

. . . Fire Protection by Computer Design

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

Job Name : 48 WILLOT STREET APT
Building : WOOD STRUCTURE
Location : 3RD FLOOR
System : WET
Contract : 16025
Data File : 48 WILMOT ST APT-HYD CALC-3RD FLR SW.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 48 WILMOT STREET APT Date - 9/2/16
Location - 3RD FLOOR
Building - WOOD STRUCTURE System No. - WET
Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - 16025
Calculated By - T. PRAY Drawing No. - 2 OF 2
Construction: (X) Combustible () Non-Combustible Ceiling Height 8'-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 - 13 Gpm System Type
Listed Pres. at Start Point - 10.6 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 - 125.38Feet Size 7/16" K-Factor 4.0
G Note: Temperature Rating 155
N

Calculation Gpm Required 59.76 Psi Required 87.51 At Test
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 6/20/16 Rated Cap. Cap.
T Time of Test - N/A @ Psi Elev.
E Static (Psi) - 96 Elev.
R Residual (Psi) - 94 Other Well
Flow (Gpm) - 1352 Proof Flow Gpm
S Elevation - 99.0'

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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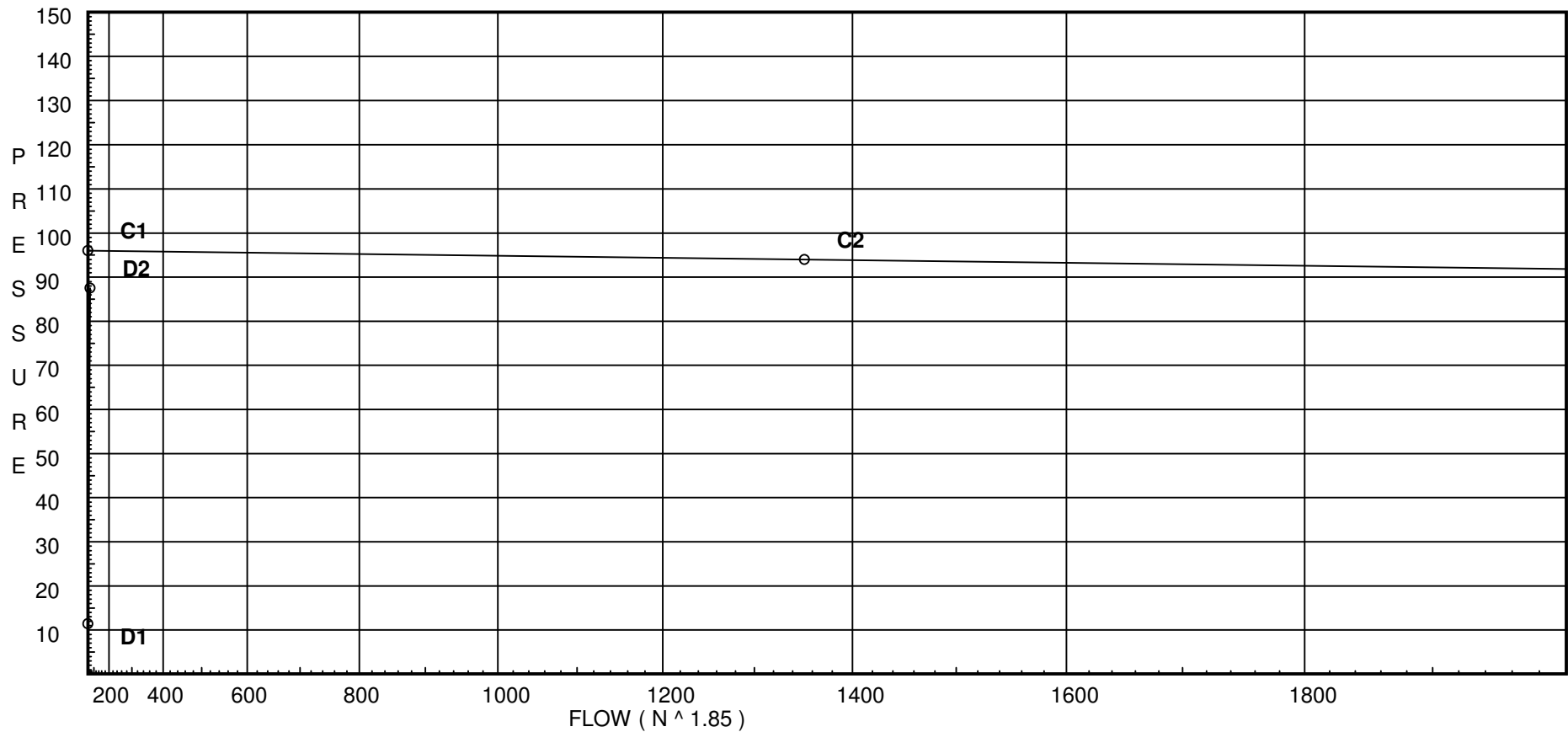
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City Water Supply:

C1 - Static Pressure : 96
C2 - Residual Pressure: 94
C2 - Residual Flow : 1352

Demand:

D1 - Elevation : 11.425
D2 - System Flow : 59.7603
D2 - System Pressure : 87.510
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 59.7603
Safety Margin : 8.484



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
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	125.38	4	10.89	na	13.2	0.0508	256	10.6
31	125.38	4	15.5	na	15.75	0.0508	256	10.6
32	125.38	4	10.6	na	13.02	0.0508	256	10.6
33	125.38	4	19.78	na	17.79	0.0508	256	10.6
51	117.25		22.48	na				
21	117.25		23.56	na				
50	117.25		16.35	na				
23	117.25		22.52	na				
52	117.25		26.01	na				
53	117.25		27.75	na				
54	117.25		60.04	na				
55	108.29		66.94	na				
56	108.29		69.15	na				
57	98.62		81.38	na				
58	98.62		83.89	na				
59	98.62		84.76	na				
TOR	98.62		85.01	na				
BFP	94.62		87.29	na				
BOR	94.62		87.54	na				
TEST	99.0		87.51	na				

The maximum velocity is 20.14 and it occurs in the pipe between nodes 53 and 54

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 50	13.20 13.2 0.0 13.20	0.874 150 0.0971	2E	8.053 0.0 0.0	11.910 8.052 19.962	10.891 3.521 1.939			K Factor = 4.00 Vel = 7.06	
							16.351		K Factor = 3.26	
31 to 51	15.75 15.75 0.0 15.75	0.874 150 0.1346	2E 1T	8.053 8.053 0.0	9.580 16.104 25.684	15.501 3.521 3.458			K Factor = 4.00 Vel = 8.42	
							22.480		K Factor = 3.32	
32 to 50	13.02 13.02 0.0 13.02	0.874 150 0.0947	1E 1T	4.026 8.053 0.0	11.460 12.078 23.538	10.600 3.521 2.230			K Factor = 4.00 Vel = 6.96	
							16.351		K Factor = 3.22	
33 to 53	17.79 17.79 0.0 17.79	0.874 150 0.1686	2E 1T	8.053 8.053 0.0	10.290 16.104 26.394	19.776 3.521 4.451			K Factor = 4.00 Vel = 9.51	
							27.748		K Factor = 3.38	
51 to 21	15.75 15.75 0.0 15.75	0.874 150 0.1346		0.0 0.0 0.0	8.000 0.0 8.000	22.480 0.0 1.077			Vel = 8.42	
21 to 52	0.0 15.75 0.0 15.75	0.874 150 0.1346	1E	4.026 0.0 0.0	14.160 4.026 18.186	23.557 0.0 2.448			Vel = 8.42	
							26.005		K Factor = 3.09	
50 to 23	26.22 26.22 0.0 26.22	0.874 150 0.3458		0.0 0.0 0.0	17.830 0.0 17.830	16.351 0.0 6.165			Vel = 14.02	
23 to 52	0.0 26.22 0.0 26.22	0.874 150 0.3457	1T	8.053 0.0 0.0	2.040 8.052 10.092	22.516 0.0 3.489			Vel = 14.02	
52 to 53	15.75 41.97 0.0 15.75	1.101 150 0.2682		0.0 0.0 0.0	6.500 0.0 6.500	26.005 0.0 1.743			Vel = 14.14	
53 to 54	17.79 59.76 0.0 17.79	1.101 150 0.5155	1T	9.563 0.0 0.0	53.080 9.562 62.642	27.748 0.0 32.292			Vel = 20.14	
54 to 55	0.0 59.76 0.0 59.76	1.394 150 0.1633	1T	9.523 0.0 0.0	8.960 9.523 18.483	60.040 3.881 3.019			Vel = 12.56	
55 to 56	0.0 59.76 0.0 59.76	1.394 150 0.1634	1T	9.523 0.0 0.0	4.000 9.523 13.523	66.940 0.0 2.209			Vel = 12.56	
56 to 57	0.0 59.76 0.0 59.76	1.38 120 0.2593	2E 1T	6.0 6.0 0.0	19.000 12.000 31.000	69.149 4.188 8.039			Vel = 12.82	

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	*****
57	0.0	1.61	1E 4.0	16.580	81.376				
to		120	0.0	4.000	0.0				
58	59.76	0.1224	0.0	20.580	2.519		Vel = 9.42		
58	0.0	2.067	2E 10.0	13.960	83.895				
to		120	0.0	10.000	0.0				
59	59.76	0.0362	0.0	23.960	0.868		Vel = 5.71		
59	0.0	2.067	1E 5.0	1.830	84.763				
to		120	0.0	5.000	0.0				
TOR	59.76	0.0363	0.0	6.830	0.248		Vel = 5.71		
TOR	0.0	2.067	1Z 5.0	5.000	85.011				
to		120	1E 5.0	10.000	1.732				
BFP	59.76	0.0363	0.0	15.000	0.544		Vel = 5.71		
BFP	0.0	2.067	1E 5.0	2.000	87.287				
to		120	0.0	5.000	0.0				
BOR	59.76	0.0363	0.0	7.000	0.254		Vel = 5.71		
BOR	0.0	1.72	1G 0.617	25.000	87.541				
to		150	1T 6.174	6.792	-1.897				
TEST	59.76	0.0587	0.0	31.792	1.866		Vel = 8.25		
	0.0								
	59.76				87.510		K Factor = 6.39		