

. . . Fire Protection by Computer Design

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

Job Name : 52 WILMOT STREET APT
Building : WOOD STRUCTURE
Location : SECOND FLOOR
System : 1
Contract : C16032
Data File : 52 WILMOT ST APT-2ND FLOOR.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 52 WILMOT STREET APARTMENTS Date - 6/28/2017
Location - SECOND FLOOR
Building - WOOD STRUCTURE System No. - 1
Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - C16032
Calculated By - Drawing No. - 1 OF 1
Construction: (X) Combustible () Non-Combustible Ceiling Height VARIES
OCCUPANCY - RESIDENTIAL / APARTMENT

S Type of Calculation: ()NFPA 13 Residential (X)NFPA 13R ()NFPA 13D
Y Number of Sprinklers Flowing: ()1 (X)2 ()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 VK468
I Elevation at Highest Outlet - 108.21Feet Size 7/16" K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 57.83 Psi Required 58.27 AT TEST
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 9/16/2016 Rated Cap. Cap.
T Time of Test - N/A @ Psi Elev.
E Static (Psi) - 82 Elev.
R Residual (Psi) - 74 Other Well
Flow (Gpm) - 1453 Proof Flow Gpm
S Elevation - 108.0'

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

L Source of Information: PORTLAND WATER DISTRICT
Y

Water Supply Curve (C)

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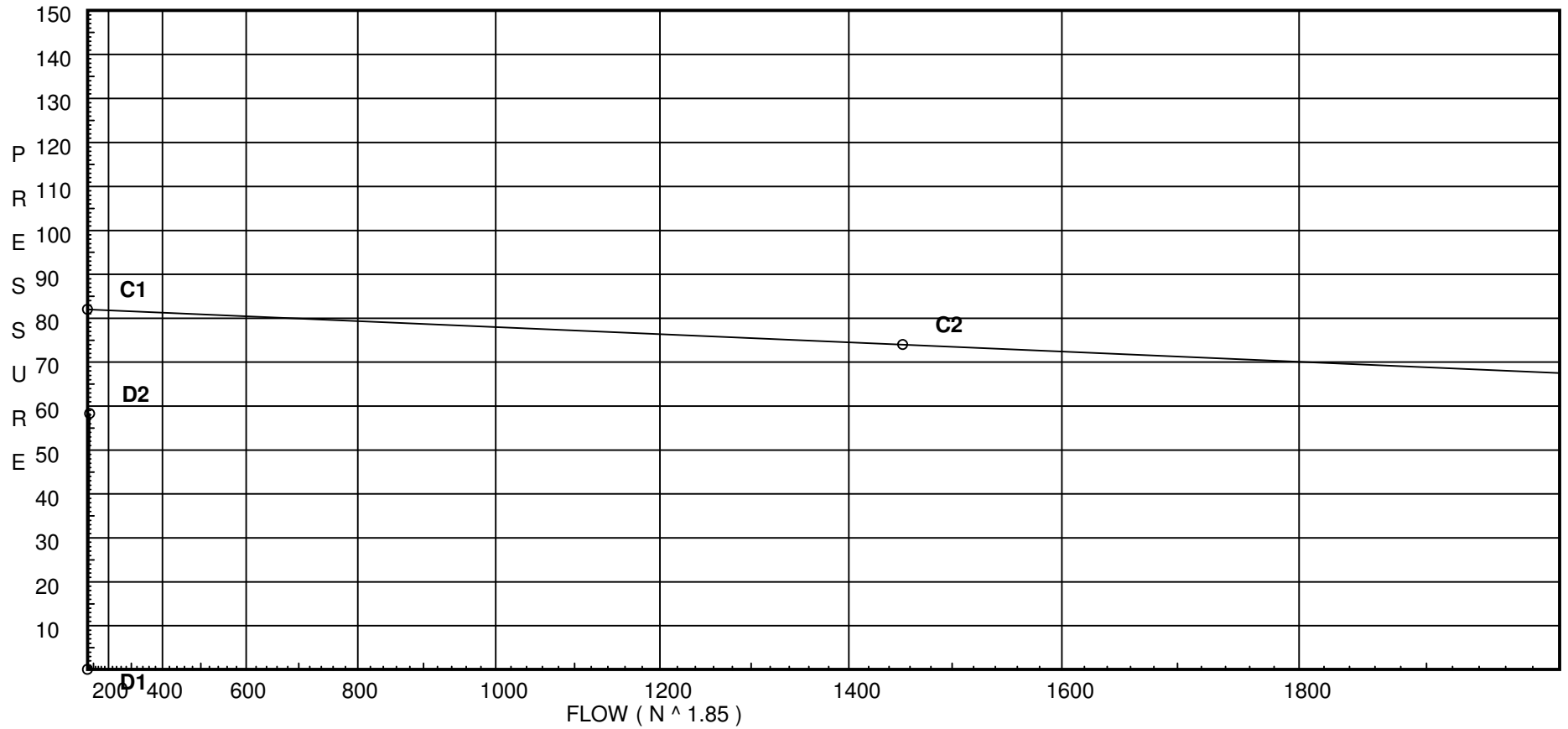
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City Water Supply:

C1 - Static Pressure : 82
C2 - Residual Pressure: 74
C2 - Residual Flow : 1453

Demand:

D1 - Elevation : 0.091
D2 - System Flow : 57.8334
D2 - System Pressure : 58.273
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 57.8334
Safety Margin : 23.707



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
N	CPVC 90'ElI 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
R	CPVC Coupling Tee - Run	1	1	1	1	1	1	2	2	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	7.1	na	13.06	256.0	0.051	7.0
DO02	0.0	4.9	7.1	na	13.06	256.0	0.051	7.0
20	108.21	K = K @ EQ01	7.86	na	13.06			
21	108.21	K = K @ EQ01	8.41	na	13.5			
12	108.21		9.01	na				
22	108.21	K = K @ EQ02	10.61	na	15.55			
23	108.21	K = K @ EQ01	11.4	na	15.72			
13	108.21		12.2	na				
14	91.0		44.2	na				
52	89.54		51.63	na				
53	89.54		54.27	na				
37	88.12		55.33	na				
54	88.67		57.75	na				
55	88.67		58.06	na				
TOR	88.67		59.06	na				
BOR	83.05		67.85	na				
CITY	83.05		68.96	na				
TEST	108.0		58.27	na				

The maximum velocity is 21.47 and it occurs in the pipe between nodes 14 and 52

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
DO01 to EQ01	13.06 13.06	0.874 150 0.0951	1N 7.0 0.0 0.0	1.000 7.000 8.000	7.100 0.0 0.761		K Factor = 4.90 Vel = 6.98		
	0.0 13.06				7.861		K Factor = 4.66		
DO02 to EQ02	13.06 13.06	0.874 150 0.0950	1O 3.0 0.0 0.0	1.000 3.000 4.000	7.100 0.0 0.380		K Factor = 4.90 Vel = 6.98		
	0.0 13.06				7.480		K Factor = 4.78		
20 to 12	13.06 13.06	0.874 150 0.0951	1O 3.0 0.0 0.0	9.080 3.000 12.080	7.861 0.0 1.149		K Factor @ node EQ01 Vel = 6.98		
	0.0 13.06				9.010		K Factor = 4.35		
21 to 12	13.50 13.5	0.874 150 0.1012	1O 3.0 0.0 0.0	2.920 3.000 5.920	8.411 0.0 0.599		K Factor @ node EQ01 Vel = 7.22		
12 to 13	13.06 26.56	0.874 150 0.3541	1R 1.0 0.0 0.0	8.000 1.000 9.000	9.010 0.0 3.187		Vel = 14.20		
	0.0 26.56				12.197		K Factor = 7.61		
22 to 13	15.55 15.55	0.874 150 0.1315	1O 3.0 0.0 0.0	9.080 3.000 12.080	10.609 0.0 1.588		K Factor @ node EQ02 Vel = 8.32		
	0.0 15.55				12.197		K Factor = 4.45		
23 to 13	15.72 15.72	0.874 150 0.1343	1O 3.0 0.0 0.0	2.920 3.000 5.920	11.402 0.0 0.795		K Factor @ node EQ01 Vel = 8.41		
13 to 14	42.11 57.83	1.101 150 0.4852	2N 14.0 2O 10.0 0.0	26.590 24.000 50.590	12.197 7.454 24.544		Vel = 19.49		
14 to 52	0.0 57.83	1.049 120 0.9280	1T 5.0 0.0 0.0	2.330 5.000 7.330	44.195 0.632 6.802		Vel = 21.47		
52 to 53	0.0 57.83	1.38 120 0.2440	1E 3.0 1T 6.0 0.0	1.830 9.000 10.830	51.629 0.0 2.643		Vel = 12.40		
53 to 37	0.0 57.83	1.61 120 0.1151		3.830 0.0 3.830	54.272 0.615 0.441		Vel = 9.11		
37 to 54	0.0 57.83	1.61 120 0.1152	3E 12.0 0.0 0.0	11.090 12.000 23.090	55.328 -0.238 2.660		Vel = 9.11		
54 to 55	0.0 57.83	2.067 120 0.0341		9.000 0.0 9.000	57.750 0.0 0.307		Vel = 5.53		

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	*****
55 to TOR	0.0 57.83	2.067 120 0.0341	1E 5.0 0.0	24.250 5.000 29.250	58.057 0.0 0.998		Vel = 5.53		
TOR to BOR	0.0 57.83	2.067 120 0.0342	1Z 5.0 0.0	5.625 5.000 10.625	59.055 8.434 0.363		* Fixed loss = 6 Vel = 5.53		
BOR to CITY	0.0 57.83	1.959 150 0.0293	1G 1.164 1T 11.635 0.0	25.000 12.799 37.799	67.852 0.0 1.108		Vel = 6.16		
CITY to TEST	0.0 57.83	4.1 140 0.0009	0.0 0.0 0.0	130.000 0.0 130.000	68.960 -10.806 0.119		Vel = 1.41		
	0.0 57.83				58.273		K Factor = 7.58		