

## CALCULATION SUMMARY

Project Name : COMMUNITY BRIDGES- RIO FRESCO HOTEL

Project Location: 2425 S.24TH ST

Contract No. :

City: PHOENIX, AZ

### 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)
22	Demand (HW)	Residential	334	156.1	Required 42.5	0.05	9.3	12.8	4	100	17.4
32	Demand (HW)	Residential	334	138.5	Required 30.5	0.05	9.3	12.8	3	100	29.4
42	Demand (HW)	Residential	285	138.5	Required 30.3	0.05	9.3	12.8	3	100	29.7
C22	Demand (HW)	Residential	380	152.3	Required 26.1	0.051	7	13	4	100	33.9
C32	Demand (HW)	Residential	380	152.5	Required 28.3	0.051	7.2	13.1	4	100	31.6
C42	Demand (HW)	Residential	380	152.5	Required 30	0.051	7.2	13.1	4	100	29.9

# HYDRAULIC CALCULATIONS for

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## Job Information

Project Name : COMMUNITY BRIDGES- RIO FRESCO HOTEL

Contract No. :

City: PHOENIX, AZ

Project Location: 2425 S.24TH ST

Date: 8/16/2024

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## Contractor Information

Name of Contractor:

Address:

City:

Phone Number:

E-mail:

Name of Designer: J.DAVILA

Authority Having Jurisdiction:

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## Design

Remote Area Name	22
Remote Area Location	BLDG-2 2ND FLR
Occupancy Classification	Residential
Density (gpm/ft <sup>2</sup> )	0.05
Area of Application (ft <sup>2</sup> )	334
Coverage per Sprinkler (ft <sup>2</sup> )	256
Number of Calculated Sprinklers	4
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	156.1
Required Pressure at Source (psi)	42.5
Type of System	Wet
Volume - Entire System (gal)	243.2 gal

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## Water Supply Information

Date	6-26-24
Location	2425 S 24TH ST
Source	W1

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## Notes

up to 4 hds

[illegible]

Hydraulic Analysis for : 22

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	60
2541	49

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	60	49	2541	59.9	156.1	42.5

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

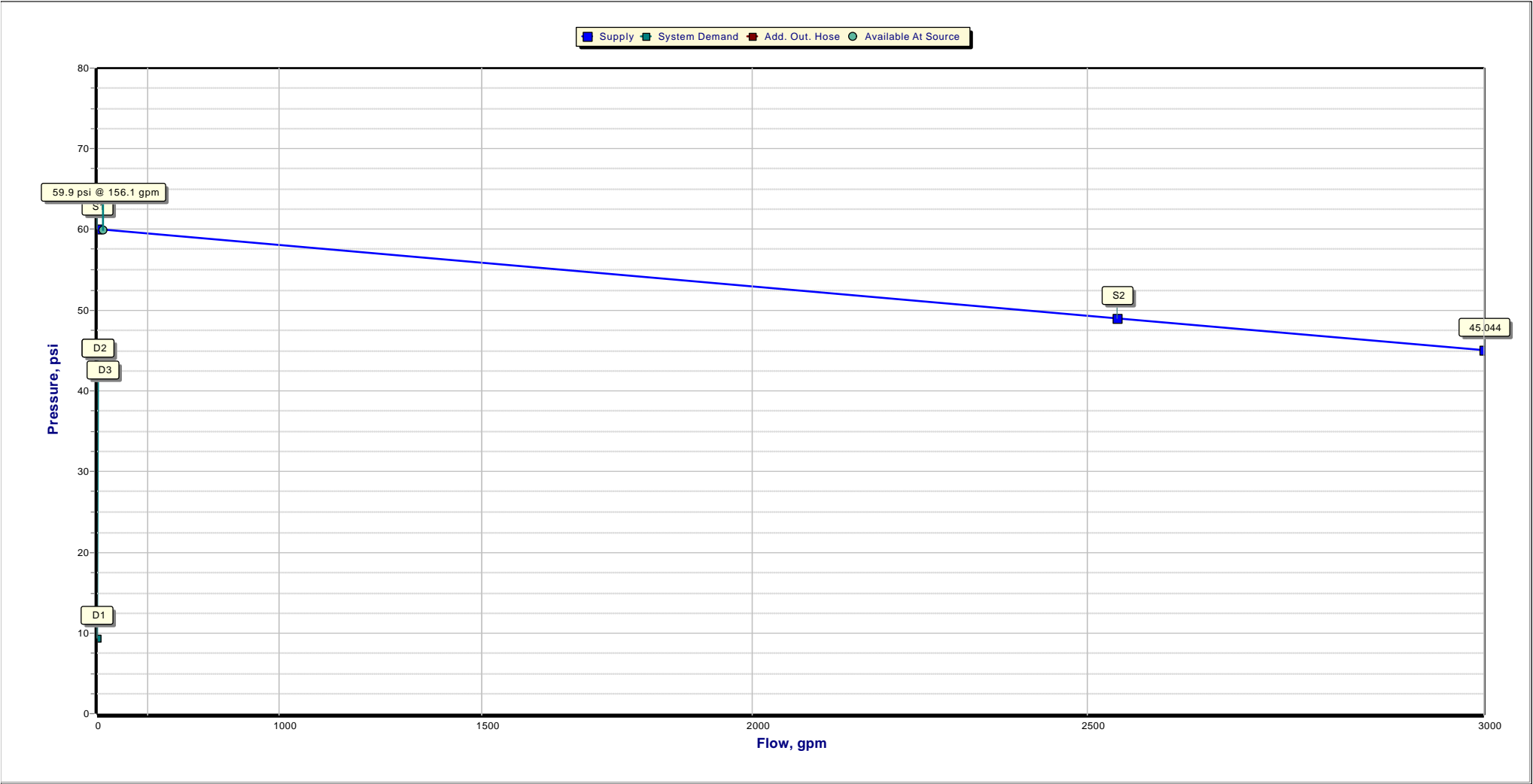
Sprinklers

Ovehead Sprinkler Flow (gpm)	56.1
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	56.1

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	42.5
W1 - Flow (gpm)	56.1
Demand w/o System Pump(s)	N/A

Hydraulic Analysis for : 22



Hydraulic Analysis for : 22

Graph Labels

Label	Description	Values	
		Flow (gpm)	Pressure (psi)
S1	Supply point #1 - Static	0	60
S2	Supply point #2 - Residual	2541	49
D1	Elevation Pressure	0	9.3
D2	System Demand	56.1	42.5
D3	System Demand + Add.Out.Hose	156.1	42.5

Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	60	70.5	17.4	156.1

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)
Z01	Overhead Sprinkler	256	4.9	0.05	12.8	7	0.06	15.3	9.8
Z02	Overhead Sprinkler	256	4.2	0.05	12.8	9.3	0.05	12.8	9.3
Z03	Overhead Sprinkler	256	4.2	0.05	12.8	9.3	0.051	13.1	9.7
Z04	Overhead Sprinkler	256	4.2	0.05	12.8	9.3	0.058	14.9	12.5

**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
Z01 17.5	Overhead Sprinkler HEAD	4.9 Open	15.3 2.5	256 0.06	9.8 -9.3	7 12.8
Z02 17.5	Overhead Sprinkler HEAD	4.2 Open	12.8 0	256 0.05	9.3 -9.3	9.3 12.8
Z03 17.5	Overhead Sprinkler HEAD	4.2 Open	13.1 0.3	256 0.051	9.7 -9.3	9.3 12.8
Z04 17.5	Overhead Sprinkler HEAD	4.2 Open	14.9 2.1	256 0.058	12.5 -9.3	9.3 12.8
O16 17.5	Node NODE				11.7 -9.3	
O17 17.5	Node NODE				21.6 -9.3	
O28-O 13.9	Node NODE				28 -7.8	
O28-I 13.33	Node NODE				29.1 -7.5	
O29-O 12.83	Node NODE				29.3 -7.3	
O29-I 12.69	Node NODE				30.8 -7.2	
O40 7.5	Node NODE				33.8 -5	
O79 1.5	Node NODE				40.1 -2.4	
O80 -4	Node NODE				42.5 0	
W1 -4	Supply SUPPLY		-56.1		42.5 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**

Z02	17.5	4.2	12.8	1	1x(us. Tee-Br) = 5.76	3.17	120	9.3	
Z03	17.5	4.2	12.8	1.08		5.76	0.0492	0	
						8.93		0.4	
Z03	17.5	4.2	13.1	1	1x(us. Tee-Br) = 5.76	5.32	120	9.7	
016	17.5		25.9	1.08		5.76	0.1816	0	
						11.09		2	
016	17.5		15.3	1		1.83	120	11.7	
Z04	17.5	4.2	41.2	1.08		0	0.4297	0	
						1.83		0.8	
Z04	17.5	4.2	14.9	1	1x(us. Tee-Br) = 5.76	6.24	120	12.5	
017	17.5		56.1	1.08		5.76	0.7599	0	
						12		9.1	
017	17.5		0	2	2x(us. 90) = 13.64	187.7	120	21.6	
028-O	13.9		56.1	2.203		13.64	0.0236	1.6	
						201.34		4.8	
028-O	13.9		0	2		0.56		28	CV-1 FR
028-I	13.33		56.1	0		0	1.5713	0.2	Check
						0.56		0.9	***
028-I	13.33		0	2		0.51	120	29.1	
029-O	12.83		56.1	2.203		0	0.0236	0.2	
						0.51		0.0	
029-O	12.83		0	2		0.14		29.3	Butterfly
029-I	12.69		56.1	0		0	9.795	0.1	BFV-300
						0.14		1.4	***
029-I	12.69		0	2	1x(us. Tee-Br) = 13.64	5.94	120	30.8	
040	7.5		56.1	2.203	2x(us. 90) = 13.64	27.28	0.0236	2.2	
						33.21		0.8	
040	7.5		0	2.5	16x(us. 90) = 149.2	258.1	120	33.8	
079	1.5		56.1	2.703	1x(us. Tee-Br) = 18.65	167.86	0.0087	2.6	
						425.95		3.7	
079	1.5		0	6	1x(us. 90) = 17.6	5.5	120	40.1	
080	-4		56.1	6.357		17.6	0.0001	2.4	
						23.1		0	
080	-4		0	6	1x(us. 90) = 24.19	69.89	140	42.5	
W1	-4		56.1	6.4		24.19	0.0001	0	
						94.08		0	
<b>W1</b>								<b>42.5</b>	

**Path No: 2**

Z01	17.5	4.9	15.3	1	2x(us. 90) = 4.61	23.75	120	9.8	
016	17.5		15.3	1.08		4.61	0.0688	0	
						28.36		2	
<b>016</b>								<b>11.7</b>	

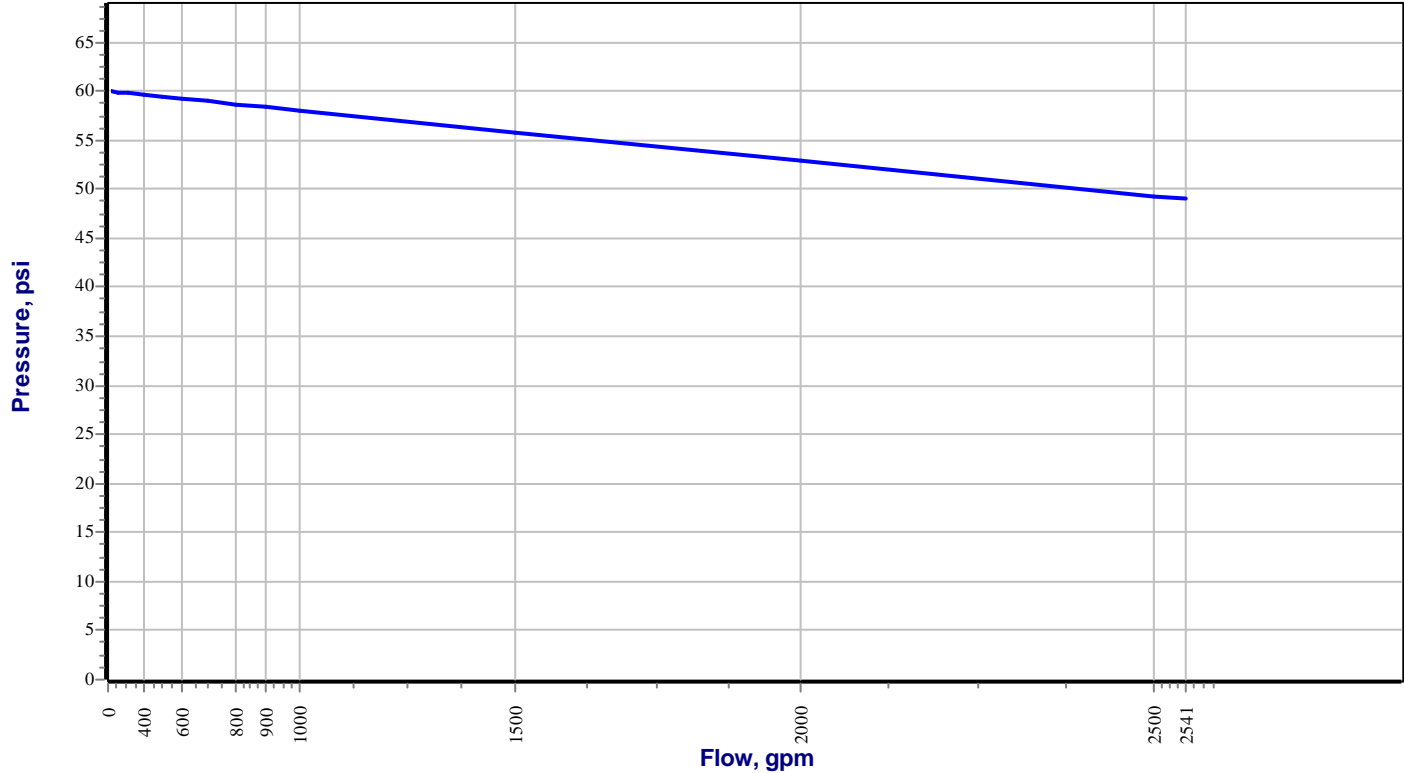


PIPE INFORMATION

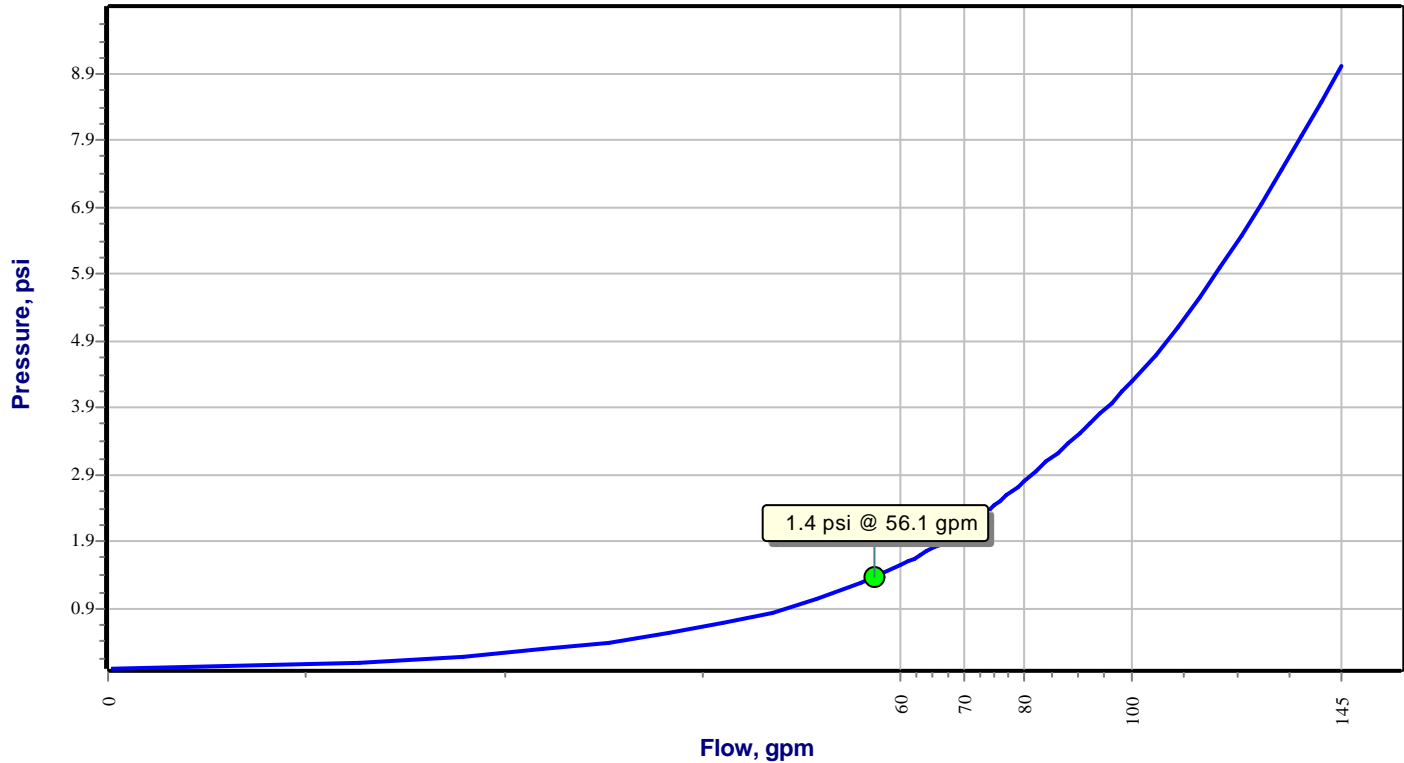
Node 1	Elev 1	K-Factor 1	Flow added (q)	Nominal ID	Fittings	L	C Factor	total (Pt)	
Node 2	Elev 2	K-Factor 2	Total flow (Q)	Actual ID	quantity x (name) = length	F	Pf per ft	elev (Pe)	NOTES
						T		frict (Pf)	
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

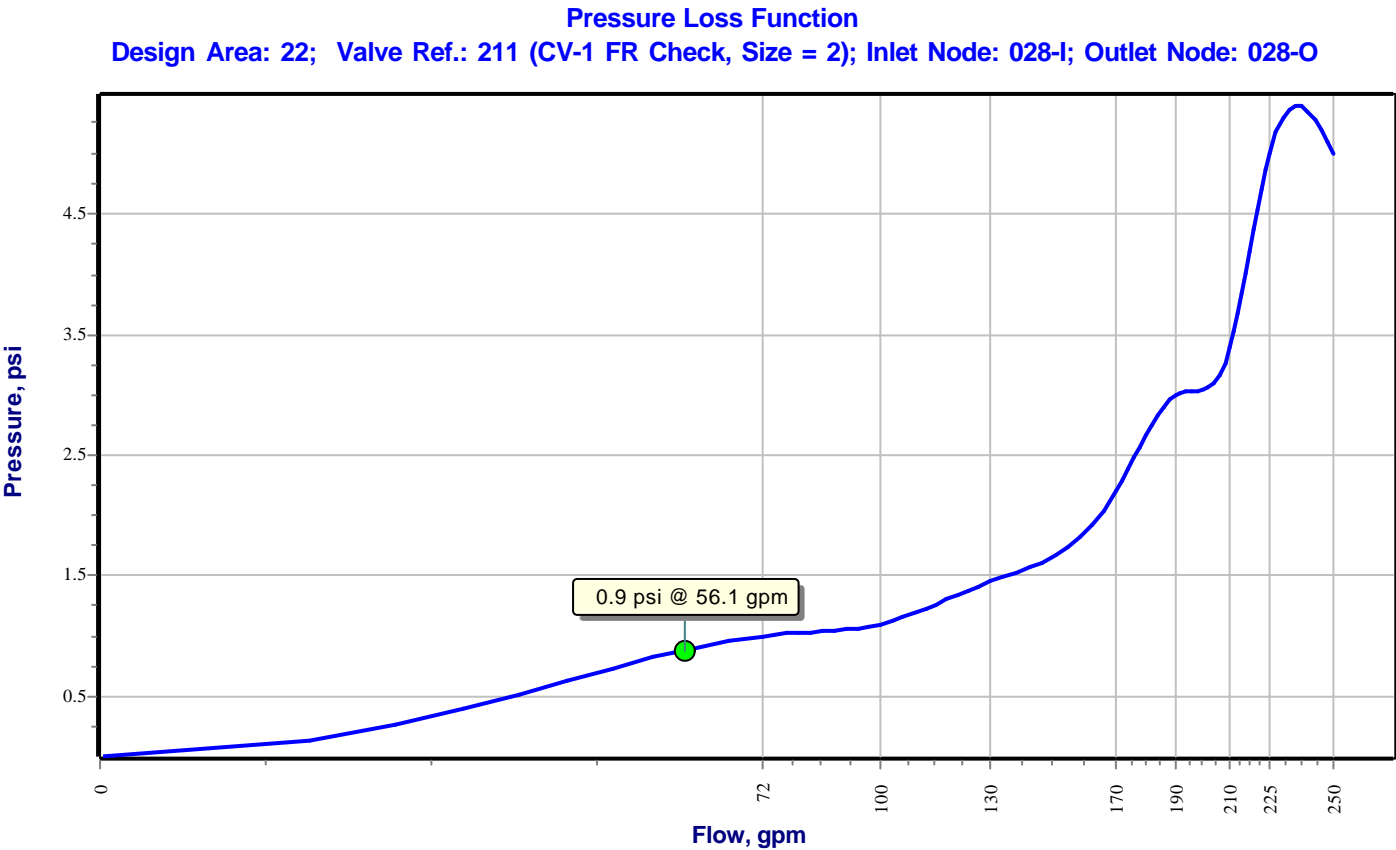
- \* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.
- \* Maximum Velocity of 19.65 ft/s occurs in the following pipe(s): (O17-Z04)
- \*\*\* Device pressure loss (gain in the case of pumps) is calculated from the device's curve. If the device curve 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: 22; Supply Ref.: W1; Supply Name:W1



Pressure Loss Function  
Design Area: 22; Valve Ref.: 210 (Butterfly BFV-300, Size = 2); Inlet Node: 029-I; Outlet Node: 029-O





# HYDRAULIC CALCULATIONS for

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## Job Information

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Contract No. :

City: PHOENIX, AZ

Project Location: 2425 S.24TH ST

Date: 8/16/2024

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## Contractor Information

Name of Contractor:

Address:

City:

Phone Number:

E-mail:

Name of Designer: J.DAVILA

Authority Having Jurisdiction:

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## Design

Remote Area Name	32
Remote Area Location	BLDG-3 2ND FLR
Occupancy Classification	Residential
Density (gpm/ft <sup>2</sup> )	0.05
Area of Application (ft <sup>2</sup> )	334
Coverage per Sprinkler (ft <sup>2</sup> )	256
Number of Calculated Sprinklers	3
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	138.5
Required Pressure at Source (psi)	30.5
Type of System	Wet
Volume - Entire System (gal)	373.2 gal

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## Water Supply Information

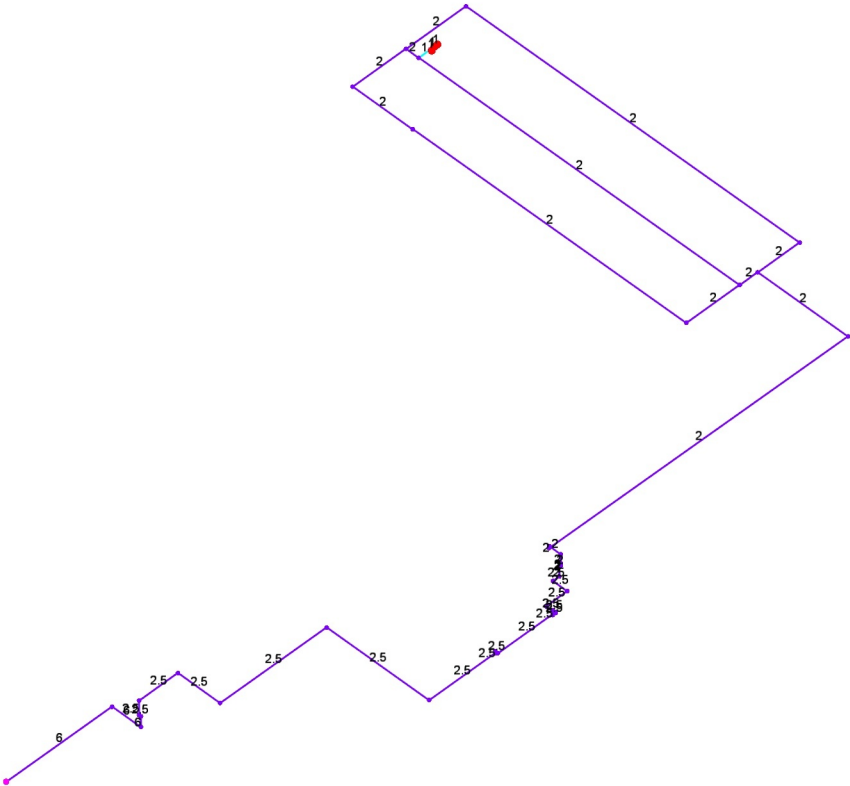
Date	6-26-24
Location	2425 S 24TH ST
Source	W1

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## Notes

up to 4 hds

Diagram for Design Area : 32  
(Optimized Hvdraulic Simplified)



Hydraulic Analysis for : 32

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	60
2541	49

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	60	49	2541	59.9	138.5	30.5

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)	38.5
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	38.5

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	30.5
W1 - Flow (gpm)	38.5
Demand w/o System Pump(s)	N/A

## 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
004 17.5	Node NODE				9.7 -9.3	
005 17.5	Node NODE				14.2 -9.3	
006 17.5	Node NODE				14.6 -9.3	
012 17.5	Node NODE				14.7 -9.3	
020 17.5	Node NODE				14.3 -9.3	
024-I 13.33	Node NODE				20 -7.5	
024-O 13.9	Node NODE				19.1 -7.8	
025-I 12.69	Node NODE				21.1 -7.2	
025-O 12.83	Node NODE				20.3 -7.3	
040 7.5	Node NODE				23.7 -5	
079 1.5	Node NODE				28.2 -2.4	
080 -4	Node NODE				30.5 0	
S1 17.5	Overhead Sprinkler HEAD	4.2 Open	12.8 0	256 0.05	9.3 -9.3	9.3 12.8
S2 17.5	Overhead Sprinkler HEAD	4.2 Open	12.9 0.1	256 0.05	9.4 -9.3	9.3 12.8
S3 17.5	Overhead Sprinkler HEAD	4.2 Open	12.9 0.1	256 0.05	9.4 -9.3	9.3 12.8
W1 -4	Supply SUPPLY		-38.5		30.5 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**

S1	17.5	4.2	12.8	1		1.5	120	9.3	
S2	17.5	4.2	12.8	1.08		0	0.0492	0	
						1.5		0.1	
S2	17.5	4.2	12.9	1		2.17	120	9.4	
004	17.5		25.7	1.08		0	0.1784	0	
						2.17		0.4	
004	17.5		12.9	1	1x(us. Tee-Br) = 5.76	6.05	120	9.7	
005	17.5		38.5	1.08		5.76	0.3792	0	
						11.81		4.5	
005	17.5		-14.9	2	1x(us. Tee-Br) = 13.64	6.59	120	14.2	
020	17.5		23.7	2.203		13.64	0.0048	0	
						20.23		0.1	
020	17.5		-10.7	2	1x(us. Tee-Br) = 13.64	226.37	120	14.3	
012	17.5		12.9	2.203	2x(us. 90) = 13.64	27.28	0.0016	0	
						253.65		0.4	
012	17.5		25.6	2	4x(us. 90) = 27.28	213.93	120	14.7	
024-O	13.9		38.5	2.203		27.28	0.0118	1.6	
						241.21		2.8	
024-O	13.9		0	2		0.56		19.1	CV-1 FR
024-I	13.33		38.5	0		0	1.1839	0.2	Check
						0.56		0.7	***
024-I	13.33		0	2		0.51	120	20	
025-O	12.83		38.5	2.203		0	0.0118	0.2	
						0.51		0	
025-O	12.83		0	2		0.14		20.3	Butterfly
025-I	12.69		38.5	0		0	5.3279	0.1	BFV-300
						0.14		0.7	***
025-I	12.69		0	2	2x(us. 90) = 13.64	5.94	120	21.1	
040	7.5		38.5	2.203	1x(us. Tee-Br) = 13.64	27.28	0.0118	2.2	
						33.21		0.4	
040	7.5		0	2.5	16x(us. 90) = 149.2	258.1	120	23.7	
079	1.5		38.5	2.703	1x(us. Tee-Br) = 18.65	167.86	0.0044	2.6	
						425.95		1.9	
079	1.5		0	6	1x(us. 90) = 17.6	5.5	120	28.2	
080	-4		38.5	6.357		17.6	0.0001	2.4	
						23.1		0	
080	-4		0	6	1x(us. 90) = 24.19	69.89	140	30.5	
W1	-4		38.5	6.4		24.19	0.0000	0	
						94.08		0	
<b>W1</b>								<b>30.5</b>	

**Path No: 2**

S3	17.5	4.2	12.9	1	1x(us. Tee-Br) = 5.76	0.76	120	9.4	
004	17.5		12.9	1.08		5.76	0.0499	0	
						6.52		0.3	
<b>004</b>								<b>9.7</b>	



**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: 3**

005	17.5		0	2	1x(us.Tee-Br)= 13.64	166.69	120	14.2	
006	17.5		14.9	2.203		13.64	0.002	0	
						180.33		0.4	
006	17.5		10.7	2	1x(us.Tee-Br)= 13.64	9.25	120	14.6	
012	17.5		25.6	2.203		13.64	0.0055	0	
						22.89		0.1	
<b>012</b>								<b>14.7</b>	

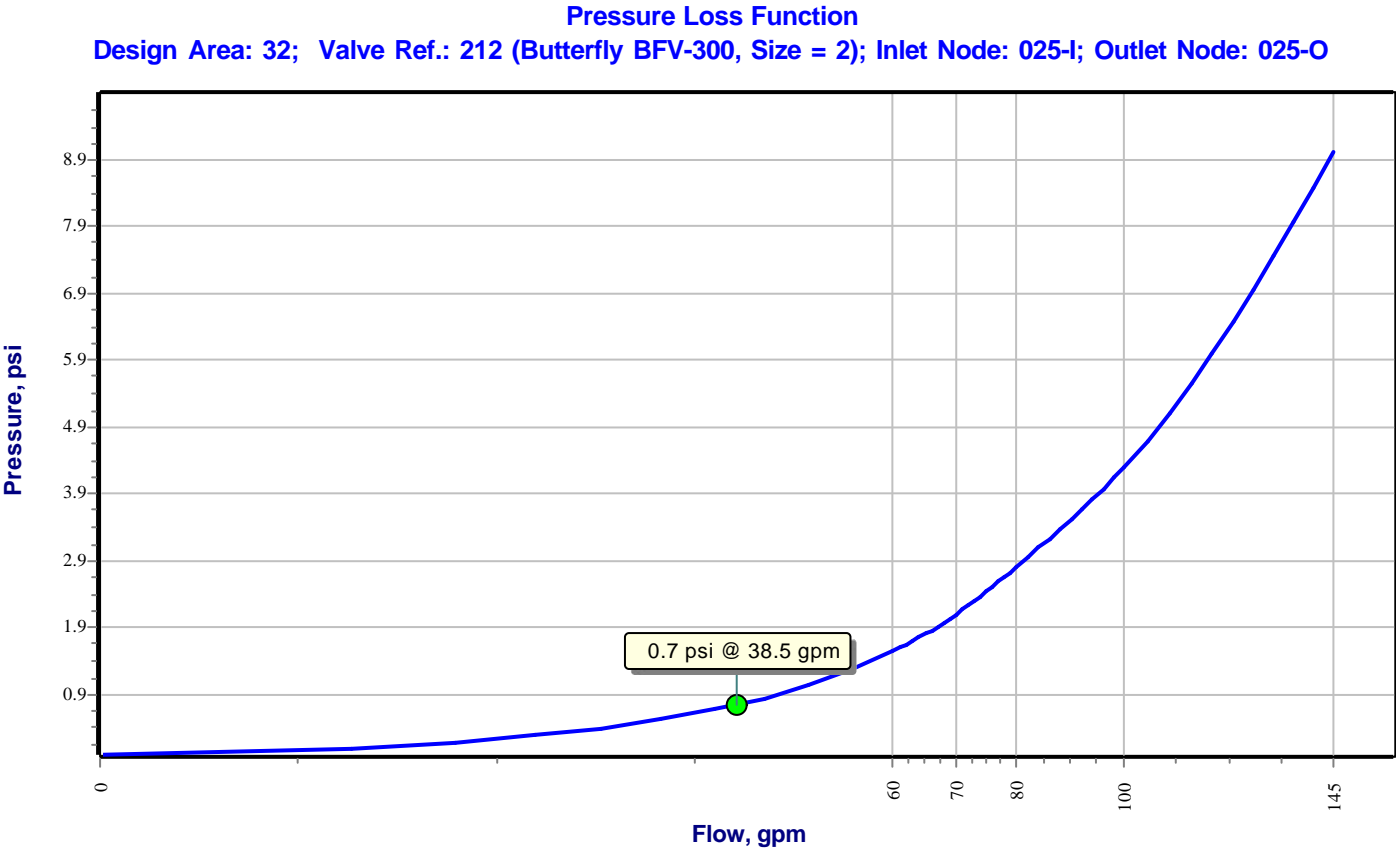
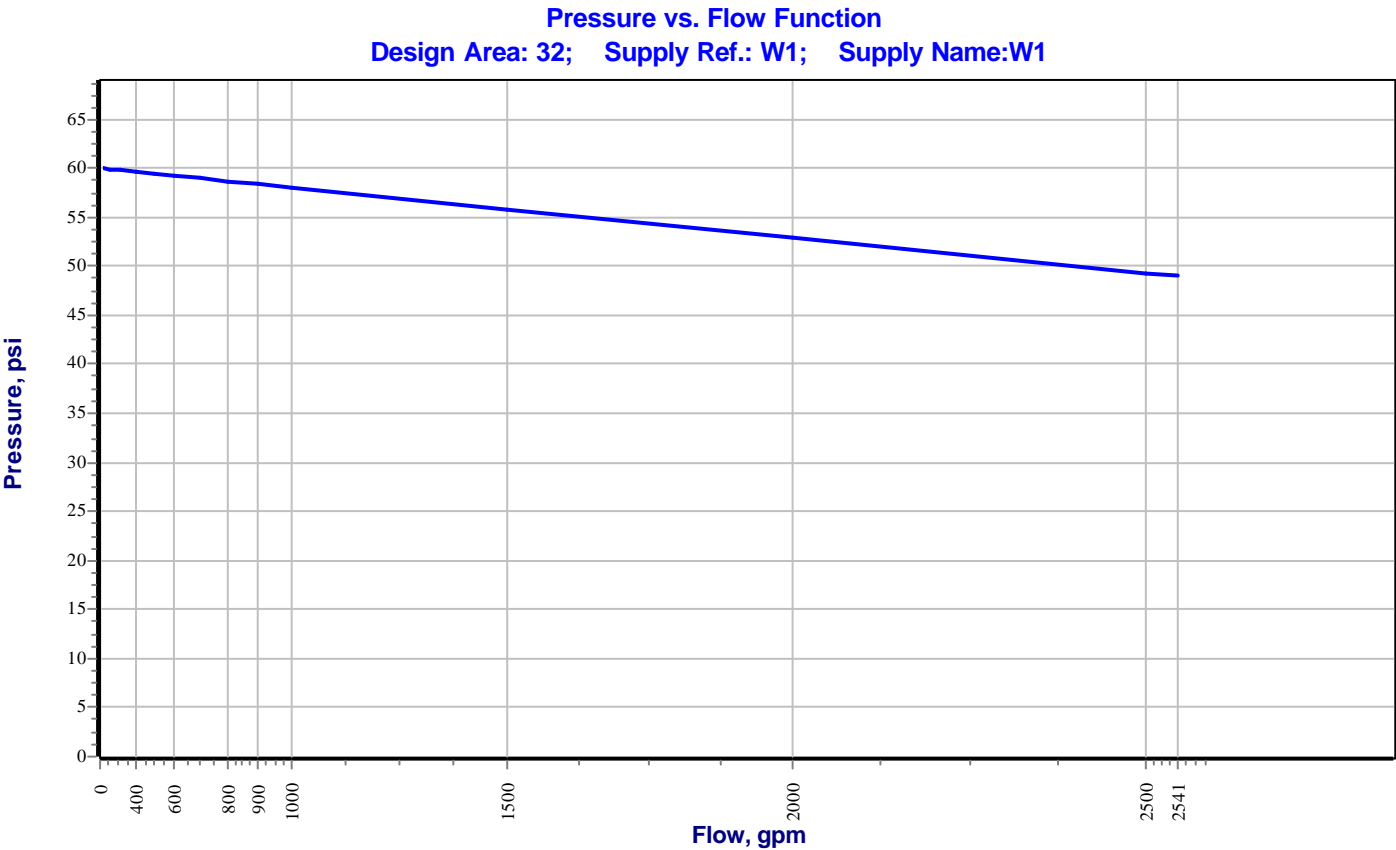
**Path No: 4**

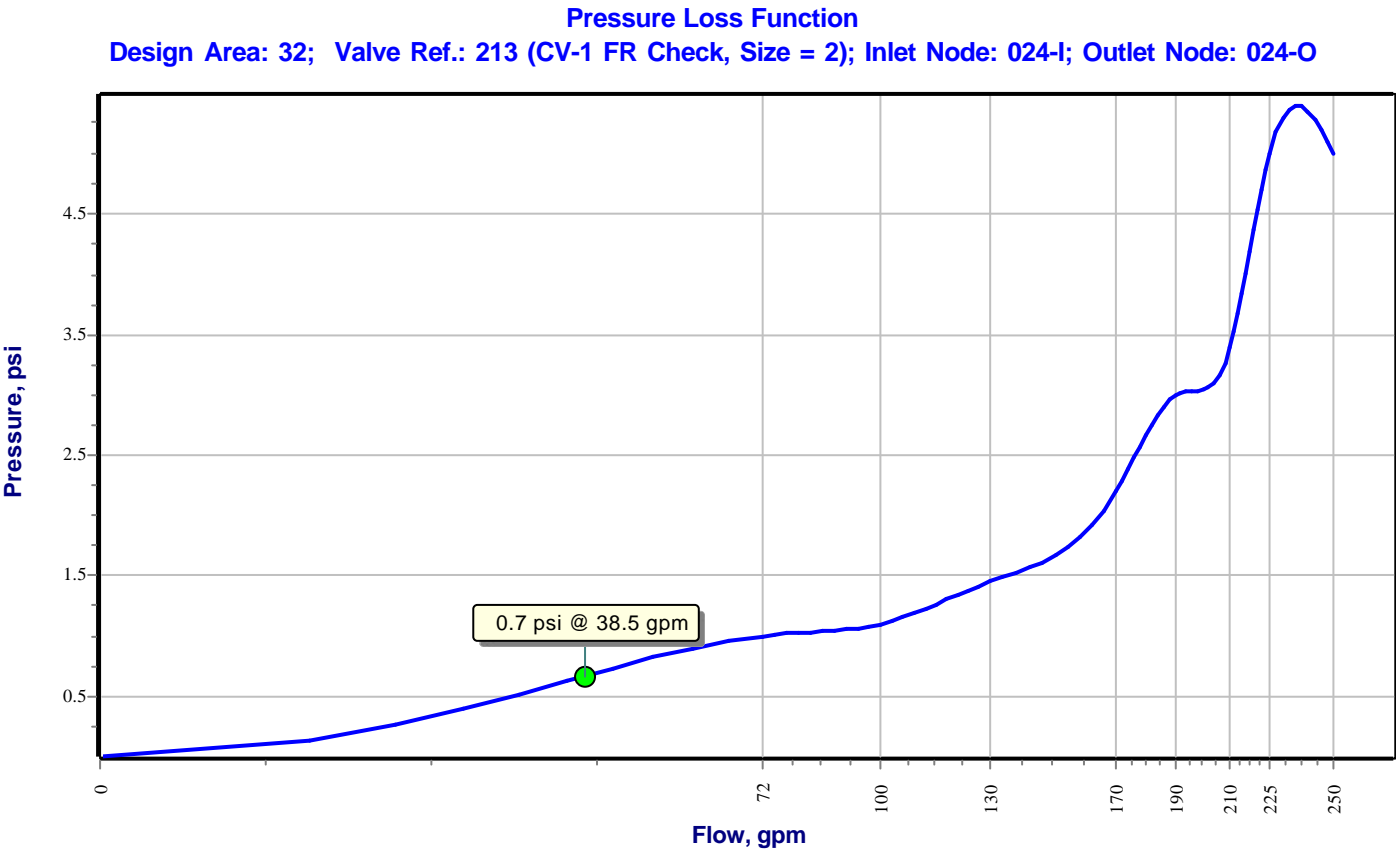
020	17.5		0	2	2x(us.90)= 13.64	228.79	120	14.3	
006	17.5		10.7	2.203		13.64	0.0011	0	
						242.42		0.3	
<b>006</b>								<b>14.6</b>	

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

\* Maximum Velocity of 13.5 ft/s occurs in the following pipe(s): (005-004)

\*\*\* 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.





# HYDRAULIC CALCULATIONS for

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## Job Information

Project Name : COMMUNITY BRIDGES- RIO FRESCO HOTEL

Contract No. :

City: PHOENIX, AZ

Project Location: 2425 S.24TH ST

Date: 8/16/2024

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## Contractor Information

Name of Contractor:

Address:

City:

Phone Number:

E-mail:

Name of Designer: J.DAVILA

Authority Having Jurisdiction:

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## Design

Remote Area Name	42
Remote Area Location	BLDG-4 2ND FLR
Occupancy Classification	Residential
Density (gpm/ft²)	0.05
Area of Application (ft²)	285
Coverage per Sprinkler (ft²)	256
Number of Calculated Sprinklers	3
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	138.5
Required Pressure at Source (psi)	30.3
Type of System	Wet
Volume - Entire System (gal)	428.1 gal

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## Water Supply Information

Date	6-26-24
Location	2425 S 24TH ST
Source	W1

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## Notes

up to 4 hds



Hydraulic Analysis for : 42

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	60
2541	49

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	60	49	2541	59.9	138.5	30.3

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)	38.5
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	38.5

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	30.3
W1 - Flow (gpm)	38.5
Demand w/o System Pump(s)	N/A

**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
001 17.5	Node NODE				9.7 -9.3	
002 17.5	Node NODE				12.6 -9.3	
003 17.5	Node NODE				13.4 -9.3	
006 17.5	Node NODE				14.3 -9.3	
009 17.5	Node NODE				13.9 -9.3	
012 17.5	Node NODE				14.5 -9.3	
015 17.5	Node NODE				13.5 -9.3	
020 17.5	Node NODE				14.1 -9.3	
024-I 13.33	Node NODE				19.8 -7.5	
024-O 13.9	Node NODE				18.9 -7.8	
025-I 12.69	Node NODE				20.8 -7.2	
025-O 12.83	Node NODE				20 -7.3	
035 17.5	Node NODE				13.5 -9.3	
040 7.5	Node NODE				23.4 -5	
079 1.5	Node NODE				27.9 -2.4	
080 -4	Node NODE				30.3 0	
U01 17.5	Overhead Sprinkler HEAD	4.2 Open	12.9 0.1	256 0.05	9.4 -9.3	9.3 12.8
U02 17.5	Overhead Sprinkler HEAD	4.2 Open	12.8 0	256 0.05	9.3 -9.3	9.3 12.8
U03 17.5	Overhead Sprinkler HEAD	4.2 Open	12.9 0.1	256 0.05	9.4 -9.3	9.3 12.8
W1 -4	Supply SUPPLY		-38.5		30.3 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 <sup>1/2</sup> )	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

**Path No: 1**

U02	17.5	4.2	12.8	1		1.5	120	9.3	
U03	17.5	4.2	12.8	1.08		0	0.0492	0	
						1.5		0.1	
U03	17.5	4.2	12.9	1		2.17	120	9.4	
001	17.5		25.7	1.08		0	0.1784	0	
						2.17		0.4	
001	17.5		12.9	1	1x(us. Tee-Br) = 5.76	1.63	120	9.7	
002	17.5		38.5	1.08		5.76	0.3792	0	
						7.39		2.8	
002	17.5		0	2	2x(us. Tee-Br) = 27.28	43.36	120	12.6	
003	17.5		38.5	2.203		27.28	0.0118	0	
						70.64		0.8	
003	17.5		-7.1	2	1x(us. Tee-Br) = 13.64	3.5	120	13.4	
015	17.5		31.5	2.203		13.64	0.0081	0	
						17.14		0.1	
015	17.5		7.1	2	1x(us. Tee-Br) = 13.64	15.04	120	13.5	
009	17.5		38.5	2.203		13.64	0.0118	0	
						28.67		0.3	
009	17.5		-17	2	1x(us. 90) = 6.82	58.98	120	13.9	
020	17.5		21.6	2.203		6.82	0.004	0	
						65.8		0.3	
020	17.5		-9.9	2	1x(us. Tee-Br) = 13.64	226.37	120	14.1	
012	17.5		11.7	2.203	2x(us. 90) = 13.64	27.28	0.0013	0	
						253.65		0.3	
012	17.5		26.8	2	4x(us. 90) = 27.28	213.93	120	14.5	
024-O	13.9		38.5	2.203		27.28	0.0118	1.6	
						241.21		2.8	
024-O	13.9		0	2		0.56		18.9	CV-1 FR
024-I	13.33		38.5	0		0	1.1839	0.2	Check
						0.56		0.7	***
024-I	13.33		0	2		0.51	120	19.8	
025-O	12.83		38.5	2.203		0	0.0118	0.2	
						0.51		0	
025-O	12.83		0	2		0.14		20	Butterfly
025-I	12.69		38.5	0		0	5.3279	0.1	BFV-300
						0.14		0.7	***
025-I	12.69		0	2	2x(us. 90) = 13.64	5.94	120	20.8	
040	7.5		38.5	2.203	1x(us. Tee-Br) = 13.64	27.28	0.0118	2.2	
						33.21		0.4	
040	7.5		0	2.5	16x(us. 90) = 149.2	258.1	120	23.4	
079	1.5		38.5	2.703	1x(us. Tee-Br) = 18.65	167.86	0.0044	2.6	
						425.95		1.9	
079	1.5		0	6	1x(us. 90) = 17.6	5.5	120	27.9	
080	-4		38.5	6.357		17.6	0.0001	2.4	
						23.1		0	
080	-4		0	6	1x(us. 90) = 24.19	69.89	140	30.3	
W1	-4		38.5	6.4		24.19	0.0000	0	
						94.08		0	
<b>W1</b>								<b>30.3</b>	



**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: 2**

U01	17.5	4.2	12.9	1	1x(us. Tee-Br)= 5.76	0.76	120	9.4	
001	17.5		12.9	1.08		5.76	0.0499	0	
						6.52		0.3	
<b>001</b>								<b>9.7</b>	

**Path No: 3**

003	17.5		0	2	6x(us. 90)= 40.92	188.92	120	13.4	
035	17.5		7.1	2.203		40.92	0.0005	0	
						229.84		0.1	
035	17.5		0	2	1x(us. Tee-Br)= 13.64	27.41	120	13.5	
015	17.5		7.1	2.203		13.64	0.0005	0	
						41.05		0.0	
<b>015</b>								<b>13.5</b>	

**Path No: 4**

009	17.5		0	2	1x(us. 90)= 6.82	169.8	120	13.9	
006	17.5		17	2.203		6.82	0.0026	0	
						176.62		0.5	
006	17.5		9.9	2	1x(us. Tee-Br)= 13.64	9.25	120	14.3	
012	17.5		26.8	2.203		13.64	0.006	0	
						22.89		0.1	
<b>012</b>								<b>14.5</b>	

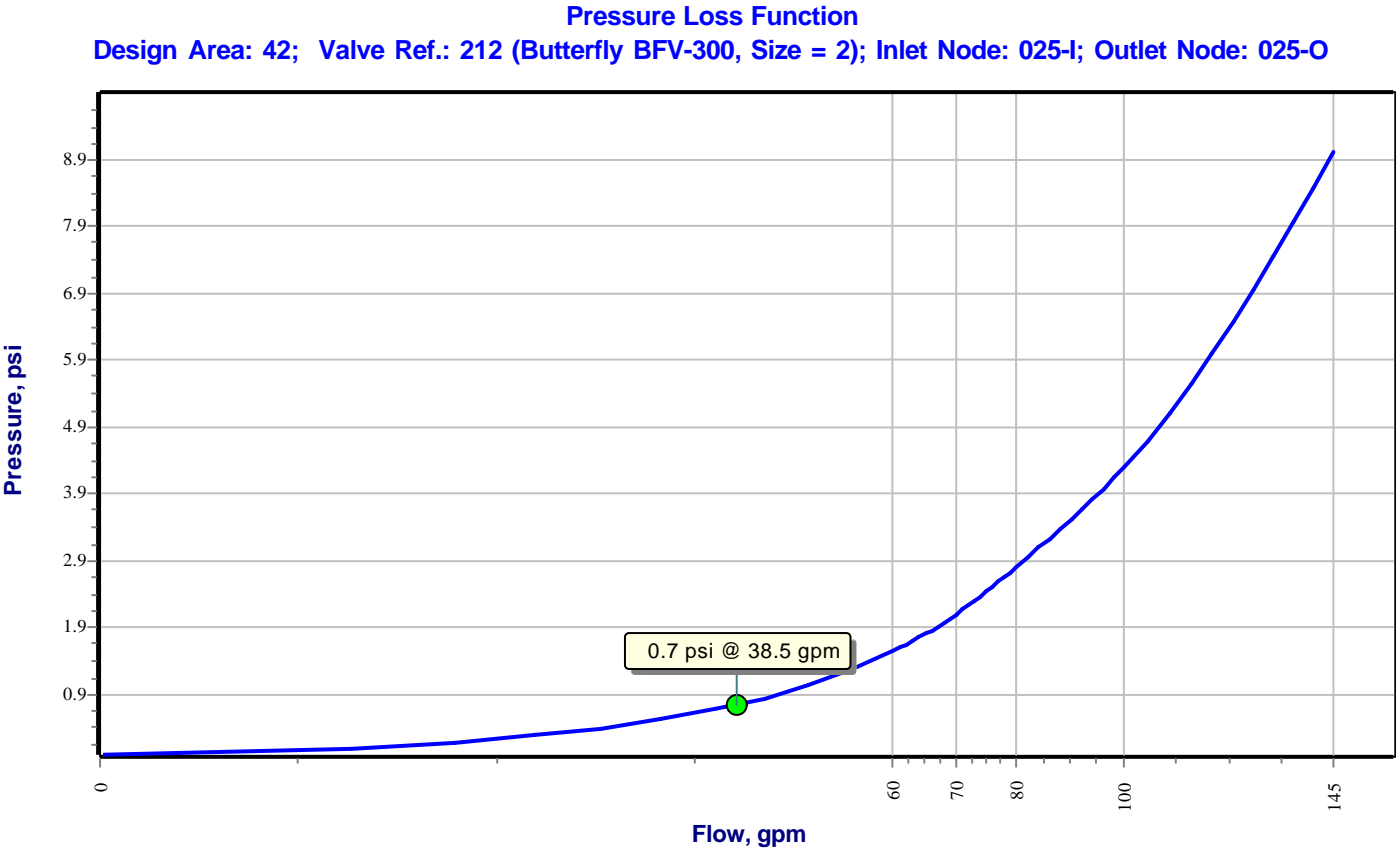
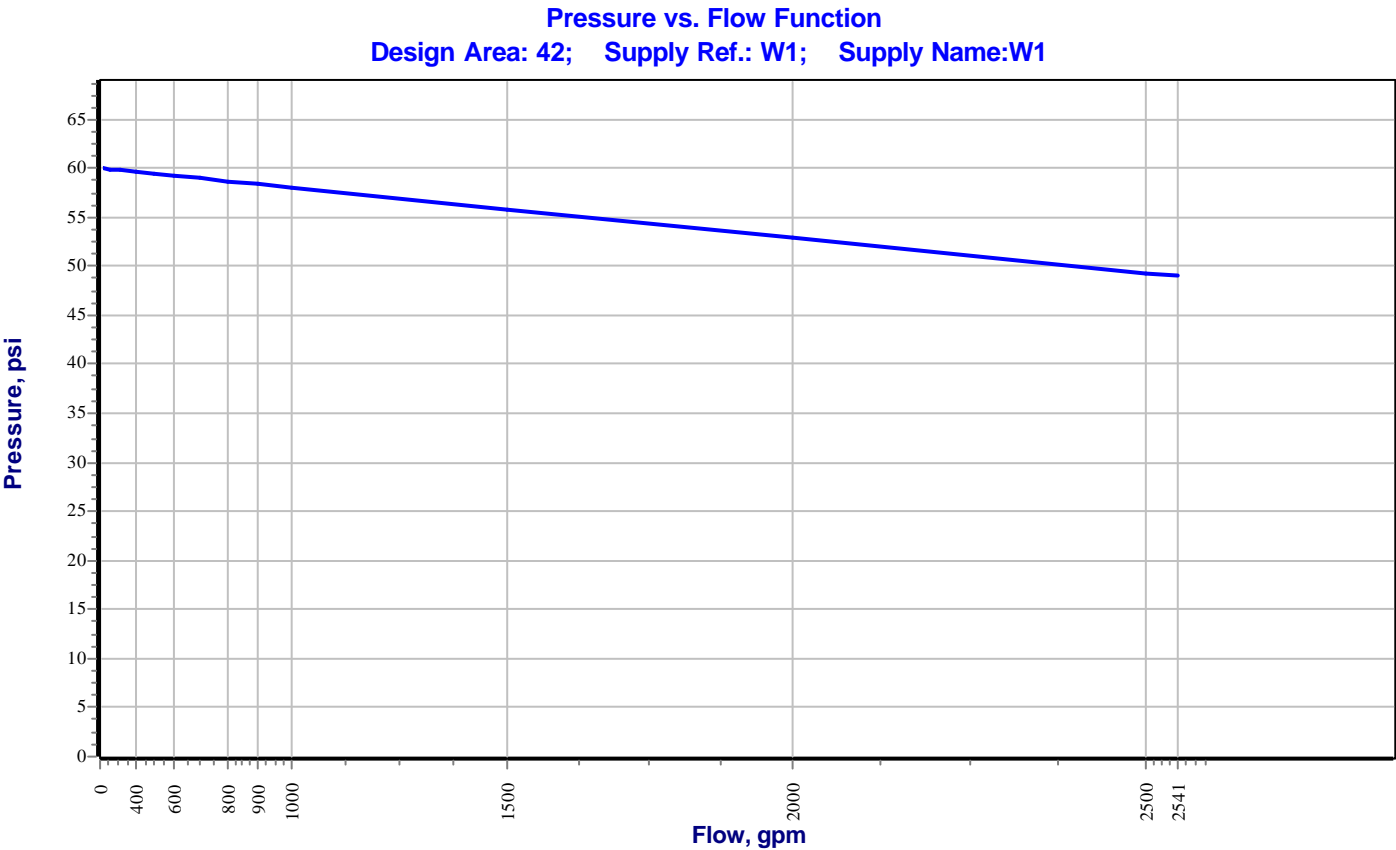
**Path No: 5**

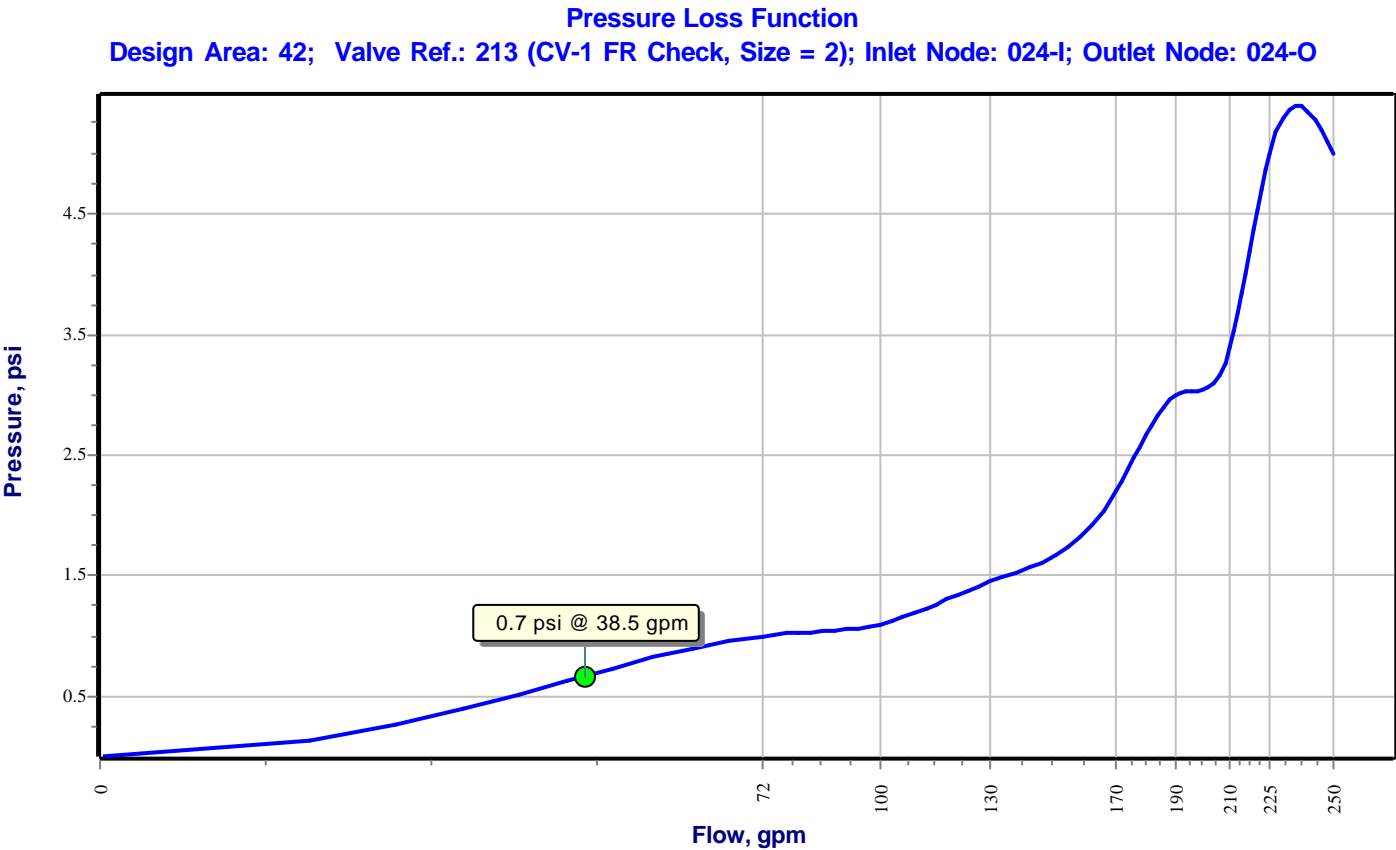
020	17.5		0	2	2x(us. Tee-Br)= 27.28	173.28	120	14.1	
006	17.5		9.9	2.203		27.28	0.0009	0	
						200.56		0.2	
<b>006</b>								<b>14.3</b>	

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

\* Maximum Velocity of 13.5 ft/s occurs in the following pipe(s): (002-001)

\*\*\* 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.





# HYDRAULIC CALCULATIONS for

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## Job Information

Project Name : COMMUNITY BRIDGES- RIO FRESCO HOTEL

Contract No. :

City: PHOENIX, AZ

Project Location: 2425 S.24TH ST

Date: 8/16/2024

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## Contractor Information

Name of Contractor:

Address:

City:

Phone Number:

E-mail:

Name of Designer: J.DAVILA

Authority Having Jurisdiction:

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## Design

Remote Area Name	C22
Remote Area Location	B2 2-Corr
Occupancy Classification	Residential
Density (gpm/ft²)	0.051
Area of Application (ft²)	380
Coverage per Sprinkler (ft²)	256
Number of Calculated Sprinklers	4
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	152.3
Required Pressure at Source (psi)	26.1
Type of System	Wet
Volume - Entire System (gal)	241.5 gal

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## Water Supply Information

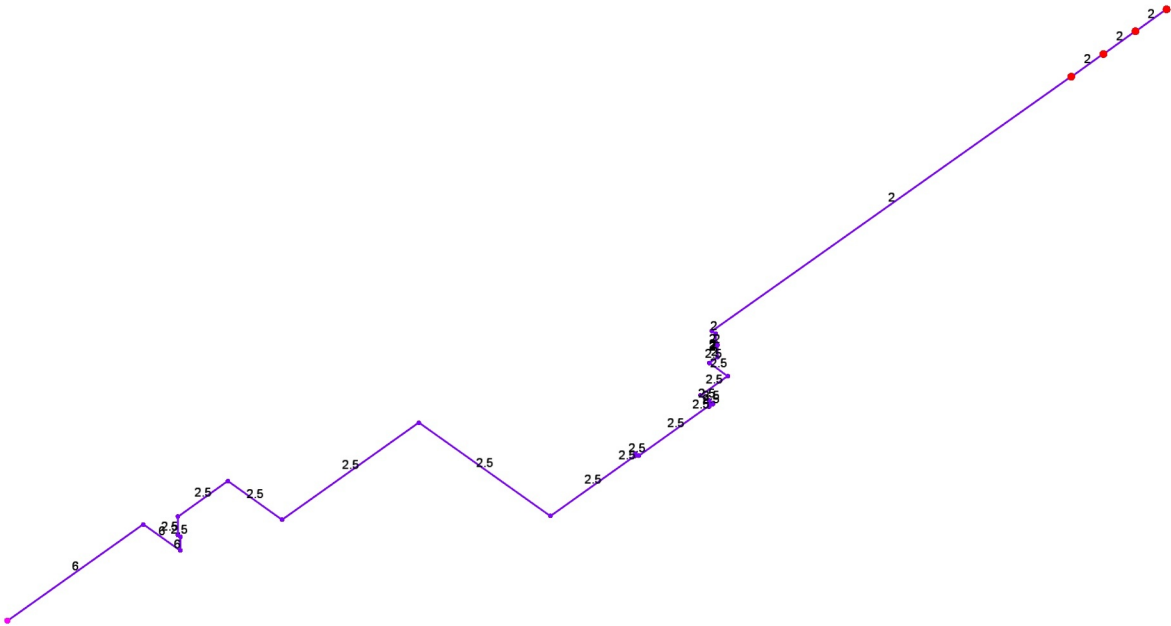
Date	6-26-24
Location	2425 S 24TH ST
Source	W1

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## Notes

up to 4 hds

Diagram for Design Area : C22  
(Optimized Hvdraulic Simplified)



Hydraulic Analysis for : C22

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	60
2541	49

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	60	49	2541	59.9	152.3	26.1

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)	52.3
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	52.3

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	26.1
W1 - Flow (gpm)	52.3
Demand w/o System Pump(s)	N/A

**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
028-I 13.33	Node NODE				13.3 -7.5	
028-O 13.9	Node NODE				12.3 -7.8	
029-I 12.69	Node NODE				14.9 -7.2	
029-O 12.83	Node NODE				13.6 -7.3	
040 7.5	Node NODE				17.8 -5	
079 1.5	Node NODE				23.7 -2.4	
080 -4	Node NODE				26 0	
W1 -4	Supply SUPPLY		-52.3		26.1 0	
X01 17.5	Overhead Sprinkler HEAD	4.9 Open	13.2 0.4	256 0.052	7.3 -9.3	7 12.8
X02 17.5	Overhead Sprinkler HEAD	4.9 Open	13 0.2	256 0.051	7 -9.3	7 12.8
X03 17.5	Overhead Sprinkler HEAD	4.9 Open	13 0.2	256 0.051	7.1 -9.3	7 12.8
X04 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.1 -9.3	7 12.8

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

**Path No: 1**

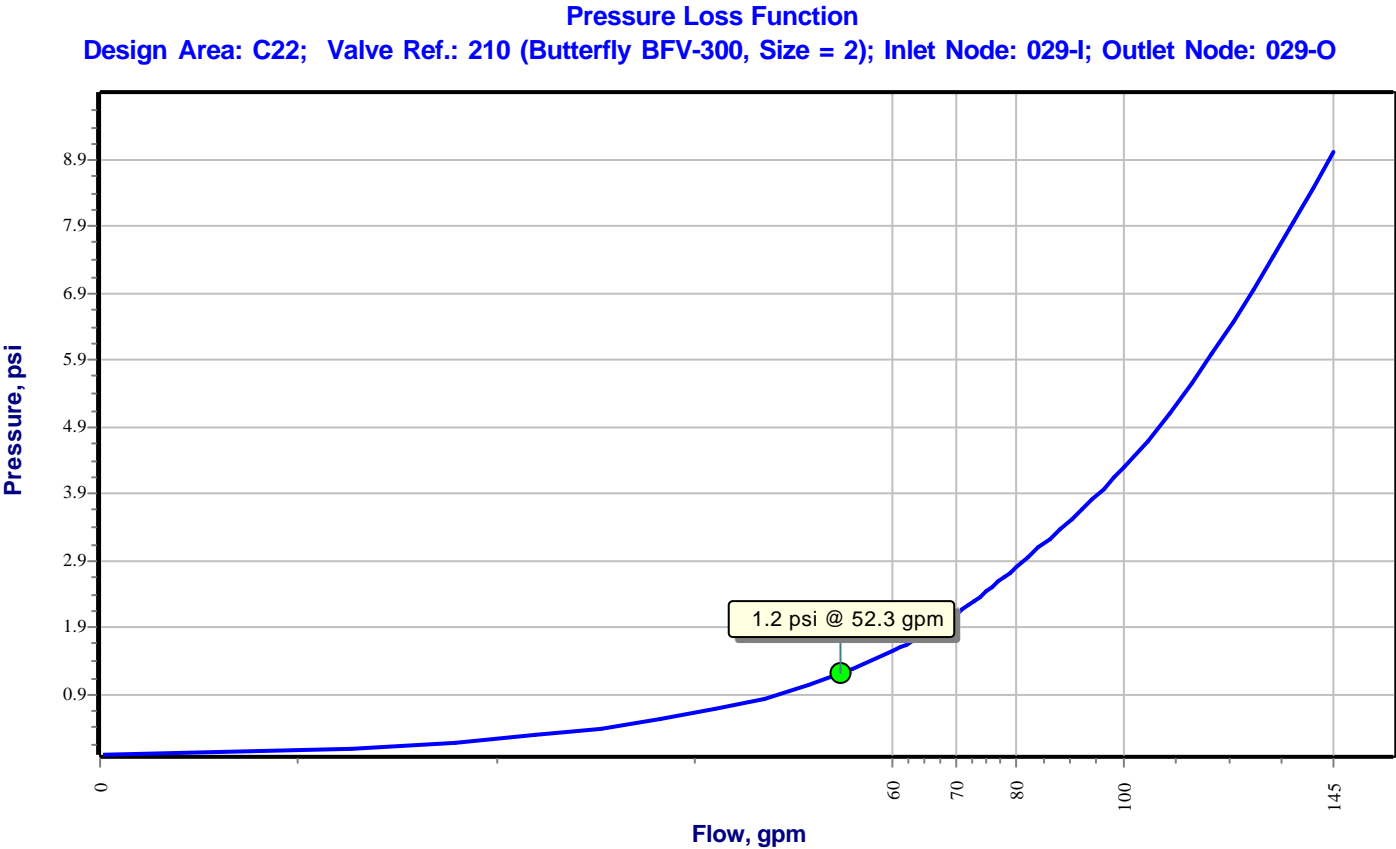
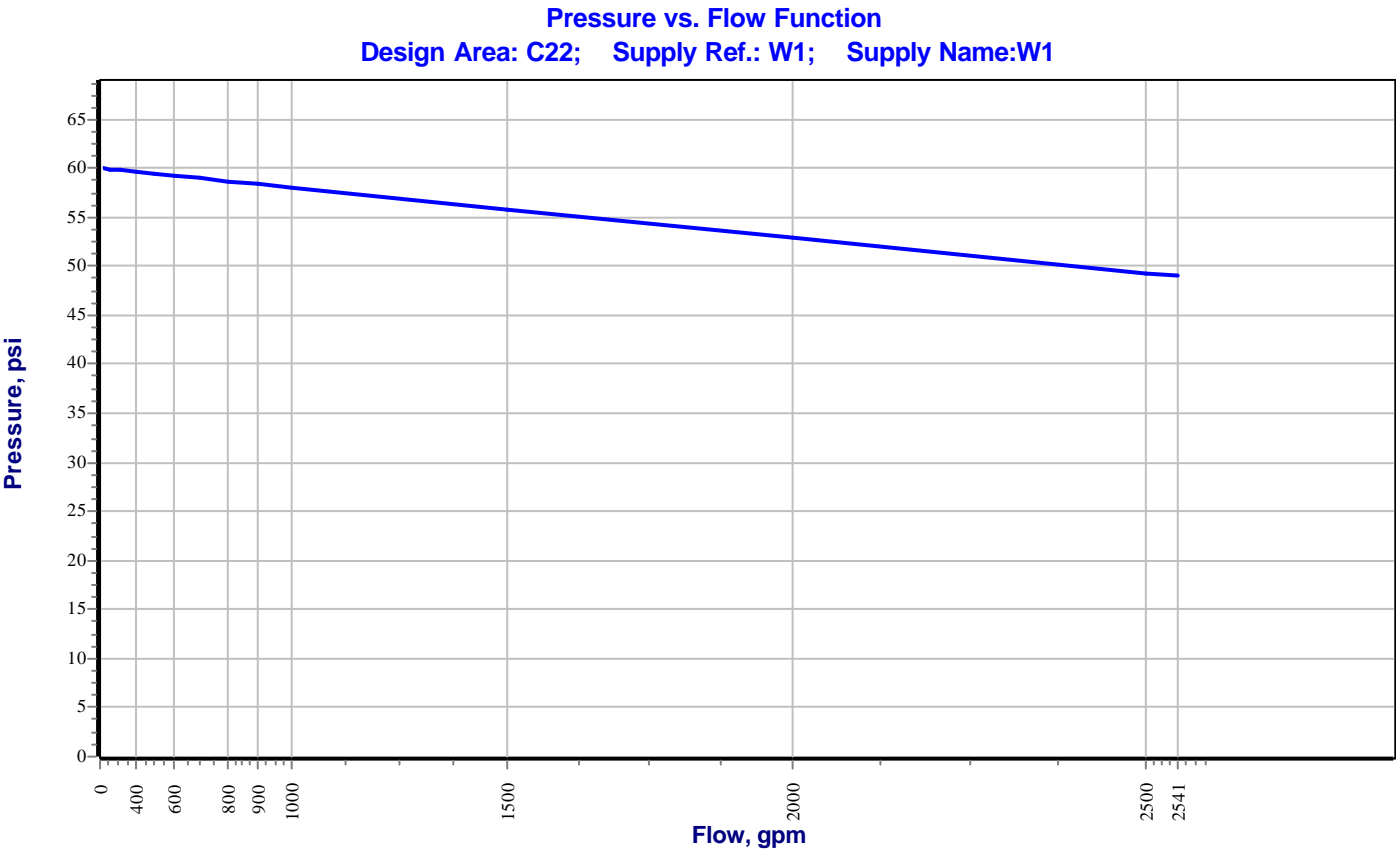
X02 X03	17.5 17.5	4.9 4.9	13 13	2 2.203		12.52 0 12.52	120 0.0016	7 0 0.0	
X03 X04	17.5 17.5	4.9 4.9	13 26	2 2.203		12.98 0 12.98	120 0.0057	7.1 0 0.1	
X04 X01	17.5 17.5	4.9 4.9	13.1 39.1	2 2.203		13.02 0 13.02	120 0.0121	7.1 0 0.2	
X01 028-O	17.5 13.9	4.9	13.2 52.3	2 2.203	2x(us. 90) = 13.64	150.49 13.64 164.13	120 0.0208	7.3 1.6 3.4	
028-O 028-I	13.9 13.33		0 52.3	2 0		0.56 0 0.56	1.5007	12.3 0.2 0.8	CV-1 FR Check ***
028-I 029-O	13.33 12.83		0 52.3	2 2.203		0.51 0 0.51	120 0.0208	13.3 0.2 0.0	
029-O 029-I	12.83 12.69		0 52.3	2 0		0.14 0 0.14	8.6716	13.6 0.1 1.2	Butterfly BFV-300 ***
029-I 040	12.69 7.5		0 52.3	2 2.203	1x(us. Tee-Br) = 13.64 2x(us. 90) = 13.64	5.94 27.28 33.21	120 0.0208	14.9 2.2 0.7	
040 079	7.5 1.5		0 52.3	2.5 2.703	16x(us. 90) = 149.2 1x(us. Tee-Br) = 18.65	258.1 167.86 425.95	120 0.0077	17.8 2.6 3.3	
079 080	1.5 -4		0 52.3	6 6.357	1x(us. 90) = 17.6	5.5 17.6 23.1	120 0.0001	23.7 2.4 0	
080 W1	-4 -4		0 52.3	6 6.4	1x(us. 90) = 24.19	69.89 24.19 94.08	140 0.0001	26 0 0	
<b>W1</b>								<b>26.1</b>	

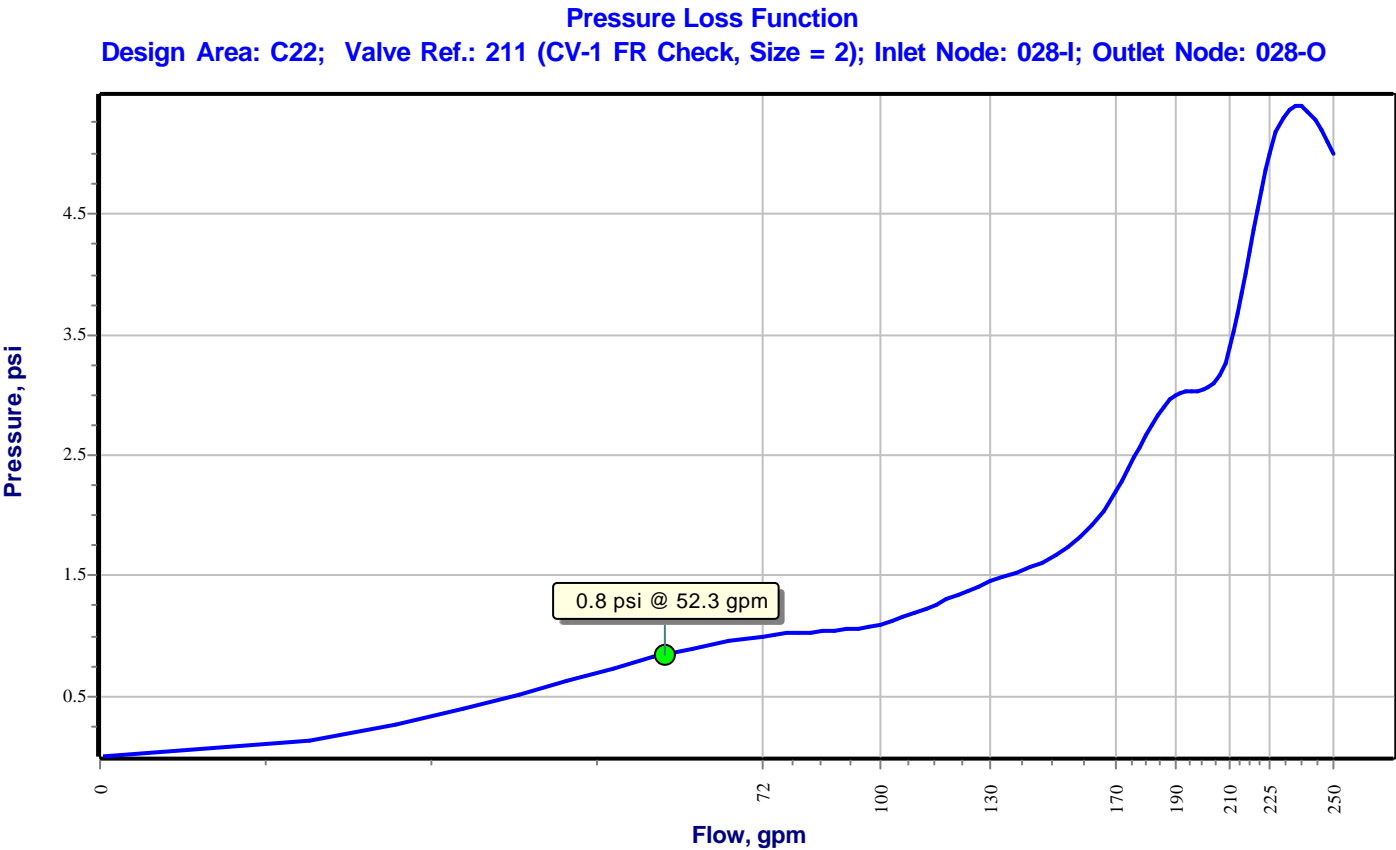
\* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.

\* Maximum Velocity of 4.41 ft/s occurs in the following pipe(s): (028-O-X01), (029-O-028-I), (040-029-I)

\*\*\* 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.







# HYDRAULIC CALCULATIONS for

---

## Job Information

Project Name : COMMUNITY BRIDGES- RIO FRESCO HOTEL

Contract No. :

City: PHOENIX, AZ

Project Location: 2425 S.24TH ST

Date: 8/16/2024

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## Contractor Information

Name of Contractor:

Address:

City:

Phone Number:

E-mail:

Name of Designer: J.DAVILA

Authority Having Jurisdiction:

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## Design

Remote Area Name	C32
Remote Area Location	B3 2-Corr
Occupancy Classification	Residential
Density (gpm/ft²)	0.051
Area of Application (ft²)	380
Coverage per Sprinkler (ft²)	256
Number of Calculated Sprinklers	4
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	152.5
Required Pressure at Source (psi)	28.3
Type of System	Wet
Volume - Entire System (gal)	372.7 gal

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## Water Supply Information

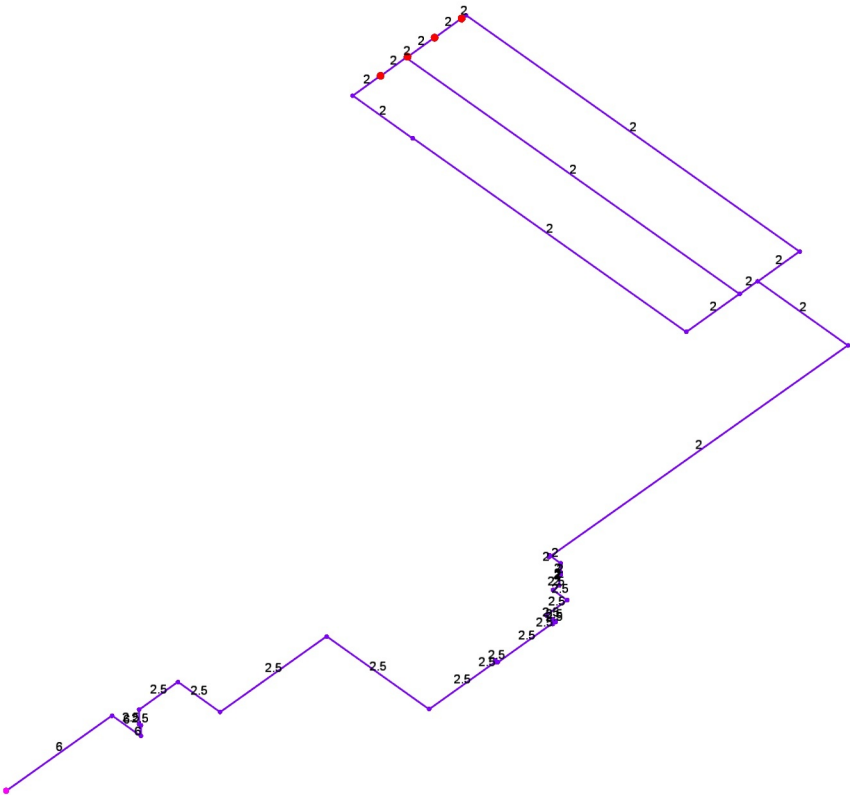
Date	6-26-24
Location	2425 S 24TH ST
Source	W1

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## Notes

up to 4 hds

Diagram for Design Area : C32  
(Optimized Hvdraulic Simplified)



Hydraulic Analysis for : C32

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	60
2541	49

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	60	49	2541	59.9	152.5	28.3

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)	52.5
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	52.5

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	28.3
W1 - Flow (gpm)	52.5
Demand w/o System Pump(s)	N/A

**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
006 17.5	Node NODE				7.7 -9.3	
012 17.5	Node NODE				7.9 -9.3	
020 17.5	Node NODE				7.2 -9.3	
024-I 13.33	Node NODE				15.6 -7.5	
024-O 13.9	Node NODE				14.5 -7.8	
025-I 12.69	Node NODE				17.1 -7.2	
025-O 12.83	Node NODE				15.8 -7.3	
040 7.5	Node NODE				20 -5	
079 1.5	Node NODE				25.9 -2.4	
080 -4	Node NODE				28.3 0	
U08 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
U09 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
U10 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
U11 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
W1 -4	Supply SUPPLY		-52.5		28.3 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 <sup>1/2</sup> )	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

**Path No: 1**

U09 U10	17.5 17.5	4.9 4.9	13.1 6.9	2 2.203		14 0 14	120 0.0005	7.2 0 0	
U10 020	17.5 17.5	4.9	13.1 20	2 2.203		0.83 0 0.83	120 0.0035	7.2 0 0	
020 006	17.5 17.5		-2.8 17.2	2 2.203	2x(us.Tee-Br)= 27.28	173.28 27.28 200.56	120 0.0026	7.2 0 0.5	
006 012	17.5 17.5		16 33.2	2 2.203	1x(us.Tee-Br)= 13.64	9.25 13.64 22.89	120 0.0089	7.7 0 0.2	
012 024-O	17.5 13.9		19.3 52.5	2 2.203	4x(us.90)= 27.28	213.93 27.28 241.21	120 0.0209	7.9 1.6 5	
024-O 024-I	13.9 13.33		0 52.5	2 0		0.56 0 0.56	1.5036	14.5 0.2 0.8	CV-1 FR Check ***
024-I 025-O	13.33 12.83		0 52.5	2 2.203		0.51 0 0.51	120 0.0209	15.6 0.2 0.0	
025-O 025-I	12.83 12.69		0 52.5	2 0		0.14 0 0.14	8.713	15.8 0.1 1.2	Butterfly BFV-300 ***
025-I 040	12.69 7.5		0 52.5	2 2.203	2x(us.90)= 13.64 1x(us.Tee-Br)= 13.64	5.94 27.28 33.21	120 0.0209	17.1 2.2 0.7	
040 079	7.5 1.5		0 52.5	2.5 2.703	16x(us.90)= 149.2 1x(us.Tee-Br)= 18.65	258.1 167.86 425.95	120 0.0077	20 2.6 3.3	
079 080	1.5 -4		0 52.5	6 6.357	1x(us.90)= 17.6	5.5 17.6 23.1	120 0.0001	25.9 2.4 0	
080 W1	-4 -4		0 52.5	6 6.4	1x(us.90)= 24.19	69.89 24.19 94.08	140 0.0001	28.3 0 0	
<b>W1</b>								<b>28.3</b>	

**Path No: 2**

U09 U08	17.5 17.5	4.9 4.9	13.1 6.2	2 2.203		14.01 0 14.01	120 0.0004	7.2 0 0	
U08 012	17.5 17.5	4.9	13.1 19.3	2 2.203	1x(us.Tee-Br)= 13.64 2x(us.90)= 13.64	197.53 27.28 224.8	120 0.0033	7.2 0 0.7	
<b>012</b>								<b>7.9</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)	
						T		frict (Pf)	
	(ft)	(gpm/psi½)	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

Path No: 3

U11	17.5	4.9	13.1	2	2x(us.90)= 13.64	215.62	120	7.2	
006	17.5		16	2.203		13.64	0.0023	0	
						229.26		0.5	
006								7.7	

Path No: 4

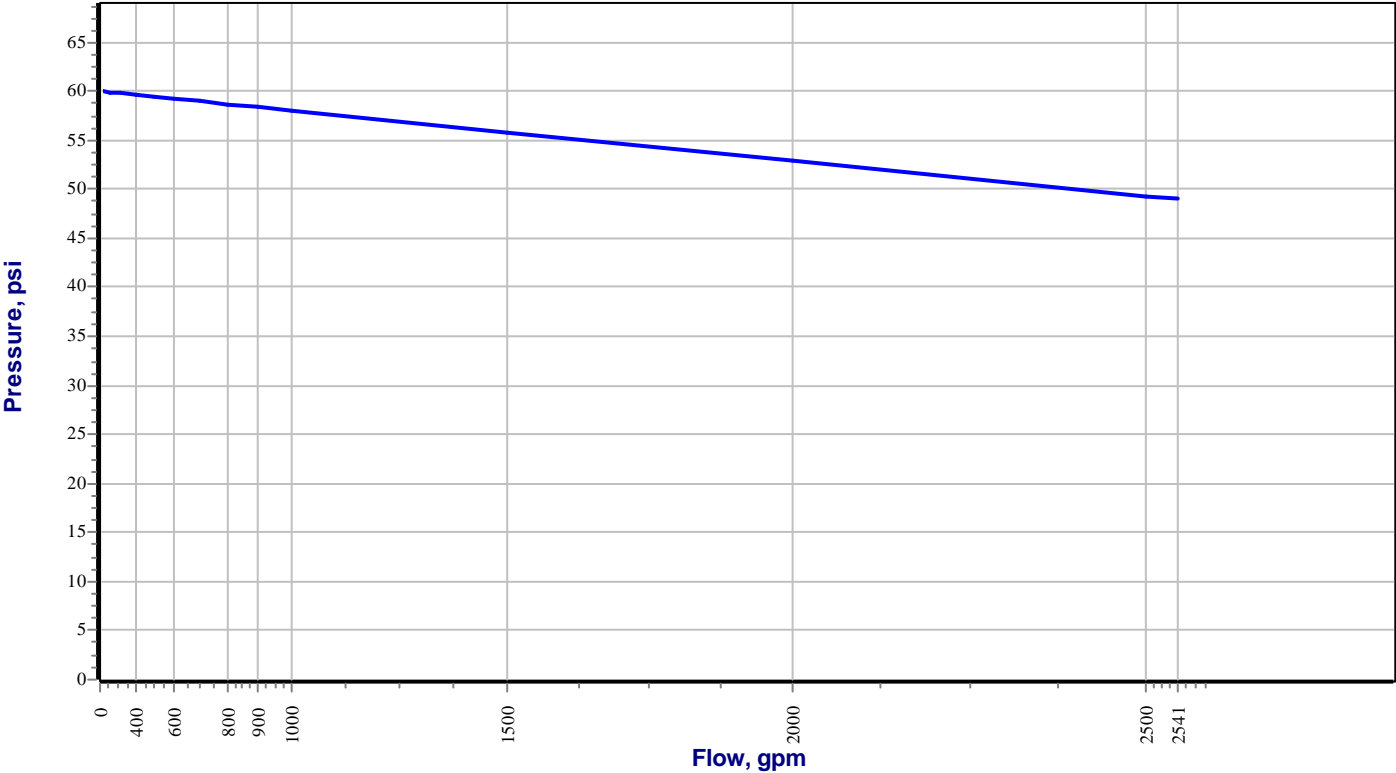
020	17.5		0	2		13.17	120	7.2	
U11	17.5	4.9	2.8	2.203		0	0.0001	0	
						13.17		0	
U11								7.2	

- \* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.
- \* Maximum Velocity of 4.42 ft/s occurs in the following pipe(s): (024-O-012), (025-O-024-I), (040-025-I)

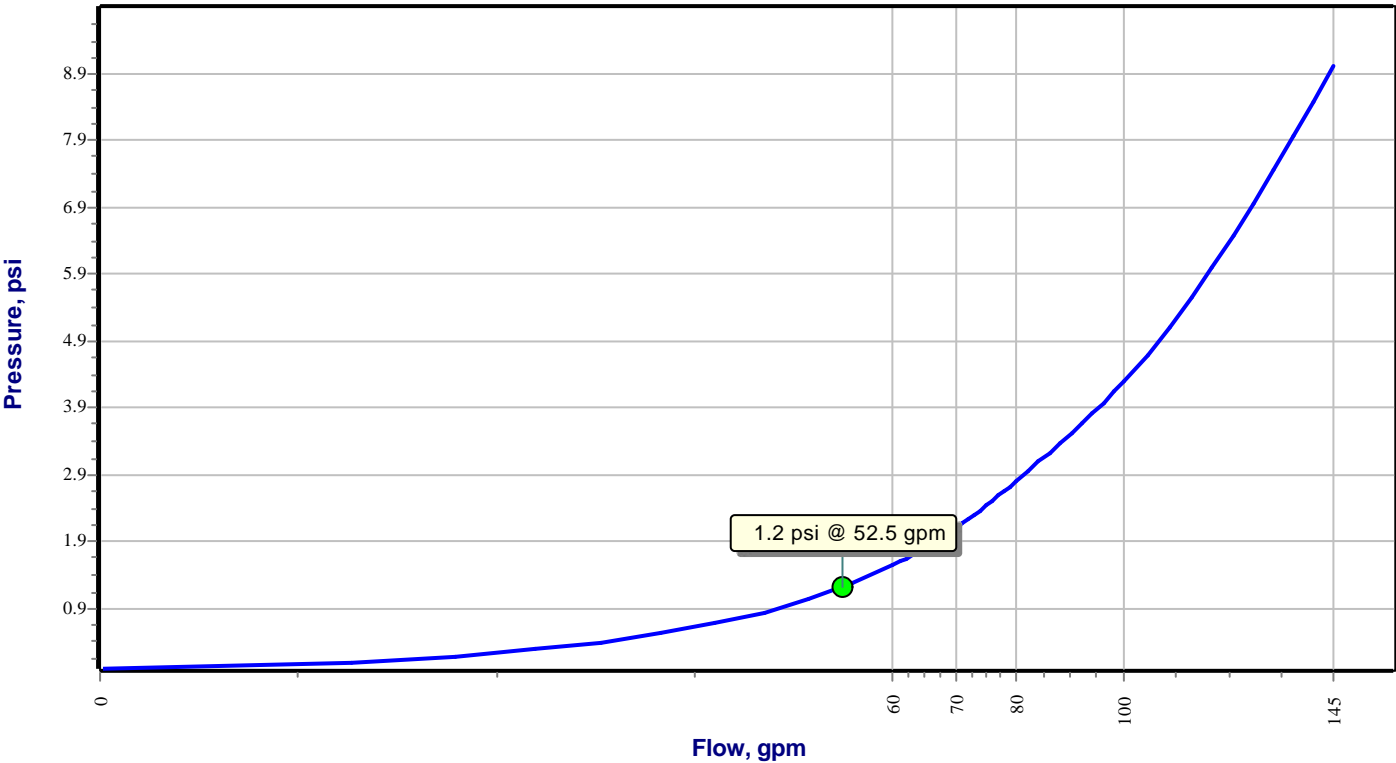
\*\*\* Device pressure loss (gain in the case of pumps) is calculated from the device's curve. If the device curve is printed with this report, it will appear below. The length of the device as shown in the table above comes from the CAD drawing. The friction loss per unit of length is calculated based 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.

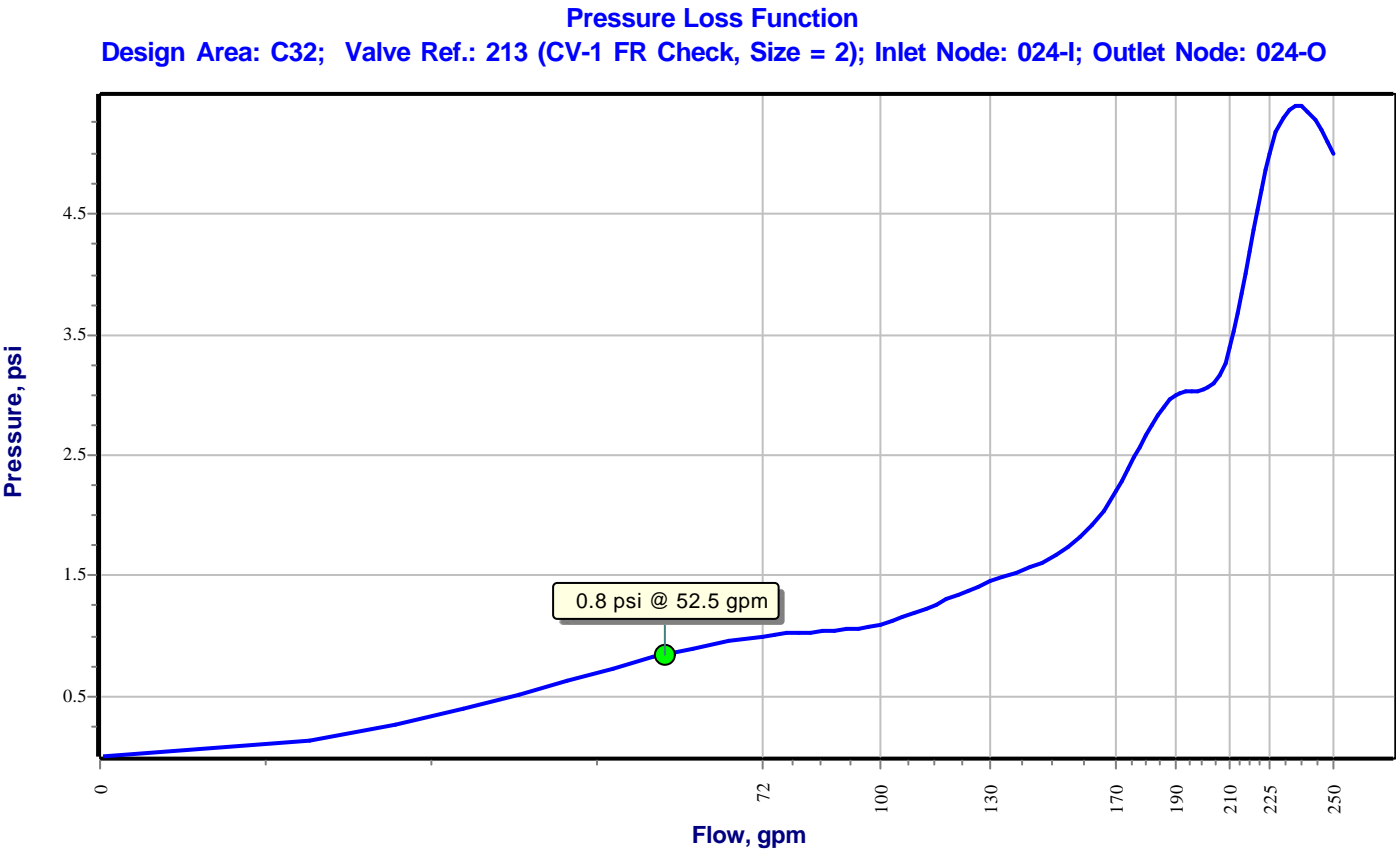


Pressure vs. Flow Function  
Design Area: C32; Supply Ref.: W1; Supply Name:W1



Pressure Loss Function  
Design Area: C32; Valve Ref.: 212 (Butterfly BFV-300, Size = 2); Inlet Node: 025-I; Outlet Node: 025-O





# HYDRAULIC CALCULATIONS for

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## Job Information

Project Name : COMMUNITY BRIDGES- RIO FRESCO HOTEL

Contract No. :

City: PHOENIX, AZ

Project Location: 2425 S.24TH ST

Date: 8/16/2024

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## Contractor Information

Name of Contractor:

Address:

City:

Phone Number:

E-mail:

Name of Designer: J.DAVILA

Authority Having Jurisdiction:

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## Design

Remote Area Name	C42
Remote Area Location	B4 2-Corr
Occupancy Classification	Residential
Density (gpm/ft <sup>2</sup> )	0.051
Area of Application (ft <sup>2</sup> )	380
Coverage per Sprinkler (ft <sup>2</sup> )	256
Number of Calculated Sprinklers	4
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	152.5
Required Pressure at Source (psi)	30
Type of System	Wet
Volume - Entire System (gal)	419.3 gal

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## Water Supply Information

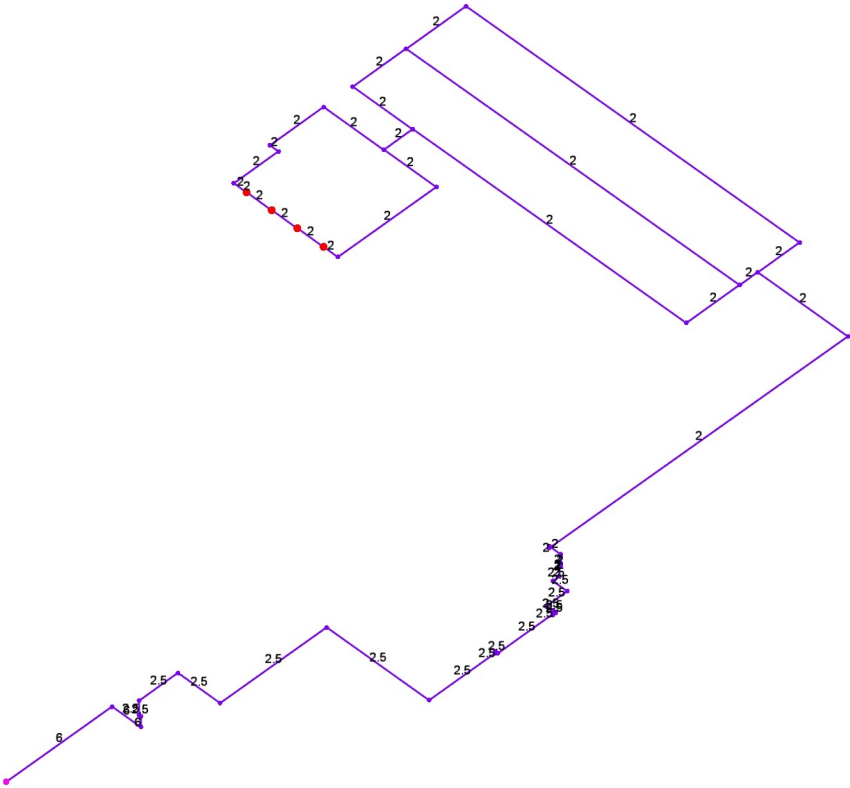
Date	6-26-24
Location	2425 S 24TH ST
Source	W1

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## Notes

up to 4 hds

Diagram for Design Area : C42  
(Optimized Hvdraulic Simplified)



Hydraulic Analysis for : C42

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	60
2541	49

Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	60	49	2541	59.9	152.5	30

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)	52.5
InRack Sprinkler Flow (gpm)	0
Other (custom defined) Sprinkler Flow (gpm)	0
Total Sprinkler Flow (gpm)	52.5

Other

Required Margin of Safety (psi)	0
W1 - Pressure (psi)	30
W1 - Flow (gpm)	52.5
Demand w/o System Pump(s)	N/A

**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
006 17.5	Node NODE				9.3 -9.3	
009 17.5	Node NODE				8.5 -9.3	
012 17.5	Node NODE				9.6 -9.3	
015 17.5	Node NODE				7.9 -9.3	
020 17.5	Node NODE				9 -9.3	
024-I 13.33	Node NODE				17.3 -7.5	
024-O 13.9	Node NODE				16.2 -7.8	
025-I 12.69	Node NODE				18.8 -7.2	
025-O 12.83	Node NODE				17.5 -7.3	
040 7.5	Node NODE				21.7 -5	
079 1.5	Node NODE				27.6 -2.4	
080 -4	Node NODE				30 0	
194 17.5	Node NODE				7.2 -9.3	
U04 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
U05 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
U06 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
U07 17.5	Overhead Sprinkler HEAD	4.9 Open	13.1 0.3	256 0.051	7.2 -9.3	7.2 12.8
W1 -4	Supply SUPPLY		-52.5		30 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**

U05 194	17.5 17.5	4.9	13.1 11.8	2 2.203	1x(us. Tee-Br) = 13.64	12.87 13.64 26.51	120 0.0013	7.2 0 0.0	
194 015	17.5 17.5		13.1 24.9	2 2.203	1x(us. Tee-Br) = 13.64 4x(us. 90) = 27.28	94.03 40.92 134.94	120 0.0053	7.2 0 0.7	
015 009	17.5 17.5		27.6 52.5	2 2.203	1x(us. Tee-Br) = 13.64	15.04 13.64 28.67	120 0.0209	7.9 0 0.6	
009 020	17.5 17.5		-23.1 29.4	2 2.203	1x(us. 90) = 6.82	58.98 6.82 65.8	120 0.0071	8.5 0 0.5	
020 012	17.5 17.5		-13.5 15.9	2 2.203	1x(us. Tee-Br) = 13.64 2x(us. 90) = 13.64	226.37 27.28 253.65	120 0.0023	9 0 0.6	
012 024-O	17.5 13.9		36.6 52.5	2 2.203	4x(us. 90) = 27.28	213.93 27.28 241.21	120 0.0209	9.6 1.6 5	
024-O 024-I	13.9 13.33		0 52.5	2 0		0.56 0 0.56	1.5043	16.2 0.2 0.8	CV-1 FR Check ***
024-I 025-O	13.33 12.83		0 52.5	2 2.203		0.51 0 0.51	120 0.0209	17.3 0.2 0.0	
025-O 025-I	12.83 12.69		0 52.5	2 0		0.14 0 0.14	8.723	17.5 0.1 1.2	Butterfly BFV-300 ***
025-I 040	12.69 7.5		0 52.5	2 2.203	2x(us. 90) = 13.64 1x(us. Tee-Br) = 13.64	5.94 27.28 33.21	120 0.0209	18.8 2.2 0.7	
040 079	7.5 1.5		0 52.5	2.5 2.703	16x(us. 90) = 149.2 1x(us. Tee-Br) = 18.65	258.1 167.86 425.95	120 0.0077	21.7 2.6 3.3	
079 080	1.5 -4		0 52.5	6 6.357	1x(us. 90) = 17.6	5.5 17.6 23.1	120 0.0001	27.6 2.4 0	
080 W1	-4 -4		0 52.5	6 6.4	1x(us. 90) = 24.19	69.89 24.19 94.08	140 0.0001	30 0 0	
<b>W1</b>								<b>30</b>	

**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: 2**

U05	17.5	4.9	13.1	2		13.26	120	7.2	
U06	17.5	4.9	1.3	2.203		0	0.0000	0	
						13.26		0	
U06	17.5	4.9	13.1	2		13.61	120	7.2	
U07	17.5	4.9	14.4	2.203		0	0.0019	0	
						13.61		0.0	
U07	17.5	4.9	13.1	2	1x(us.Tee-Br)= 13.64	86.06	120	7.2	
O15	17.5		27.6	2.203	2x(us.90)= 13.64	27.28	0.0063	0	
						113.34		0.7	
<b>O15</b>								<b>7.9</b>	

**Path No: 3**

U04	17.5	4.9	13.1	2	1x(us.Tee-Br)= 13.64	0.33	120	7.2	
194	17.5		13.1	2.203		13.64	0.0016	0	
						13.96		0.0	
<b>194</b>								<b>7.2</b>	

**Path No: 4**

009	17.5		0	2	1x(us.90)= 6.82	169.8	120	8.5	
006	17.5		23.1	2.203		6.82	0.0046	0	
						176.62		0.8	
006	17.5		13.5	2	1x(us.Tee-Br)= 13.64	9.25	120	9.3	
O12	17.5		36.6	2.203		13.64	0.0107	0	
						22.89		0.2	
<b>O12</b>								<b>9.6</b>	

**Path No: 5**

O20	17.5		0	2	2x(us.Tee-Br)= 27.28	173.28	120	9	
006	17.5		13.5	2.203		27.28	0.0017	0	
						200.56		0.3	
<b>O06</b>								<b>9.3</b>	

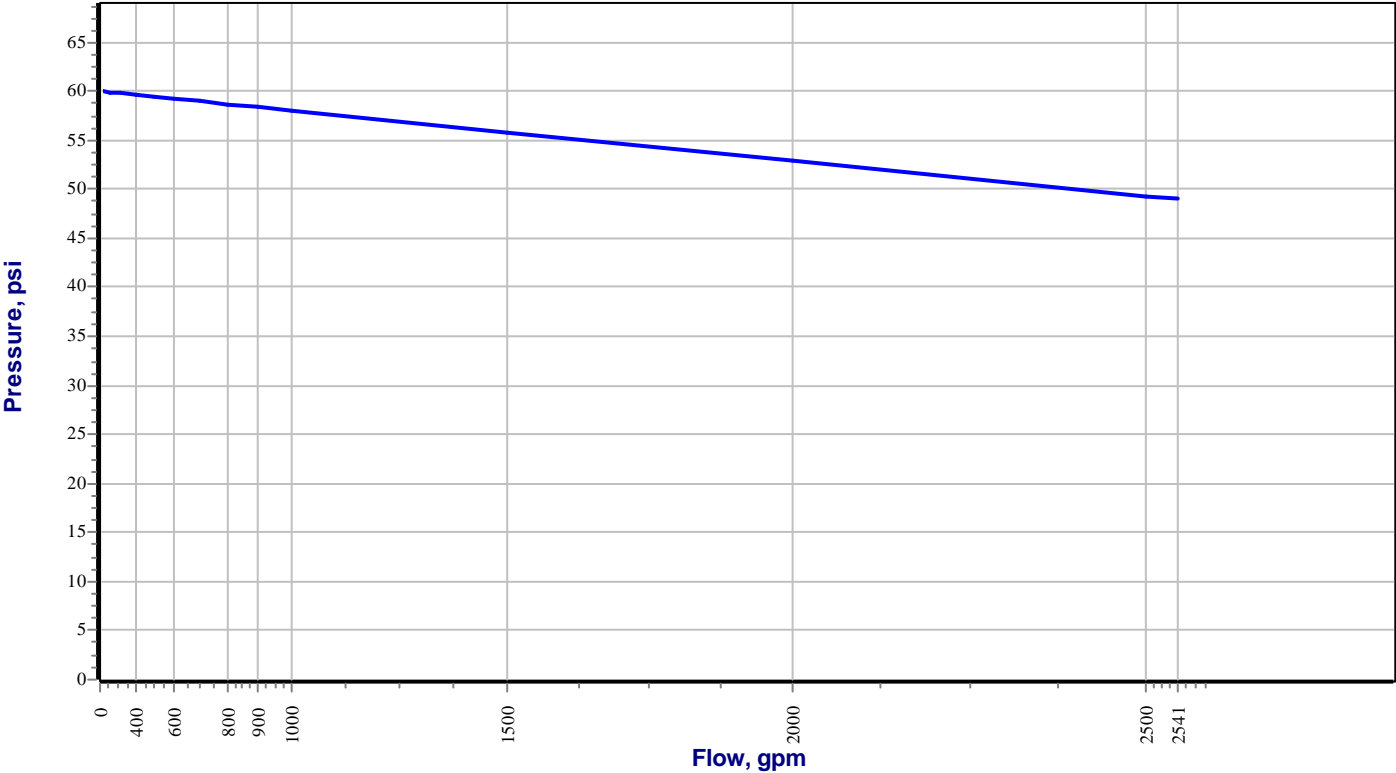
\* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.

\* Maximum Velocity of 4.42 ft/s occurs in the following pipe(s): (009-015), (024-0-012), (025-0-024-I), (040-025-I)

\*\*\* 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: C42; Supply Ref.: W1; Supply Name:W1



Pressure Loss Function  
Design Area: C42; Valve Ref.: 212 (Butterfly BFV-300, Size = 2); Inlet Node: 025-I; Outlet Node: 025-O

