



. . . Fire Protection by Computer Design

Sprinkler Systems Inc.
2-4 Avon Street
P O Box 1285
Lewiston, Maine 04240
207-782-0104

Job Name : 137 NEWTON STREET
Building :
Location : 137 NEWTON STREET, PORTLAND, MAINE 04102
System : 1 OF 1
Contract : 13094
Data File : 13094137NEWTONSTPTLDA1.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - GOODWILL GROUP HOME Date - 11-15-2013
Location - 137 NEWTON STREET, PORTLAND, MAINE 04102
Building - System No. - 1 OF 1
Contractor - OWNER Contract No. - 13094
Calculated By - SCOTT E. GARLAND Drawing No. - 1 OF 1
Construction: (X) Combustible () Non-Combustible Ceiling Height 8-0
OCCUPANCY - RESIDENTIAL - GROUP HOME

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 - 16.0 Gpm System Type
Listed Pres. at Start Point - 13.3 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 RELIABLE Model F1RES44
I Elevation at Highest Outlet - 83.5 Feet Size 1/2 X 1/2 K-Factor 4.4
G Note: Temperature Rating 155 DEGREES
N DESIGN AREA #1 - FIRST FLOOR BEDROOMS

Calculation Gpm Required 71.261 Psi Required 67.368 AT BASE OF RISER
Summary C-Factor Used: Overhead 120 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 9-8-2011 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 68 Elev.
R Residual (Psi) - 66 Other Well
Flow (Gpm) - 1087 Proof Flow Gpm
S Elevation - 105.0

P Location: ON FOREST AVENUE NEAR FARNHAM STREET, APPROX 2500' AWAY

P
L Source of Information: PORTLAND WATER DISTRICT
Y

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	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units Inches
Length Units Feet
Flow Units US Gallons per Minute
Pressure Units Pounds per Square Inch

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	83.5	4.4	14.16	na	16.56	0.05	320	13.3
2	83.5	4.4	13.3	na	16.05	0.05	320	13.3
A	83.5		14.47	na				
3	83.5	4.4	18.21	na	18.78	0.05	320	13.3
4	83.5	4.4	20.42	na	19.88	0.05	320	13.3
B	83.5		20.56	na				
C	83.5		32.22	na				
D	83.5		37.27	na				
E	83.5		41.96	na				
F	74.5		52.5	na				
18	74.5		52.78	na				
G	74.5		56.38	na				
K	74.5		57.01	na				
RT	74.5		57.45	na				
TV	71.042		62.13	na				
RB	69.042		67.37	na				
X1	70.0		70.96	na				
X2	110.0		53.77	na				
X3	110.0		53.78	na				
X4	105.0		55.94	na				
TEST	105.0		55.95	na				

The maximum velocity is 15.29 and it occurs in the pipe between nodes B and C

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	*****
1 to A	16.56	1.049 120.0		0.0	3.375	14.163			K Factor = 4.40	
	16.56	0.0916		0.0	3.375	0.309			Vel = 6.15	
	0.0									
	16.56					14.472			K Factor = 4.35	
2 to A	16.05	1.049 120.0	1E 1T	2.0 5.0	6.542 7.000	13.300			K Factor = 4.40	
	16.05	0.0865		0.0	13.542	1.172			Vel = 5.96	
	0.0									
	16.05					14.472			K Factor = 4.22	
A to 3	32.61	1.049 120.0		0.0	11.625	14.472				
	32.61	0.3215		0.0	11.625	3.737			Vel = 12.11	
3 to B	18.77	1.380 120.0	1T	6.0	6.000	18.209			K Factor = 4.40	
	51.38	0.1961		0.0	12.000	2.353			Vel = 11.02	
	0.0									
	51.38					20.562			K Factor = 11.33	
4 to B	19.88	1.380 120.0		0.0	4.333	20.415			K Factor = 4.40	
	19.88	0.0339		0.0	4.333	0.147			Vel = 4.26	
	0.0									
	19.88					20.562			K Factor = 4.38	
B to C	71.26	1.380 120.0	1E	3.0	29.458	20.562				
	71.26	0.3591		0.0	3.000	0.0			Vel = 15.29	
C to D	0.0	1.380 120.0	1T	6.0	8.083	32.218				
	71.26	0.3591		0.0	6.000	0.0			Vel = 15.29	
D to E	0.0	1.380 120.0	1T	6.0	7.042	37.275				
	71.26	0.3591		0.0	6.000	0.0			Vel = 15.29	
E to F	0.0	1.380 120.0	1E 1T	3.0 6.0	9.500 9.000	41.958				
	71.26	0.3591		0.0	18.500	6.644			Vel = 15.29	
F to 18	0.0	1.380 120.0		0.0	0.792	52.500				
	71.26	0.3586		0.0	0.0	0.0			Vel = 15.29	
18 to G	0.0	1.380 120.0	1T	6.0	4.000	52.784				
	71.26	0.3591		0.0	6.000	0.0			Vel = 15.29	
G to K	0.0	2.067 120.0		0.0	12.583	56.375				
	71.26	0.0502		0.0	0.0	0.0			Vel = 6.81	
K to RT	0.0	2.067 120.0	1E	5.0	3.917	57.007				
	71.26	0.0501		0.0	5.000	0.0			Vel = 6.81	
RT to TV	0.0	2.067 120.0	1Fsp	0.0	3.458	57.454			* Fixed loss = 3	
	71.26	0.0503		0.0	0.0	4.498			Vel = 6.81	

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	*****
TV	0.0	2.067	1E	5.0	2.500	62.126				
to		120.0		0.0	5.000	4.866			* Fixed loss = 4	
RB	71.26	0.0501		0.0	7.500	0.376			Vel = 6.81	
RB	0.0	1.959	1G	1.164	80.000	67.368				
to		150.0	1T	11.635	12.799	-0.415				
X1	71.26	0.0432		0.0	92.799	4.005			Vel = 7.59	
X1	0.0	8.39	1G	3.641	1800.000	70.958				
to		100.0	1T	31.863	35.504	-17.324				
X2	71.26	0.0001		0.0	1835.504	0.140			Vel = 0.41	
X2	0.0	16.6	1E	46.767	950.000	53.774				
to		100.0	1G	9.353	56.121	0.0				
X3	71.26	0.0		0.0	1006.121	0.003			Vel = 0.11	
X3	0.0	12.46	1T	52.745	25.000	53.777				
to		100.0		0.0	52.745	2.166				
X4	71.26	0.0		0.0	77.745	0.0			Vel = 0.19	
X4	0.0	12.24		0.0	200.000	55.943				
to		100.0		0.0	0.0	0.0				
TEST	71.26	0.0		0.0	200.000	0.003			Vel = 0.19	
	0.0									
	71.26					55.946			K Factor = 9.53	

Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 68
C2 - Residual Pressure: 66
C2 - Residual Flow : 1087

Demand:
D1 - Elevation : -9.312
D2 - System Flow : 71.2613
D2 - System Pressure : 55.946
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 71.2613
Safety Margin : 12.041

