

. . . Fire Protection by Computer Design

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

Job Name : LUEDKE RESIDENCE
Building : WOOD STRUCTURE
Location : LOFT ABOVE GARAGE
System : 1
Contract : 17010
Data File : LUEDKE RESIDENCE-2ND FLR GARAGE.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - LUEDKE RESIDENCE Date - 4/11/2017
Location - LOFT ABOVE GARAGE
Building - WOOD STRUCTURE System No. - 1
Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - 17010
Calculated By - T. PRAY Drawing No. - 1 OF 1
Construction: (X) Combustible () Non-Combustible Ceiling Height 9'-9.5"
OCCUPANCY - RESIDENTIAL

S Type of Calculation: ()NFPA 13 Residential ()NFPA 13R (X)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 - 119.54Feet Size 7/16" K-Factor 4.9
G Note: Temperature Rating
N

Calculation Gpm Required 26.62 Psi Required 78.76 At Test
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 4/15/2015 Rated Cap. Cap.
T Time of Test - N/A @ Psi Elev.
E Static (Psi) - 105 Elev.
R Residual (Psi) - 20 Other Well
Flow (Gpm) - 1200 Proof Flow Gpm
S Elevation - 100.0'

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

L Source of Information: PORTLAND WATER DISTRICT
Y

Water Supply Curve (C)

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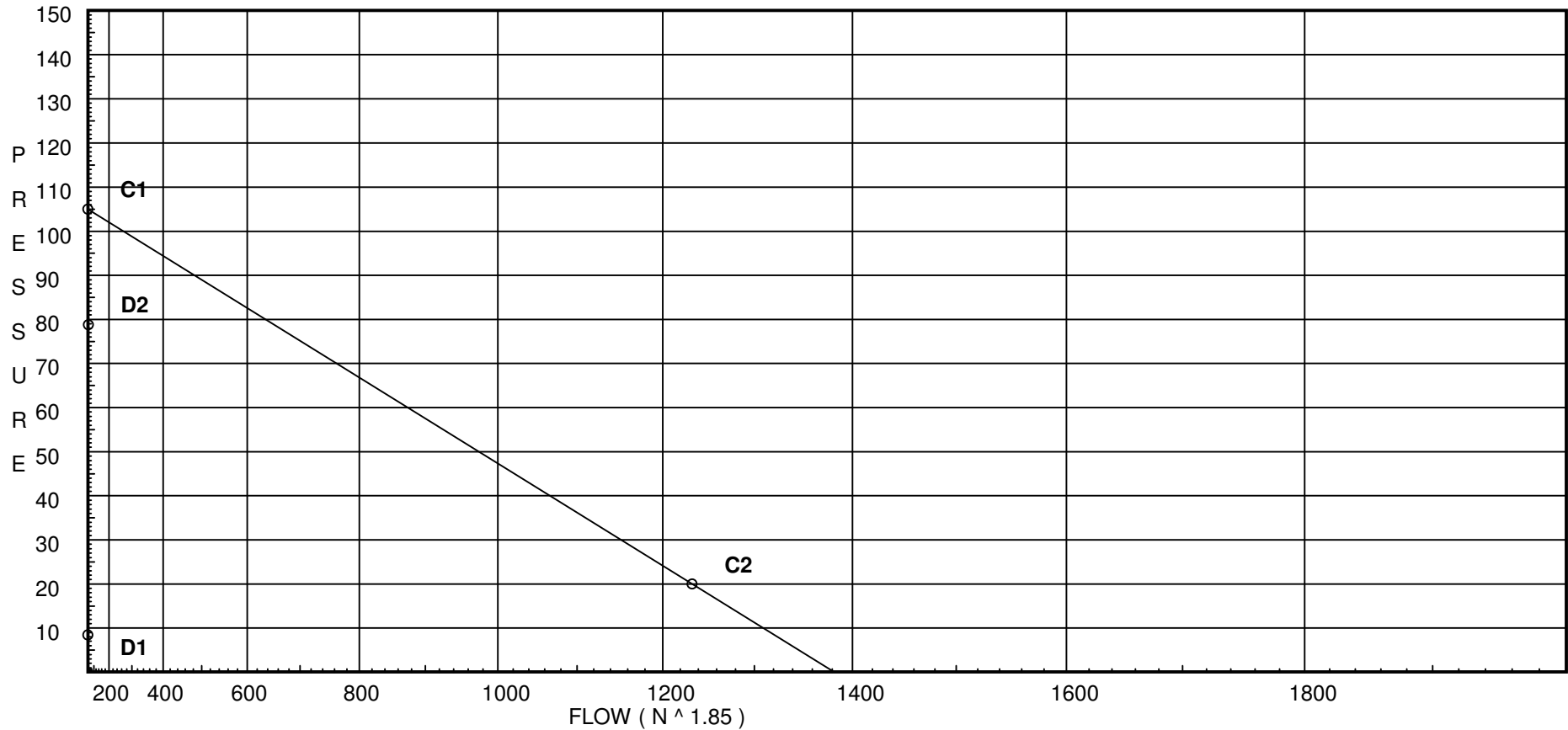
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City Water Supply:

C1 - Static Pressure : 105
C2 - Residual Pressure: 20
C2 - Residual Flow : 1233

Demand:

D1 - Elevation : 8.463
D2 - System Flow : 26.6174
D2 - System Pressure : 78.762
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 26.6174
Safety Margin : 26.168



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
F	45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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
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	119.54	K = K @ EQ01	7.5	na	13.0			
2	119.54	K = K @ EQ02	8.63	na	13.61			
50	119.54		23.72	na				
51	108.71		33.31	na				
52	100.42		45.59	na				
55	99.54		53.09	na				
TOR	99.54		59.25	na				
BOR	92.375		73.06	na				
TEST	100.0		78.76	na				

The maximum velocity is 14.24 and it occurs in the pipe between nodes 2 and 50

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	0.874 150 0.0944	1E	4.026 0.0 0.0	0.750 4.026 4.776	7.044 0.0 0.451		K Factor = 4.90 Vel = 6.95	
	0.0 13.00					7.495		K Factor = 4.75	
DO02 to EQ02	13.00 13.0	0.874 150 0.0944	1T	8.053 0.0 0.0	0.750 8.052 8.802	7.044 0.0 0.831		K Factor = 4.90 Vel = 6.95	
	0.0 13.00					7.875		K Factor = 4.63	
1 to 2	13.00 13.0	0.874 150 0.0945		0.0 0.0 0.0	12.000 0.0 12.000	7.495 0.0 1.134		K Factor @ node EQ01 Vel = 6.95	
2 to 50	13.62 26.62	0.874 150 0.3554	3N 1O	21.0 3.0 0.0	18.460 24.000 42.460	8.629 0.0 15.091		K Factor @ node EQ02 Vel = 14.24	
50 to 51	0.0 26.62	0.874 150 0.3555	1O	3.0 0.0 0.0	10.790 3.000 13.790	23.720 4.690 4.902		Vel = 14.24	
51 to 52	0.0 26.62	0.874 120 0.5371	1N	7.0 0.0 0.0	9.170 7.000 16.170	33.312 3.590 8.685		Vel = 14.24	
52 to 55	0.0 26.62	1.049 120 0.2208	3E 1F 1T	6.0 1.0 5.0	20.250 12.000 32.250	45.587 0.381 7.122		Vel = 9.88	
55 to TOR	0.0 26.62	1.049 120 0.2208	2O	10.0 0.0 0.0	17.880 10.000 27.880	53.090 0.0 6.156		Vel = 9.88	
TOR to BOR	0.0 26.62	1.049 150 0.1461	2E 1Z	6.044 3.022 0.0	9.500 9.066 18.566	59.246 11.103 2.713		* Fixed loss = 8 Vel = 9.88	
BOR to TEST	0.0 26.62	1.314 150 0.0488	1T	4.495 0.0 0.0	180.000 4.495 184.495	73.062 -3.302 9.002		Vel = 6.30	
	0.0 26.62					78.762		K Factor = 3.00	