

**. . . Fire Protection by Computer Design**

Residential Fire Protection  
64 Daggett Hill Rd.  
Greene, ME 04236  
(207)946-343

Job Name : PLEASANT AVENUE APARTMENTS  
Building : WOOD STRUCTURE  
Location : SECOND FLOOR  
System : 1  
Contract : C16015  
Data File : PLEASANT AVE APT-2ND FLR.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - PLEASANT AVE APARTMENTS Date - 6-30-2016  
Location - SECOND FLOOR  
Building - WOOD STRUCTURE System No. - 1  
Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - C16015  
Calculated By - T. PRAY Drawing No. - 2 OF 2  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 11'-0"  
OCCUPANCY - APARTMENT

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 - 16 Gpm System Type  
Listed Pres. at Start Point - 16 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 16' x 18' ( ) Deluge ( ) PreAction  
E Domestic Flow Added - Gpm Sprinkler or Nozzle  
S Additional Flow Added - Gpm Make VIKING Model VK486  
I Elevation at Highest Outlet - 120.55Feet Size 7/16" K-Factor 4.0  
G Note: Temperature Rating 155  
N

Calculation Gpm Required 65.81 Psi Required 63.46 At Test  
Summary C-Factor Used: Overhead 120 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 6-30-2016 Rated Cap. Cap.  
T Time of Test - 9:00 AM @ Psi Elev.  
E Static (Psi) - 82 Elev.  
R Residual (Psi) - 80 Other Well  
Flow (Gpm) - 1209 Proof Flow Gpm  
S Elevation - 99.0'

P Location: HYDRANTS ARE LOCATED ON PLEASANT AVE, SEE PLOT PLAN

L Source of Information: PORTLAND WATER DISTRICT  
Y

# Water Supply Curve (C)

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PLEASANT AVENUE APARTMENTS

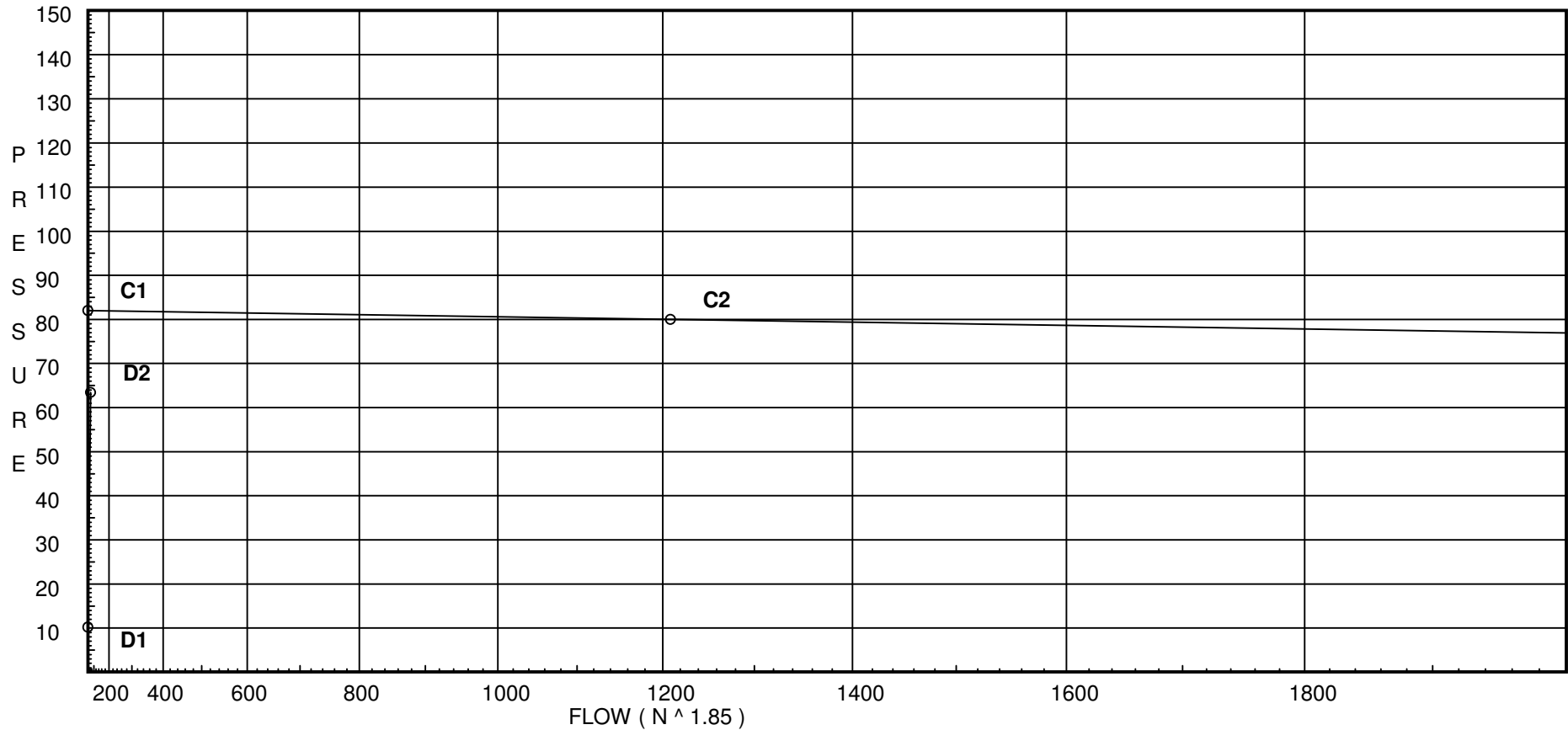
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### City Water Supply:

C1 - Static Pressure : 82  
C2 - Residual Pressure: 80  
C2 - Residual Flow : 1209

### Demand:

D1 - Elevation : 10.234  
D2 - System Flow : 65.8111  
D2 - System Pressure : 63.455  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 65.8111  
Safety Margin : 18.536



# 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
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
J	90'Tee-Branch Grv Vic #20	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
L	Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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.
30	120.55	4	16.03	na	16.01	0.0556	288	16.0
31	120.55	4	17.06	na	16.52	0.0556	288	16.0
32	120.55	4	16.55	na	16.27	0.0556	288	16.0
33	120.55	4	18.07	na	17.0	0.0556	288	16.0
120	120.55		21.16	na				
121	112.42		30.26	na				
122	112.42		32.47	na				
123	97.75		48.0	na				
124	97.75		49.37	na				
125	97.75		53.24	na				
126	97.75		53.95	na				
28	98.42		54.8	na				
TOR	98.42		55.6	na				
BOR	92.92		65.17	na				
TEST	96.92		63.46	na				

The maximum velocity is 14.12 and it occurs in the pipe between nodes 120 and 121

# 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	*****
30 to 31	16.01	1.049 120		0.0	12.000	16.026 0.0			K Factor = 4.00	
31 to 120	16.01	0.0862		0.0	12.000	1.035			Vel = 5.94	
31 to 120	16.52	1.049 120	1T	5.0	7.800	17.061 0.0			K Factor = 4.00	
	32.53	0.3201		0.0	12.800	4.097			Vel = 12.08	
	0.0 32.53					21.158			K Factor = 7.07	
32 to 33	16.27	1.049 120	2E	4.0	13.120	16.550 0.0			K Factor = 4.00	
	16.27	0.0888		0.0	17.120	1.521			Vel = 6.04	
33 to 120	17.01	1.049 120	1T	5.0	4.250	18.071 0.0			K Factor = 4.00	
	33.28	0.3337		0.0	9.250	3.087			Vel = 12.35	
120 to 121	32.53	1.38 120	1T	6.0	12.000	21.158 3.521				
	65.81	0.3099		0.0	18.000	5.579			Vel = 14.12	
121 to 122	0.0	1.38 120	1T	6.0	1.125	30.258 0.0				
	65.81	0.3100		0.0	7.125	2.209			Vel = 14.12	
122 to 123	0.0	1.38 120	2E 1T	6.0	17.630	32.467 6.354				
	65.81	0.3099		0.0	29.630	9.183			Vel = 14.12	
123 to 124	0.0	1.38 120		0.0	4.420	48.004 0.0				
	65.81	0.3100		0.0	4.420	1.370			Vel = 14.12	
124 to 125	0.0	1.61 120	1E 1T	4.0	14.420	49.374 0.0				
	65.81	0.1463		0.0	26.420	3.866			Vel = 10.37	
125 to 126	0.0	2.067 120	1E 1I	5.0	8.000	53.240 0.0				
	65.81	0.0433		0.0	16.500	0.715			Vel = 6.29	
126 to 28	0.0	2.157 120	1J	10.461	21.830	53.955 -0.290				
	65.81	0.0352		0.0	32.291	1.136			Vel = 5.78	
28 to TOR	0.0	2.635 120	2I	16.474	43.960	54.801 0.0				
	65.81	0.0133		0.0	60.434	0.803			Vel = 3.87	
TOR to BOR	0.0	2.635 120	1Z	8.237	5.500	55.604 9.382			* Fixed loss = 7	
	65.81	0.0133		0.0	13.737	0.183			Vel = 3.87	
BOR to TEST	0.0	6.16 140	2L 1G	25.822	45.000	65.169 -1.732				
	65.81	0.0002	1T	43.037	118.163	0.018			Vel = 0.71	
	0.0 65.81					63.455			K Factor = 8.26	