

Hydraulic Calculations for

Project: BABU RES 2 HD CALC
2199 DIAMOND MTN. RD.
CALISTOGA, CA. 94515
COUNTY OF NAPA

Drawing no.: PAGE 2
Date: 11/2/2023

Design

Remote area number: UPPER RIDGE HEADS
Remote area location: HIGHEST ELEV.REMOTE
Occupancy classification: NFPA 13D
Density: 13 GPM/SPKLER MINIMUM
Area of application: 2 HEAD
Coverage per sprinkler: 16X16
Type of sprinklers calculated: CONCEALED PENDENTS
SENJU RC-RES SS48464 4.9K
No. of sprinklers calculated: 2
Hose streams: NA outside + 5 GAL DOMESTIC inside
Total water required (including hose streams): 31.36 gpm at -11.35 psi [16.35 psi safety margin (326.9%)]
Total water required at base of system riser: 26.36 gpm at 27.99 psi
Maximum water flow velocity: 11.51 ft/s
Type of system: Wet pipe

Water Supply Information

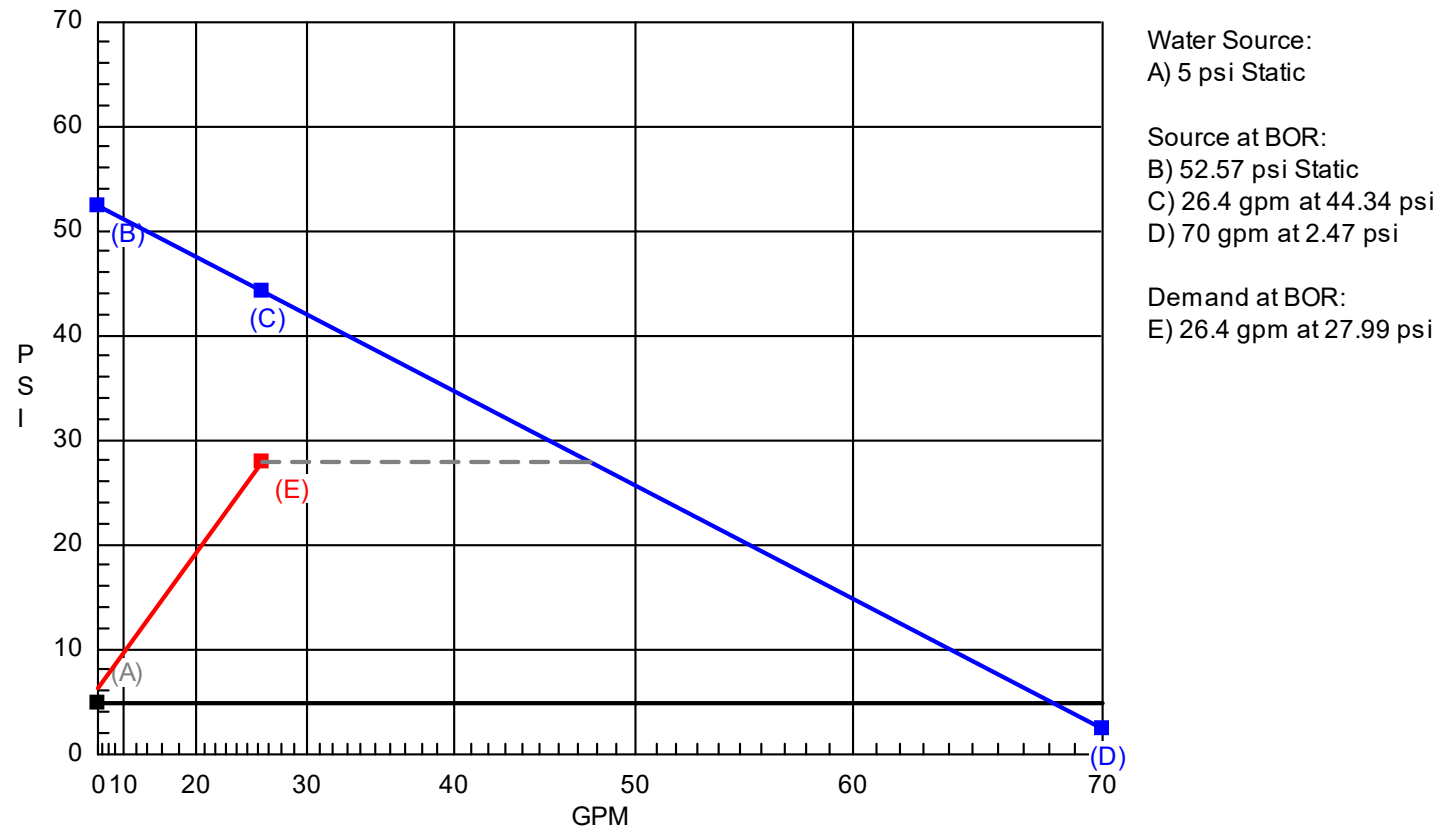
Date:
Location:
Source:

Contractor: CB PLUMBING & FIRE PROTECTION
Name of designer: BA
Authority having jurisdiction: COUNTY OF NAPA

Notes

BY OTHERS:
(N) PUMP SYSTEM - MINIMUM 40 GPM @ 40 PSI
TALCO 150C OR EQUAL.
(N) 2" PVC LINE FROM PUMP TO ASR
(E) 500 GALLON MIN. STORAGE TANK

Hydraulic Demand Graph



Node Analysis

Node Tag	Elev [ft]	Type	Pressure [psi]	Discharge [gpm]
T	0.000	source	-11.347	-31.362
P	0.000	ref	-11.519	0.000
U1	0.000	ref	31.069	0.000
u2	-3.000	ref	32.143	0.000
U3	-3.000	ref	31.885	0.000
BOR	1.000	ref	27.994	5.000
TOR	9.500	ref	16.634	0.000
1	9.500	ref	14.933	0.000
2	17.000	ref	10.154	0.000
3	17.000	ref	7.035	0.000
4	17.000	ref	6.636	0.000
H1	16.000	K=4.90	7.436	13.362
H2	16.000	K=4.90	7.039	13.000

Pipe Information

negative pipe flow (Q) indicates flow is from node 2 towards node 1

Node 1 Node 2	Elev [ft]	K-factor	Discharge & Flow [gpm]	Nom i.d. [in]	Fittings num & length [ft]	L [ft] F [ft] T [ft]	C factor psi/ft	total (Pt) elev (Pe) frict (Pf)	Notes
T	0.000		q= -31.362 Q= 31.362	2 2.003	2E=12.965 1G=1.296	6.000 14.261 20.261		Pt=-11.347 Pe= 0.000 Pf= 0.172	Mat="PVC"
P	0.000						C=150 0.008		
P	0.000		q= 0.000 Q= 31.362	2 2.003	2E=12.965	5.000 12.965 17.965		Pt=-11.519 Pe= 0.000 Pf= 0.152	Mat="PVC"
U1	0.000						C=150 0.008	Pdev=-42.74 psi	
U1	0.000		q= 0.000 Q= 31.362	2 2.003	1E=6.482	20.000 6.482 26.482		Pt= 31.069 Pe= -1.299 Pf= 0.225	Mat="PVC"
u2	-3.000						C=150 0.008		
u2	-3.000		q= 0.000 Q= 31.362	2 2.003	1E=6.482	24.000 6.482 30.482		Pt= 32.143 Pe= 0.000 Pf= 0.259	Mat="PVC"
U3	-3.000						C=150 0.008		
U3	-3.000		q= 0.000 Q= 31.362	1 1.055	2E=6.215	5.000 6.215 11.215		Pt= 31.885 Pe= 1.732 Pf= 2.159	Mat="CM"
BOR	1.000						C=150 0.193		
BOR	1.000		q= 5.000 Q= 26.362	1 1.055	2E=6.215 1G=1.554	8.500 7.768 16.268		Pt= 27.994 Pe= 3.681 Pf= 2.271	Mat="CM"
TOR	9.500						C=150 0.14		Pdev=5.41 psi
TOR	9.500		q= 0.000 Q= 26.362	1 1.101	1E=5.000 2TN=2.000	8.000 7.000 15.000		Pt= 16.634 Pe= 0.000 Pf= 1.701	Mat="CPVC"
1	9.500						C=150 0.113		
1	9.500		q= 0.000 Q= 26.362	1 1.101	1E=5.000	8.500 5.000 13.500		Pt= 14.933 Pe= 3.247 Pf= 1.531	Mat="CPVC"
2	17.000						C=150 0.113		
2	17.000		q= 0.000 Q= 26.362	1 1.101	1T=5.000	22.500 5.000 27.500		Pt= 10.154 Pe= 0.000 Pf= 3.119	Mat="CPVC"
3	17.000						C=150 0.031		
3	17.000		q= 0.000 Q= 13.000	1 1.101	1E=5.000	8.000 5.000 13.000		Pt= 7.035 Pe= 0.000 Pf= 0.399	Mat="CPVC"
4	17.000						C=150 0.032		
3	17.000		q= 0.000 Q= 13.362	1 1.101		1.000 0.000 1.000		Pt= 7.035 Pe= -0.433 Pf= 0.032	Mat="CPVC"
H1	16.000						C=150 0.031		
4	17.000		q= 0.000 Q= 13.000	1 1.101		1.000 0.000 1.000		Pt= 6.636 Pe= -0.433 Pf= 0.031	Mat="CPVC"
H2	16.000								

Material Codes

Pipe Material

CM - Copper Tube Type M
PVC - PVC C900 Pressure Class 150
CPVC - CPVC SDR 13.5 ASTM F442

Fittings

E - Standard 90 degree elbow
G - Gate Valve
E [CPVC] - ASTM CPVC 90 degree elbow
T [CPVC] - ASTM CPVC Tee - Flow turn 90 degrees
TN [CPVC] - ASTM CPVC Tee - Straight thru path

report created by the "Simple Hydraulic Calculator" version 2.3.8 from www.igneusinc.com

