



. . . Fire Protection by Computer Design

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

Job Name : 135 CONGRESS STREET
Building :
Location : 135 CONGRESS STREET, PORTLAND, MAINE 04104
System : 1 OF 1
Contract : 13087
Data File : 13087135CONGRESSSTA2.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 135 CONGRESS STREET Date - 10-11-2013
Location - 135 CONGRESS STREET, PORTLAND, MAINE 04104
Building - System No. - 1 OF 1
Contractor - OWNER Contract No. - 13087
Calculated By - SCOTT E. GARLAND Drawing No. - 1-3 OF 3
Construction: (X) Combustible () Non-Combustible Ceiling Height 7-6
OCCUPANCY - CONDOMINIUMS - RESIDENTIAL

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 - 14.0 Gpm System Type
Listed Pres. at Start Point - 10.2 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 14 x 14 () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make RELIABLE Model F1RES44
I Elevation at Highest Outlet - 129.42Feet Size 1/2 X 1/2 K-Factor 4.4
G Note: Temperature Rating 155 DEG
N DESIGN AREA #2 - 3RD FLOOR BEDROOM

Calculation Gpm Required 54.628 Psi Required 38.762 AT BASE OF RISER
Summary C-Factor Used: Overhead 150 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 11-2-1999 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 50 Elev.
R Residual (Psi) - 44 Other Well
Flow (Gpm) - 1047 Proof Flow Gpm
S Elevation - 100.0

P Location: ON NORTH STREET, NEXT TO THE BUILDING

P
L Source of Information: PORTLAND WATER DISTRICT
Y

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
5	129.417	4.4	8.71	na	12.99	0.05	240	7.5
6	129.417	4.4	9.54	na	13.59	0.05	240	7.5
7	129.417	4.4	10.12	na	14.0	0.05	240	7.5
8	129.417	4.4	10.2	na	14.05	0.05	280	10.2
G	129.417		10.68	na				
XG	131.5		10.02	na				
X	131.5		10.2	na				
D	131.5		10.62	na				
E	131.5		10.89	na				
F	131.5		11.59	na				
H	121.083		17.09	na				
J	121.083		17.76	na				
EE	121.083		18.66	na				
FF	109.583		24.23	na				
DD	109.583		24.31	na				
GG	98.75		29.18	na				
RT	98.75		29.21	na				
TV	96.833		33.05	na				
RB	92.417		38.76	na				
X1	92.417		38.77	na				
TEST	100.0		35.49	na				

The maximum velocity is 6.4 and it occurs in the pipe between nodes 7 and G

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	*****
5 to 6	12.99	1.049 120.0	2E	4.0 0.0	10.083 4.000	8.715 0.0			K Factor = 4.40	
6 to 7	12.99	0.0586		0.0	14.083	0.825			Vel = 4.82	
6 to 7	13.59	1.380 120.0		0.0 0.0	10.000 0.0	9.540 0.0			K Factor = 4.40	
7 to G	26.58	0.0579		0.0	10.000	0.579			Vel = 5.70	
7 to G	14.00	1.610 120.0	1T	8.0 0.0	1.333 8.000	10.119 0.0			K Factor = 4.40	
	40.58	0.0598		0.0	9.333	0.558			Vel = 6.40	
	0.0 40.58					10.677			K Factor = 12.42	
8 to G	14.05	1.049 120.0	1T	5.0 0.0	2.042 5.000	10.200 0.0			K Factor = 4.40	
	14.05	0.0677		0.0	7.042	0.477			Vel = 5.22	
	0.0 14.05					10.677			K Factor = 4.30	
G to XG	54.63	2.067 120.0	1E	5.0 0.0	3.083 5.000	10.677 -0.902				
XG to X	54.63	0.0307		0.0	8.083	0.248			Vel = 5.22	
XG to X	0.0	2.003 150.0		0.0 0.0	7.333 0.0	10.023 0.0				
X to D	54.63	0.0237		0.0	7.333	0.174			Vel = 5.56	
X to D	0.0	2.003 150.0	1T	12.965 0.0	4.917 12.965	10.197 0.0				
D to E	54.63	0.0237		0.0	17.882	0.423			Vel = 5.56	
D to E	0.0	2.003 150.0		0.0 0.0	11.333 0.0	10.620 0.0				
E to F	54.63	0.0236		0.0	11.333	0.268			Vel = 5.56	
E to F	0.0	2.003 150.0	2E	12.965 0.0	16.667 12.965	10.888 0.0				
F to H	54.63	0.0237		0.0	29.632	0.702			Vel = 5.56	
F to H	0.0	2.067 120.0	2E 1T	10.0 10.0	12.333 20.000	11.590 4.512				
H to J	54.63	0.0307		0.0	32.333	0.992			Vel = 5.22	
H to J	0.0	2.067 120.0	1T	10.0 0.0	11.833 10.000	17.094 0.0				
J to EE	54.63	0.0307		0.0	21.833	0.671			Vel = 5.22	
J to EE	0.0	2.067 120.0	1E 1T	5.0 10.0	14.000 15.000	17.765 0.0				
EE to FF	54.63	0.0307		0.0	29.000	0.890			Vel = 5.22	
EE to FF	0.0	2.157 120.0	1T	12.307 0.0	11.583 12.307	18.655 4.981				
FF to DD	54.63	0.0249		0.0	23.890	0.596			Vel = 4.80	
FF to DD	0.0	3.26 120.0	1T	20.159 0.0	4.333 20.159	24.232 0.0				
DD to GG	54.63	0.0033		0.0	24.492	0.082			Vel = 2.10	
DD to GG	0.0	3.26 120.0	1E 1T	9.408 20.159	22.542 29.567	24.314 4.692				
	54.63	0.0033		0.0	52.109	0.173			Vel = 2.10	

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	*****
GG to RT	0.0 54.63	4.26 120.0 0.0009	1E	13.167 0.0 0.0	24.125 13.167 37.292	29.179 0.0 0.034		Vel = 1.23	
RT to TV	0.0 54.63	4.26 120.0 0.0010	1Fsp	0.0 0.0 0.0	1.917 0.0 1.917	29.213 3.830 0.002		* Fixed loss = 3 Vel = 1.23	
TV to RB	0.0 54.63	4.26 120.0 0.0009	1Zac	0.0 0.0 0.0	4.417 0.0 4.417	33.045 5.713 0.004		* Fixed loss = 3.8 Vel = 1.23	
RB to X1	0.0 54.63	6.16 140.0 0.0001	1G 1T	4.304 43.037 0.0	35.000 47.341 82.341	38.762 0.0 0.009		Vel = 0.59	
X1 to TEST	0.0 54.63	12.34 140.0 0.0		0.0 0.0 0.0	20.000 0.0 20.000	38.771 -3.284 0.0		Vel = 0.15	
	0.0 54.63					35.487		K Factor = 9.17	

Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 50
C2 - Residual Pressure: 44
C2 - Residual Flow : 1047

Demand:
D1 - Elevation : 12.741
D2 - System Flow : 54.6282
D2 - System Pressure : 35.487
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 54.6282
Safety Margin : 14.488

