

. . . Fire Protection by Computer Design

Residential Fire Protection
64 Daggett Hill Rd.
Greene, ME 04236
946-3473

Job Name : 65 Munjoy Street
Building : WOOD STRUCTURE
Location : 3RD FLOOR APARTMENT
System : WET
Contract : 16038
Data File : 65 Munjoy St-3rd Flr-Hyd Calc.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 65 MUNJOY STREET Date - 1/9/16
Location - 3RD FLOOR APARTMENT
Building - WOOD STRUCTURE System No. - WET
Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - 16038
Calculated By - T. PRAY Drawing No. - 1 OF 1
Construction: (X) Combustible () Non-Combustible Ceiling Height 8'8.5"
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 - Gpm Make VIKING Model VK486
I Elevation at Highest Outlet - 31.25Feet Size 7/16" K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 55.86 Psi Required 40.15 At Test
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 7/15/1991 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 44 Elev.
R Residual (Psi) - 37 Other Well
Flow (Gpm) - 503 Proof Flow Gpm
S Elevation - 1

P Location: HYDRANTS ARE LOCATED ON MUNJOY STREET, SEE PLOT PLAN

L Source of Information: PORTLAND WATER DISTRICT
Y

Water Supply Curve (C)

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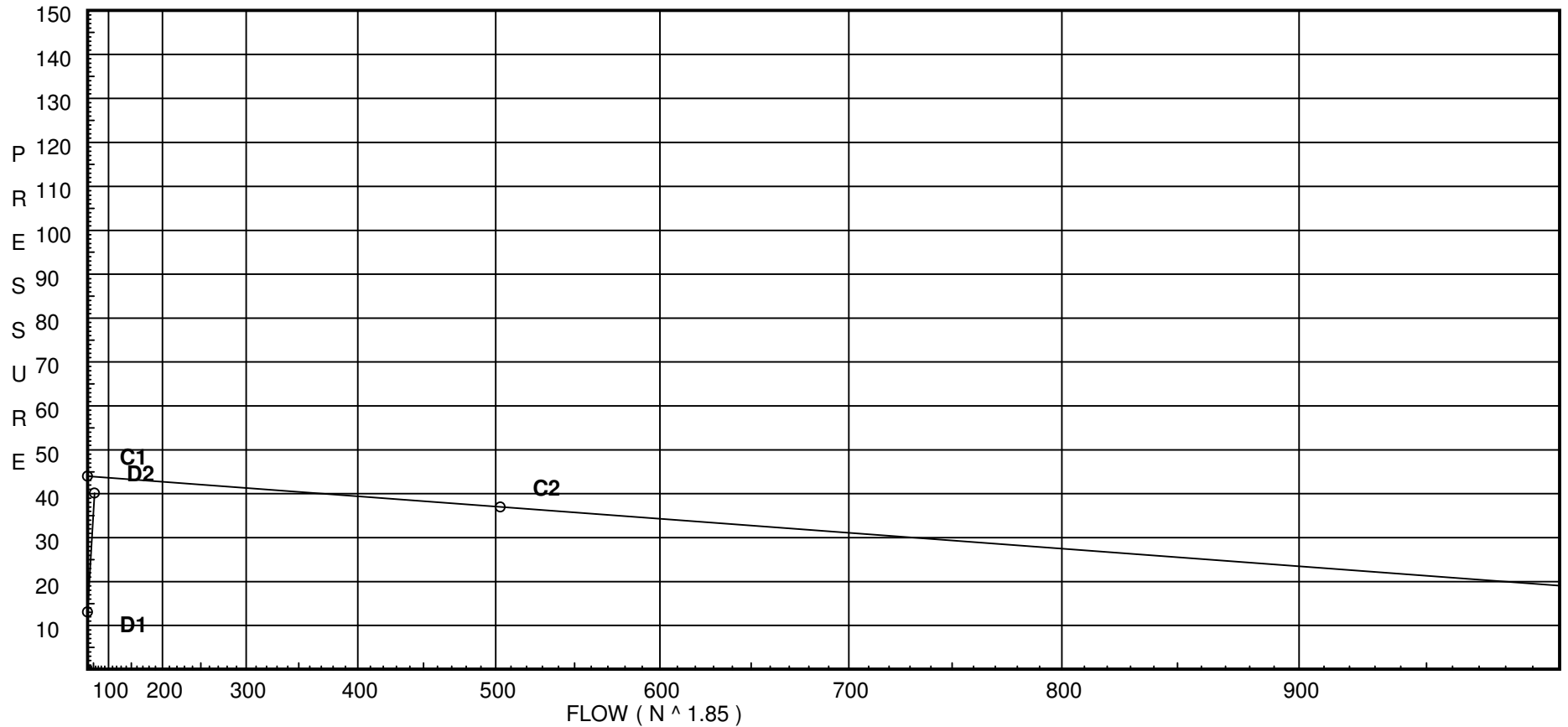
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City Water Supply:

C1 - Static Pressure : 44
C2 - Residual Pressure: 37
C2 - Residual Flow : 503

Demand:

D1 - Elevation : 13.101
D2 - System Flow : 55.8585
D2 - System Pressure : 40.151
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 55.8585
Safety Margin : 3.729



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
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
L	Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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.
DO01	0.0	4.9	7.04	na	13.0	0.0508	256	7.0
DO02	0.0	4.9	7.04	na	13.0	0.0508	256	7.0
1	31.25	K = K @ EQ01	7.28	na	13.0			
2	31.25	K = K @ EQ02	8.6	na	14.2			
3	31.25	K = K @ EQ01	8.09	na	13.71			
3A	31.25		8.97	na				
4	31.25	K = K @ EQ02	9.54	na	14.95			
20	31.25		9.98	na				
21	20.71		16.41	na				
22	20.71		18.49	na				
23	20.71		15.62	na				
24	20.71		17.68	na				
25	20.71		19.96	na				
26	20.71		21.92	na				
27	9.79		27.23	na				
28	9.79		28.06	na				
TOR	9.79		28.48	na				
HDR	2.0		32.62	na				
6UG	1.0		40.14	na				
TEST	1.0		40.15	na				

The maximum velocity is 9.66 and it occurs in the pipe between nodes 4 and 23

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	*****
DO01 to EQ01	13.00 13.0 0.0 13.00	1.101 150 0.0307	1N	7.0 0.0 0.0	0.750 7.000 7.750	7.044 0.0 0.238			K Factor = 4.90 Vel = 4.38	
						7.282			K Factor = 4.82	
DO02 to EQ02	13.00 13.0 0.0 13.00	1.101 150 0.0306	1O	5.0 0.0 0.0	0.750 5.000 5.750	7.044 0.0 0.176			K Factor = 4.90 Vel = 4.38	
						7.220			K Factor = 4.84	
1 to 2	13.00 13.0	0.874 150 0.0944		0.0 0.0 0.0	14.000 0.0	7.282 0.0			K Factor @ node EQ01 Vel = 6.95	
2 to 20	14.20 27.2 0.0 27.20	1.101 150 0.1202	1O	5.0 0.0 0.0	6.420 5.000 11.420	8.604 0.0 1.373			K Factor @ node EQ02 Vel = 9.17	
						9.977			K Factor = 8.61	
3 to 3A	13.71 13.71	0.874 150 0.1040		0.0 0.0 0.0	8.460 0.0	8.089 0.0			K Factor @ node EQ01 Vel = 7.33	
3A to 4	0.0 13.71	1.101 150 0.0338	1O	5.0 0.0 0.0	11.960 5.000 16.960	8.969 0.0 0.574			Vel = 4.62	
4 to 23	14.95 28.66 0.0 28.66	1.101 150 0.1323	1O	5.0 0.0 0.0	6.420 5.000 11.420	9.543 4.565 1.511			K Factor @ node EQ02 Vel = 9.66	
						15.619			K Factor = 7.25	
20 to 21	27.20 27.2	1.101 150 0.1202	1O	5.0 0.0 0.0	10.580 5.000 15.580	9.977 4.565 1.872			Vel = 9.17	
21 to 22	0.0 27.2	1.101 150 0.1202	1O	5.0 0.0 0.0	12.250 5.000 17.250	16.414 0.0 2.074			Vel = 9.17	
22 to 25	0.0 27.2 0.0 27.20	1.101 150 0.1202		0.0 0.0 0.0	12.290 0.0 12.290	18.488 0.0 1.477			Vel = 9.17	
						19.965			K Factor = 6.09	
23 to 24	28.66 28.66	1.101 150 0.1324	1O	5.0 0.0 0.0	10.580 5.000 15.580	15.619 0.0 2.063			Vel = 9.66	
24 to 25	0.0 28.66	1.101 150 0.1323	1O	5.0 0.0 0.0	12.250 5.000 17.250	17.682 0.0 2.283			Vel = 9.66	
25 to 26	27.20 55.86	2.003 150 0.0247	3O 1N	30.0 11.0 0.0	38.090 41.000 79.090	19.965 0.0 1.951			Vel = 5.69	

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	*****
26 to 27	0.0 55.86	2.003 150 0.0247	1T 0.0 0.0	12.965 0.0 23.840	10.875 12.965 23.840	21.916 4.729 0.589		Vel = 5.69	
27 to 28	0.0 55.86	2.003 150 0.0247	1O 0.0 0.0	10.0 0.0 33.620	23.620 10.000 33.620	27.234 0.0 0.830		Vel = 5.69	
28 to TOR	0.0 55.86	2.067 120 0.0320	1N 0.0 0.0	11.0 0.0 13.125	2.125 11.000 13.125	28.064 0.0 0.420		Vel = 5.34	
TOR to HDR	0.0 55.86	2.067 120 0.0320	1Z 1T 1G	5.0 10.0 1.0	7.790 16.000 23.790	28.484 3.374 0.761		Vel = 5.34	
HDR to 6UG	0.0 55.86	3.26 120 0.0035	3I 0.0 0.0	20.159 0.0 25.159	5.000 20.159 25.159	32.619 7.433 0.087		* Fixed loss = 7 Vel = 2.15	
6UG to TEST	0.0 55.86	6.16 140 0.0001	1L 1G 1T	12.911 4.304 43.037	40.000 60.252 100.252	40.139 0.0 0.012		Vel = 0.60	
	0.0 55.86					40.151		K Factor = 8.82	