

Hydraulic Calculations for



Project: MONTOYA MAIN RESIDENCE
COCKRILL STREET
BLOOMFIELD, CA.
APN - 026-100-027

Drawing no.: FPS- 02
Date: 1/21/2025

Design

Remote area number: 2
Remote area location: UF - BEDROOM
Occupancy classification: light hazard
Density: .05
Area of application: 400
Coverage per sprinkler: 20' X 20'
Type of sprinklers calculated: SENJU RC-RES 4.9K CONCEALED SSP
No. of sprinklers calculated: 1
Hose streams: none outside + 5 GPM DOMESTIC DEMAND inside
Total water required (including hose streams): 26.0 gpm at -22.87 psi [25.87 psi safety margin (862.2%)]
Total water required at base of system riser: 21.0 gpm at 36.36 psi
Maximum water flow velocity: 9.542 ft/s
Type of system: wet pipe

Water Supply Information

Date:
Location:
Source: PUMP

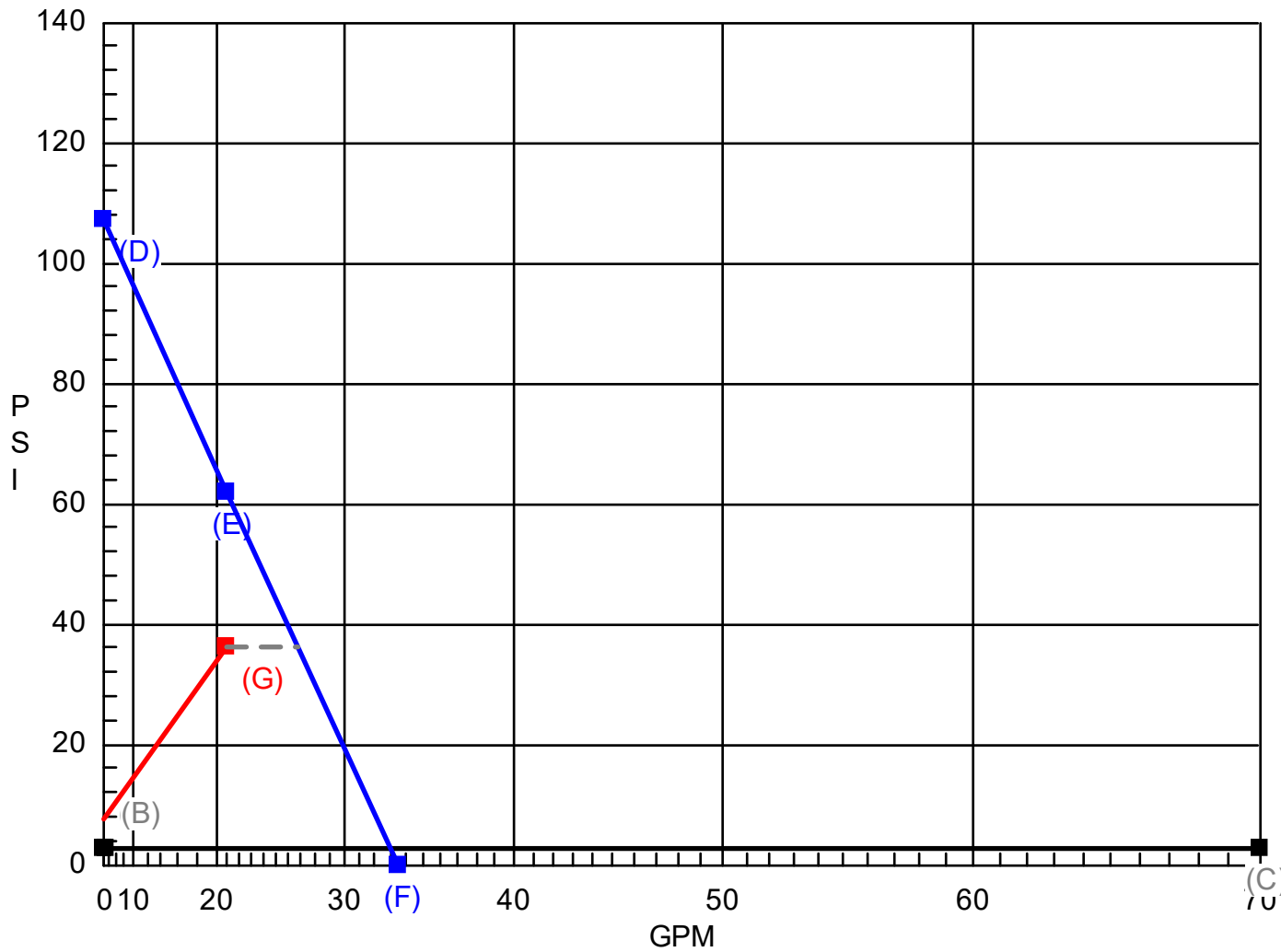
Contractor: NEMESIS FIRE PROTECTION
P.O. BOX 11651
SANTA ROSA, CA. 95406
707-495-5051

Name of designer: DDD
Authority having jurisdiction: SONOMA COUNTY

Notes

(N) 10,000 GAL WATER STORAGE TANK
(N) FIRE PUMP; 35 GPM @ 50 PSI minimum output
(N) 2" PVC PIPE FROM FIRE PUMP TO RESIDENCE
(N) 1" COPPER PIPE FROM UG TO BOTTOM OF ASR
(N) 1" ASR - AUTOMATIC SPRINKLER RISER

Hydraulic Demand Graph



Water Source:

- A) 3 psi Static
- B) 3 gpm at 3 psi
- C) 70 gpm at 3 psi

Source at BOR:

- D) 107.57 psi Static
- E) 21 gpm at 62.23 psi
- F) 33.5 gpm at 0 psi

Demand at BOR:

- G) 21 gpm at 36.36 psi

Supply Analysis

Node at	Static Pressure [psi]	Residual Pressure [psi]	Flow [gpm]	Available Pressure [psi]	Total Demand [gpm]	Required Pressure [psi]
TNK	3.0	3.0	3.0	3.0	26.0	-22.87

Node Analysis

Node Tag	Elev [ft]	Type	Pressure [psi]	Discharge [gpm]
TNK	501.000	source	-22.866	-26.000
EP	501.000	ref	44.088	0.000
UG1	496.000	ref	46.025	0.000
UG2	496.000	ref	45.489	0.000
DOM	501.000	ref	37.493	5.000
BOR	502.000	ref	36.364	0.000
TOR	504.000	ref	30.552	0.000
7	510.000	ref	27.061	0.000
6	510.000	ref	26.937	0.000
5	520.000	ref	22.370	0.000
4	520.000	ref	22.087	0.000
3	520.000	ref	21.607	0.000
1	520.000	ref	21.983	0.000
H1	520.000	ref	21.983	0.000
H2	520.000	ref	21.862	0.000
H3	520.000	K=4.90	18.367	21.000

Pipe Information

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

Node 1	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
H1	520.000		q= 0.000 Q= 0.000	1	1E=5.000 1T=6.000	5.000 11.000 16.000	C=150	Pt= 21.983 Pe= 0.000 Pf= 0.000	Mat="CPVC"
1	520.000						0		
1	520.000		q= 0.000 Q= 5.588	1	2T=12.000	6.750 12.000	C=150	Pt= 21.983 Pe= 0.000	Mat="CPVC"
H2	520.000					18.750	0.006	Pf= 0.121	
H2	520.000		q= 0.000 Q= 5.588	1	3T=18.000	21.750 18.000	C=150	Pt= 21.862 Pe= 0.000	Mat="CPVC"
3	520.000					39.750	0.006	Pf= 0.256	
H3	520.000	4.9	q= 21.000 Q= -21.000	1	1E=5.000 1T=6.000	32.500 11.000	C=150	Pt= 18.367 Pe= 0.000	Mat="CPVC"
3	520.000					43.500	0.074	Pf= -3.239	
3	520.000		q= 0.000 Q= -15.412	1	1E=5.000 1T=6.000	15.750 11.000	C=150	Pt= 21.607 Pe= -4.330	Mat="CPVC"
7	510.000					26.750	0.042	Pf= -1.124	
1	520.000		q= 0.000 Q= -5.588	1	1T=6.000	10.250 6.000	C=150	Pt= 21.983 Pe= 0.000	Mat="CPVC"
4	520.000					16.250	0.006	Pf= -0.105	
4	520.000		q= 0.000 Q= -5.588	1	2E=10.000 1T=6.000	28.000 16.000	C=150	Pt= 22.087 Pe= 0.000	Mat="CPVC"
5	520.000					44.000	0.006	Pf= -0.283	
5	520.000		q= 0.000 Q= -5.588	1	1T=6.000	30.750 6.000	C=150	Pt= 22.370 Pe= -4.330	Mat="CPVC"
6	510.000					36.750	0.006	Pf= -0.236	
6	510.000		q= 0.000 Q= -5.588	1	1T=6.000	13.250 6.000	C=150	Pt= 26.937 Pe= 0.000	Mat="CPVC"
7	510.000					19.250	0.006	Pf= -0.124	
7	510.000		q= 0.000 Q= -21.000	1	1T=6.000	6.000 6.000	C=150	Pt= 27.061 Pe= -2.598	Mat="CPVC"
TOR	504.000					12.000	0.074	Pf= -0.894	
TOR	504.000		q= 0.000 Q= -21.000	1	1C=7.768	2.000 7.768	C=150	Pt= 30.552 Pe= -0.866	Mat="CM" Pdev=-4.05 psi
BOR	502.000					9.768	0.092	Pf= -0.895	
BOR	502.000		q= 0.000 Q= -21.000	1	2CME=6.600	1.000 6.600	C=150	Pt= 36.364 Pe= -0.433	Mat="CM"
DOM	501.000					7.600	0.092	Pf= -0.697	
DOM	501.000		q= 5.000 Q= -26.000	1	1LV=38.841	4.000 38.841	C=150	Pt= 37.493 Pe= -2.165	Mat="CM"
UG2	496.000					42.841	0.136	Pf= -5.830	
UG2	496.000		q= 0.000 Q= -26.000	2	3E=19.447	70.000 19.447	C=150	Pt= 45.489 Pe= 0.000	Mat="PVC"
UG1	496.000					89.447	0.006	Pf= -0.536	

Pipe Information, cont.

Node 1	Elev	K-factor	Discharge & Flow	Nom i.d.	Fittings num & length	L [ft]	C factor	total (Pt) elev (Pe)	Notes
Node 2	[ft]		[gpm]	[in]	[ft]	F [ft]	psi/ft	frict (Pf)	
UG1	496.000		q= 0.000 Q= -26.000	2 2.003	2E=12.965	25.000		Pt= 46.025 Pe= 2.165	Mat="PVC"
EP	501.000					37.965	0.006	Pf= -0.228	
EP	501.000		q= 0.000 Q= -26.000	2 2.003	3E=19.447 1LV=68.713	10.000		Pt= 44.088 Pe= 0.000	Mat="PVC" Pdev=67.54 psi
TNK	501.000					98.160	0.006	Pf= -0.589	

Material Codes

Pipe Material

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

Fittings

C - Check Valve (Swing)
 E - Standard 90 degree elbow
 LV - Globe Valve
 CME [CM] - COPPER M 90 EL
 E [CPVC] - ASTM CPVC 90 degree elbow
 T [CPVC] - ASTM CPVC Tee - Flow turn 90 degrees

