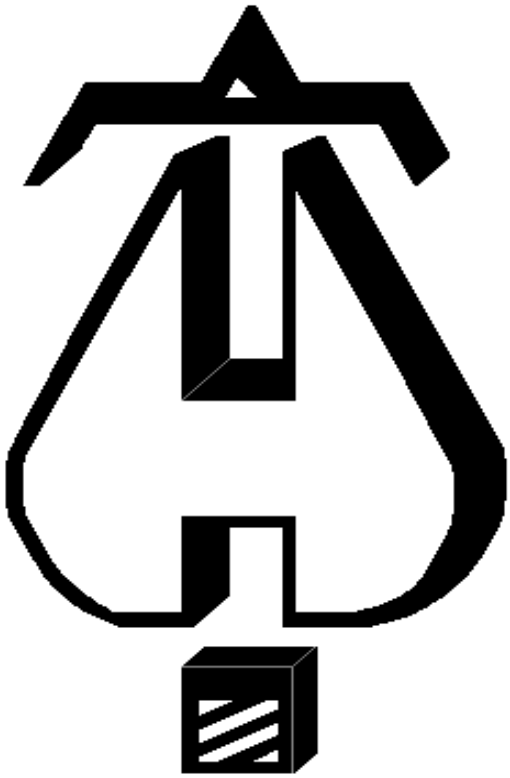


. . . Fire Protection by Computer Design

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

Job Name : PLEASANT AVENUE APARTMENTS
Building : WOOD STRUCTURE
Location : THIRD FLOOR
System : 1
Contract : C16015
Data File : PLEASANT AVE APT-3RD FLR.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - PLEASANT AVE APARTMENTS Date - 6-30-2016
Location - THIRD 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 12'-4"
OCCUPANCY - APARTMENT

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 - 16 Gpm System Type
Listed Pres. at Start Point - 16 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16' x 18' ( ) Deluge ( ) PreAction
Domestic Flow Added - Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make VIKING Model VK486
Elevation at Highest Outlet - 133.17Feet Size 7/16" K-Factor 4.0
Note: Temperature Rating 155

Calculation Summary: Gpm Required 63.51 Psi Required 70.83 At Test
C-Factor Used: Overhead 120 Underground 140

WATER SUPPLY

Water Flow Test:
Date of Test - 6-30-2016
Time of Test - 9:00 AM
Static (Psi) - 82
Residual (Psi) - 80
Flow (Gpm) - 1209
Elevation - 99.0'

Pump Data:
Rated Cap.
@ Psi
Elev.
Other

Tank or Reservoir:
Cap.
Elev.
Well
Proof Flow Gpm

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

Source of Information: PORTLAND WATER DISTRICT

Water Supply Curve (C)

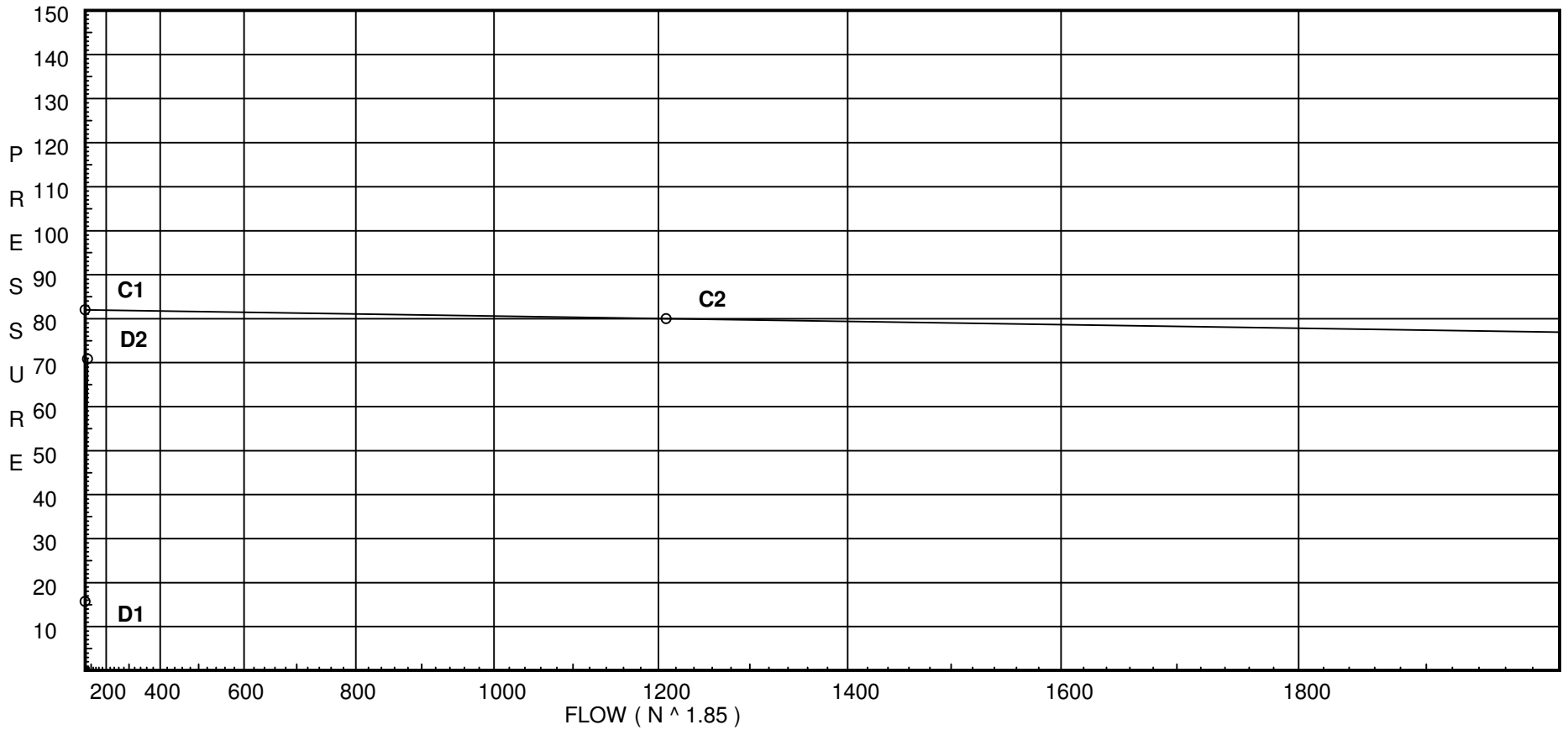
Residential Fire Protection
PLEASANT AVENUE APARTMENTS

Date 6/1/16

City Water Supply:
- C1 - Static Pressure : 82
- C2 - Residual Pressure: 80
- C2 - Residual Flow : 1209

Demand:

D1 - Elevation	:	15.700
D2 - System Flow	:	63.5095
D2 - System Pressure	:	70.830
Hose (Adj City)	:	_____
Hose (Demand)	:	_____
D3 - System Demand	:	63.5095
Safety Margin	:	11.162



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
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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
BA01	0.0	5.6	10.33	na	18.0	0.15	120	7.0
40	133.17	4	10.6	na	13.02	0.0508	256	10.6
41	133.17	4	11.7	na	13.68	0.0508	256	10.6
42	133.17	4.9	15.73	na	19.43	0.0714	196	8.16
43	133.17	4	18.86	na	17.37	0.0508	256	10.6
100	133.17		20.99	na				
101	132.25		30.01	na				
102	132.25		33.11	na				
103	121.71		40.61	na				
104	108.25		49.24	na				
105	108.25		52.9	na				
106	97.75		60.63	na				
27	98.375		61.82	na				
28	98.42		62.24	na				
TOR	98.42		62.99	na				
BOR	92.92		72.54	na				
TEST	96.92		70.83	na				

The maximum velocity is 13.66 and it occurs in the pipe between nodes 43 and 100

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
BA01	18.00	1.049	1T	5.0	0.790	10.332		K Factor = 5.60
to		120		0.0	5.000	0.0		
EQ01	18.0	0.1071		0.0	5.790	0.620		Vel = 6.68
	0.0							
	18.00					10.952		K Factor = 5.44
40	13.02	1.049	4E	8.0	10.710	10.600		K Factor = 4.00
to		120		0.0	8.000	0.0		
41	13.02	0.0588		0.0	18.710	1.101		Vel = 4.83
41	13.69	1.049	2E	4.0	32.790	11.701		K Factor = 4.00
to		120	1T	5.0	9.000	0.0		
100	26.71	0.2222		0.0	41.790	9.285		Vel = 9.92
	0.0							
	26.71					20.986		K Factor = 5.83
42	19.43	1.049	4E	8.0	17.360	15.729		K Factor = 4.90
to		120		0.0	8.000	0.0		
43	19.43	0.1234		0.0	25.360	3.129		Vel = 7.21
43	17.37	1.049	1T	5.0	0.290	18.858		K Factor = 4.00
to		120		0.0	5.000	0.0		
100	36.8	0.4023		0.0	5.290	2.128		Vel = 13.66
100	26.71	1.38	2E	6.0	17.710	20.986		
to		120	1T	6.0	12.000	0.398		
101	63.51	0.2902		0.0	29.710	8.622		Vel = 13.62
101	0.0	1.38	1T	6.0	1.710	30.006		
to		120	1E	3.0	9.000	0.0		
102	63.51	0.2902		0.0	10.710	3.108		Vel = 13.62
102	0.0	1.61	2E	8.0	13.370	33.114		
to		120		0.0	8.000	4.565		
103	63.51	0.1370		0.0	21.370	2.927		Vel = 10.01
103	0.0	1.61	1T	8.0	12.460	40.606		
to		120		0.0	8.000	5.830		
104	63.51	0.1370		0.0	20.460	2.802		Vel = 10.01
104	0.0	1.61	2T	16.0	10.750	49.238		
to		120		0.0	16.000	0.0		
105	63.51	0.1370		0.0	26.750	3.664		Vel = 10.01
105	0.0	1.61	1E	4.0	11.250	52.902		
to		120	1T	8.0	12.000	4.548		
106	63.51	0.1370		0.0	23.250	3.185		Vel = 10.01
106	0.0	1.61	1T	8.0	2.625	60.635		
to		120		0.0	8.000	-0.271		
27	63.51	0.1370		0.0	10.625	1.456		Vel = 10.01
27	0.0	2.635	1J	14.827	20.540	61.820		
to		120		0.0	14.827	-0.019		
28	63.51	0.0124		0.0	35.367	0.439		Vel = 3.74
28	0.0	2.635	2I	16.474	43.960	62.240		
to		120		0.0	16.474	0.0		
TOR	63.51	0.0124		0.0	60.434	0.752		Vel = 3.74
TOR	0.0	2.635	1Z	8.237	5.500	62.992		
to		120		0.0	8.237	9.382		* Fixed loss = 7
BOR	63.51	0.0124		0.0	13.737	0.170		Vel = 3.74

Final Calculations - Standard

Residential Fire Protection
PLEASANT AVENUE APARTMENTS

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
BOR	0.0	6.16	2L	25.822	45.000	72.544				
to		140	1G	4.304	73.163	-1.732				
TEST	63.51	0.0002	1T	43.037	118.163	0.018		Vel = 0.68		
	0.0									
	63.51					70.830		K Factor = 7.55		