

HYDRAULIC DESIGN INFORMATION SHEET

Name - Munjoy heights Date - 2-21-14
Location - second floor
Building - F System No. - 1 of 1
Contractor - Residential Fire Protection Contract No. - C14005
Calculated By - JAL Drawing No. - 6 of 7
Construction: (X) Combustible () Non-Combustible Ceiling Height 8'-9"
OCCUPANCY - Residential

S Type of Calculation: ()NFPA 13 Residential (X)NFPA 13R ()NFPA 13D
Y Number of Sprinklers Flowing: ()1 ()2 (X)4 ()
S ()Other
T ()Specific Ruling Made by Date
E
M Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 7 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16 x 16 () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - 100 Gpm Make Viking Model VK468
I Elevation at Highest Outlet - Feet Size 1/2" K-Factor 4.9
G Note:Safety Margin: 12.210 Temperature Rating
N

Calculation Gpm Required 158.696 Psi Required 50.642 At Test
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 11-7-13 Rated Cap. Cap.
T Time of Test - 12:35 PM @ Psi Elev.
E Static (Psi) - 63 Elev.
R Residual (Psi) - 58 Other Well
Flow (Gpm) - 1061 Proof Flow Gpm
S Elevation - 0

P Location:
P
L Source of Information:
Y

Water Supply Curve (C)

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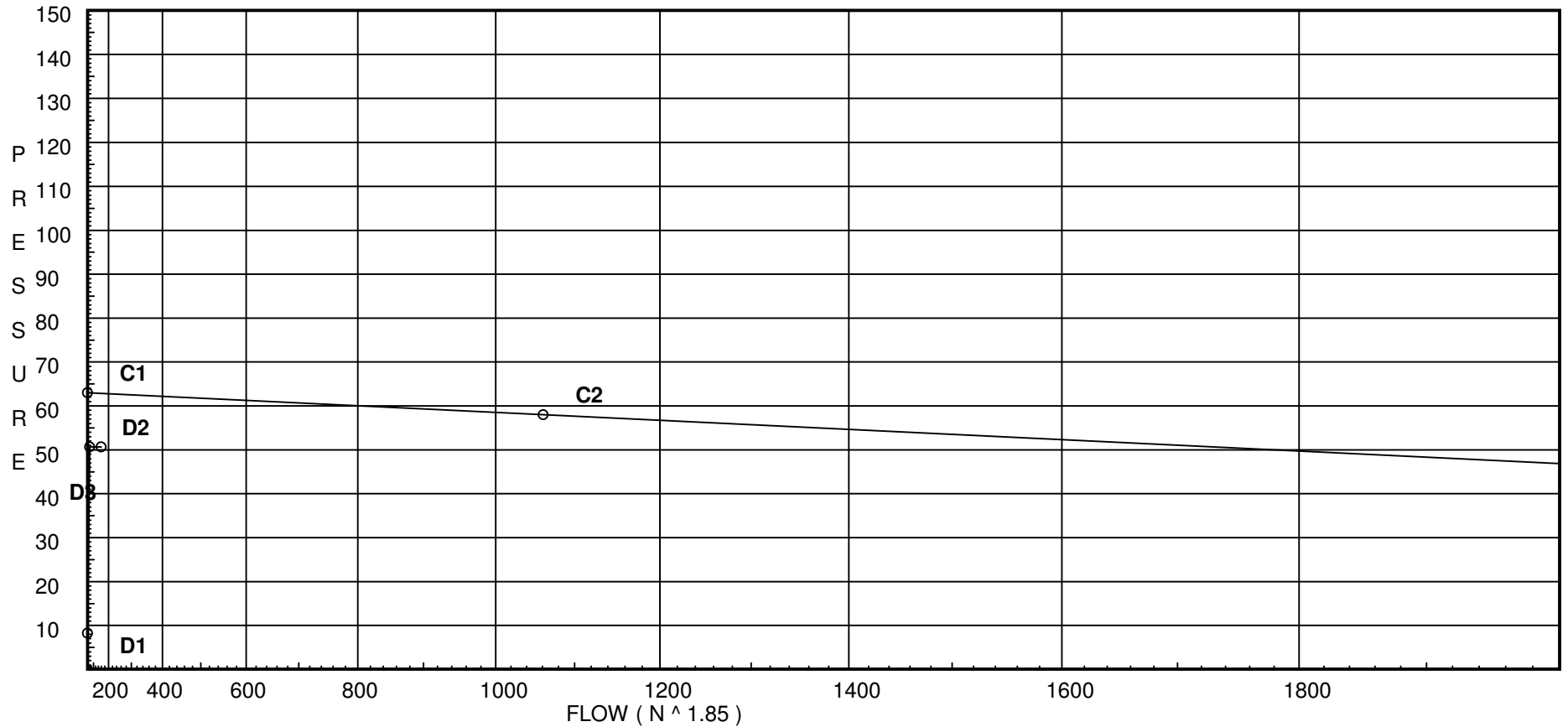
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City Water Supply:

C1 - Static Pressure : 63
C2 - Residual Pressure: 58
C2 - Residual Flow : 1061

Demand:

D1 - Elevation : 8.229
D2 - System Flow : 58.696
D2 - System Pressure : 50.642
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 158.696
Safety Margin : 12.210



Fittings Used Summary

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Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N	CPVC 90'El Harvel-Spears	7	7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
T	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	19.0	4.9	7.04	na	13.0	0.1	130	7.0
2	19.0	4.9	7.69	na	13.59	0.1	130	7.0
3	19.0	4.9	9.28	na	14.93	0.1	130	7.0
3A	0.0		17.96	na				
4	19.0	4.9	12.3	na	17.18	0.1	130	7.0
5	0.0		21.12	na				
6	0.0		21.61	na				
7	0.0		25.46	na				
16	0.0		22.57	na				
17	0.0		26.43	na				
18	0.0		33.92	na				
TR	-5.0		38.25	na				
BR	0.0		44.22	na				
UNG1	0.0		46.56	na	100.0			
TEST	0.0		50.64	na				

The maximum velocity is 13.99 and it occurs in the pipe between nodes 3A and 5

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
1 to 2	13.00 13.0	1.101 150 0.0306	1N	7.0 0.0 0.0	14.250 7.000 21.250	7.039 0.0 0.651			K Factor = 4.90 Vel = 4.38	
2 to 3A	13.59 26.59	1.101 150 0.1152	1O	5.0 0.0 0.0	12.750 5.000 17.750	7.690 8.229 2.045			K Factor = 4.90 Vel = 8.96	
	0.0 26.59					17.964			K Factor = 6.27	
3 to 3A	14.93 14.93	0.874 150 0.1216	1O	3.0 0.0 0.0	0.750 3.000 3.750	9.279 8.229 0.456			K Factor = 4.90 Vel = 7.98	
3A to 5	26.58 41.51	1.101 150 0.2628		0.0 0.0 0.0	12.000 0.0 12.000	17.964 0.0 3.153			Vel = 13.99	
	0.0 41.51					21.117			K Factor = 9.03	
4 to 5	17.18 17.18	0.874 150 0.1579	1O	3.0 0.0 0.0	0.750 3.000 3.750	12.296 8.229 0.592			K Factor = 4.90 Vel = 9.19	
5 to 6	41.52 58.7	1.394 150 0.1581		0.0 0.0 0.0	3.100 0.0 3.100	21.117 0.0 0.490			Vel = 12.34	
6 to 7	-29.35 29.35	1.394 150 0.0438		0.0 0.0 0.0	88.000 0.0 88.000	21.607 0.0 3.858			Vel = 6.17	
	0.0 29.35					25.465			K Factor = 5.82	
6 to 16	29.35 29.35	1.394 150 0.0439	2O	12.0 0.0 0.0	10.000 12.000 22.000	21.607 0.0 0.965			Vel = 6.17	
	0.0 29.35					22.572			K Factor = 6.18	
7 to 17	29.35 29.35	1.394 150 0.0438	2O	12.0 0.0 0.0	10.000 12.000 22.000	25.465 0.0 0.964			Vel = 6.17	
	0.0 29.35					26.429			K Factor = 5.71	
16 to 17	29.35 29.35	1.394 150 0.0438		0.0 0.0 0.0	88.000 0.0 88.000	22.572 0.0 3.857			Vel = 6.17	
17 to 18	29.35 58.7	1.394 150 0.1580	1N	8.0 0.0 0.0	39.400 8.000 47.400	26.429 0.0 7.491			Vel = 12.34	
18 to TR	0.0 58.7	1.61 120 0.1184	2E 1T	8.0 8.0 0.0	2.300 16.000 18.300	33.920 2.166 2.166			Vel = 9.25	
TR to BR	0.0 58.7	1.61 120 0.1184	1E 1Z	4.0 4.0 0.0	10.000 8.000 18.000	38.252 3.834 2.132			* Fixed loss = 6 Vel = 9.25	

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
BR	0.0	1.92	1T 10.55	60.000	44.218				
to UNG1	58.7	150 0.0332	0.0	10.550	0.0				
			0.0	70.550	2.344		Vel = 6.50		
UNG1	100.00	8.27	1T 55.354	290.000	46.562		Qa = 100		
to TEST	158.7	140 0.0002	1G 6.326	118.616	4.000		* Fixed loss = 4		
			4F 56.936	408.616	0.080		Vel = 0.95		
	0.0								
	158.70				50.642		K Factor = 22.30		