

HYDRAULIC DESIGN INFORMATION SHEET

Name - Munjoy heights Date - 2-21-14  
Location - second floor  
Building - E System No. - 1 of 1  
Contractor - Contract No. - C14005  
Calculated By - Drawing No. - 5 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: 14.403 Temperature Rating  
N

Calculation Gpm Required 155.808 Psi Required 48.453 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)

Residential Fire Protection  
Munjoy Heights building E

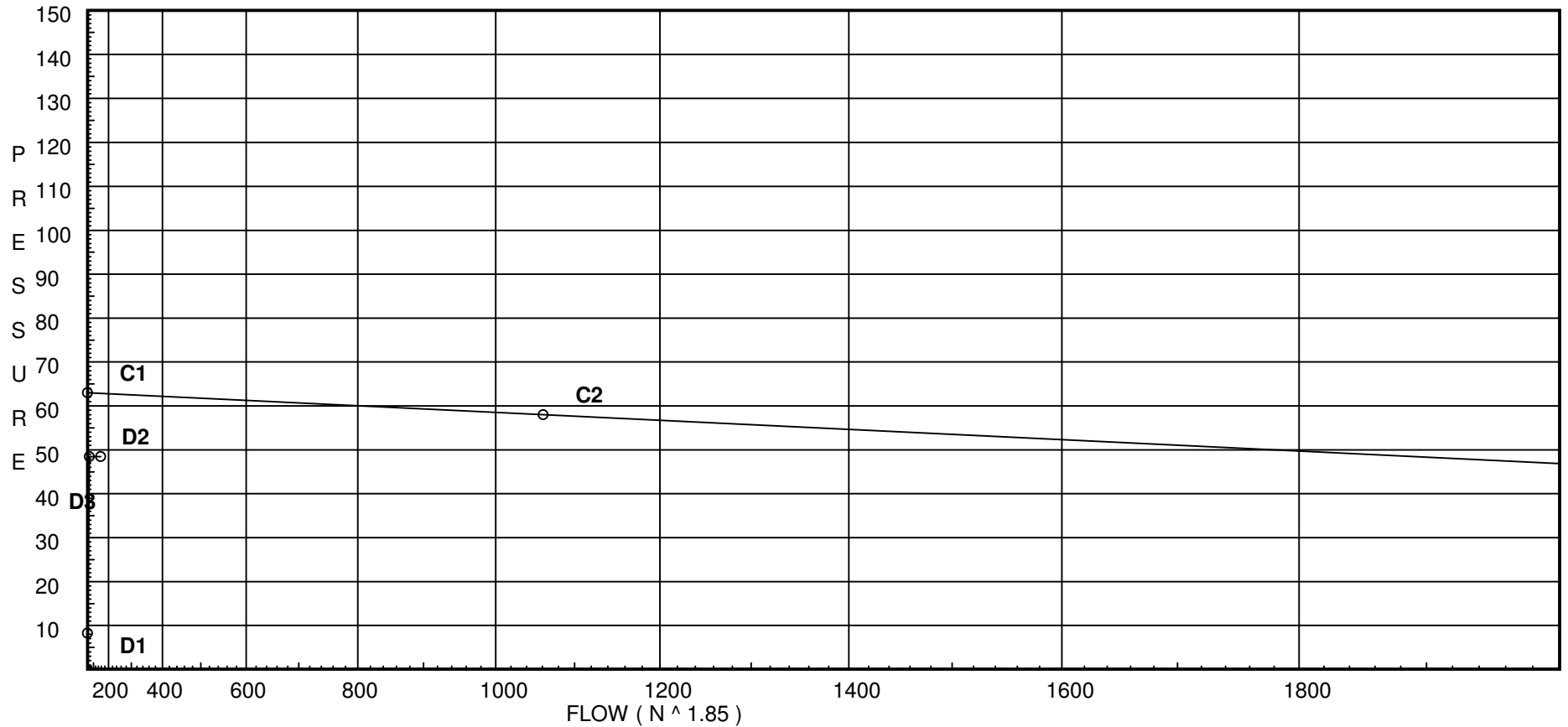
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### City Water Supply:

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

### Demand:

D1 - Elevation : 8.229  
D2 - System Flow : 55.808  
D2 - System Pressure : 48.453  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : 100  
D3 - System Demand : 155.808  
Safety Margin : 14.403



# 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
4	19.0	4.9	8.68	na	14.43	0.1	130	7.0
4A	0.0		17.34	na				
3	19.0	4.9	9.1	na	14.79	0.1	130	7.0
5	0.0		17.78	na				
6	0.0		18.83	na				
7	0.0		21.58	na				
16	0.0		19.7	na				
17	0.0		22.46	na				
18	0.0		32.22	na				
TR	-5.0		36.44	na				
BR	0.0		42.21	na				
UNG1	0.0		44.35	na	100.0			
TEST	0.0		48.45	na				

The maximum velocity is 11.73 and it occurs in the pipe between nodes 5 and 6

# Final Calculations - Hazen-Williams

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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	*****
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	
2 to 5	13.59 26.59	1.101 150 0.1152	1O	5.0 0.0 0.0	11.170 5.000 16.170	7.690 8.229 1.863			K Factor = 4.90	
	0.0 26.59					17.782			K Factor = 6.31	
4 to 4A	14.43 14.43	0.874 150 0.1147	1O	3.0 0.0 0.0	0.750 3.000 3.750	8.677 8.229 0.430			K Factor = 4.90	
4A to 5	0.0 14.43	1.101 150 0.0372		0.0 0.0 0.0	12.000 0.0 12.000	17.336 0.0 0.446				Vel = 4.86
	0.0 14.43					17.782			K Factor = 3.42	
3 to 5	14.78 14.78	0.874 150 0.1197	1O	3.0 0.0 0.0	0.750 3.000 3.750	9.104 8.229 0.449			K Factor = 4.90	
5 to 6	41.03 55.81	1.394 150 0.1440		0.0 0.0 0.0	7.250 0.0 7.250	17.782 0.0 1.044				Vel = 11.73
6 to 7	-27.91 27.9	1.394 150 0.0399		0.0 0.0 0.0	69.000 0.0 69.000	18.826 0.0 2.755				Vel = 5.87
	0.0 27.90					21.581			K Factor = 6.01	
6 to 16	27.90 27.9	1.394 150 0.0399	2O	12.0 0.0 0.0	10.000 12.000 22.000	18.826 0.0 0.878				Vel = 5.87
	0.0 27.90					19.704			K Factor = 6.29	
7 to 17	27.90 27.9	1.394 150 0.0400	2O	12.0 0.0 0.0	10.000 12.000 22.000	21.581 0.0 0.879				Vel = 5.87
	0.0 27.90					22.460			K Factor = 5.89	
16 to 17	27.90 27.9	1.394 150 0.0399		0.0 0.0 0.0	69.000 0.0 69.000	19.704 0.0 2.756				Vel = 5.87
17 to 18	27.91 55.81	1.394 150 0.1439	1EqL	31.744 0.0 0.0	37.600 30.221 67.821	22.460 0.0 9.762				Vel = 11.73
18 to TR	0.0 55.81	1.61 120 0.1078	2E 1T	8.0 8.0 0.0	3.000 16.000 19.000	32.222 2.166 2.049				Vel = 8.80
TR to BR	0.0 55.81	1.61 120 0.1078	1E 1Z	4.0 4.0 0.0	10.000 8.000 18.000	36.437 3.834 1.941			* Fixed loss = 6	Vel = 8.80

# 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	42.212				
to UNG1	55.81	150 0.0303	0.0	10.550	0.0				
			0.0	70.550	2.136		Vel = 6.18		
UNG1	100.00	8.27	1T 55.354	440.000	44.348				
to TEST	155.81	140 0.0002	1G 6.326	118.616	4.000				
			4F 56.936	558.616	0.105		Qa = 100 * Fixed loss = 4 Vel = 0.93		
	0.0								
	155.81				48.453		K Factor = 22.38		