

ALPHA FIRE SUPPRESSION SYSTEMS, INC.

2391 CIRCADIAN WAY
SANTA ROSA, CA 95407

HYDRAULIC CALCULATIONS

FOR

HOYT DUPLEX #1
127 URSULINE ROAD
SANTA ROSA, CA

FILE NUMBER: 20-3324

DATE: SEP 25, 2020

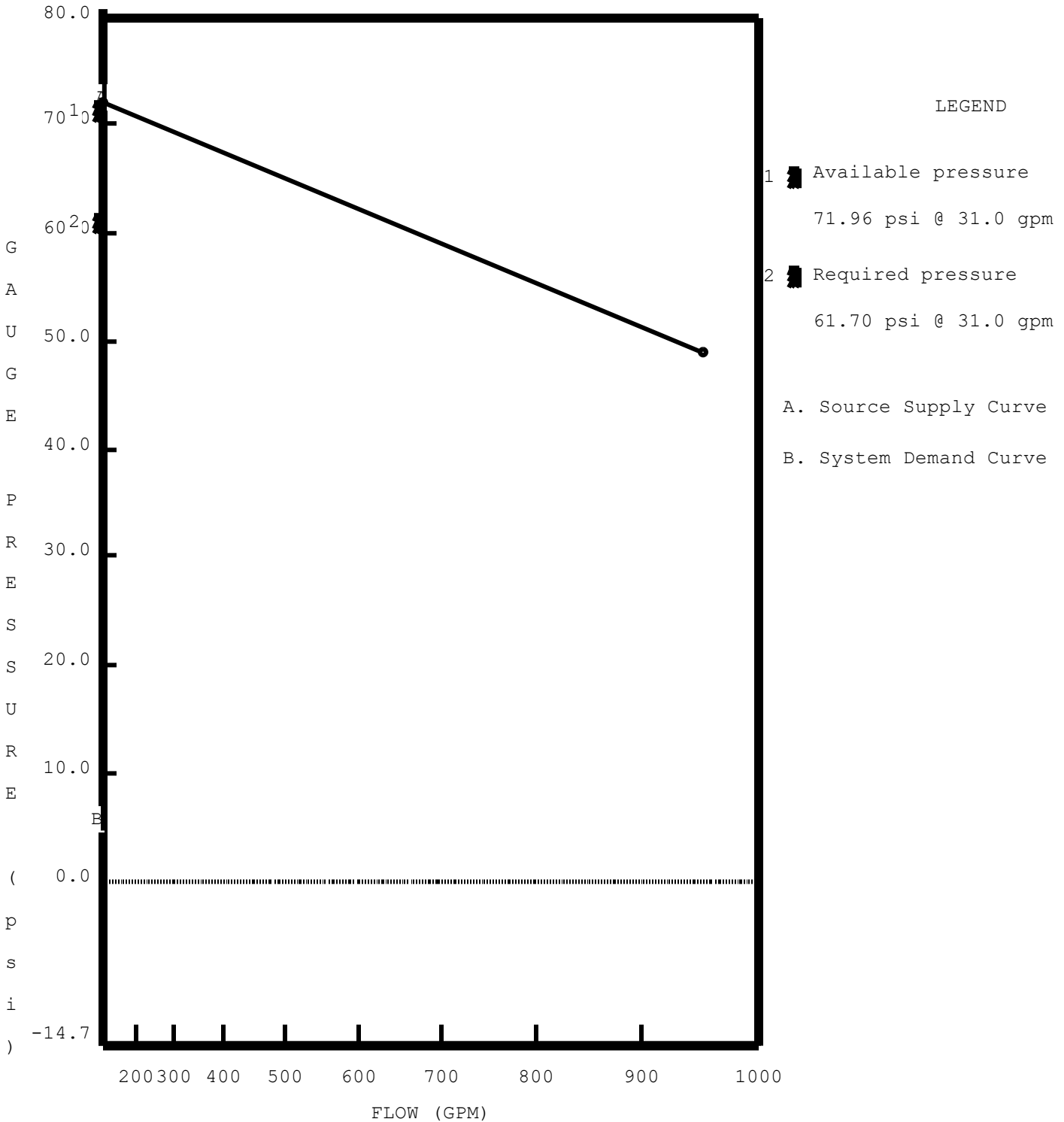
-DESIGN DATA-

OCCUPANCY CLASSIFICATION:	NFPA 13-D
DENSITY:	.05 gpm/sq. ft.
AREA OF APPLICATION:	KITCHEN/LIVING RM
COVERAGE PER SPRINKLER:	256 sq. ft.
NUMBER OF SPRINKLERS CALCULATED:	2 sprinklers
TOTAL SPRINKLER WATER FLOW REQUIRED:	26.0 gpm
TOTAL WATER REQUIRED (including hose):	31.0 gpm
FLOW AND PRESSURE (@ BOR):	26.0 gpm @ 21.3 psi
SPRINKLER ORIFICE SIZE:	7/16 inch
NAME OF CONTRACTOR:	BRIAN HOYT
DESIGN/LAYOUT BY:	K. GIOMETTI-BOLLOCK
AUTHORITY HAVING JURISDICTION:	COUNTY OF SONOMA
CONTRACTOR CERTIFICATION NUMBER:	C-16 670313

CALCULATIONS BY HASS COMPUTER PROGRAM (LICENSE # 64616443)
HRS SYSTEMS, INC.

WATER SUPPLY ANALYSIS

Static: 72.00 psi Resid: 49.00 psi Flow: 953.0 gpm



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

DATE: 9/25/2020DESIGN\127 URSULINE RD., HOYT RESI\127 URSULINE DUPLEX.SDF

JOB TITLE: 127 URSULINE DUPLEX

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	72.0	49.0	953.0	72.0	31.0	61.7

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)	NOTES
S3	9.0	K= 4.90	7.1	13.0	
S4	9.0	K= 4.90	7.0	13.0	
C	9.5	- - - -	7.1	- - -	
D	9.5	- - - -	7.1	- - -	
201	9.5	- - - -	7.3	- - -	
202	9.5	- - - -	7.2	- - -	
203	9.5	- - - -	9.7	- - -	
204	9.5	- - - -	12.8	- - -	
TOR	2.0	- - - -	17.7	- - -	
FS1	2.0	- - - -	18.2	- - -	
FS2	2.0	- - - -	21.2	- - -	
BOR	2.0	- - - -	21.3	- - -	
DOM	2.0	HOSE STREAM	23.0	5.0	
U1	-2.0	- - - -	26.1	- - -	
U2	-2.0	- - - -	26.8	- - -	
U3	-2.0	- - - -	34.0	- - -	
BF1	-2.0	- - - -	28.4	- - -	
BF2	-2.0	- - - -	32.4	- - -	
W1	-1.5	- - - -	37.0	- - -	
W2	-1.5	- - - -	40.5	- - -	
SOURCE	-2.0	SOURCE	61.7	31.0	

DATE: 9/25/2020DESIGN\127 URSULINE RD., HOYT RESI\127 URSULINE DUPLEX.SDF

JOB TITLE: 127 URSULINE DUPLEX

NFPA PIPE DATA

Pipe Tag	K-fac	Add Fl	Add Fl	To	Fit:	L	C	(Pt)	Notes
Frm Node	El (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	F	(Pe)	
To Node	El (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	T	Pf/ft.	(Pf)
Pipe: 1		4.90	13.0	Disch			0.50	150	0.0
C	9.5	7.1	0.0		P1.000	E: 7.0	7.00		-0.2
S3	9.0	7.1	13.0		1.101		7.50	0.031	0.2
Pipe: 2		4.90	13.0	Disch			0.50	150	0.0
D	9.5	7.1	0.0		P1.000	E: 7.0	7.00		-0.2
S4	9.0	7.0	13.0		1.101		7.50	0.031	0.2
Pipe: 4		0.0	0.0				1.00	150	0.2
201	9.5	7.3	13.0		P1.000	T: 5.0	5.00		-0.0
C	9.5	7.1	13.0		1.101		6.00	0.031	0.2
Pipe: 5		0.0	0.0				1.33	150	0.2
202	9.5	7.2	13.0		P1.000	T: 5.0	5.00		-0.0
D	9.5	7.1	13.0		1.101		6.33	0.031	0.2
Pipe: 6		0.0	13.0D				11.25	150	0.0
201	9.5	7.3	-11.6		P1.000	----	0.00		-0.0
202	9.5	7.2	1.4		1.101		11.25	0.000	0.0
Pipe: 7		0.0	13.0D			E: 7.0	75.00	150	2.5
203	9.5	9.7	-1.4		P1.000	2T:10.0	25.00		-0.0
202	9.5	7.2	11.6		1.101	8R: 8.0	100.00	0.025	2.5
Pipe: 8		0.0	1.4	202			62.50	150	2.5
203	9.5	9.7	13.0	C	P1.000	5R: 5.0	5.00		-0.0
201	9.5	7.3	14.4		1.101		67.50	0.037	2.5
Pipe: 9		0.0	14.4	201			14.00	150	3.1
204	9.5	12.8	11.6	202	P1.000	2E:14.0	14.00		-0.0
203	9.5	9.7	26.0		1.101		28.00	0.111	3.1
Pipe: 10		0.0	0.0				7.50	150	4.9
TOR	2.0	17.7	26.0	203	P1.000	E: 7.0	7.00		3.2
204	9.5	12.8	26.0		1.101		14.50	0.111	1.6
Pipe: 11		0.0	0.0				1.00	150	0.5
FS1	2.0	18.2	26.0	204	M1.000	E: 2.5	2.50		-0.0
TOR	2.0	17.7	26.0		1.055		3.50	0.136	0.5
Pipe: 12			0.0			Fixed Pressure Loss Device			
FS2	2.0	21.2	26.0	TOR		3.0 psi,	26.0 gpm		
FS1	2.0	18.2	26.0						
Pipe: 13		0.0	0.0				1.00	150	0.1
BOR	2.0	21.3	26.0	FS1	M1.000	----	0.00		-0.0
FS2	2.0	21.2	26.0		1.055		1.00	0.136	0.1

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 JOB TITLE: 127 URSULINE DUPLEX

- (3) Total pressure at each node is used in balancing the system.
 Maximum water velocity is 22.8 ft/sec at pipe 23.
- (4) Items listed in bold print on the cover sheet
 are automatically transferred from the calculation report.
- (5) Available pressure at source node SOURCE under full flow conditions is
 71.95 psi with a flow of 34.25 gpm.

(6) PIPE FITTINGS TABLE

User Pipe Table Name: ALPHA.PIP

PAGE: K MATERIAL: CT-K HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet							
	E	T	F	R	C	S	G	N
	Ell	BR-TEE	45-Ell	TeeRun	Couplg	SwgChk	GatVlv	NPTee
0.745	2.00	3.00	0.50	0.00	0.00	3.00	0.00	3.00
0.995	2.50	4.50	1.00	0.00	0.00	4.50	0.00	4.50

PAGE: M MATERIAL: CT-M HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet							
	E	T	F	R	C	S	G	N
	Ell	BR	45-Ell	TeeRun	Couplg	SwgChk	GatVlv	NPTee
1.055	2.50	4.50	1.00	0.00	0.00	4.50	0.00	4.50

PAGE: P MATERIAL: CPVC HWC: 150

Diameter (in)	Equivalent Fitting Lengths in Feet				
	F	E	T	R	C
	45	90	Branch	Run	Coup.
1.101	1.00	7.00	5.00	1.00	1.00
2.003	2.00	11.00	10.00	1.00	1.00