Security, Inc.

Address: 343 Technology Drive - Suite 2110

City: Garner, NC 27529

Phone Number: 919-645-5880

E-mail: SHGarner@vscfs.com

Name of Designer: STEVEN H. GARNER, SR.

Authority Having Jurisdiction: HARNETT COUNTY FIRE MARSHALL

Design

Remote Area Name	1
Remote Area Location	ATTIC
Occupancy Classification	LIGHT
Density (gpm/ft ²)	0.125
Area of Application (ft ²)	3072
Coverage per Sprinkler (ft ²)	120
Number of Calculated Sprinklers	26
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	540.5
Required Pressure at Source (psi)	47.3
Type of System	Wet
Volume - Entire System (gal)	1822.9 gal

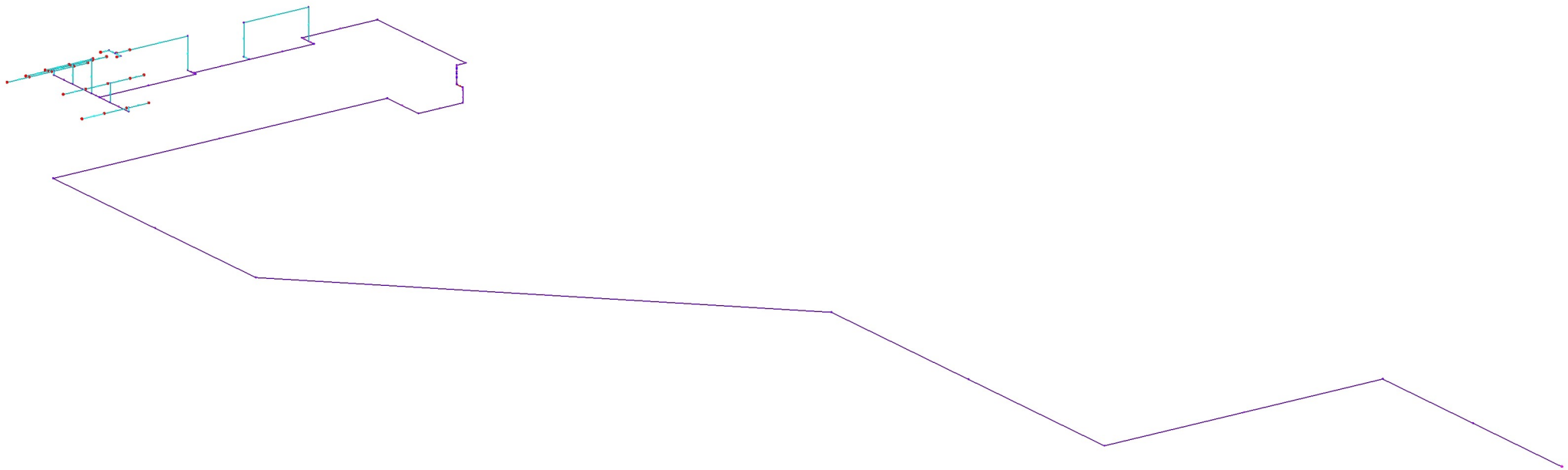
Water Supply Information

Date	07/13/17
Location	OAK HILL DRIVE
Source	TST

Notes

1500 + 30%% + 30%%

Diagram for Design Area : 1 (Optimized Hvdraulic Simplified)



Hydraulic Analysis for : 1

Calculation Info

Calculation Mode	Demand
Hydraulic Model	Hazen-Williams
Fluid Name	Water @ 60F (15.6C)
Fluid Weight, (lb/ft ³)	N/A for Hazen-Williams calculation.
Fluid Dynamic Viscosity, (lb-s/ft ²)	N/A for Hazen-Williams calculation.

Water Supply Parameters

Supply 1 : TST

Flow (gpm)	Pressure (psi)
0	60
712	55

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
TST	60	55	712	57.9	540.5	47.3

Hoses

Inside Hose Flow / Standpipe Demand (gpm)

Outside Hose Flow (gpm)

Additional Outside Hose Flow (gpm) 100

Other (custom defined) Hose Flow (gpm)

Total Hose Flow (gpm) 100

Sprinklers

Ovehead Sprinkler Flow (gpm) 440.5

InRack Sprinkler Flow (gpm) 0

Other (custom defined) Sprinkler Flow (gpm) 0

Total Sprinkler Flow (gpm) 440.5

Other

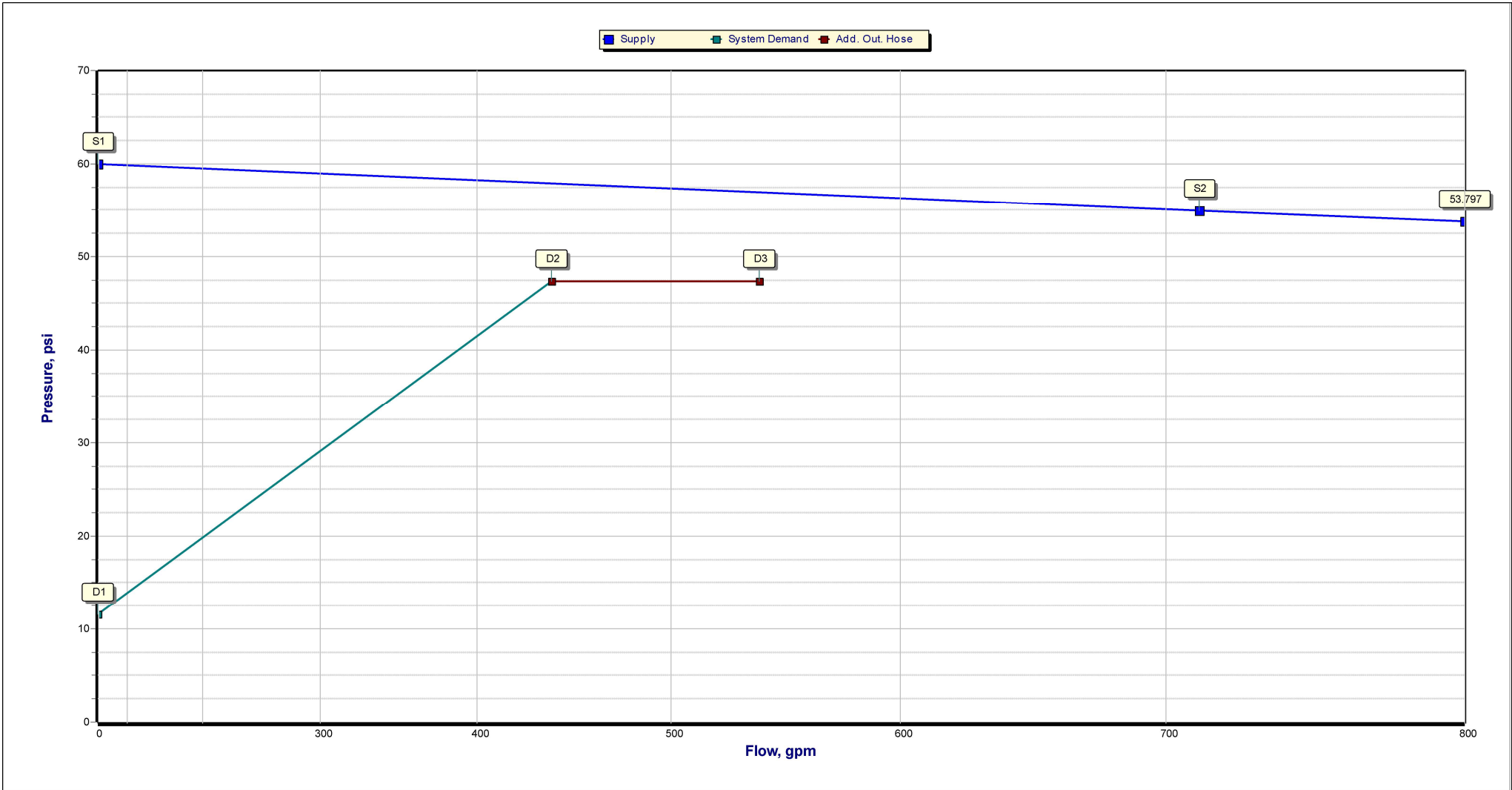
Required Margin of Safety (psi) 0

TST - Pressure (psi) 47.3

TST - Flow (gpm) 440.5

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	60
S2	Supply point #2 - Residual	712	55
D1	Elevation Pressure	0	11.6
D2	System Demand	440.5	47.3
D3	System Demand + Add.Out.Hose	540.5	47.3

Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	57.4	503.6	9.7	540.5

Open Heads

Head Ref.	Head Type	Coverage	K-Factor	Required			Calculated		
				Density	Flow	Pressure	Density	Flow	Pressure
		(ft ²)	(gpm/psi ^{1/2})	(gpm/ft ²)	(gpm)	(psi)	(gpm/ft ²)	(gpm)	(psi)
A1	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.154	18.5	10.9
A10	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.135	16.2	8.3
A11	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.126	15.2	7.3
A12	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.127	15.3	7.4
A13	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.132	15.8	7.9
A14	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.125	15	7.2
A15	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.125	15	7.2
A16	Overhead Sprinkler	96	5.6	0.1	9.6	7.2	0.158	15.2	7.3
A17	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.13	15.6	7.8
A18	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.133	15.9	8.1
A19	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.134	16	8.2
A2	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.155	18.6	11
A20	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.137	16.4	8.6

A21	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.137	16.4	8.6
A22	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.136	16.3	8.5
A23	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.159	19.1	11.6
A24	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.16	19.2	11.8
A25	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.164	19.7	12.3
A26	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.168	20.1	12.9
A3	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.158	19	11.5
A4	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.158	19	11.5
A5	Overhead Sprinkler	96	5.6	0.1	9.6	7.2	0.197	18.9	11.4
A6	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.132	15.8	7.9
A7	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.132	15.9	8
A8	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.135	16.3	8.4
A9	Overhead Sprinkler	120	5.6	0.1	12	7.2	0.135	16.2	8.4

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi ^{1/2}	gpm gpm	ft ² gpm/ft ²	psi psi	psi gpm
A14 22.83	Overhead Sprinkler HEAD	5.6 Open	15 3	120 0.125	7.2 -11.6	7.2 12
A15 22.83	Overhead Sprinkler HEAD	5.6 Open	15 3	120 0.125	7.2 -11.6	7.2 12
A11 22.83	Overhead Sprinkler HEAD	5.6 Open	15.2 3.2	120 0.126	7.3 -11.6	7.2 12
A12 22.83	Overhead Sprinkler HEAD	5.6 Open	15.3 3.3	120 0.127	7.4 -11.6	7.2 12
A17 22.83	Overhead Sprinkler HEAD	5.6 Open	15.6 3.6	120 0.13	7.8 -11.6	7.2 12
A6 17	Overhead Sprinkler HEAD	5.6 Open	15.8 3.8	120 0.132	7.9 -9.1	7.2 12
A13 22.83	Overhead Sprinkler HEAD	5.6 Open	15.8 3.8	120 0.132	7.9 -11.6	7.2 12
A16 22.83	Overhead Sprinkler HEAD	5.6 Open	15.2 5.6	96 0.158	7.3 -11.6	7.2 9.6
A7 17	Overhead Sprinkler HEAD	5.6 Open	15.9 3.9	120 0.132	8 -9.1	7.2 12
A18 17	Overhead Sprinkler HEAD	5.6 Open	15.9 3.9	120 0.133	8.1 -9.1	7.2 12
A19 17	Overhead Sprinkler HEAD	5.6 Open	16 4	120 0.134	8.2 -9.1	7.2 12
A10 17	Overhead Sprinkler HEAD	5.6 Open	16.2 4.2	120 0.135	8.3 -9.1	7.2 12
A9 17	Overhead Sprinkler HEAD	5.6 Open	16.2 4.2	120 0.135	8.4 -9.1	7.2 12
A8 17	Overhead Sprinkler HEAD	5.6 Open	16.3 4.3	120 0.135	8.4 -9.1	7.2 12
A22 17	Overhead Sprinkler HEAD	5.6 Open	16.3 4.3	120 0.136	8.5 -9.1	7.2 12
A21 17	Overhead Sprinkler HEAD	5.6 Open	16.4 4.4	120 0.137	8.6 -9.1	7.2 12
A20 17	Overhead Sprinkler HEAD	5.6 Open	16.4 4.4	120 0.137	8.6 -9.1	7.2 12
A1 11	Overhead Sprinkler HEAD	5.6 Open	18.5 6.5	120 0.154	10.9 -6.5	7.2 12
A2 11	Overhead Sprinkler HEAD	5.6 Open	18.6 6.6	120 0.155	11 -6.5	7.2 12
A4 11	Overhead Sprinkler HEAD	5.6 Open	19 7	120 0.158	11.5 -6.5	7.2 12
A3 11	Overhead Sprinkler HEAD	5.6 Open	19 7	120 0.158	11.5 -6.5	7.2 12
A23 11	Overhead Sprinkler HEAD	5.6 Open	19.1 7.1	120 0.159	11.6 -6.5	7.2 12
A24 11	Overhead Sprinkler HEAD	5.6 Open	19.2 7.2	120 0.16	11.8 -6.5	7.2 12
A5 11	Overhead Sprinkler HEAD	5.6 Open	18.9 9.3	96 0.197	11.4 -6.5	7.2 9.6
A25 11	Overhead Sprinkler HEAD	5.6 Open	19.7 7.7	120 0.164	12.3 -6.5	7.2 12

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi ^{1/2}	gpm gpm	ft ² gpm/ft ²	psi psi	psi gpm
A26 11	Overhead Sprinkler HEAD	5.6 Open	20.1 8.1	120 0.168	12.9 -6.5	7.2 12
401 22.83	Node NODE				7.3 -11.6	
085 22.83	Node NODE				8 -11.6	
044 17	Node NODE				9 -9.1	
598 17	Node NODE				9.2 -9.1	
392 22.83	Node NODE				11.9 -11.6	
019 11	Node NODE				12.3 -6.5	
001 11	Node NODE				13.2 -6.5	
017 9.5	Node NODE				15.2 -5.8	
014 9.5	Node NODE				15.2 -5.8	
011 9.5	Node NODE				15.3 -5.8	
003 9.5	Node NODE				15.4 -5.8	
007 9.5	Node NODE				15.4 -5.8	
010 9.5	Node NODE				15.6 -5.8	
214 9.5	Node NODE				18.4 -5.8	
213 9.5	Node NODE				18.5 -5.8	
379 9.5	Node NODE				19.5 -5.8	
380 9.5	Node NODE				21 -5.8	
381 9.5	Node NODE				21.2 -5.8	
496-O 8.57	Node NODE				28 -5.4	
496-I 8.07	Node NODE				31.3 -5.2	
497-O 6.96	Node NODE				31.8 -4.7	
497-I 6.16	Node NODE				33.7 -4.4	
498-O 4.92	Node NODE				34.3 -3.9	
498-I 4.53	Node NODE				34.8 -3.7	

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi ^{1/2}	gpm gpm	ft ² gpm/ft ²	psi psi	psi gpm
500-O 2	Node NODE				35.9 -2.6	
500-I 2	Node NODE				39.3 -2.6	
501 1	Node NODE				40.3 -2.2	
TST -4	Supply SUPPLY		-440.5		47.3 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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 1

A14 401	22.83 22.83	5.6	15 15	1.5 1.61	1x(vsc.Tee-Br)=6.35 1x(vsc.90)=2.6	7.75 8.95 16.7	120 0.0094	7.2 0 0.2	
401 A16	22.83 22.83	5.6	15 30	2 2.067		0.5 0 0.5	120 0.0101	7.3 0 0	
A16 A17	22.83 22.83	5.6 5.6	15.2 45.2	1.5 1.61		6 0 6	120 0.0728	7.3 0 0.4	
A17 392	22.83 22.83	5.6	15.6 60.8	1.5 1.61	1x(vsc.Tee-Br)=6.35	26 6.35 32.35	120 0.1261	7.8 0 4.1	
392 214	22.83 9.5		0 60.8	2 2.067	1x(vsc.Tee-Br)=8.5	13.33 8.5 21.83	120 0.0374	11.9 5.8 0.8	
214 213	9.5 9.5		0 60.8	4 4.26	1x(vsc.Tee-Br)=21.07	3.52 21.07 24.58	120 0.0011	18.4 0 0.0	
213 379	9.5 9.5		379.7 440.5	4 4.26		25.2 0 25.2	120 0.0432	18.5 0 1.1	
379 380	9.5 9.5		-22.2 418.3	4 4.26	1x(vsc.90)=8.95	29.09 8.95 38.04	120 0.0393	19.5 0 1.5	
380 381	9.5 9.5		0 418.3	4 4.26		3.51 0 3.51	120 0.0393	21 0 0.1	
381 496-O	9.5 8.57		22.2 440.5	4 4.26	1x(coupling)=1.32 3x(vsc.90)=26.86 1x(vsc.Tee-Br)=21.07	100.25 49.24 149.49	120 0.0432	21.2 0.4 6.5	
496-O 496-I	8.57 8.07		0 440.5	4 0		0.5 0 0.5	0 6	28 0.2 3	Waterflow-Pot ter ***
496-I 497-O	8.07 6.96		0 440.5	4 4.26	1x(coupling)=1.32	1.11 1.32 2.43	120 0.0432	31.3 0.5 0.1	
497-O 497-I	6.96 6.16		0 440.5	4 0		0.8 0 0.8	0 1.8296	31.8 0.3 1.5	Vic717 Check ***
497-I 498-O	6.16 4.92		0 440.5	4 4.26	1x(coupling)=1.32	1.25 1.32 2.56	120 0.0432	33.7 0.5 0.1	
498-O 498-I	4.92 4.53		0 440.5	4 0		0.38 0 0.38	0 0.7998	34.3 0.2 0.3	Vic705 Bfly ***
498-I 500-O	4.53 2		0 440.5	4 4.26		1.15 0 1.15	120 0.0432	34.8 1.1 0.0	

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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 1

500-O	2		0	4		3.38	0	35.9	Ames 3000SS ***
500-I	2		440.5	0		0	0.9855	0	
						3.38		3.3	
500-I	2		0	4	1x(coupling)=1.32	3	120	39.3	
501	1		440.5	4.26	1x(vsc.90)=8.95	10.27	0.0432	0.4	
						13.27		0.6	
501	1		0	6	6x(UG.90)=114.05	954.99	140	40.3	
TST	-4		440.5	6.4	2x(UG.45)=26.61	140.66	0.0045	2.2	
						1095.6		4.9	
						5			
TST								47.3	

Path No: 2

A15	22.83	5.6	15	1.5	1x(vsc.Tee-Br)=6.35	5.26	120	7.2	
401	22.83		15	1.61	1x(vsc.90)=2.6	8.95	0.0095	0	
						14.21		0.1	
401								7.3	

Path No: 3

A11	22.83	5.6	15.2	1.5		10.75	120	7.3	
A12	22.83	5.6	15.2	1.61		0	0.0097	0	
						10.75		0.1	
A12	22.83	5.6	15.3	1.5	1x(vsc.Tee-Br)=6.35	10	120	7.4	
085	22.83		30.5	1.61		6.35	0.0351	0	
						16.35		0.6	
085	22.83		15.8	1.5	1x(vsc.Tee-Br)=6.35	13.33	120	8	
011	9.5		46.2	1.61		6.35	0.076	5.8	
						19.68		1.5	
011	9.5		174.3	4	1x(vsc.Tee-Br)=21.07	5.18	120	15.3	
010	9.5		220.5	4.26		21.07	0.012	0	
						26.25		0.3	
010	9.5		159.2	4	2x(vsc.Tee-Br)=42.13	44.92	120	15.6	
213	9.5		379.7	4.26		42.13	0.0328	0	
						87.05		2.9	
213								18.5	

PIPE INFORMATION

Path No: 4

A6	17	5.6	15.8	1.5		10	120	7.9	
A7	17	5.6	15.8	1.61		0	0.0104	0	
						10		0.1	
A7	17	5.6	15.9	1.5		10	120	8	
A8	17	5.6	31.7	1.61		0	0.0377	0	
						10		0.4	
A8	17	5.6	16.3	1.5	1x(vsc.Tee-Br)=6.35	1	120	8.4	
044	17		47.9	1.61		6.35	0.0812	0	
						7.35		0.6	
044	17		32.4	1.5	1x(vsc.Tee-Br)=6.35	7.5	120	9	
014	9.5		80.3	1.61		6.35	0.2115	3.2	
						13.85		2.9	
014	9.5		93.9	4		12	120	15.2	
011	9.5		174.3	4.26		0	0.0078	0	
						12		0.1	
011								15.3	

Path No: 5

A13	22.83	5.6	15.8	1.5	1x(vsc.Tee-Br)=6.35	0.75	120	7.9	
085	22.83		15.8	1.61		6.35	0.0104	0	
						7.1		0.1	
085								8	

Path No: 6

A18	17	5.6	15.9	1.5		10	120	8.1	
A19	17	5.6	15.9	1.61		0	0.0106	0	
						10		0.1	
A19	17	5.6	16	1.5		10	120	8.2	
A20	17	5.6	32	1.61		0	0.0384	0	
						10		0.4	
A20	17	5.6	16.4	1.5	1x(vsc.Tee-Br)=6.35	1	120	8.6	
598	17		48.4	1.61		6.35	0.0827	0	
						7.35		0.6	
598	17		32.7	1.5	1x(vsc.Tee-Br)=6.35	7.5	120	9.2	
007	9.5		81.1	1.61		6.35	0.2152	3.2	
						13.85		3	
007	9.5		78.1	4	1x(vsc.Tee-Br)=21.07	6.82	120	15.4	
010	9.5		159.2	4.26		21.07	0.0066	0	
						27.88		0.2	
010								15.6	

Path No: 7

A10	17	5.6	16.2	1.5		6.24	120	8.3	
A9	17	5.6	16.2	1.61		0	0.0109	0	
						6.24		0.1	
A9	17	5.6	16.2	1.5	1x(vsc.Tee-Br)=6.35	9	120	8.4	
044	17		32.4	1.61		6.35	0.0394	0	
						15.35		0.6	
044								9	

PIPE INFORMATION

Path No: 8

A22	17	5.6	16.3	1.5		6.24	120	8.5	
A21	17	5.6	16.3	1.61		0	0.0111	0	
						6.24		0.1	
A21	17	5.6	16.4	1.5	1x(vsc.Tee-Br)=6.35	9	120	8.6	
598	17		32.7	1.61		6.35	0.0401	0	
						15.35		0.6	
598								9.2	

Path No: 9

A1	11	5.6	18.5	1.5		10	120	10.9	
A2	11	5.6	18.5	1.61		0	0.0139	0	
						10		0.1	
A2	11	5.6	18.6	1.5		10	120	11	
A3	11	5.6	37	1.61		0	0.0504	0	
						10		0.5	
A3	11	5.6	19	1.5	1x(vsc.Tee-Br)=6.35	1	120	11.5	
019	11		56	1.61		6.35	0.1084	0	
						7.35		0.8	
019	11		37.9	1.5	1x(vsc.Tee-Br)=6.35	1.5	120	12.3	
017	9.5		93.9	1.61		6.35	0.2823	0.6	
						7.85		2.2	
017	9.5		0	4		12	120	15.2	
014	9.5		93.9	4.26		0	0.0025	0	
						12		0.0	
014								15.2	

Path No: 10

A5	11	5.6	18.9	1.5		6.24	120	11.4	
A4	11	5.6	18.9	1.61		0	0.0145	0	
						6.24		0.1	
A4	11	5.6	19	1.5	1x(vsc.Tee-Br)=6.35	9	120	11.5	
019	11		37.9	1.61		6.35	0.0526	0	
						15.35		0.8	
019								12.3	

Path No: 11

A23	11	5.6	19.1	1.5		10	120	11.6	
A24	11	5.6	19.1	1.61		0	0.0148	0	
						10		0.1	
A24	11	5.6	19.2	1.5		10	120	11.8	
A25	11	5.6	38.3	1.61		0	0.0537	0	
						10		0.5	
A25	11	5.6	19.7	1.5	1x(vsc.Tee-Br)=6.35	1	120	12.3	
001	11		58	1.61		6.35	0.1156	0	
						7.35		0.8	
001	11		20.1	1.5	1x(vsc.Tee-Br)=6.35	1.5	120	13.2	
003	9.5		78.1	1.61		6.35	0.2007	0.6	
						7.85		1.6	
003	9.5		0	4		12	120	15.4	
007	9.5		78.1	4.26		0	0.0018	0	
						12		0.0	
007								15.4	

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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 12

A26	11	5.6	20.1	1.5	1x(vsc.Tee-Br)=6.35	9	120	12.9	
001	11		20.1	1.61		6.35 15.35	0.0163	0 0.3	
001								13.2	

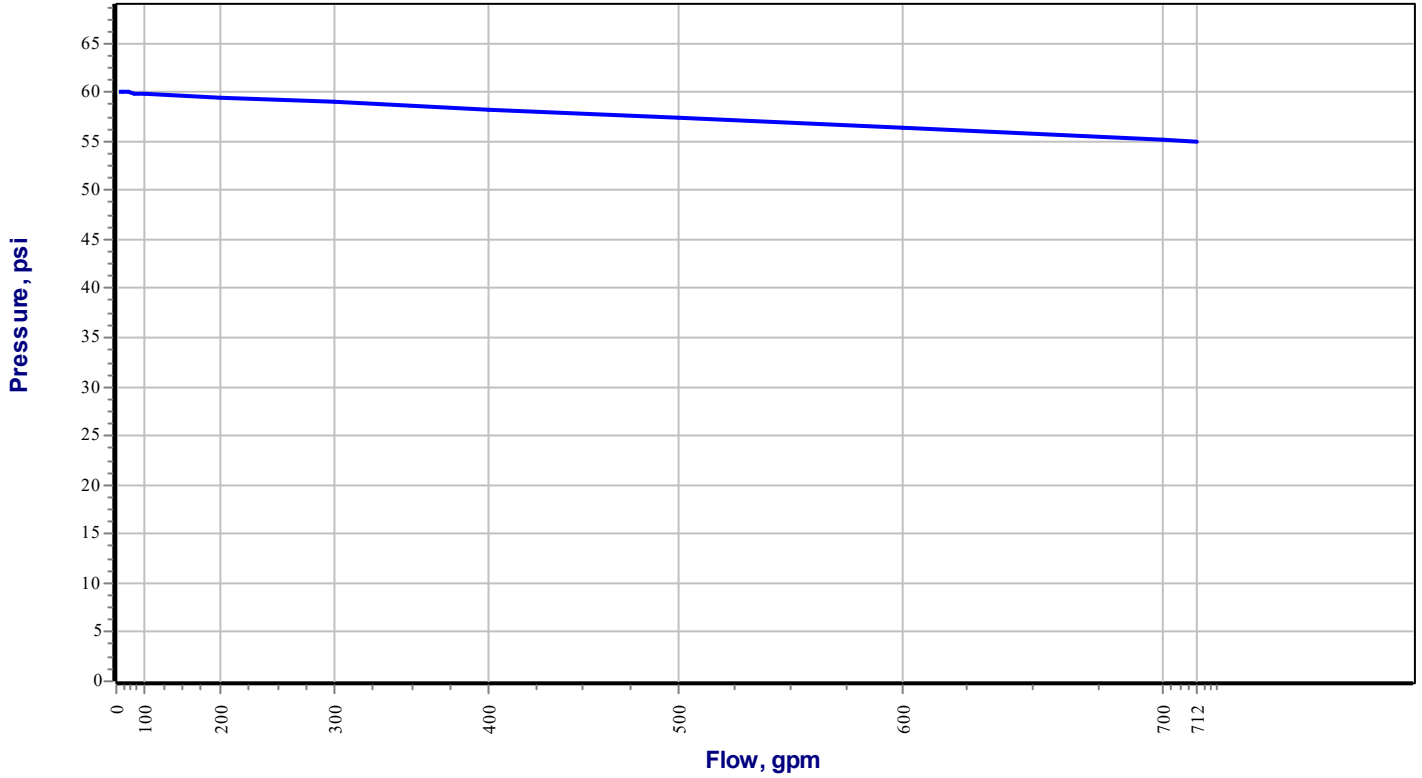
Path No: 13

379	9.5		0	1.5	3x(vsc.Tee-Br)=19.05	59.27	120	19.5	
381	9.5		22.2	1.61	2x(vsc.90)=5.2	24.25 83.52	0.0195	0 1.6	
381								21.2	

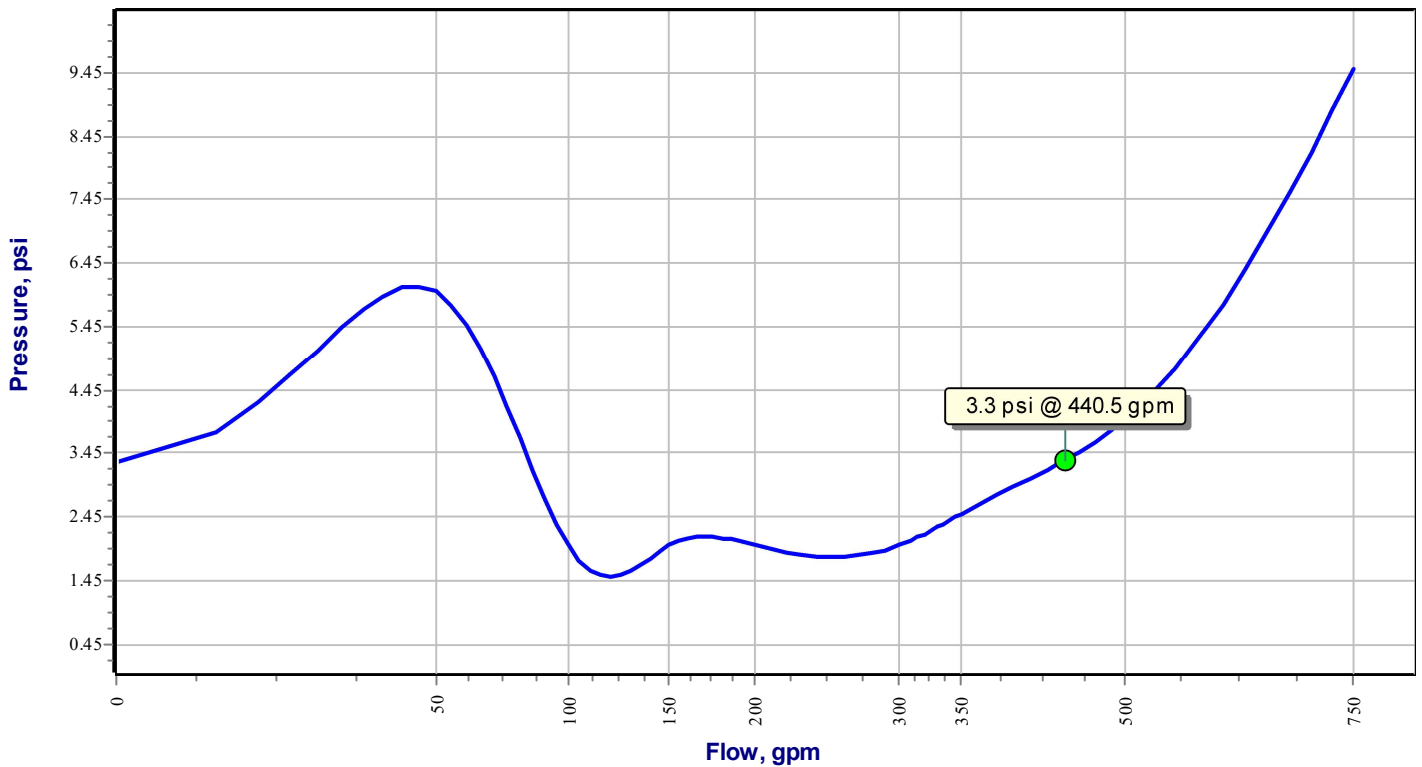
- * Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.
- * Maximum Velocity of 14.8 ft/s occurs in the following pipe(s): (017-019)

*** 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.: TST; Supply Name:TST

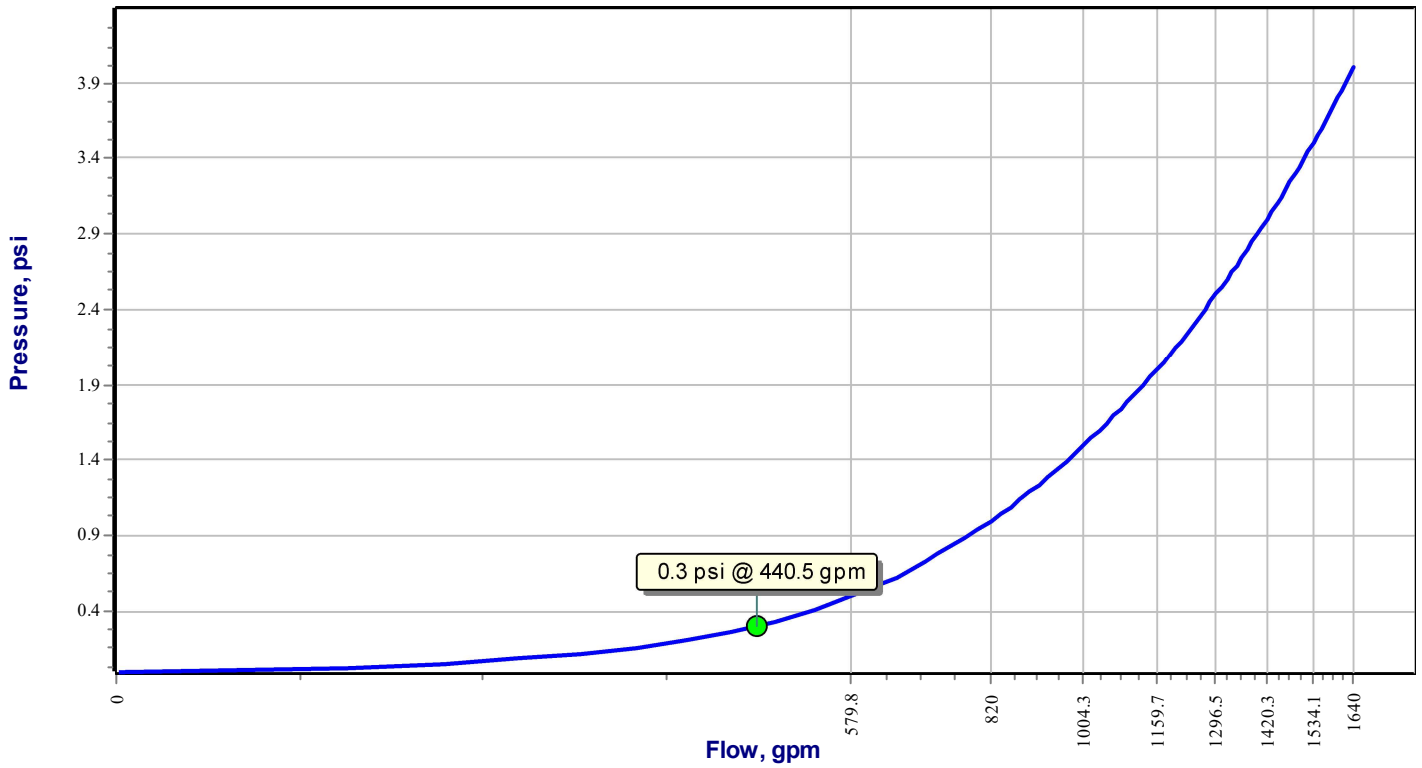


Pressure Loss Function
Design Area: 1; BFP Ref.: 747 (Ames 3000SS, Size = 4); Inlet Node: 500-I; Outlet Node: 500-O



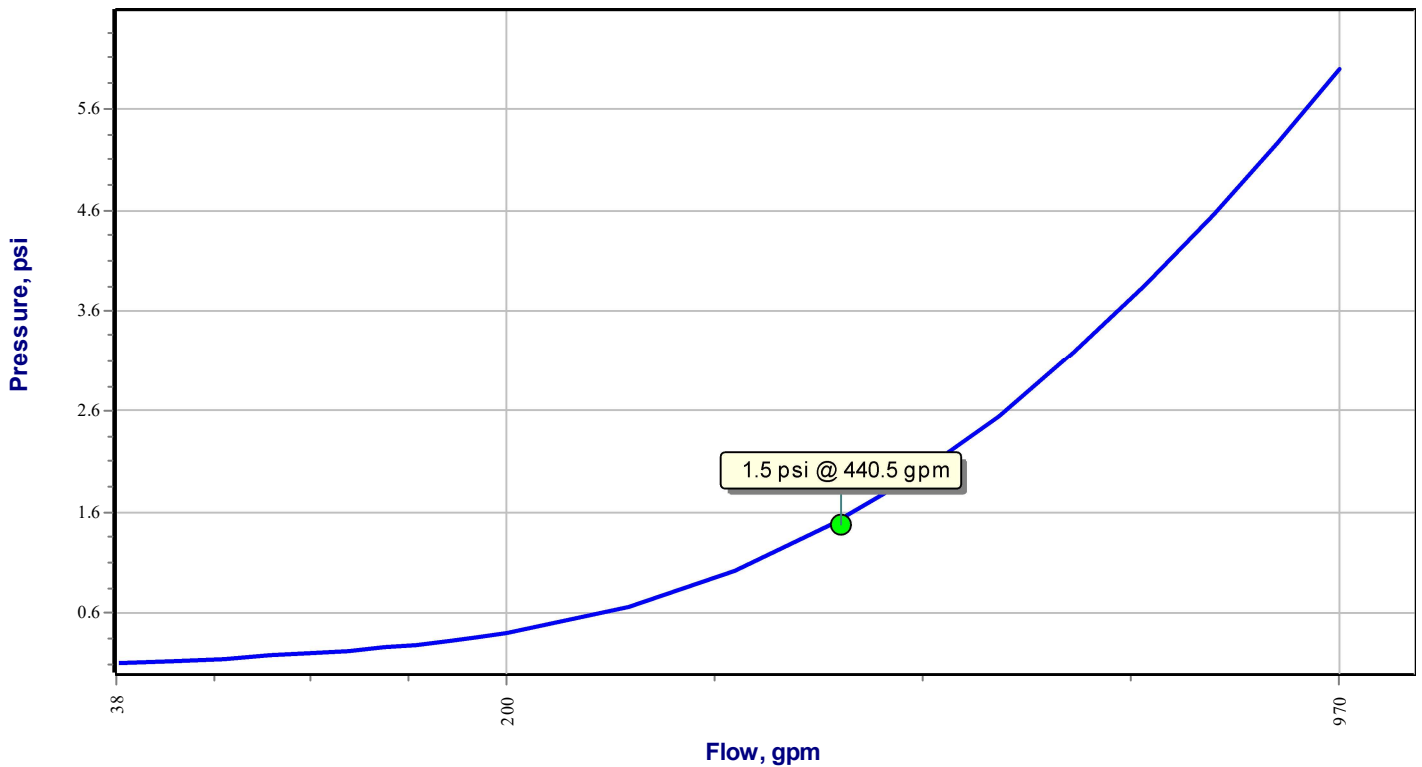
Pressure Loss Function

Design Area: 1; Valve Ref.: 744 (Vic705 Btfly, Size = 4); Inlet Node: 498-I; Outlet Node: 498-O



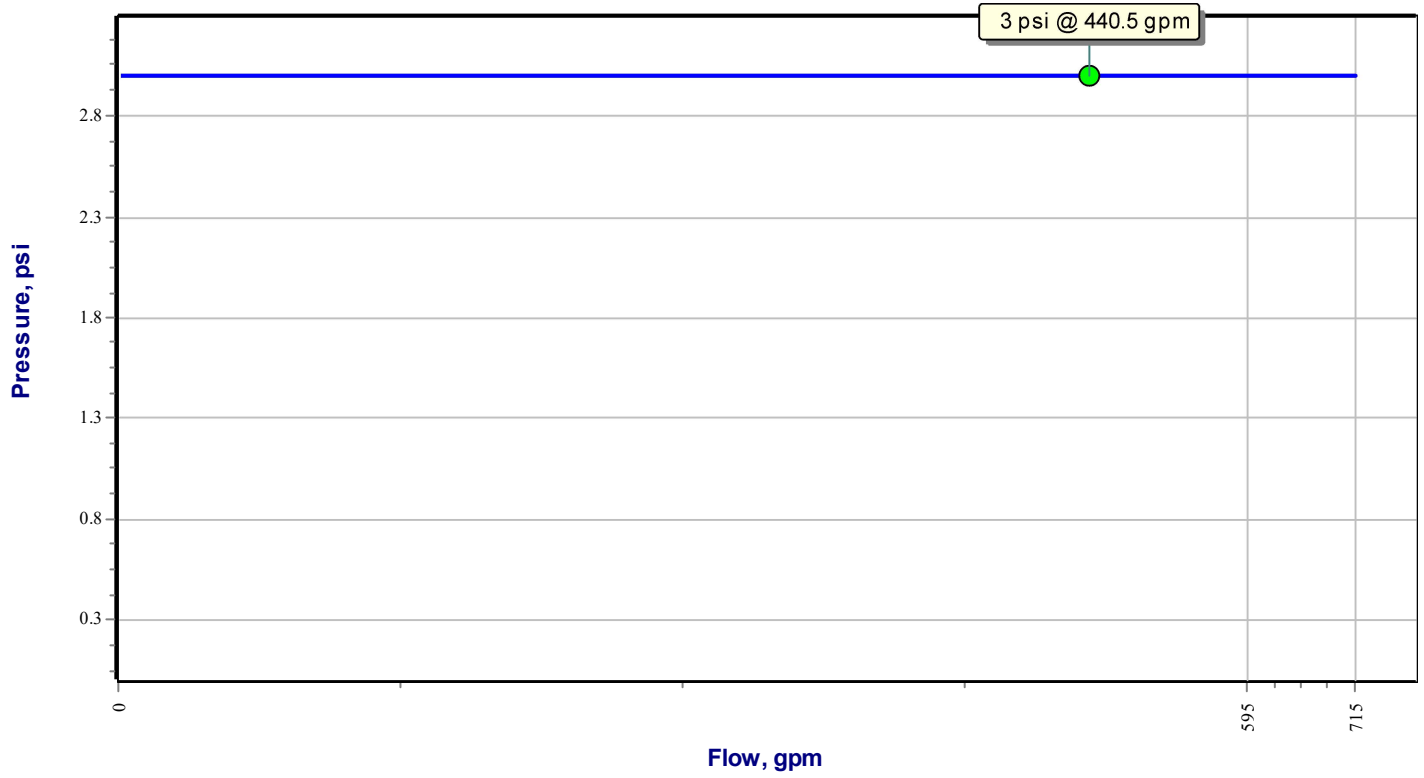
Pressure Loss Function

Design Area: 1; Valve Ref.: 745 (Vic717 Check, Size = 4); Inlet Node: 497-I; Outlet Node: 497-O



Pressure Loss Function

Design Area: 1; Valve Ref.: 746 (Waterflow-Potter, Size = 4); Inlet Node: 496-I; Outlet Node: 496-O



CALCULATION SUMMARY

Project Name : OAKHILL LIVING CENTER

Project Location: 9767 NC-210

Drawing No. : PC8965

City: ANGIER, NC 27501

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
			(ft ²)	(gpm)	(psi)	(gpm/ft ²)	(psi)	(gpm)	#	(gpm)	(psi)
2	Demand (HW)	LIGHT	3268	535.8	Required 46.6	0.1	9	16.8	23	100	10.5

HYDRAULIC CALCULATIONS for

Job Information

Project Name : OAKHILL LIVING CENTER

Contract No. : PC8965

City: ANGIER, NC 27501

Project Location: 9767 NC-210

Date: 7/10/2017

Contractor Information

Name of Contractor: VSC Fire & Security, Inc.

Address: 343 Technology Drive - Suite 2110

City: Garner, NC 27529

Phone Number: 919-645-5880

E-mail: SHGarner@vscfs.com

Name of Designer: STEVEN H. GARNER, SR.

Authority Having Jurisdiction: HARNETT COUNTY FIRE MARSHALL

Design

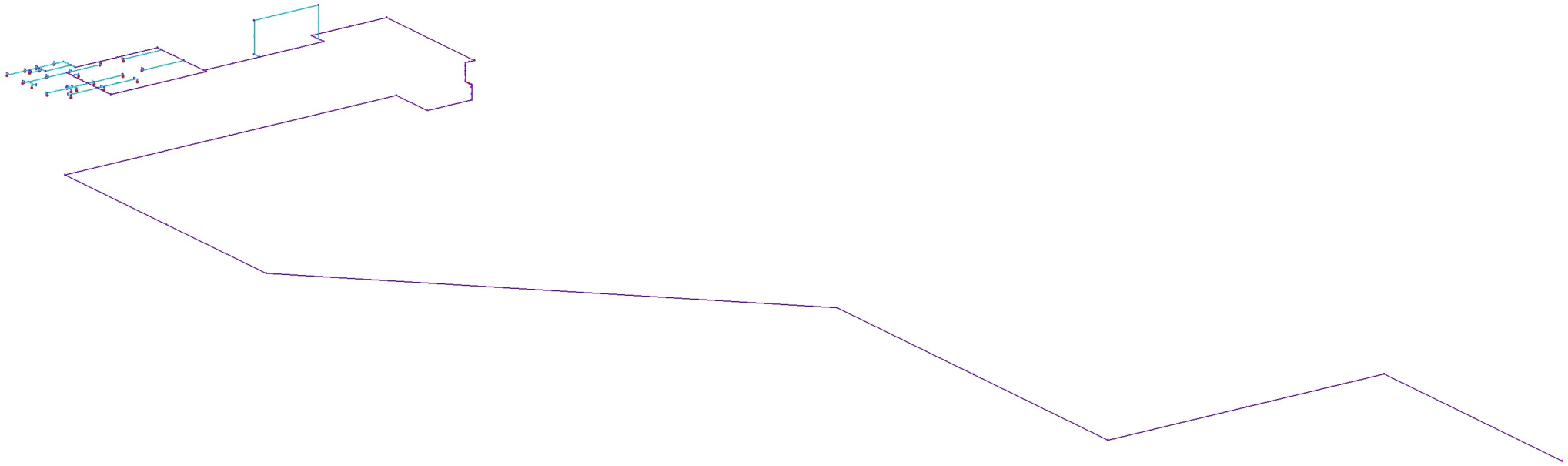
Remote Area Name	2
Remote Area Location	MOST REMOTE
Occupancy Classification	LIGHT
Density (gpm/ft ²)	0.1
Area of Application (ft ²)	3268
Coverage per Sprinkler (ft ²)	196
Number of Calculated Sprinklers	23
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	535.8
Required Pressure at Source (psi)	46.6
Type of System	Wet
Volume - Entire System (gal)	1829.5 gal

Water Supply Information

Date	07/13/17
Location	OAK HILL DRIVE
Source	TST

Notes

Diagram for Design Area : 2 (Optimized Hvdraulic Simplified)



Hydraulic Analysis for : 2

Calculation Info

Calculation Mode	Demand
Hydraulic Model	Hazen-Williams
Fluid Name	Water @ 60F (15.6C)
Fluid Weight, (lb/ft ³)	N/A for Hazen-Williams calculation.
Fluid Dynamic Viscosity, (lb-s/ft ²)	N/A for Hazen-Williams calculation.

Water Supply Parameters

Supply 1 : TST

Flow (gpm)	Pressure (psi)
0	60
712	55

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
TST	60	55	712	58	535.8	46.6

Hoses

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

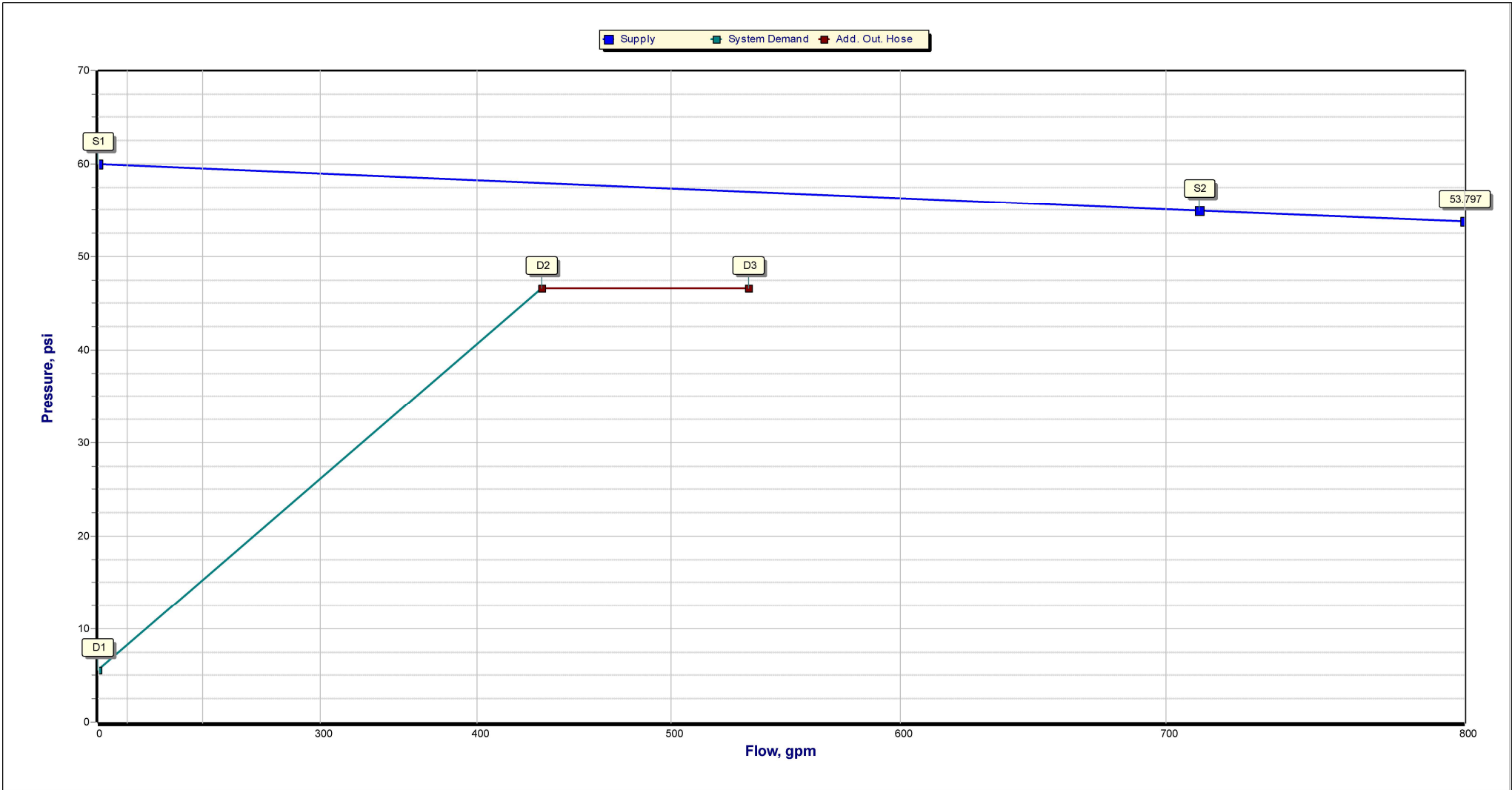
Sprinklers

Ovehead Sprinkler Flow (gpm)	435.8
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	435.8

Other

Required Margin of Safety (psi)	0
TST - Pressure (psi)	46.6
TST - Flow (gpm)	435.8
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	60
S2	Supply point #2 - Residual	712	55
D1	Elevation Pressure	0	5.6
D2	System Demand	435.8	46.6
D3	System Demand + Add.Out.Hose	535.8	46.6

Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	57.4	494.9	10.5	535.8

Open Heads

Head Ref.	Head Type	Coverage	K-Factor	Required			Calculated		
				Density	Flow	Pressure	Density	Flow	Pressure
		(ft ²)	(gpm/psi ^{1/2})	(gpm/ft ²)	(gpm)	(psi)	(gpm/ft ²)	(gpm)	(psi)
L1	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.1	16.8	9
L10	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.124	20.8	13.8
L11	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.12	20.2	13
L12	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.103	20.2	13
L13	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.112	21.9	15.3
L14	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.103	17.4	9.6
L15	Overhead Sprinkler	36	5.6	0.1	3.6	7.2	0.477	17.2	9.4
L16	Overhead Sprinkler	96	5.6	0.1	9.6	7.2	0.181	17.4	9.7
L17	Overhead Sprinkler	36	5.6	0.1	3.6	7.2	0.485	17.5	9.7
L18	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.12	20.2	13
L19	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.103	20.2	13
L2	Overhead Sprinkler	96	5.6	0.1	9.6	7.2	0.177	17	9.2
L20	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.111	21.7	15

L21	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.104	20.4	13.3
L22	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.103	20.2	13
L23	Overhead Sprinkler	196	5.6	0.1	19.6	12.3	0.103	20.1	12.9
L3	Overhead Sprinkler	96	5.6	0.1	9.6	7.2	0.181	17.3	9.6
L4	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.11	18.5	11
L5	Overhead Sprinkler	48	5.6	0.1	4.8	7.2	0.382	18.4	10.7
L6	Overhead Sprinkler	48	5.6	0.1	4.8	7.2	0.379	18.2	10.6
L7	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.108	18.1	10.5
L8	Overhead Sprinkler	168	5.6	0.1	16.8	9	0.104	17.4	9.7
L9	Overhead Sprinkler	96	5.6	0.1	9.6	7.2	0.195	18.7	11.1

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi ^{1/2}	gpm gpm	ft ² gpm/ft ²	psi psi	psi gpm
L1 9	Overhead Sprinkler HEAD	5.6 Open	16.8 0	168 0.1	9 -5.6	9 16.8
L14 9	Overhead Sprinkler HEAD	5.6 Open	17.4 0.6	168 0.103	9.6 -5.6	9 16.8
L8 9	Overhead Sprinkler HEAD	5.6 Open	17.4 0.6	168 0.104	9.7 -5.6	9 16.8
L2 9	Overhead Sprinkler HEAD	5.6 Open	17 7.4	96 0.177	9.2 -5.6	7.2 9.6
L3 9	Overhead Sprinkler HEAD	5.6 Open	17.3 7.7	96 0.181	9.6 -5.6	7.2 9.6
L16 9	Overhead Sprinkler HEAD	5.6 Open	17.4 7.8	96 0.181	9.7 -5.6	7.2 9.6
L15 9	Overhead Sprinkler HEAD	5.6 Open	17.2 13.6	36 0.477	9.4 -5.6	7.2 3.6
L17 9	Overhead Sprinkler HEAD	5.6 Open	17.5 13.9	36 0.485	9.7 -5.6	7.2 3.6
L7 9	Overhead Sprinkler HEAD	5.6 Open	18.1 1.3	168 0.108	10.5 -5.6	9 16.8
L6 9	Overhead Sprinkler HEAD	5.6 Open	18.2 13.4	48 0.379	10.6 -5.6	7.2 4.8
L5 9	Overhead Sprinkler HEAD	5.6 Open	18.4 13.6	48 0.382	10.7 -5.6	7.2 4.8
L4 9	Overhead Sprinkler HEAD	5.6 Open	18.5 1.7	168 0.11	11 -5.6	9 16.8
L9 9	Overhead Sprinkler HEAD	5.6 Open	18.7 9.1	96 0.195	11.1 -5.6	7.2 9.6
L23 9	Overhead Sprinkler HEAD	5.6 Open	20.1 0.5	196 0.103	12.9 -5.6	12.3 19.6
L12 9	Overhead Sprinkler HEAD	5.6 Open	20.2 0.6	196 0.103	13 -5.6	12.3 19.6
L19 9	Overhead Sprinkler HEAD	5.6 Open	20.2 0.6	196 0.103	13 -5.6	12.3 19.6
L22 9	Overhead Sprinkler HEAD	5.6 Open	20.2 0.6	196 0.103	13 -5.6	12.3 19.6
L21 9	Overhead Sprinkler HEAD	5.6 Open	20.4 0.8	196 0.104	13.3 -5.6	12.3 19.6
L11 9	Overhead Sprinkler HEAD	5.6 Open	20.2 3.4	168 0.12	13 -5.6	9 16.8
L18 9	Overhead Sprinkler HEAD	5.6 Open	20.2 3.4	168 0.12	13 -5.6	9 16.8
L10 9	Overhead Sprinkler HEAD	5.6 Open	20.8 4	168 0.124	13.8 -5.6	9 16.8
L20 9	Overhead Sprinkler HEAD	5.6 Open	21.7 2.1	196 0.111	15 -5.6	12.3 19.6
L13 9	Overhead Sprinkler HEAD	5.6 Open	21.9 2.3	196 0.112	15.3 -5.6	12.3 19.6
239 9.5	Node NODE				10.1 -5.8	
237 9.5	Node NODE				10.3 -5.8	

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi ^{1/2}	gpm gpm	ft ² gpm/ft ²	psi psi	psi gpm
604 9.5	Node NODE				10.6 -5.8	
235 9.5	Node NODE				10.8 -5.8	
603 9.5	Node NODE				10.8 -5.8	
602 9.5	Node NODE				10.9 -5.8	
601 9.5	Node NODE				11.2 -5.8	
577 9.5	Node NODE				11.7 -5.8	
264 9.5	Node NODE				11.8 -5.8	
263 9.5	Node NODE				11.9 -5.8	
233 9.5	Node NODE				12.3 -5.8	
576 9.5	Node NODE				12.6 -5.8	
590 9.5	Node NODE				14.2 -5.8	
618 9.5	Node NODE				14.3 -5.8	
626 9.5	Node NODE				14.4 -5.8	
589 9.5	Node NODE				14.7 -5.8	
231 9.5	Node NODE				14.7 -5.8	
617 9.5	Node NODE				14.7 -5.8	
625 9.5	Node NODE				14.9 -5.8	
230 9.5	Node NODE				14.9 -5.8	
006 9.5	Node NODE				15.1 -5.8	
574 9.5	Node NODE				15.7 -5.8	
573 9.5	Node NODE				15.7 -5.8	
572 9.5	Node NODE				15.7 -5.8	
015 9.5	Node NODE				15.8 -5.8	
228 9.5	Node NODE				16.1 -5.8	
315 9.5	Node NODE				16.9 -5.8	

Node Data

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi ^{1/2}	gpm gpm	ft ² gpm/ft ²	psi psi	psi gpm
362 9.5	Node NODE				16.9 -5.8	
224 9.5	Node NODE				17.8 -5.8	
222 9.5	Node NODE				17.8 -5.8	
220 9.5	Node NODE				17.9 -5.8	
213 9.5	Node NODE				18.1 -5.8	
379 9.5	Node NODE				19.2 -5.8	
380 9.5	Node NODE				20.6 -5.8	
381 9.5	Node NODE				20.8 -5.8	
496-O 8.57	Node NODE				27.5 -5.4	
496-I 8.07	Node NODE				30.7 -5.2	
497-O 6.96	Node NODE				31.3 -4.7	
497-I 6.16	Node NODE				33.1 -4.4	
498-O 4.92	Node NODE				33.7 -3.9	
498-I 4.53	Node NODE				34.2 -3.7	
500-O 2	Node NODE				35.3 -2.6	
500-I 2	Node NODE				38.6 -2.6	
501 1	Node NODE				39.6 -2.2	
TST -4	Supply SUPPLY		-435.8		46.6 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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 1

L1 239	9 9.5	5.6	16.8 16.8	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	1.97 12 13.97	120 0.0939	9 -0.2 1.3	
239 237	9.5 9.5		0 16.8	1.25 1.38		8 0 8	120 0.0247	10.1 0 0.2	
237 235	9.5 9.5		17 33.8	1.25 1.38		5.19 0 5.19	120 0.0899	10.3 0 0.5	
235 233	9.5 9.5		17.3 51.1	1.25 1.38		8 0 8	120 0.1938	10.8 0 1.6	
233 231	9.5 9.5		18.5 69.6	1.25 1.38	1x(vsc.90)=3	4 3 7	120 0.3437	12.3 0 2.4	
231 230	9.5 9.5		0 69.6	2 2.067		4.62 0 4.62	120 0.048	14.7 0 0.2	
230 228	9.5 9.5		36.6 106.2	2 2.067	1x(vsc.Tee-Br)=8.5	2.96 8.5 11.46	120 0.105	14.9 0 1.2	
228 224	9.5 9.5		0 106.2	2.5 2.635	1x(vsc.Tee-Br)=14.83	37.26 14.83 52.09	120 0.0322	16.1 0 1.7	
224 222	9.5 9.5		0 106.2	4 4.26		2.92 0 2.92	120 0.0031	17.8 0 0	
222 220	9.5 9.5		21.9 128.1	4 4.26		14 0 14	120 0.0044	17.8 0 0.1	
220 213	9.5 9.5		21.7 149.8	4 4.26	1x(vsc.Tee-Br)=21.07	13.01 21.07 34.08	120 0.0059	17.9 0 0.2	
213 379	9.5 9.5		286 435.8	4 4.26		25.2 0 25.2	120 0.0424	18.1 0 1.1	
379 380	9.5 9.5		-22 413.8	4 4.26	1x(vsc.90)=8.95	29.09 8.95 38.04	120 0.0385	19.2 0 1.5	
380 381	9.5 9.5		0 413.8	4 4.26		3.51 0 3.51	120 0.0385	20.6 0 0.1	
381 496-O	9.5 8.57		22 435.8	4 4.26	1x(coupling)=1.32 3x(vsc.90)=26.86 1x(vsc.Tee-Br)=21.07	100.25 49.24 149.49	120 0.0424	20.8 0.4 6.3	
496-O 496-I	8.57 8.07		0 435.8	4 0		0.5 0 0.5	0 6	27.5 0.2 3	Waterflow-Pot ter ***

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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 1

496-I 497-O	8.07 6.96		0 435.8	4 4.26	1x(coupling)=1.32	1.11 1.32 2.43	120 0.0424	30.7 0.5 0.1	
497-O 497-I	6.96 6.16		0 435.8	4 0		0.8 0 0.8	0 1.7927	31.3 0.3 1.4	Vic717 Check ***
497-I 498-O	6.16 4.92		0 435.8	4 4.26	1x(coupling)=1.32	1.25 1.32 2.56	120 0.0424	33.1 0.5 0.1	
498-O 498-I	4.92 4.53		0 435.8	4 0		0.38 0 0.38	0 0.7857	33.7 0.2 0.3	Vic705 Btfly ***
498-I 500-O	4.53 2		0 435.8	4 4.26		1.15 0 1.15	120 0.0424	34.2 1.1 0.0	
500-O 500-I	2 2		0 435.8	4 0		3.38 0 3.38	0 0.9724	35.3 0 3.3	Ames 3000SS ***
500-I 501	2 1		0 435.8	4 4.26	1x(coupling)=1.32 1x(vsc.90)=8.95	3 10.27 13.27	120 0.0424	38.6 0.4 0.6	
501 TST	1 -4		0 435.8	6 6.4	6x(UG.90)=114.05 2x(UG.45)=26.61	954.99 140.66 1095.6 5	140 0.0044	39.6 2.2 4.8	
TST								46.6	

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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 2

L14 604	9 9.5	5.6	17.4 17.4	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	2.53 9 11.53	120 0.0998	9.6 -0.2 1.2	
604 603	9.5 9.5		0 17.4	1.25 1.38		9.35 0 9.35	120 0.0263	10.6 0 0.2	
603 602	9.5 9.5		17.2 34.5	1.25 1.38		1.05 0 1.05	120 0.0938	10.8 0 0.1	
602 601	9.5 9.5		17.4 51.9	1.25 1.38		1.45 0 1.45	120 0.1996	10.9 0 0.3	
601 572	9.5 9.5		17.5 69.4	1.25 1.38	1x(vsc.Tee-Br)=6	7.35 6 13.35	120 0.3415	11.2 0 4.6	
572 015	9.5 9.5		155.8 225.2	4 4.26		6.12 0 6.12	120 0.0125	15.7 0 0.1	
015 213	9.5 9.5		60.8 286	4 4.26	3x(vsc.Tee-Br)=63.2	53.47 63.2 116.67	120 0.0194	15.8 0 2.3	
213								18.1	

Path No: 3

L8 577	9 9.5	5.6	17.4 17.4	1 1.049	2x(vsc.Tee-Br)=10 2x(vsc.90)=4	8.53 14 22.53	120 0.1003	9.7 -0.2 2.3	
577 576	9.5 9.5		18.1 35.5	1.25 1.38		8.79 0 8.79	120 0.0989	11.7 0 0.9	
576 574	9.5 9.5		18.7 54.2	1.25 1.38	1x(vsc.Tee-Br)=6	8.41 6 14.41	120 0.2163	12.6 0 3.1	
574 573	9.5 9.5		40.4 94.6	4 4.26		5.03 0 5.03	120 0.0025	15.7 0 0.0	
573 572	9.5 9.5		20.8 115.4	4 4.26		8.97 0 8.97	120 0.0036	15.7 0 0.0	
572								15.7	

PIPE INFORMATION

Path No: 4

L23 626	9 9.5	5.6	20.1 20.1	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	3.5 9 12.5	120 0.1313	12.9 -0.2 1.6	
626 625	9.5 9.5		0 20.1	1.25 1.38		15 0 15	120 0.0345	14.4 0 0.5	
625 015	9.5 9.5		20.2 40.4	1.25 1.38	1x(vsc.Tee-Br)=6	1.59 6 7.59	120 0.1251	14.9 0 1	
015								15.8	

Path No: 5

L12 590	9 9.5	5.6	20.2 20.2	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	2 9 11	120 0.1319	13 -0.2 1.5	
590 589	9.5 9.5		0 20.2	1.25 1.38		13.44 0 13.44	120 0.0347	14.2 0 0.5	
589 574	9.5 9.5		20.2 40.4	1.25 1.38	1x(vsc.Tee-Br)=6	1.99 6 7.99	120 0.1253	14.7 0 1	
574								15.7	

Path No: 6

L19 618	9 9.5	5.6	20.2 20.2	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	2 9 11	120 0.1323	13 -0.2 1.5	
618 617	9.5 9.5		0 20.2	1.25 1.38		13.44 0 13.44	120 0.0348	14.3 0 0.5	
617 572	9.5 9.5		20.2 40.4	1.25 1.38	1x(vsc.Tee-Br)=6	1.99 6 7.99	120 0.1256	14.7 0 1	
572								15.7	

Path No: 7

L22 625	9 9.5	5.6	20.2 20.2	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	3.5 12 15.5	120 0.1323	13 -0.2 2.1	
625								14.9	

Path No: 8

L21 006	9 9.5	5.6	20.4 20.4	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	3.5 12 15.5	120 0.1345	13.3 -0.2 2.1	
006 015	9.5 9.5		0 20.4	1.25 1.38	1x(vsc.Tee-Br)=6	13.41 6 19.41	120 0.0354	15.1 0 0.7	
015								15.8	

PIPE INFORMATION

Path No: 9

L7 577	9 9.5	5.6	18.1 18.1	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	4.47 9 13.47	120 0.108	10.5 -0.2 1.5
577								11.7

Path No: 10

L4 233	9 9.5	5.6	18.5 18.5	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	1.97 12 13.97	120 0.1126	11 -0.2 1.6
233								12.3

Path No: 11

L2 237	9 9.5	5.6	17 17	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	1.97 12 13.97	120 0.0956	9.2 -0.2 1.3
237								10.3

Path No: 12

L15 603	9 9.5	5.6	17.2 17.2	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	4.58 12 16.58	120 0.0977	9.4 -0.2 1.6
603								10.8

Path No: 13

L3 235	9 9.5	5.6	17.3 17.3	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	1.97 12 13.97	120 0.0995	9.6 -0.2 1.4
235								10.8

Path No: 14

L16 602	9 9.5	5.6	17.4 17.4	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	2.52 12 14.52	120 0.1002	9.7 -0.2 1.5
602								10.9

Path No: 15

L17 601	9 9.5	5.6	17.5 17.5	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	4.58 12 16.58	120 0.1009	9.7 -0.2 1.7
601								11.2

Path No: 16

L20 362	9 9.5	5.6	21.7 21.7	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	2.3 12 14.3	120 0.1505	15 -0.2 2.2
362 220	9.5 9.5		0 21.7	1.25 1.38	1x(vsc.Tee-Br)=6	18.41 6 24.41	120 0.0396	16.9 0 1
220								17.9

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/psi ^{1/2})	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 17

L13 315	9 9.5	5.6	21.9 21.9	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	2.29 9 11.29	120 0.1538	15.3 -0.2 1.7	
315 222	9.5 9.5		0 21.9	1.25 1.38	1x(vsc.Tee-Br)=6	17.99 6 23.99	120 0.0404	16.9 0 1	
222								17.8	

Path No: 18

L6 263	9 9.5	5.6	18.2 18.2	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	2.17 12 14.17	120 0.1089	10.6 -0.2 1.5	
263 230	9.5 9.5		18.4 36.6	1.25 1.38	2x(vsc.Tee-Br)=12 1x(vsc.90)=3	14.23 15 29.23	120 0.1042	11.9 0 3	
230								14.9	

Path No: 19

L5 264	9 9.5	5.6	18.4 18.4	1 1.049	2x(vsc.90)=4 1x(vsc.Tee-Br)=5	2.17 9 11.17	120 0.1106	10.7 -0.2 1.2	
264 263	9.5 9.5		0 18.4	1.25 1.38		4.4 0 4.4	120 0.0291	11.8 0 0.1	
263								11.9	

Path No: 20

L9 576	9 9.5	5.6	18.7 18.7	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	2.52 12 14.52	120 0.1144	11.1 -0.2 1.7	
576								12.6	

Path No: 21

L11 589	9 9.5	5.6	20.2 20.2	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	2.47 12 14.47	120 0.132	13 -0.2 1.9	
589								14.7	

Path No: 22

L18 617	9 9.5	5.6	20.2 20.2	1 1.049	2x(vsc.Tee-Br)=10 1x(vsc.90)=2	2.53 12 14.53	120 0.1323	13 -0.2 1.9	
617								14.7	

PIPE INFORMATION

Path No: 23

L10	9	5.6	20.8	1	2x(vsc.Tee-Br)=10	3.49	120	13.8	
573	9.5		20.8	1.049	1x(vsc.90)=2	12	0.1392	-0.2	
								15.49	2.2
573								15.7	

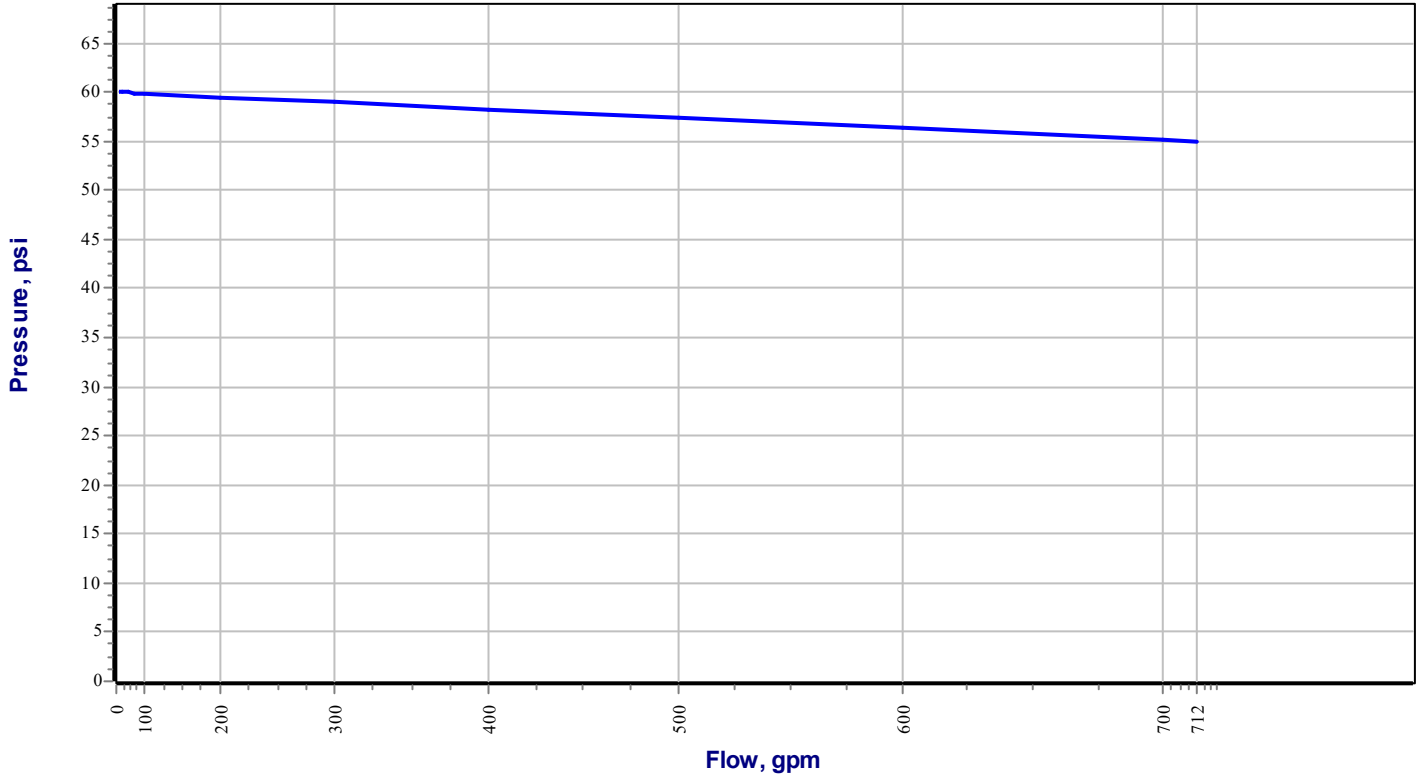
Path No: 24

379	9.5		0	1.5	3x(vsc.Tee-Br)=19.05	59.27	120	19.2	
381	9.5		22	1.61	2x(vsc.90)=5.2	24.25	0.0192	0	
								83.52	1.6
381								20.8	

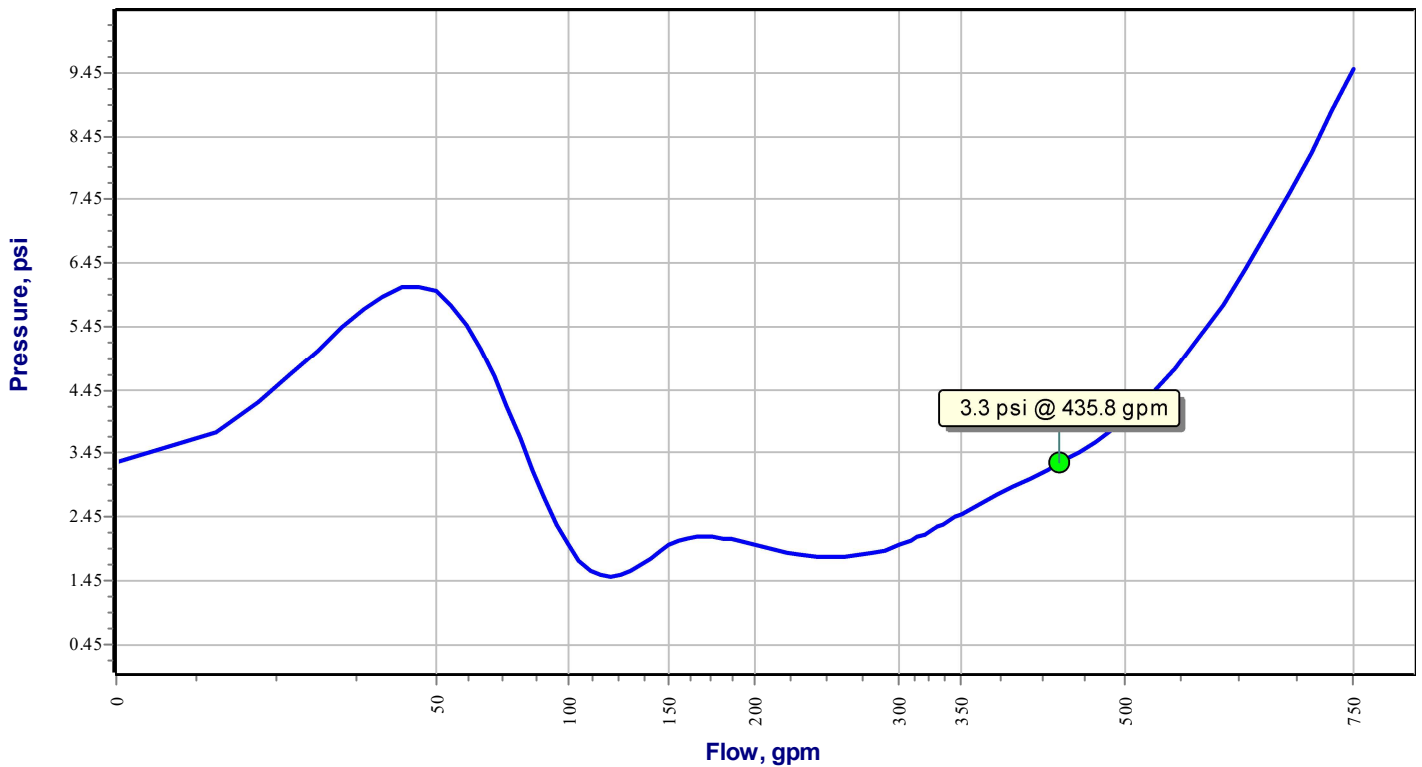
- * Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.
- * Maximum Velocity of 14.94 ft/s occurs in the following pipe(s): (231-233)

*** 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.: TST; Supply Name:TST

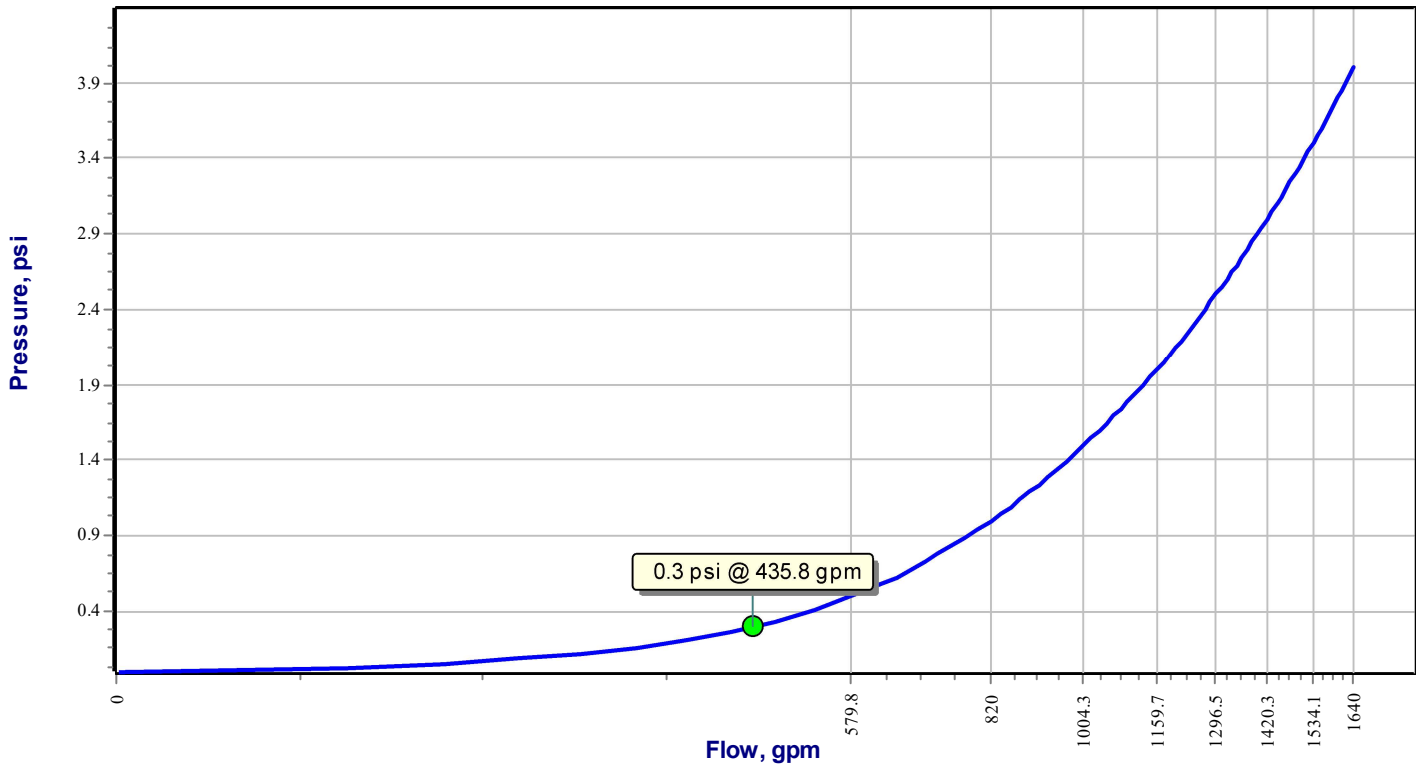


Pressure Loss Function
Design Area: 2; BFP Ref.: 747 (Ames 3000SS, Size = 4); Inlet Node: 500-I; Outlet Node: 500-O



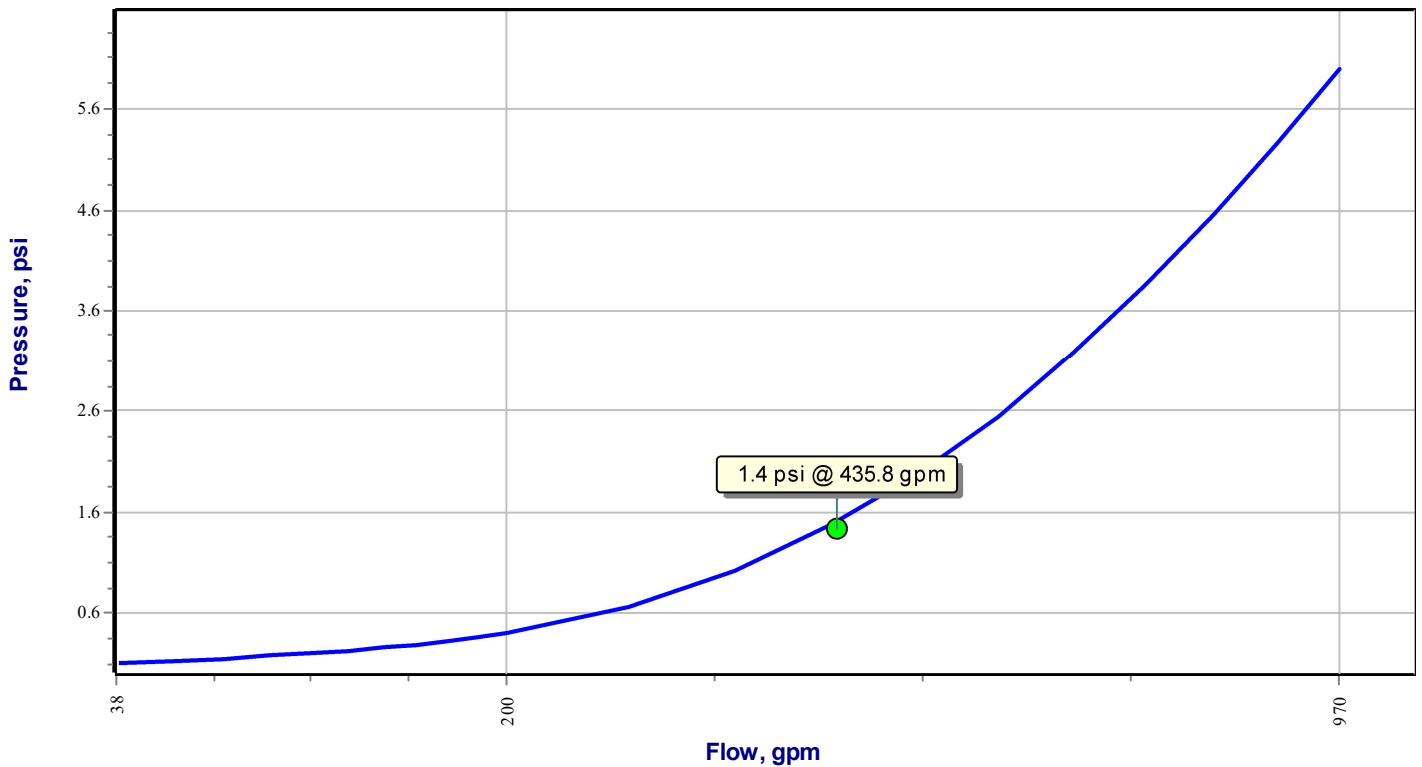
Pressure Loss Function

Design Area: 2; Valve Ref.: 744 (Vic705 Btfly, Size = 4); Inlet Node: 498-I; Outlet Node: 498-O



Pressure Loss Function

Design Area: 2; Valve Ref.: 745 (Vic717 Check, Size = 4); Inlet Node: 497-I; Outlet Node: 497-O



Pressure Loss Function

Design Area: 2; Valve Ref.: 746 (Waterflow-Potter, Size = 4); Inlet Node: 496-I; Outlet Node: 496-O

