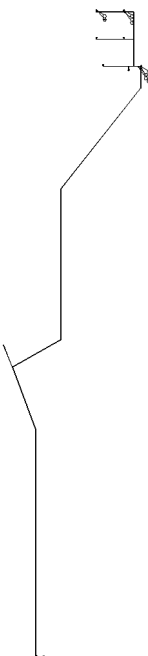
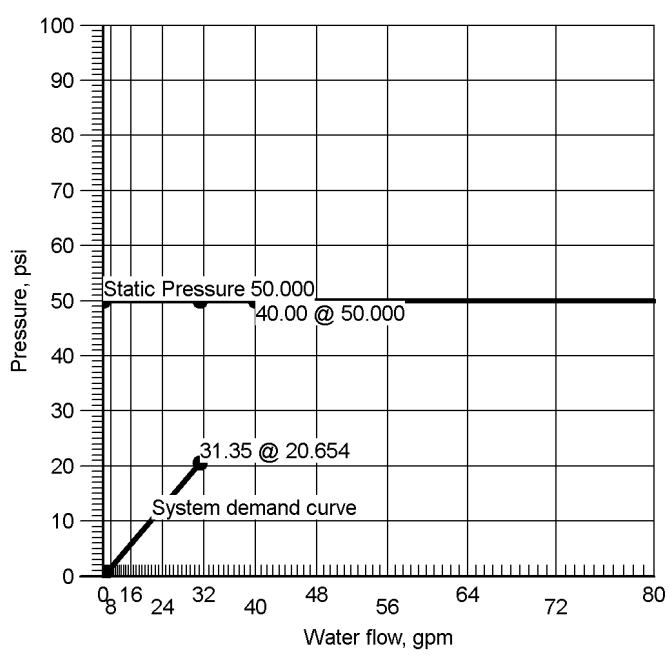




Hydraulic Overview

Job Number: 22981
Report Description: NFPA 13D 2019

Job					
Job Number 22981			Design Engineer L. CLEM		
Job Name: CASA LUNA			Phone		FAX
Address 1 7186 DRY CREEK ROAD			State Certification/License Number C16 656463		
Address 2 HEALDSBURG, CALIFORNIA			AHJ SCDES		
Address 3 AP# 139-170-003			Job Site/Building STUDIO		
System					
Density 0.050gpm/ft²			Area of Application 512.00ft²		
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039			Hose Streams 0.00		
Coverage Per Sprinkler 296.00ft²			Number Of Sprinklers Calculated 2		
System Pressure Demand 20.654			System Flow Demand 31.35		
Total Demand 31.35 @ 20.654			Pressure Result +29.346 (58.7%)		
Supplies			Check Point Gauges		
<u>Node</u>	<u>Name</u>	<u>Flow(gpm)</u>	<u>Hose Flow(gpm)</u>	<u>Static(psi)</u>	<u>Residual(psi)</u>
1	Water Supply	40.00		50.000	50.000
					
					
981Cash			Water Supply at Node 1 (40.00, 0.00, 50.000, 50.000)		



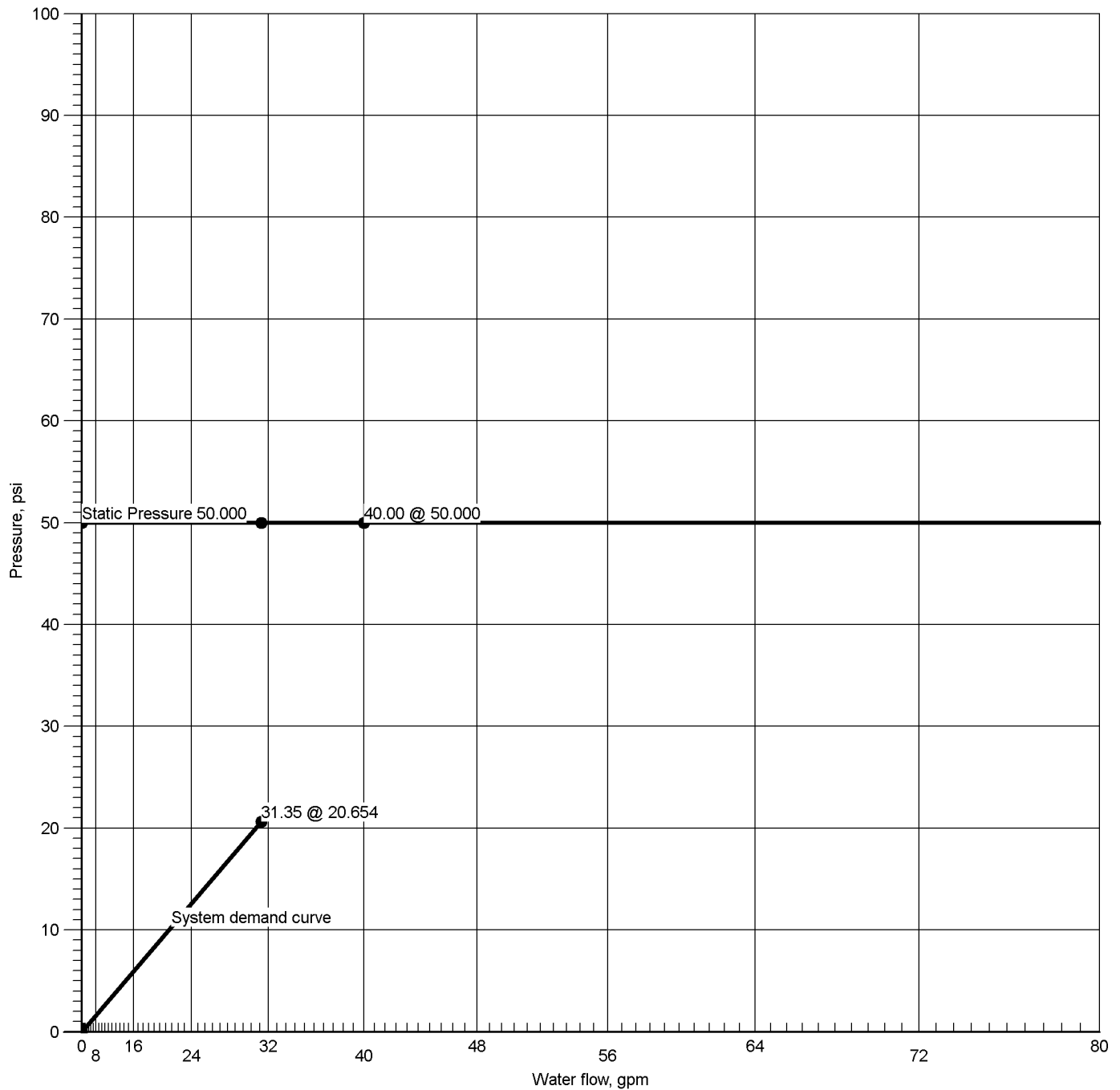
Hydraulic Summary

Job Number: 22981
Report Description: NFPA 13D 2019

Job											
Job Number 22981				Design Engineer L. CLEM							
Job Name: CASA LUNA				State Certification/License Number C16 656463							
Address 1 7186 DRY CREEK ROAD				AHJ SCDES							
Address 2 HEALDSBURG, CALIFORNIA				Job Site/Building STUDIO							
Address 3 AP# 139-170-003				Drawing Name 981Cash							
System				Remote Area(s)							
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039				Occupancy Residential				Job Suffix Manually Flowing			
Hose Allowance At Source 0.00				Density 0.050gpm/ft²				Area of Application 512.00ft²			
Additional Hose Supplies Node Hydrant At Node 3 Flow(gpm) 5.00				Number Of Sprinklers Calculated 2				Coverage Per Sprinkler 296.00ft²			
				AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area							
Total Hose Streams 5.00											
System Flow Demand 31.35		Total Water Required (Including Hose Allowance) 31.35									
Maximum Pressure Unbalance In Loops 0.000											
Maximum Velocity Above Ground 11.50 between nodes 2 and 3											
Maximum Velocity Under Ground 3.19 between nodes 1 and 2											
Volume capacity of Wet Pipes 44.81gal		Volume capacity of Dry Pipes									
Supplies											
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@	Flow (gpm)	Available (psi)	@	Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply		50.000	50.000		40.00	50.000		31.35	20.654	29.346
Contractor											
Contractor Number 22981		Contact Name JOE ALLEN					Contact Title MANAGER.				
Name of Contractor: SWAN PLUMBING AND FIRE PROTECTION		Phone 707-575-5541					Extension				
Address 1 3168 CONDO COURT		FAX									
Address 2 SANTA ROSA, CALIFORNIA		E-mail									
Address 3		Web-Site									



Water Supply at Node 1



Hydraulic Graph

Water Supply at Node 1

Static: Pressure
50.000

Residual: Pressure
50.000 @ 40.00

Available Pressure at Time of Test
50.000 @ 31.35

System Demand
20.654 @ 31.35

System Demand (Including Hose Allowance at Source)
20.654 @ 31.35



Summary Of Outflowing Devices

Job Number: 22981
Report Description: NFPA 13D 2019

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Hydrant	3	5.00	5.00	0	22.491		
➡ Sprinkler	101	13.00	13.00	4.9	7.039		
Sprinkler	102	13.35	13.00	4.9	7.418		

➡ Most Demanding Sprinkler Data



Node Analysis

Job Number: 22981

Report Description: NFPA 13D 2019

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)
1	12'-0	S	20.654	31.35
3	0'-10¾	Hyd	22.491	5.00
101	9'-5	Spr(-7.039)	7.039	13.00
102	9'-5	Spr(-7.418)	7.418	13.35
2	-0'-6	cplg(0'-6)	23.656	
4	1'-11¾	E(7'-0)	17.851	
5	9'-11	E(7'-0)	12.718	
6	9'-11	T(5'-0), Tr(1'-0)	7.619	
7	9'-11	E(7'-0)	7.052	
8	9'-11	E(7'-0)	7.442	



Hydraulic Analysis

Job Number: 22981
Report Description: NFPA 13D 2019

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream						Total Length	
Route 1							
DR	1.1010	13.00	4.38	150	0.030666	0'-6	Pf 0.230
101	9'-5	13.00	4.9	7.039	Sprinkler,	7'-0	Pe -0.217
7	9'-11			7.052	E(7'-0)	7'-6	Pv
BL	1.1010	13.00	4.38	150	0.030666	10'-6	Pf 0.567
7	9'-11			7.052		8'-0	Pe
6	9'-11			7.619	E(7'-0), Tr(1'-0)	18'-6	Pv
BL	1.1010	26.35	8.88	150	0.113283	25'-0	Pf 5.098
6	9'-11	13.35		7.619	Flow (q) from Route 2	20'-0	Pe
5	9'-11			12.718	2E(7'-0), Tr(1'-0), T(5'-0)	45'-0	Pv
FR	1.1010	26.35	8.88	150	0.113283	7'-11 1/4	Pf 1.692
5	9'-11			12.718		7'-0	Pe 3.441
4	1'-11 1/4			17.851	E(7'-0)	14'-11 1/4	Pv
FR	1.0550	26.35	9.67	150	0.139454	2'-1	Pf 4.172
4	1'-11 1/4			17.851		13'-6	Pe 0.467
3	0'-10 3/4			22.491	E(2'-0), f(-2.000), Tr(0'-6), sCV(11'-0), Hyd	15'-7	Pv
FR	1.0550	31.35	11.50	150	0.192331	1'-4 3/4	Pf 0.558
3	0'-10 3/4	5.00		22.491		1'-6	Pe 0.608
2	-0'-6			23.656	BalV(1'-0), cplg(0'-6)	2'-10 3/4	Pv
UG	2.0030	31.35	3.19	150	0.008474	242'-2	Pf 2.417
2	-0'-6			23.656		43'-0	Pe -5.419
1	12'-0			20.654	2E(11'-0), 5EE(2'-0), cplg(1'-0), T(10'-0), S	285'-2	Pv
		0.00			Hose Allowance At Source		
1		31.35					
Route 2							
DR	1.1010	13.35	4.50	150	0.032190	0'-6	Pf 0.241
102	9'-5	13.35	4.9	7.418	Sprinkler,	7'-0	Pe -0.217
8	9'-11			7.442	E(7'-0)	7'-6	Pv
BL	1.1010	13.35	4.50	150	0.032190	0'-6	Pf 0.177
8	9'-11			7.442		5'-0	Pe
6	9'-11			7.619	T(5'-0)	5'-6	Pv
Equivalent Pipe Lengths of Valves and Fittings (C=120 only)					C Value Multiplier		
$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$					Value Of C	100	130
					Multiplying Factor	0.713	1.16
						140	150
						1.33	1.51



Hydraulic Analysis

Job Number: 22981
Report Description: NFPA 13D 2019

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	
Pipe Type Legend		Units Legend				Fittings Legend		
AO	Arm-Over	Diameter	Inch			ALV	Alarm Valve	
BL	Branch Line	Elevation	Foot			AngV	Angle Valve	
CM	Cross Main	Flow	gpm			b	Bushing	
DN	Drain	Discharge	gpm			BaIV	Ball Valve	
DR	Drop	Velocity	fps			BFP	Backflow Preventer	
DY	Dynamic	Pressure	psi			BV	Butterfly Valve	
FM	Feed Main	Length	Foot			C	Cross Flow Turn 90°	
FR	Feed Riser	Friction Loss	psi/Foot			cplg	Coupling	
MS	Miscellaneous	HWC	Hazen-Williams Constant			Cr	Cross Run	
OR	Outrigger	Pt	Total pressure at a point in a pipe			CV	Check Valve	
RN	Riser Nipple	Pn	Normal pressure at a point in a pipe			DeIV	Deluge Valve	
SP	Sprig	Pf	Pressure loss due to friction between points			DPV	Dry Pipe Valve	
ST	Stand Pipe	Pe	Pressure due to elevation difference between indicated points			E	90° Elbow	
UG	Underground	Pv	Velocity pressure at a point in a pipe			EE	45° Elbow	
						Ee1	11¼° Elbow	
						Ee2	22½° Elbow	
						f	Flow Device	
						fd	Flex Drop	
						FDC	Fire Department Connection	
						fE	90° FireLock(TM) Elbow	
						fEE	45° FireLock(TM) Elbow	
						flg	Flange	
						FN	Floating Node	
						fT	FireLock(TM) Tee	
						g	Gauge	
						GloV	Globe Valve	
						GV	Gate Valve	
						Ho	Hose	
						Hose	Hose	
						HV	Hose Valve	
						Hyd	Hydrant	
						LtE	Long Turn Elbow	
						mecT	Mechanical Tee	
						Noz	Nozzle	
						P1	Pump In	
						P2	Pump Out	
						PIV	Post Indicating Valve	
						PO	Pipe Outlet	
						PRV	Pressure Reducing Valve	
						PrV	Pressure Relief Valve	
						red	Reducer/Adapter	
						S	Supply	
						sCV	Swing Check Valve	
						Spr	Sprinkler	
						St	Strainer	
						T	Tee Flow Turn 90°	
						Tr	Tee Run	
						U	Union	
						WirF	Wirsbo	
						WMV	Water Meter Valve	
						Z	Cap	

