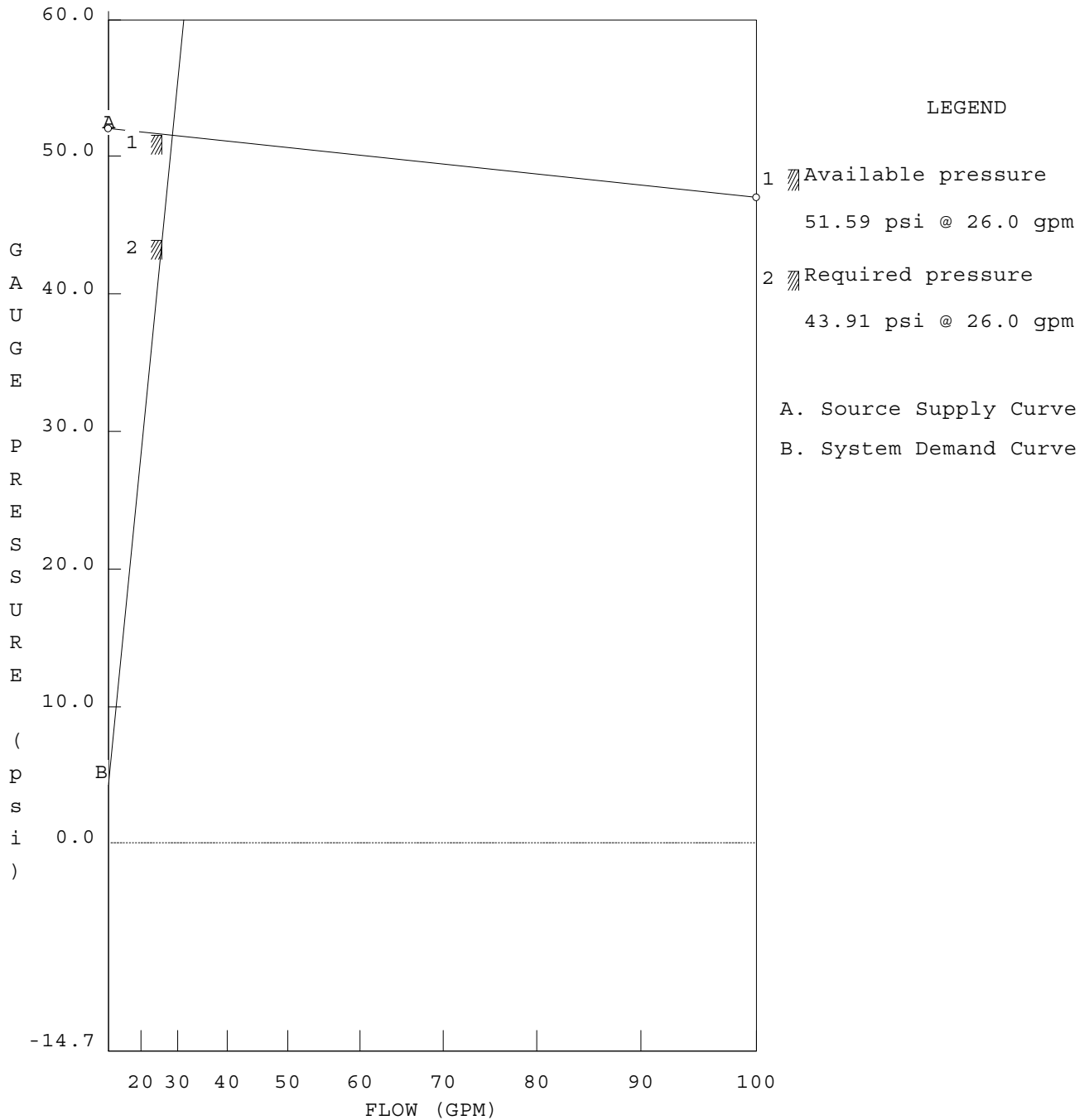


SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
JOB TITLE:

WATER SUPPLY ANALYSIS

Static: 52.00 psi Resid: 47.00 psi Flow: 100.0 gpm



SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

NFPA WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL @ DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	52.0	47.0	100.0	51.6	26.0	43.9

Available pressure is 7.7 psi (15%) greater than required pressure.

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	26.0 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	5.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	21.0 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
1	-1.5	- - - -	37.3	- - -
2	-1.5	- - - -	33.3	- - -
3	-1.5	- - - -	31.8	- - -
4	1.5	HOSE STREAM	30.3	5.0
5	3.5	- - - -	29.3	- - -
F1	5.0	- - - -	28.6	- - -
F2	5.0	- - - -	25.6	- - -
6	6.5	- - - -	24.6	- - -
7	11.1	- - - -	21.0	- - -
8A	10.6	- - - -	19.1	- - -
8B	10.6	- - - -	18.6	- - -
9	10.6	- - - -	19.0	- - -
10	13.4	- - - -	18.9	- - -
11A	10.6	- - - -	19.0	- - -
11B	10.6	- - - -	19.0	- - -
S1	10.1	K= 4.90	18.4	21.0
S2	10.1	- - - -	19.2	- - -
S3	10.1	- - - -	19.2	- - -
SOURCE	0.0	SOURCE	43.9	26.0

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

NFPA PIPE DATA 5

Pipe Tag	K-fac	Add Fl	Add Fl To	Fit:	L	C	(Pt)		
Frm Node	El (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	F		
To Node	El (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	T Pf/ft.	(Pe)	(Pf)
Pipe: SOURCE	Source	0.0					35.00	150	6.6
SOURCE	0.0	43.9	26.0	2	K1.000	T: 5.0	5.00		-0.6
1	-1.5	37.3	26.0		0.995		40.00	0.181	7.3
Pipe: 1	1	0.0							
1	-1.5	37.3	26.0	3		4.0 psi, 26.0 gpm			
2	-1.5	33.3	26.0						
Pipe: 2		0.0	0.0				70.00	150	1.5
2	-1.5	33.3	26.0	4	S1.500	3E:12.0	12.00		-0.0
3	-1.5	31.8	26.0		1.593		82.00	0.018	1.5
Pipe: 3		H.S.	5.0	Disch			3.00	150	1.5
3	-1.5	31.8	21.0	5	L1.500	E: 4.0	4.00		1.3
4	1.5	30.3	26.0		1.505		7.00	0.024	0.2
Pipe: 4	4	0.0	0.0				3.00	150	1.0
4	1.5	30.3	21.0	F1	L1.500	E: 4.0	7.00		0.9
5	3.5	29.3	21.0		1.505	R: 3.0	10.00	0.016	0.2
Pipe: 5		0.0	0.0				1.50	150	0.8
5	3.5	29.3	21.0	F2	Y1.500	C: 7.0	7.00		0.6
F1	5.0	28.6	21.0		1.598		8.50	0.012	0.1
Pipe: F1	F1	0.0							
F1	5.0	28.6	21.0	6		3.0 psi, 21.0 gpm			
F2	5.0	25.6	21.0						
Pipe: F2		0.0	0.0				1.50	150	0.9
F2	5.0	25.6	21.0	7	Y1.000	2R: 2.0	2.00		0.6
6	6.5	24.6	21.0		1.101		3.50	0.074	0.3
Pipe: 6		0.0	10.1	10		E: 5.0	11.92	150	3.7
6	6.5	24.6	10.9	8A	Y1.000	T: 5.0	11.00		2.0
7	11.1	21.0	21.0		1.101	R: 1.0	22.92	0.074	1.7
Pipe: 7		0.0	0.0			5E:25.0	62.00	150	1.9
7	11.1	21.0	10.9	8B	Y1.000	T: 5.0	33.00		-0.2
8A	10.6	19.1	10.9		1.101	3R: 3.0	95.00	0.022	2.1
Pipe: 8A		0.0	21.0	S1			15.33	150	0.5
8A	10.6	19.1	-10.1		Y1.000	T: 5.0	7.00		-0.0
8B	10.6	18.6	10.9		1.101	2R: 2.0	22.33	0.022	0.5
Pipe: 8B		0.0	21.0	S1			11.67	150	0.4
9	10.6	19.0	-10.9		Y1.000	E: 5.0	10.00		-0.0
8B	10.6	18.6	10.1		1.101	T: 5.0	21.67	0.019	0.4

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

Pipe Tag	K-fac	Add Fl	Add Fl To	Fit:	L	C	(Pt)
Frm Node	El (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	(Pe)
To Node	El (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	(Pf)
Pipe: 9	0.0	0.0	11B	3E:15.0	37.67	150	-0.1
10	13.4	18.9	10.1	8B Y1.000	T: 5.0	23.00	-1.2
9	10.6	19.0	10.1	1.101 3R: 3.0	60.67	0.019	1.2
Pipe: 10	0.0	0.0			31.67	150	2.1
7	11.1	21.0	10.1	9 Y1.000	4E:20.0	23.00	1.0
10	13.4	18.9	10.1	1.101 3R: 3.0	54.67	0.019	1.0
Pipe: 11A	0.0	0.0			24.33	150	-0.0
9	10.6	19.0	0.0	Y1.000	2E:10.0	11.00	-0.0
11A	10.6	19.0	0.0	1.101 R: 1.0	35.33	0.000	0.0
Pipe: 11B	0.0	0.0		E: 5.0	23.67	150	-0.0
9	10.6	19.0	0.0	Y1.000	T: 5.0	11.00	-0.0
11B	10.6	19.0	0.0	1.101 R: 1.0	34.67	0.000	0.0
Pipe: S1	4.90	21.0	Disch		0.50	150	0.2
8B	10.6	18.6	0.0	Y1.000	T: 5.0	5.00	-0.2
S1	10.1	18.4	21.0	1.101	5.50	0.074	0.4
Pipe: S2	0.0	0.0			0.50	150	0.2
S2	10.1	19.2	0.0	Y1.000	E: 5.0	5.00	0.2
11A	10.6	19.0	0.0	1.101	5.50	0.000	0.0
Pipe: S3	0.0	0.0			0.50	150	0.2
S3	10.1	19.2	0.0	Y1.000	E: 5.0	5.00	0.2
11B	10.6	19.0	0.0	1.101	5.50	0.000	0.0

NOTES (HASS):

- (1) Calculations were performed by the HASS 2023 D computer program in accordance with NFPA (2020) under license no. 64618092 granted by
 HRS Systems, Inc.
 208 Southside Square
 Petersburg, TN 37144
 (931) 659-9760
- (2) The system has been calculated to provide an average imbalance at each node of 0.006 gpm and a maximum imbalance at any node of 0.104 gpm.
- (3) Total pressure at each node is used in balancing the system. Maximum water velocity is 10.7 ft/sec at pipe SOURCE.
- (4) Items listed in bold print on the cover sheet
 are automatically transferred from the calculation report.

THORPE DESIGN, INC.
410 BEATRICE COURT SUITE A
BRENTWOOD, CA 94513
HYDRAULIC CALCULATIONS

FOR

NEW RESIDENCE
21950 TIMBER COVE ROAD
JENNER, CA
DESIGN/LAYOUT BY: BRAD MARTIN
FILE NUMBER: 25-357
DATE: JUL 28, 2025

-DESIGN DATA-

OCCUPANCY CLASSIFICATION: RESIDENTIAL
GPM REQ. PER HEAD: 13 GPM
SPRINKLER SPACING: 16 X 16 SQ. FT.
NUMBER OF SPRINKLERS CALCULATED: 2 SPRINKLER(S)
AUTHORITY HAVING JURISDICTION: SONOMA COUNTY FIRE DEPARTMENT
CONTRACTOR CERTIFICATION NUMBER: 541016

-SPRINKLERS-

MANUFACTURER: SENJU
MODEL: FLAT PLATE (SS8464)
K-FACTOR: 4.9K
TEMP. RATING: 205 DEG.

-WATER FLOW-

STATIC: 52
RESIDUAL: 47
FLOW: 100.0
PROVIDED BY: TIMBER COVE COUNTY WATER DISTRICT

-DEMAND-

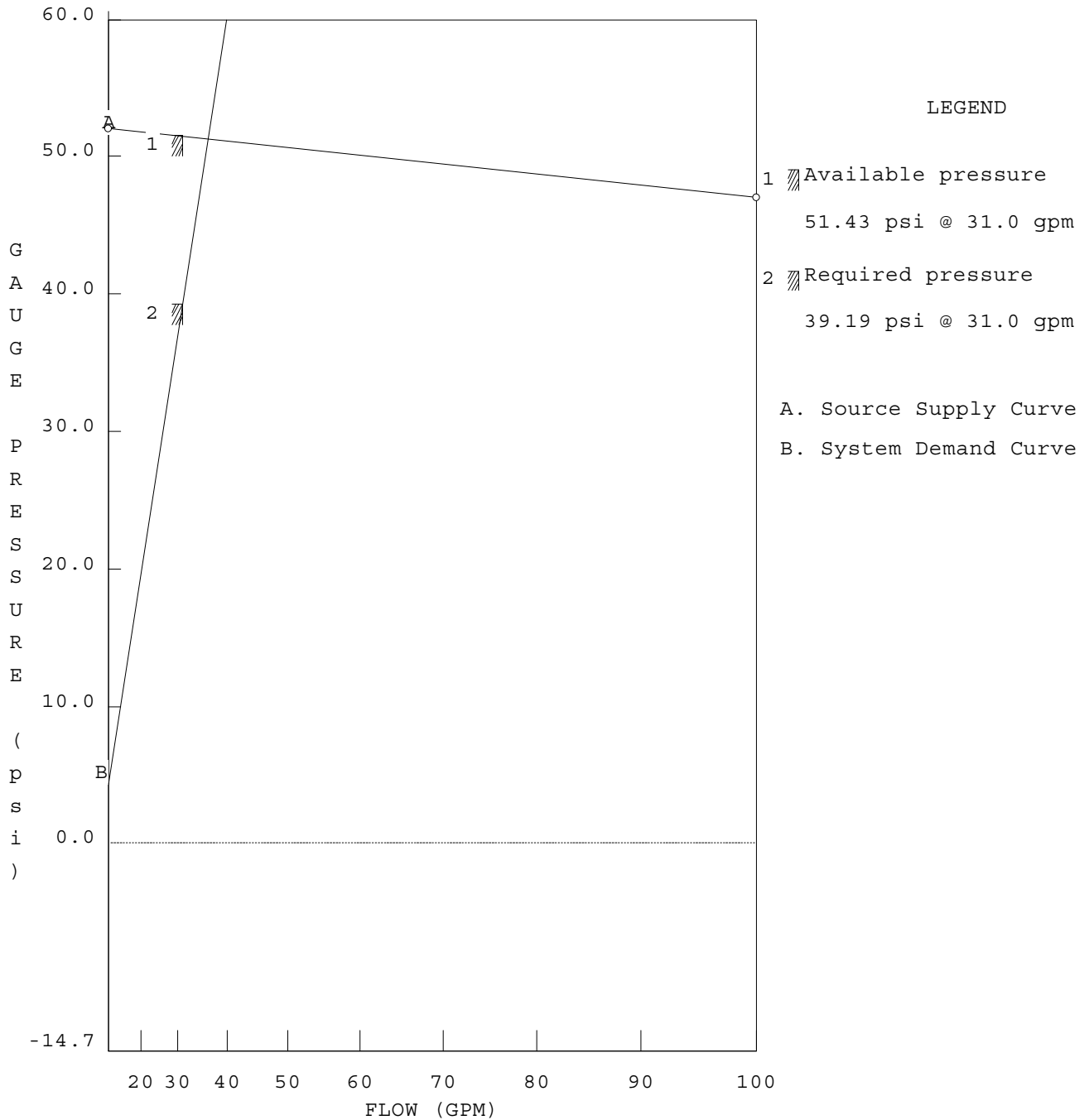
PRESSURE REQUIRED @ GAUGE: 16.3 psi
SPRINKLER REQUIRED PRESSURE @ WATER SOURCE: 39.2
SPRINKLER REQUIRED FLOW @ WATER SOURCE: 26.0
ADDITIONAL FLOWS: 5 GPM
TOTAL FLOW: 31.0

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
JOB TITLE:

WATER SUPPLY ANALYSIS

Static: 52.00 psi Resid: 47.00 psi Flow: 100.0 gpm



Note: (1) Dashed Lines indicate extrapolated values from Test Results

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

NFPA WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL @ DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	52.0	47.0	100.0	51.4	31.0	39.2

Available pressure is 12.2 psi (24%) greater than required pressure.

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	31.0 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	5.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	26.0 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
1	-1.5	- - - -	29.8	- - -
2	-1.5	- - - -	25.8	- - -
3	-1.5	- - - -	23.7	- - -
4	1.5	HOSE STREAM	22.2	5.0
5	3.5	- - - -	21.1	- - -
F1	5.0	- - - -	20.3	- - -
F2	5.0	- - - -	17.3	- - -
6	6.5	- - - -	16.3	- - -
7	11.1	- - - -	11.7	- - -
8A	10.6	- - - -	9.3	- - -
8B	10.6	- - - -	8.7	- - -
9	10.6	- - - -	8.1	- - -
10	13.4	- - - -	8.9	- - -
11A	10.6	- - - -	7.0	- - -
11B	10.6	- - - -	7.0	- - -
S1	10.1	- - - -	8.9	- - -
S2	10.1	K= 4.90	7.0	13.0
S3	10.1	K= 4.90	7.1	13.0
SOURCE	0.0	SOURCE	39.2	31.0

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

NFPA PIPE DATA 5

Pipe Tag	K-fac	Add Fl	Add Fl To	Fit:	L	C	(Pt)
Frm Node	El (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	F
To Node	El (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	T Pf/ft.
							(Pe)
							(Pf)
Pipe: SOURCE	Source	0.0					35.00 150 9.4
SOURCE	0.0	39.2	31.0	2	K1.000	T: 5.0	5.00 -0.6
1	-1.5	29.8	31.0		0.995		40.00 0.251 10.0
Pipe: 1			0.0	Fixed Pressure Loss Device			
1	-1.5	29.8	31.0	3	4.0 psi,	31.0 gpm	
2	-1.5	25.8	31.0				
Pipe: 2		0.0	0.0				70.00 150 2.1
2	-1.5	25.8	31.0	4	S1.500	3E:12.0	12.00 -0.0
3	-1.5	23.7	31.0		1.593		82.00 0.025 2.1
Pipe: 3		H.S.	5.0	Disch			3.00 150 1.5
3	-1.5	23.7	26.0	5	L1.500	E: 4.0	4.00 1.3
4	1.5	22.2	31.0		1.505		7.00 0.033 0.2
Pipe: 4		0.0	0.0				3.00 150 1.1
4	1.5	22.2	26.0	F1	L1.500	E: 4.0	7.00 0.9
5	3.5	21.1	26.0		1.505	R: 3.0	10.00 0.024 0.2
Pipe: 5		0.0	0.0				1.50 150 0.8
5	3.5	21.1	26.0	F2	Y1.500	C: 7.0	7.00 0.6
F1	5.0	20.3	26.0		1.598		8.50 0.018 0.2
Pipe: F1			0.0	Fixed Pressure Loss Device			
F1	5.0	20.3	26.0	6	3.0 psi,	26.0 gpm	
F2	5.0	17.3	26.0				
Pipe: F2		0.0	0.0				1.50 150 1.0
F2	5.0	17.3	26.0	7	Y1.000	2R: 2.0	2.00 0.6
6	6.5	16.3	26.0		1.101		3.50 0.111 0.4
Pipe: 6		0.0	13.7	10		E: 5.0	11.92 150 4.5
6	6.5	16.3	12.4	8A	Y1.000	T: 5.0	11.00 2.0
7	11.1	11.7	26.0		1.101	R: 1.0	22.92 0.111 2.5
Pipe: 7		0.0	0.0			5E:25.0	62.00 150 2.4
7	11.1	11.7	12.4	8B	Y1.000	T: 5.0	33.00 -0.2
8A	10.6	9.3	12.4		1.101	3R: 3.0	95.00 0.028 2.6
Pipe: 8A		0.0	0.0				15.33 150 0.6
8A	10.6	9.3	12.4	9	Y1.000	T: 5.0	7.00 -0.0
8B	10.6	8.7	12.4		1.101	2R: 2.0	22.33 0.028 0.6
Pipe: 8B		0.0	13.0	11B			11.67 150 0.6
8B	10.6	8.7	13.0	11A	Y1.000	E: 5.0	10.00 -0.0
9	10.6	8.1	12.4		1.101	T: 5.0	21.67 0.028 0.6

SPRINKLER SYSTEM HYDRAULIC ANALYSIS

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

Pipe Tag	K-fac	Add Fl	Add Fl To	Fit:	L	C	(Pt)
Frm Node	El (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	(Pe)
To Node	El (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	(Pf)
Pipe: 9	0.0	13.0	11B	3E:15.0	37.67	150	0.8
10	13.4	8.9	13.0	11A Y1.000	T: 5.0	23.00	-1.2
9	10.6	8.1	13.7	1.101 3R: 3.0	60.67	0.034	2.0
Pipe: 10	0.0	0.0			31.67	150	2.9
7	11.1	11.7	13.7	9 Y1.000	4E:20.0	23.00	1.0
10	13.4	8.9	13.7	1.101 3R: 3.0	54.67	0.034	1.8
Pipe: 11A	0.0	0.0			24.33	150	1.1
9	10.6	8.1	13.0	S2 Y1.000	2E:10.0	11.00	-0.0
11A	10.6	7.0	13.0	1.101 R: 1.0	35.33	0.031	1.1
Pipe: 11B	0.0	0.0		E: 5.0	23.67	150	1.1
9	10.6	8.1	13.0	S3 Y1.000	T: 5.0	11.00	-0.0
11B	10.6	7.0	13.0	1.101 R: 1.0	34.67	0.031	1.1
Pipe: S1	0.0	0.0			0.50	150	0.2
S1	10.1	8.9	0.0	Y1.000	T: 5.0	5.00	0.2
8B	10.6	8.7	0.0	1.101	5.50	0.000	0.0
Pipe: S2	4.90	13.0	Disch		0.50	150	-0.0
11A	10.6	7.0	0.0	Y1.000	E: 5.0	5.00	-0.2
S2	10.1	7.0	13.0	1.101	5.50	0.031	0.2
Pipe: S3	4.90	13.0	Disch		0.50	150	-0.0
11B	10.6	7.0	0.0	Y1.000	E: 5.0	5.00	-0.2
S3	10.1	7.1	13.0	1.101	5.50	0.031	0.2

NOTES (HASS):

- (1) Calculations were performed by the HASS 2023 D computer program in accordance with NFPA (2020) under license no. 64618092 granted by
 HRS Systems, Inc.
 208 Southside Square
 Petersburg, TN 37144
 (931) 659-9760
- (2) The system has been calculated to provide an average imbalance at each node of 0.001 gpm and a maximum imbalance at any node of 0.019 gpm.
- (3) Total pressure at each node is used in balancing the system. Maximum water velocity is 12.8 ft/sec at pipe SOURCE.
- (4) Items listed in bold print on the cover sheet
 are automatically transferred from the calculation report.

DATE: 7/28/2025D, JENNER (SONOMA COUNTY FIRE)\CALCS\NEW FOLDER\25-XXX.SDF
 JOB TITLE:

(5) Available pressure at source node SOURCE under full flow conditions is
 51.21 psi with a flow of 36.86 gpm.

(6) PIPE FITTINGS TABLE

User Pipe Table Name: SIGMA1

PAGE: K MATERIAL: Coppe HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet								
	F	E	T	B	G	C	R	A	Q
0.995	F45Ell 1.00	Ell 3.00	Tee 5.00	BfyVlv 1.00	GatVlv 2.00	ChkVlv 4.00	TeeRun 2.00	Angl 14.60	Qfitti 9.00

PAGE: L MATERIAL: Coppe HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet						
	F	E	T	B	G	C	R
1.505	F45Ell 2.00	Ell 4.00	Tee 8.00	BfyVlv 2.00	GatVlv 3.00	ChkVlv 6.00	TeeRun 3.00

PAGE: S MATERIAL: PVC - HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet								
	F	E	T	B	G	C	R	Z	
1.593	F45Ell 2.10	Ell 4.00	Tee 8.00	BfyVlv 0.00	GatVlv 1.00	ChkVlv 8.91	TeeRun 2.70	10runZ 0.00	

PAGE: Y MATERIAL: Blaze HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet									
	F	E	T	B	G	C	R	Z	A	
1.101	F45Ell 1.00	Ell 5.00	Tee 5.00	BfyVlv 1.00	GatVlv 1.00	ChkVlv 7.00	TeeRun 1.00	10runZ 10.00	A 0.00	
1.598	F45Ell 2.00	Ell 9.00	Tee 8.00	BfyVlv 1.00	GatVlv 1.00	ChkVlv 7.00	TeeRun 1.00	10runZ 10.00	A 0.00	

