HYDRAULIC DESIGN INFORMATION SHEET

Name - Munjoy heights Date - 2-21-14
Location - Third floor
Building - D System No. - 1 of 1
Contractor - Residential Fire Protection Contract No. - C14005
Calculated By - JAL Drawing No. - 4 of 7
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 9'-5"
OCCUPANCY - Residential

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 10.6 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction
Domestic Flow Added - Gpm Sprinkler or Nozzle
Additional Flow Added - 100 Gpm Make Viking Model VK486
Elevation at Highest Outlet - Feet Size 1/2" K-Factor 4.0
Note:Safety Margin: 11.580 Temperature Rating

Calculation Summary: Gpm Required 151.477 Psi Required 51.283 At Test
C-Factor Used: Overhead 150 Underground 150

WATER SUPPLY

Water Flow Test:
Date of Test - 11-7-13
Time of Test - 12:35 PM
Static (Psi) - 63
Residual (Psi) - 58
Flow (Gpm) - 1061
Elevation - 0

Pump Data:
Rated Cap.
@ Psi
Elev.
Other

Tank or Reservoir:
Cap.
Elev.

Well
Proof Flow Gpm

Location:

Source of Information:

Water Supply Curve (C)

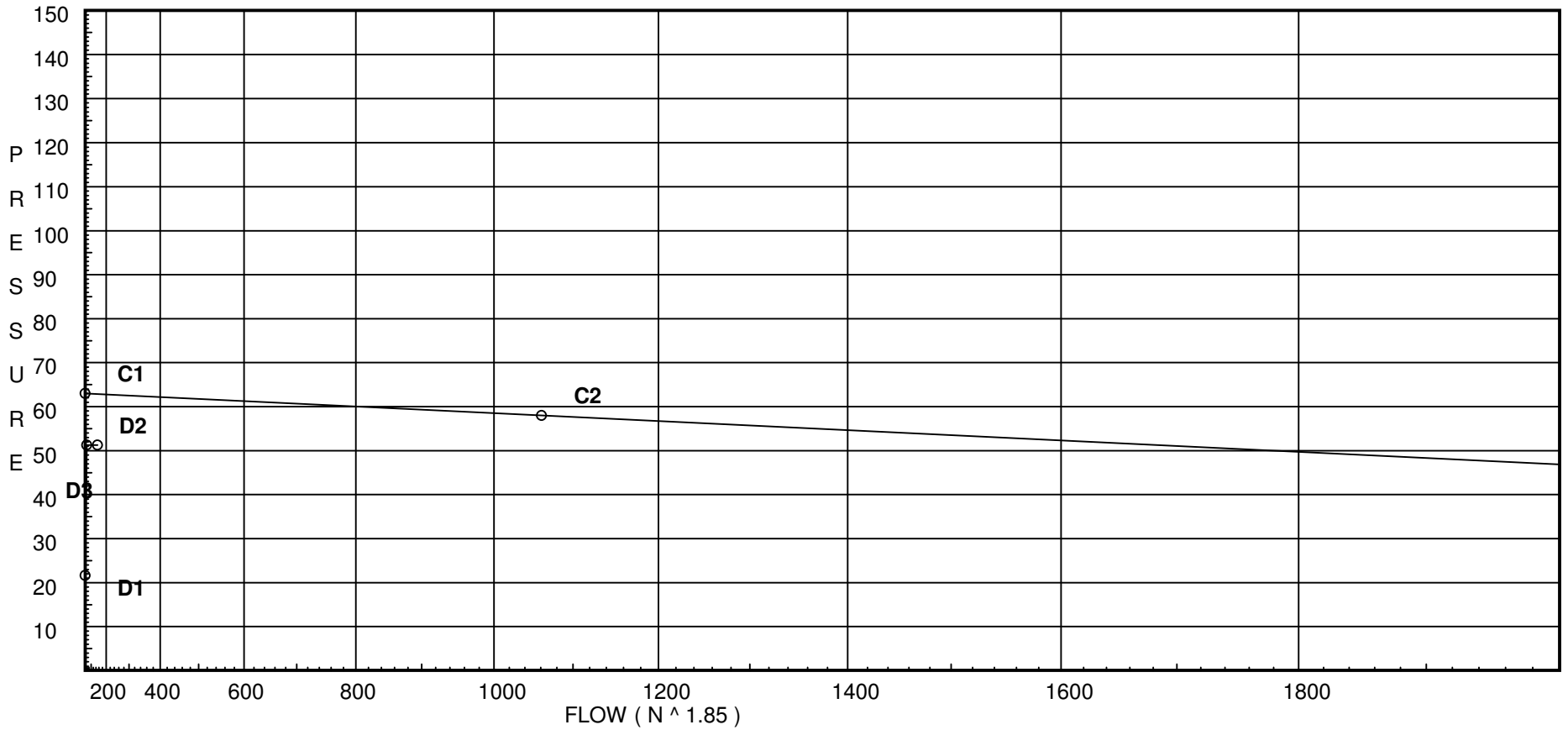
Residential Fire Protection
Munjoy Heights building D

Date 2-21-14

City Water Supply:
- C1 - Static Pressure : 63
- C2 - Residual Pressure: 58
- C2 - Residual Flow : 1061

Demand:

D1 - Elevation	:	21.655
D2 - System Flow	:	51.477
D2 - System Pressure	:	51.283
Hose (Adj City)	:	_____
Hose (Demand)	:	100
D3 - System Demand	:	151.477
Safety Margin	:	11.580



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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'Ell 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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	50.0	4	7.6	na	11.03	0.1	110	7.6
1A	50.0		9.18	na				
2	50.0	4	8.67	na	11.78	0.1	110	7.6
2A	50.0		9.46	na				
3	40.0	4	12.59	na	14.19	0.1	130	10.6
4	40.0	4	13.1	na	14.48	0.1	130	10.6
10	50.0		10.47	na				
11	50.0		9.67	na				
11A	50.0		10.07	na				
12	50.0		11.31	na				
13	50.0		12.02	na				
14	50.0		12.48	na				
23	50.0		12.66	na				
24	50.0		12.79	na				
33	50.0		12.97	na				
34	50.0		13.43	na				
35	50.0		16.49	na				
TR	5.0		36.63	na				
BR	0.0		45.34	na				
UNG1	0.0		47.18	na	100.0			
TEST	0.0		51.28	na				

The maximum velocity is 10.82 and it occurs in the pipe between nodes 12 and 13

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
1	11.03	0.824		0.0	11.250	7.600		K Factor = 4.00
to		120		0.0	0.0	0.0		
1A	11.03	0.1402		0.0	11.250	1.577		Vel = 6.64
1A	0.0	1.049	2N	14.0	16.000	9.177		
to		120		0.0	14.000	0.0		
10	11.03	0.0433		0.0	30.000	1.298		Vel = 4.09
	0.0							
	11.03					10.475		K Factor = 3.41
2	11.78	0.874		0.0	10.000	8.672		K Factor = 4.00
to		150		0.0	0.0	0.0		
2A	11.78	0.0787		0.0	10.000	0.787		Vel = 6.30
2A	0.0	1.101	1N	7.0	12.000	9.459		
to		150	1O	5.0	12.000	0.0		
11A	11.78	0.0255		0.0	24.000	0.613		Vel = 3.97
	0.0							
	11.78					10.072		K Factor = 3.71
3	14.19	0.874	1O	3.0	10.000	12.585		K Factor = 4.00
to		150	1N	7.0	10.000	-4.331		
10	14.19	0.1110		0.0	20.000	2.221		Vel = 7.59
	0.0							
	14.19					10.475		K Factor = 4.38
4	14.48	1.101	1O	5.0	12.000	13.104		K Factor = 4.00
to		150	1N	7.0	12.000	-4.331		
11	14.48	0.0375		0.0	24.000	0.899		Vel = 4.88
	0.0							
	14.48					9.672		K Factor = 4.66
10	25.22	1.101	1O	5.0	3.000	10.475		
to		150		0.0	5.000	0.0		
12	25.22	0.1044		0.0	8.000	0.835		Vel = 8.50
	0.0							
	25.22					11.310		K Factor = 7.50
11	14.48	1.101		0.0	10.680	9.672		
to		150		0.0	0.0	0.0		
11A	14.48	0.0375		0.0	10.680	0.400		Vel = 4.88
11A	11.78	1.101	1O	5.0	6.000	10.072		
to		150		0.0	5.000	0.0		
12	26.26	0.1125		0.0	11.000	1.238		Vel = 8.85
12	25.22	1.394		0.0	5.750	11.310		
to		150		0.0	0.0	0.0		
13	51.48	0.1240		0.0	5.750	0.713		Vel = 10.82
13	-20.66	1.598	2O	16.0	10.000	12.023		
to		150		0.0	16.000	0.0		
23	30.82	0.0247		0.0	26.000	0.642		Vel = 4.93
	0.0							
	30.82					12.665		K Factor = 8.66
13	20.66	1.598		0.0	39.000	12.023		
to		150		0.0	0.0	0.0		
14	20.66	0.0118		0.0	39.000	0.459		Vel = 3.30

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
14	0.0	1.598	2O	16.0	10.000	12.482		
to		150		0.0	16.000	0.0		
24	20.66	0.0118		0.0	26.000	0.306		Vel = 3.30
	0.0							
	20.66					12.788		K Factor = 5.78
23	10.16	1.598		0.0	39.000	12.665		
to		150		0.0	0.0	0.0		
24	10.16	0.0032		0.0	39.000	0.123		Vel = 1.63
	0.0							
	10.16					12.788		K Factor = 2.84
23	20.66	1.598	2O	16.0	10.000	12.665		
to		150		0.0	16.000	0.0		
33	20.66	0.0118		0.0	26.000	0.306		Vel = 3.30
	0.0							
	20.66					12.971		K Factor = 5.74
24	30.82	1.598	2O	16.0	10.000	12.788		
to		150		0.0	16.000	0.0		
34	30.82	0.0247		0.0	26.000	0.642		Vel = 4.93
	0.0							
	30.82					13.430		K Factor = 8.41
33	20.66	1.598		0.0	39.000	12.971		
to		150		0.0	0.0	0.0		
34	20.66	0.0118		0.0	39.000	0.459		Vel = 3.30
34	30.82	1.598	1N	9.0	39.000	13.430		
to		150		0.0	9.000	0.0		
35	51.48	0.0638		0.0	48.000	3.060		Vel = 8.24
35	0.0	2.067	2E	10.0	3.500	16.490		
to		120	1T	10.0	20.000	19.490		
TR	51.48	0.0274		0.0	23.500	0.645		Vel = 4.92
TR	0.0	2.067	1E	5.0	10.000	36.625		
to		120	1Z	5.0	10.000	8.166		* Fixed loss = 6
BR	51.48	0.0275		0.0	20.000	0.550		Vel = 4.92
BR	0.0	1.92	1T	10.55	60.000	45.341		
to		150		0.0	10.550	0.0		
UNG1	51.48	0.0261		0.0	70.550	1.839		Vel = 5.70
UNG1	100.00	8.27	1T	55.354	460.000	47.180		Qa = 100
to		140	1G	6.326	118.616	4.000		* Fixed loss = 4
TEST	151.48	0.0002	4F	56.936	578.616	0.103		Vel = 0.90
	0.0							
	151.48					51.283		K Factor = 21.15