

Remote Area #3

<b>SHOP DRAWING / SUBMITTAL REVIEW</b>	
<input checked="" type="checkbox"/> REVIEWED	<input type="checkbox"/> REVIEWED AS NOTED
<input type="checkbox"/> REVISE AND RESUBMIT	<input type="checkbox"/> REJECTED
Project No.: <u>2265</u>	Submittal No.: <u>211300.001</u>
<p>Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. This contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his or her work with that and other trades and performing all in a safe and satisfactory manner.</p>	
By: <u>David Dammon</u>	Date: <u>11/9/2016</u>
<b>DAMMON ENGINEERING, INC.</b> Slidell, LA	

# HYDRAULIC CALCULATIONS for

---

## Job Information

Project Name : MAINSTAY SUITES

Contract No. :

City: HACKBERRY, LA 70645

Project Location: 700 MAIN ST - LA HWY 27

Date: 11/3/2016

---

## Contractor Information

Name of Contractor: LIFE SAFETY

Address: 11168 LUCUIS LANE

City: HAMMOND, LA 70404

Phone Number: 504-915-5514

E-mail:

Name of Designer: DRURY

Authority Having Jurisdiction: STATE FIRE MARSHAL

---

## Design

Remote Area Name	3
Remote Area Location	LAUNDRY
Occupancy Classification	ORDINARY I
Density (gpm/ft <sup>2</sup> )	0.15
Area of Application (ft <sup>2</sup> )	456
Coverage per Sprinkler (ft <sup>2</sup> )	100
Number of Calculated Sprinklers	4
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	250
Total Water Required (incl. Hose Streams) (gpm)	314.1
Required Pressure at Source (psi)	33.1
Type of System	Wet
Volume - Entire System (gal)	603.7 gal

---

## Water Supply Information

Date	11/02/16
Location	LA HWY 27 11:55am
Source	W1

---

## Notes

LESS THAN 500 SF ROOM, 4 SPRINKLER - MAX FLOWING



### Hydraulic Analysis for : 3

**Calculation Info**

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

**Water Supply Parameters**

Supply 1 : W1

Flow (gpm)	Pressure (psi)
0	58
1060	55

**Supply Analysis**

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	58	55	1060	58	314.1	33.1

**Hoses**

Inside Hose Flow / Standpipe Demand (gpm)

Outside Hose Flow (gpm)

Additional Outside Hose Flow (gpm) 250

Other (custom defined) Hose Flow (gpm)

-----  
 Total Hose Flow (gpm) 250

**Sprinklers**

Ovehead Sprinkler Flow (gpm) 64.1

InRack Sprinkler Flow (gpm) 0

Other (custom defined) Sprinkler Flow (gpm) 0

-----  
 Total Sprinkler Flow (gpm) 64.1

**Other**

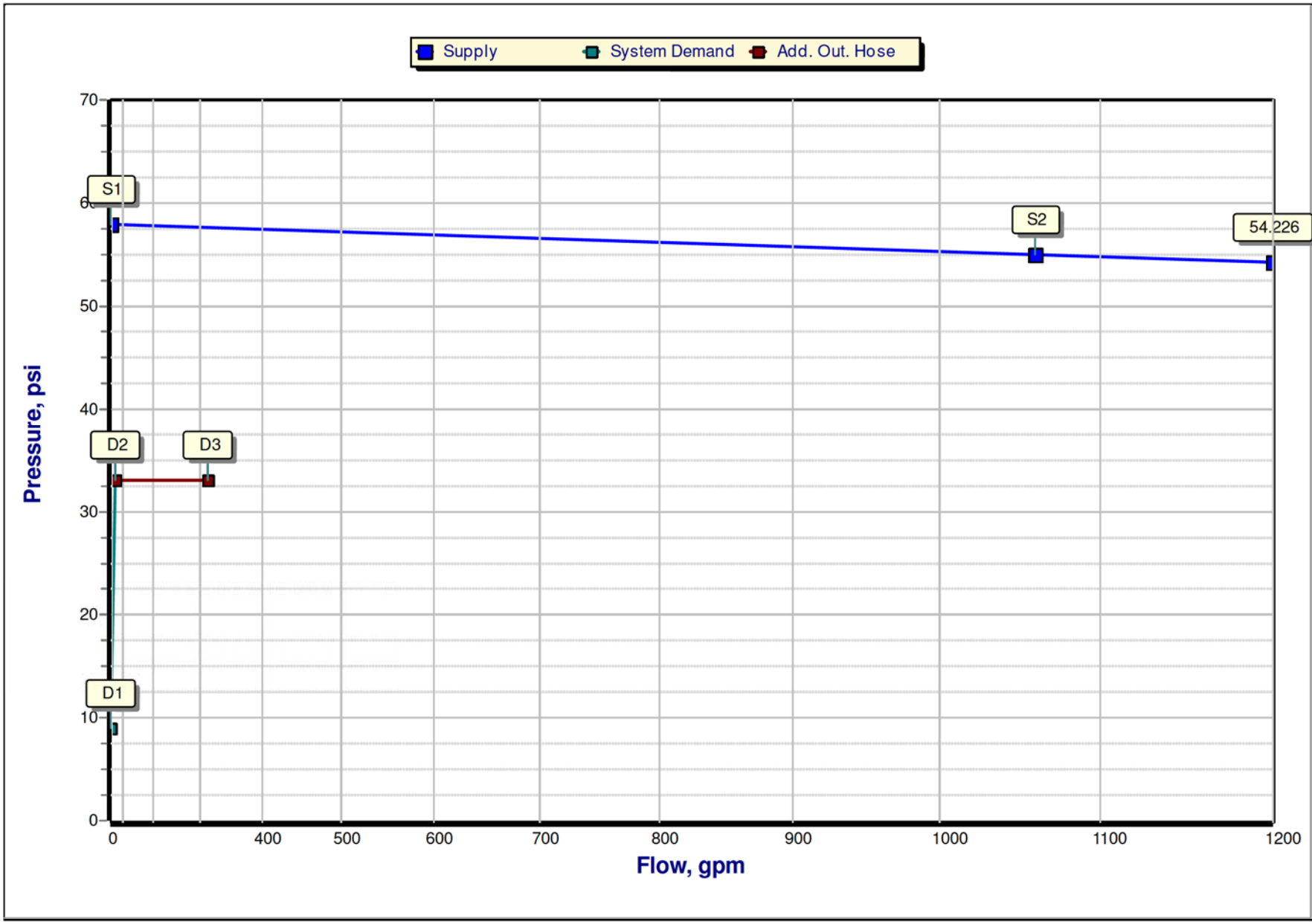
Required Margin of Safety (psi) 0

W1 - Pressure (psi) 33.1

W1 - Flow (gpm) 64.1

Demand w/o System Pump(s) N/A

### Hydraulic Analysis for : 3



### Hydraulic Analysis for : 3

#### Graph Labels

Label	Description	Values	
		Flow (gpm)	Pressure (psi)
S1	Supply point #1 - Static	0	58
S2	Supply point #2 - Residual	1060	55
D1	Elevation Pressure	0	9
D2	System Demand	64.1	33.1
D3	System Demand + Add.Out.Hose	314.1	33.1

#### Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	58	94	24.6	314.1

#### Open Heads

Head Ref.	Head Type	Coverage	K-Factor	Required			Calculated		
				Density	Flow	Pressure	Density	Flow	Pressure
		(ft <sup>2</sup> )	(gpm/psi <sup>1/2</sup> )	(gpm/ft <sup>2</sup> )	(gpm)	(psi)	(gpm/ft <sup>2</sup> )	(gpm)	(psi)
10	Overhead Sprinkler	100	5.6	0.15	15	7.2	0.173	17.3	9.6
7	Overhead Sprinkler	100	5.6	0.15	15	7.2	0.15	15	7.2
8	Overhead Sprinkler	100	5.6	0.15	15	7.2	0.154	15.4	7.6
9	Overhead Sprinkler	100	5.6	0.15	15	7.2	0.164	16.4	8.6

**Node Data**

Node# Elev	Type Hgroup	K-Fact. Open/Closed	Discharge Overdischarge	Coverage Density	Tot. Pres. Elev. Pres.	Req. Pres. Req. Discharge
ft		gpm/psi <sup>1/2</sup>	gpm gpm	ft <sup>2</sup> gpm/ft <sup>2</sup>	psi psi	psi gpm
7 10.75	Overhead Sprinkler HEAD	5.6 Open	15 0	100 0.15	7.2 -9	7.2 15
8 10.75	Overhead Sprinkler HEAD	5.6 Open	15.4 0.4	100 0.154	7.6 -9	7.2 15
9 10.75	Overhead Sprinkler HEAD	5.6 Open	16.4 1.4	100 0.164	8.6 -9	7.2 15
10 10.75	Overhead Sprinkler HEAD	5.6 Open	17.3 2.3	100 0.173	9.6 -9	7.2 15
268 11.5	Node NODE				7.7 -9.3	
267 11.5	Node NODE				10.1 -9.3	
006 11.5	Node NODE				10.8 -9.3	
279 11.5	Node NODE				10.8 -9.3	
278 11.5	Node NODE				11.1 -9.3	
008 11.5	Node NODE				11.2 -9.3	
011 11.5	Node NODE				11.3 -9.3	
020 11.5	Node NODE				13.9 -9.3	
033 11.5	Node NODE				14 -9.3	
035-O 6.08	Node NODE				16.6 -7	
035-I 5.42	Node NODE				17.3 -6.7	
036-O 4.32	Node NODE				17.8 -6.2	
036-I 4	Node NODE				18.1 -6.1	
043-I 3	Node NODE				18.5 -5.6	
037 1	Node NODE				19.4 -4.8	
043-O 3	Node NODE				24.4 -5.6	
046-I -4	Node NODE				27.5 -2.6	
046-O -4	Node NODE				27.5 -2.6	
047-I -4	Node NODE				27.5 -2.6	
047-O -4	Node NODE				30.5 -2.6	
050-I -10	Node NODE				33.1 0	

### 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 <sup>1/2</sup>	gpm gpm	ft <sup>2</sup> gpm/ft <sup>2</sup>	psi psi	psi gpm
050-O -10	Node NODE				33.1 0	
W1 -10	Supply SUPPLY		-64.1		33.1 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 <sup>1/2</sup> )	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

**Path No: 1**

7 268	10.75 11.5	5.6	15 15	1 1.049	1x(us.90)=2	9.75 2 11.75	120 0.0761	7.2 -0.3 0.9	
268 267	11.5 11.5		15.4 30.4	1 1.049	1x(coupling)=1	7.37 1 8.37	120 0.2824	7.7 0 2.4	
267 011	11.5 11.5		0 30.4	1 1.101	1x(BM.Tee-Br)=5	3 5 8	150 0.1476	10.1 0 1.2	
011 020	11.5 11.5		33.7 64.1	2 2.003	1x(coupling)=1.3 7x(BM.Tee-Run)=7 1x(BM.90)=10	63.45 18.3 81.75	150 0.0318	11.3 0 2.6	
020 033	11.5 11.5		0 64.1	2 2.157		1.83 0 1.83	120 0.0335	13.9 0 0.1	
033 035-O	11.5 6.08		0 64.1	2.5 2.635	1x(coupling)=1.37 1x(us.90)=8.24	12.16 9.61 21.77	120 0.0127	14 2.3 0.3	
035-O 035-I	6.08 5.42		0 64.1	2.5 0		0.67 0 0.67	0 0.6897	16.6 0.3 0.5	CV-1 FR Check ***
035-I 036-O	5.42 4.32		0 64.1	2.5 2.635	1x(coupling)=1.37	1.1 1.37 2.47	120 0.0127	17.3 0.5 0.0	
036-O 036-I	4.32 4		0 64.1	2.5 0		0.32 0 0.32	0 0.3275	17.8 0.1 0.1	BFV-N ***
036-I 037	4 1		0 64.1	4 4.26	1x(coupling)=1.32	3 1.32 4.32	120 0.0012	18.1 1.3 0	
037 043-I	1 3		0 64.1	6 5.86	1x(coupling)=1.28 5x(us.90)=89.4	85.83 90.68 176.51	150 0.0002	19.4 -0.9 0.0	
043-I 043-O	3 3		0 64.1	6 0		0.5 0 0.5	0 11.7528	18.5 0 5.9	WATTS 757 ***
043-O 046-I	3 -4		0 64.1	6 5.86	1x(coupling)=1.28 2x(us.90)=35.76	14.04 37.04 51.08	150 0.0002	24.4 3 0	
046-I 046-O	-4 -4		0 64.1	6 0		0.88 0 0.88	0 0.0008	27.5 0 0	Gate A2360 ***
046-O 047-I	-4 -4		0 64.1	6 5.86	1x(coupling)=1.28	4.11 1.28 5.39	150 0.0002	27.5 0 0	
047-I 047-O	-4 -4		0 64.1	6 0		0.5 0 0.5	0 6	27.5 0 3	WATTS SS07F ***

### 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 <sup>1/2</sup> )	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

**Path No: 1**

047-O	-4		0	6	1x(coupling)=1.28	310.41	150	30.5	
050-I	-10		64.1	5.86	1x(us.Tee-Br)=38.32 1x(us.90)=17.88	57.47 367.88	0.0002	2.6 0.1	
050-I	-10		0	6		0.88	0	33.1	Gate A2360
050-O	-10		64.1	0		0	0.0008	0	***
						0.88		0	
050-O	-10		0	6		0.48	150	33.1	
W1	-10		64.1	5.86		0	0.0002	0	
						0.48		0	
<b>W1</b>								<b>33.1</b>	

**Path No: 2**

8	10.75	5.6	15.4	1	1x(us.Tee-Br)=5	0.75	120	7.6	
268	11.5		15.4	1.049		5	0.0803	-0.3	
						5.75		0.5	
<b>268</b>								<b>7.7</b>	

**Path No: 3**

9	10.75	5.6	16.4	1	1x(coupling)=1	20.35	120	8.6	
279	11.5		16.4	1.049	1x(us.Tee-Br)=5 1x(us.90)=2	8 28.35	0.0896	-0.3 2.5	
279	11.5		0	1	1x(BM.Tee-Br)=5	3	150	10.8	
278	11.5		16.4	1.101		5 8	0.0468	0 0.4	
278	11.5		0	2	3x(BM.Tee-Run)=3	11.31	150	11.1	
008	11.5		16.4	2.003		3 14.31	0.0025	0 0.0	
008	11.5		17.3	2	3x(BM.Tee-Run)=3	8.34	150	11.2	
011	11.5		33.7	2.003		3 11.34	0.0097	0 0.1	
<b>011</b>								<b>11.3</b>	

**Path No: 4**

10	10.75	5.6	17.3	1	1x(coupling)=1	7.36	120	9.6	
006	11.5		17.3	1.049	1x(us.Tee-Br)=5 1x(us.90)=2	8 15.36	0.0993	-0.3 1.5	
006	11.5		0	1	1x(BM.Tee-Br)=5	3	150	10.8	
008	11.5		17.3	1.101		5 8	0.0519	0 0.4	
<b>008</b>								<b>11.2</b>	

### PIPE INFORMATION

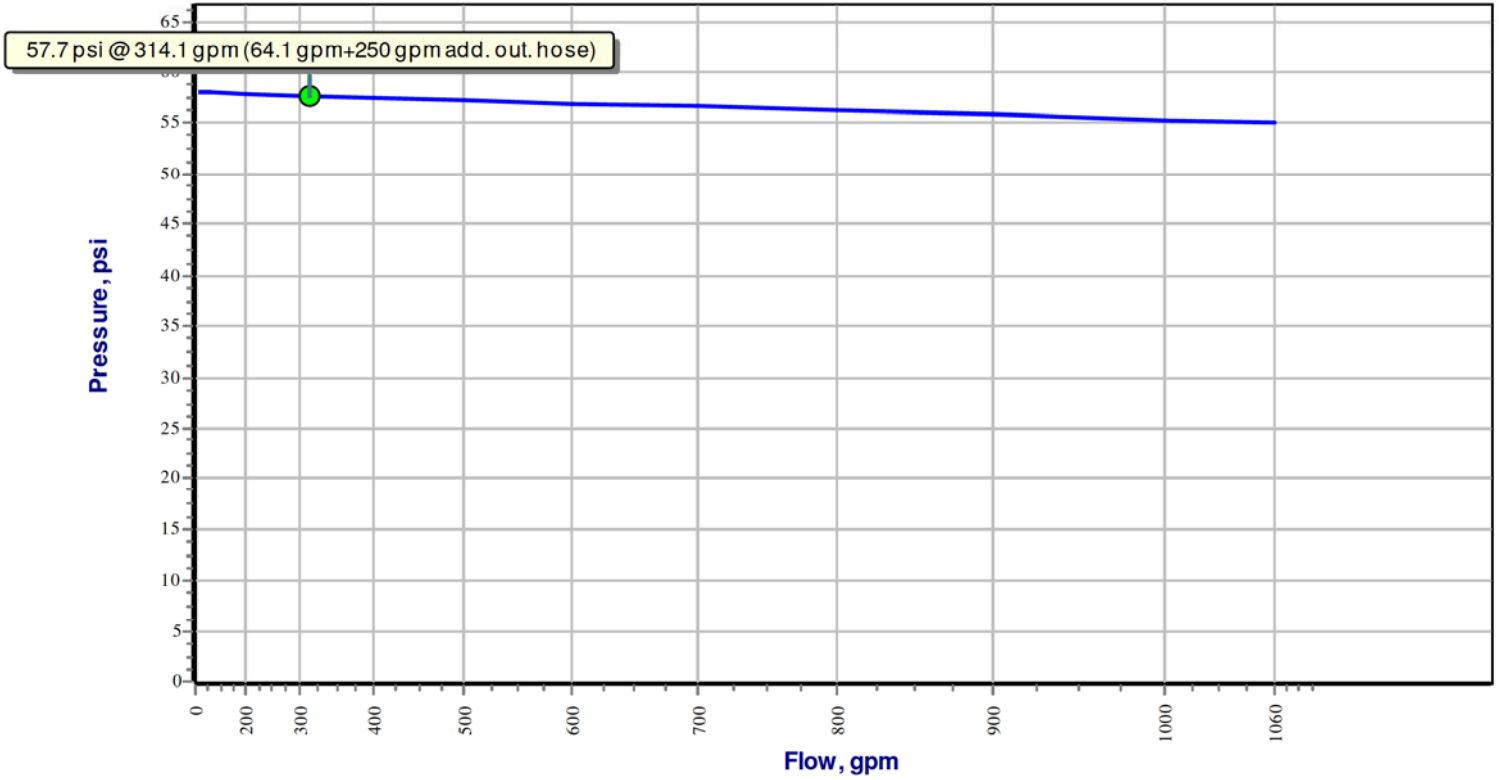
Node 1	Elev 1	K-Factor 1	Flow added (q)	Nominal ID	Fittings	L	C Factor	total (Pt)	NOTES
Node 2	Elev 2	K-Factor 2	Total flow (Q)	Actual ID	quantity x (name) = length	F	Pf per ft	elev (Pe)	
	(ft)	(gpm/psi <sup>1/2</sup> )	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

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

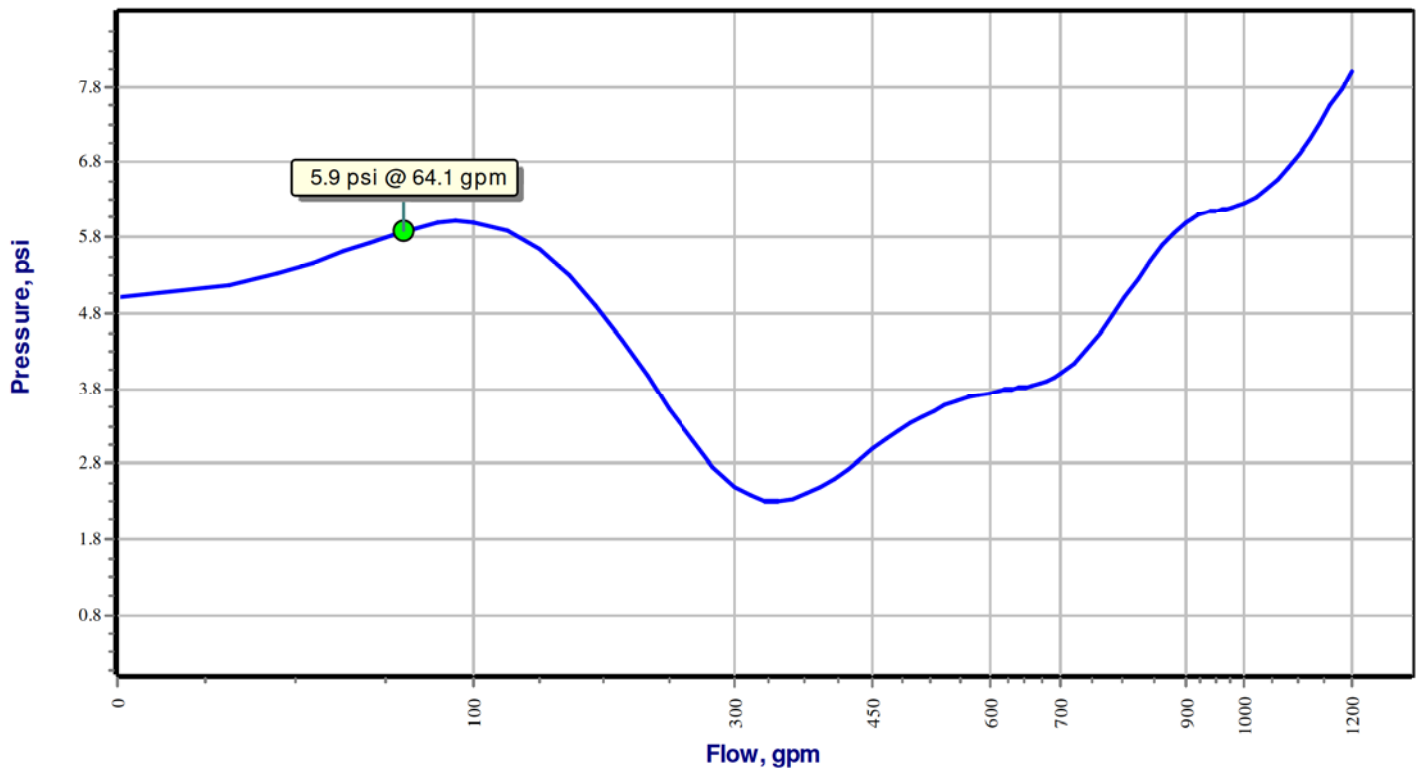
\* Maximum Velocity of 11.3 ft/s occurs in the following pipe(s): (267-268)

\*\*\* 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: 3; Supply Ref.: W1; Supply Name:W1

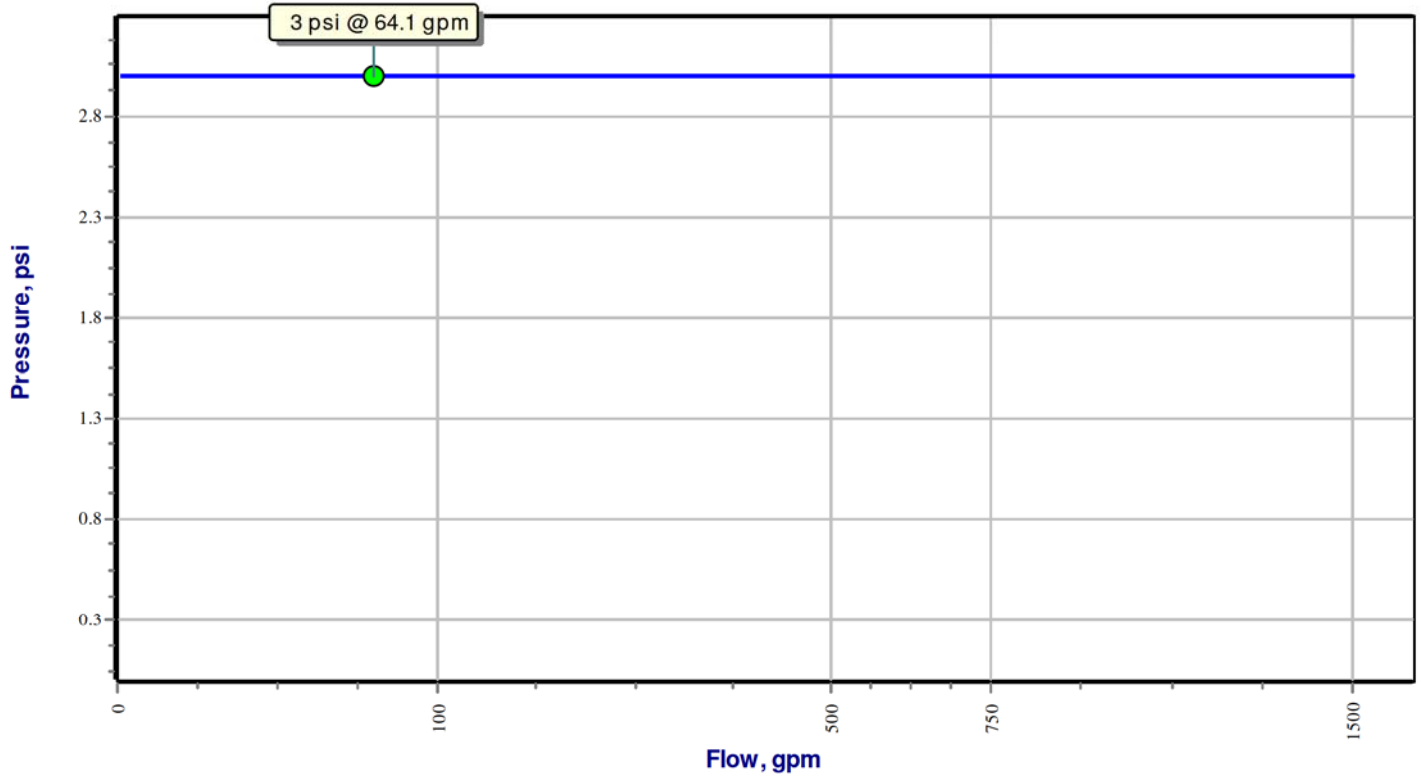


### Pressure Loss Function Design Area: 3; BFP Ref.: 650 (WATTS 757, Size = 6); Inlet Node: 043-I; Outlet Node: 043-O



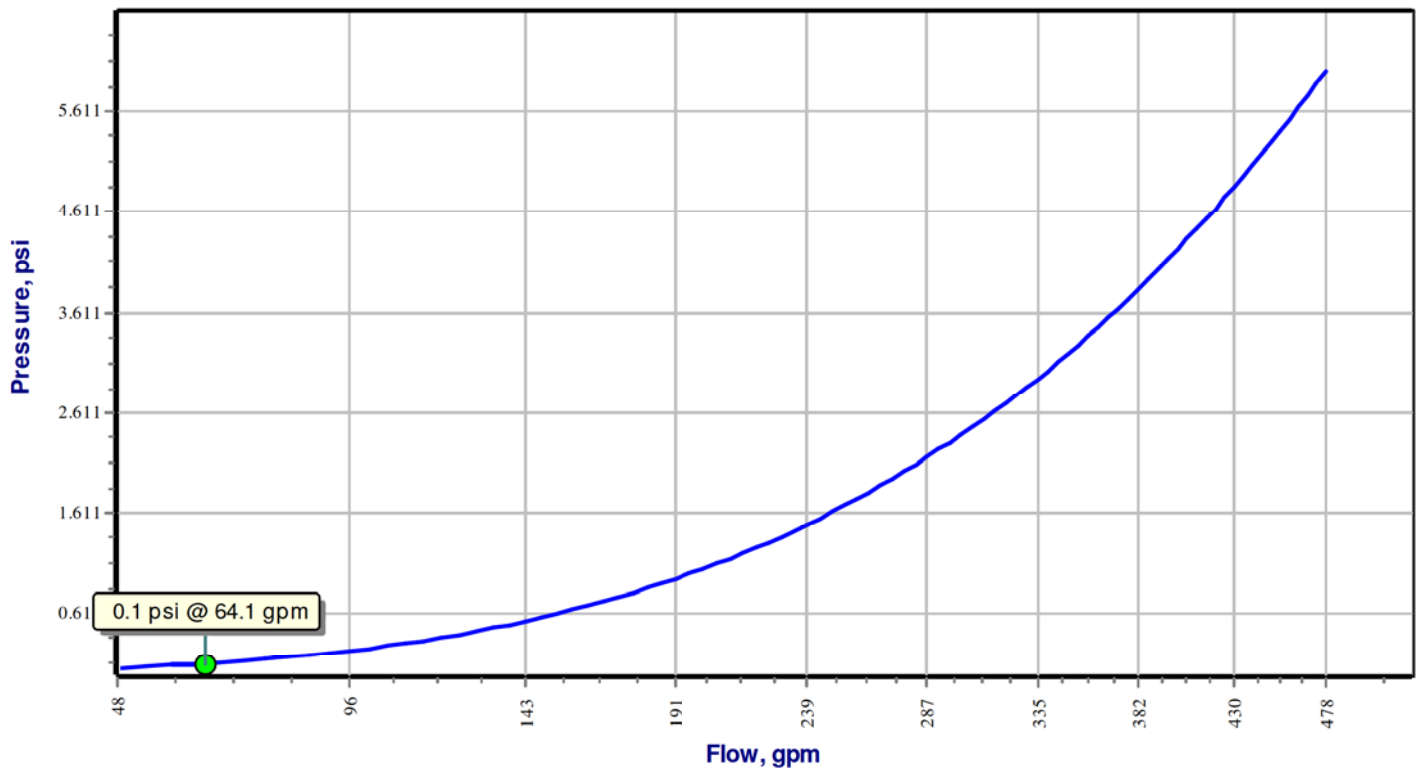
### Pressure Loss Function

Design Area: 3; BFP Ref.: 652 (WATTS SS07F, Size = 6); Inlet Node: 047-I; Outlet Node: 047-O



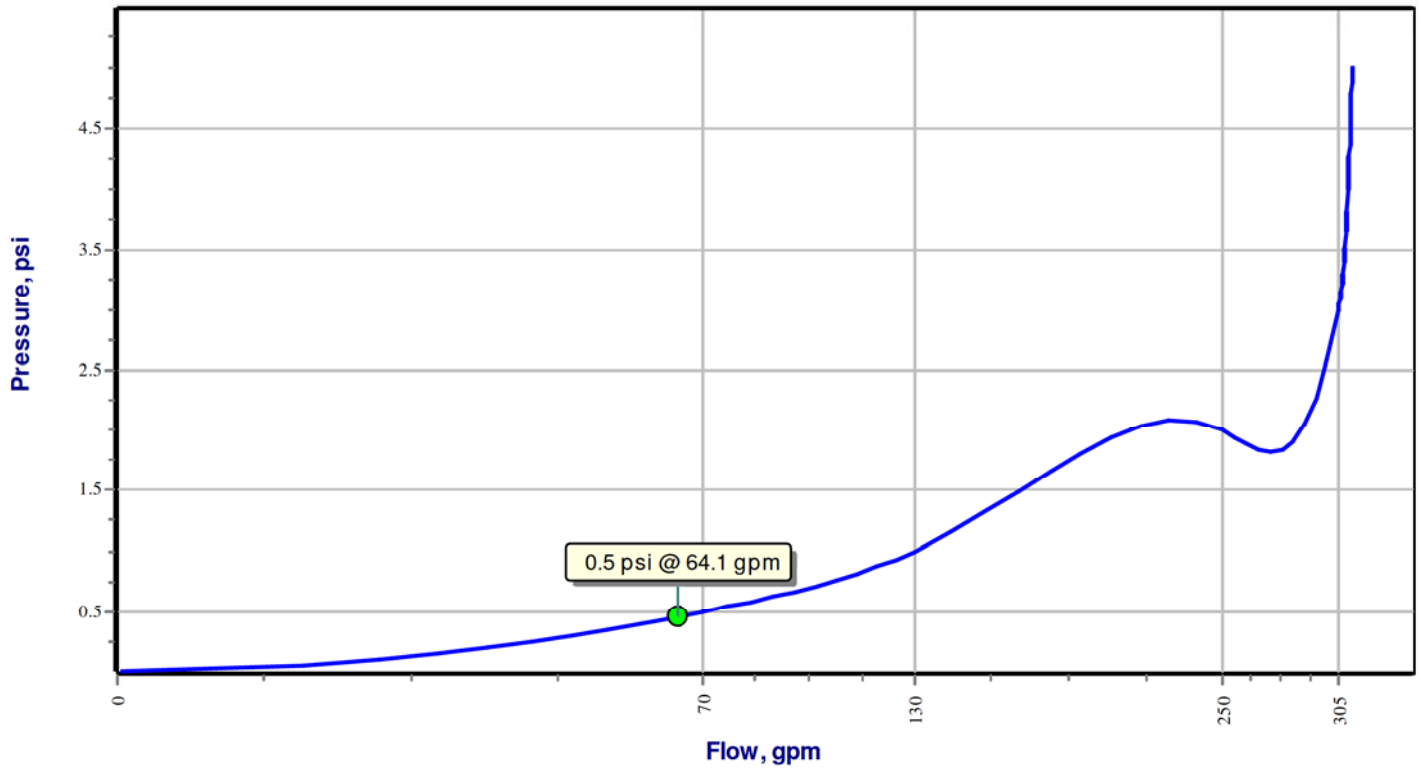
### Pressure Loss Function

Design Area: 3; Valve Ref.: 648 (BFV-N, Size = 2.5); Inlet Node: 036-I; Outlet Node: 036-O



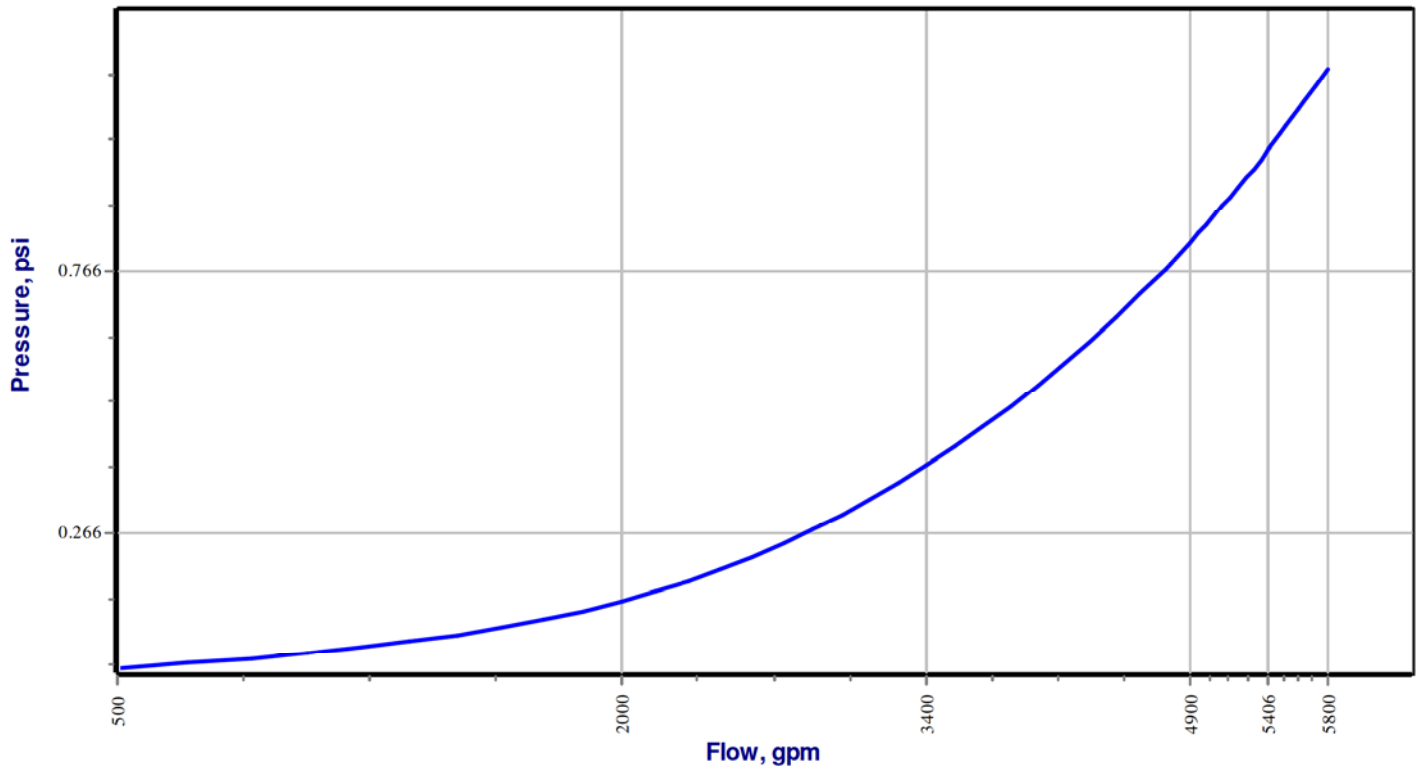
### Pressure Loss Function

Design Area: 3; Valve Ref.: 649 (CV-1 FR Check, Size = 2.5); Inlet Node: 035-I; Outlet Node: 035-O



### Pressure Loss Function

Design Area: 3; Valve Ref.: 651 (Gate A2360, Size = 6); Inlet Node: 046-I; Outlet Node: 046-O



**Pressure Loss Function**  
**Design Area: 3; Valve Ref.: 653 (Gate A2360, Size = 6); Inlet Node: 050-I; Outlet Node: 050-O**

