



. . . Fire Protection by Computer Design

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

Job Name : KING RESIDENCE
Building :
Location : 23 BAY STREET, PORTLAND, MAINE 04103
System : 1 OF 1
Contract : 11083
Data File : KINGRES111083.wxf

HYDRAULIC DESIGN INFORMATION SHEET

Name - KING RESIDENCE Date - 12-9-2011
Location - 23 BAY STREET, PORTLAND, MAINE 04103
Building - System No. - 1 OF 1
Contractor - REDFERN PROPERTIES Contract No. - 11083
Calculated By - SCOTT E. GARLAND Drawing No. - 1 OF 1
Construction: (X) Combustible () Non-Combustible Ceiling Height 9-8
OCCUPANCY - RESIDENTIAL - SINGLE FAMILY DWELLING

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 - 13.0 Gpm System Type
Listed Pres. at Start Point - 7.0 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 RFC49
I Elevation at Highest Outlet - 70.167Feet Size 1/2 X 1/2 K-Factor 4.9
G Note: Temperature Rating 165 DEG
N DESIGN AREA #1 - 2ND FLOOR BATHROOM & STAIRS

Calculation Gpm Required 26.135 Psi Required 35.526 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 - 7-28-2004 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 92 Elev.
R Residual (Psi) - 89 Other Well
Flow (Gpm) - 1433 Proof Flow Gpm
S Elevation - 50.0

P Location: ON OCEAN AVENUE AT READ STREET, 390-0 FROM BAY STREET

P Source of Information: PORTLAND WATER DISTRICT

Y

Fittings Used Summary

Sprinkler Systems, Inc.
KING RESIDENCE

Page 3
Date 12-9-2011

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
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

Units Summary

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

Pressure / Flow Summary - STANDARD

Sprinkler Systems, Inc.
KING RESIDENCE

Page 4
Date 12-9-2011

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	4.9	7.04	na	13.0	0.05	260	7.0
1	70.167	K = K @ DROP	7.35	na	13.0			
2	70.167	K = K @ DROP	7.5	na	13.13			
A	70.167		9.01	na				
B	59.5		16.72	na				
C	59.5		18.69	na				
D	59.5		22.89	na				
E	59.5		25.61	na				
RT	59.5		26.2	na				
RB	51.0		35.53	na				
X	51.0		39.62	na				
X1	51.0		39.63	na				
X2	51.0		39.63	na				
TEST	50.0		40.06	na				

The maximum velocity is 8.81 and it occurs in the pipe between nodes 2 and A

Final Calculations - Hazen-Williams

Sprinkler Systems, Inc.
KING RESIDENCE

Page 5
Date 12-9-2011

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	***** Notes *****
TYP to DROP	13.00 13.0	1.101 150 0.0306	1T 9.563 0.0	0.500 9.562 10.062	7.039 0.0 0.308		K Factor = 4.90 Vel = 4.38
	0.0 13.00				7.347		K Factor = 4.80
1 to 2	13.00 13.0	1.101 150 0.0308	0.0 0.0 0.0	5.000 0.0 5.000	7.347 0.0 0.154		K Factor @ node DROP Vel = 4.38
2 to A	13.13 26.13	1.101 150 0.1116	1T 9.563 0.0	4.000 9.562 13.562	7.501 0.0 1.513		K Factor @ node DROP Vel = 8.81
A to B	0.0 26.13	1.101 150 0.1116	1E 3.825 1T 9.563	14.250 13.387 27.637	9.014 4.620 3.085		Vel = 8.81
B to C	0.0 26.13	1.101 150 0.1116	1T 9.563 0.0	8.083 9.562 17.645	16.719 0.0 1.969		Vel = 8.81
C to D	0.0 26.13	1.101 150 0.1116	1E 3.825 1T 9.563	24.250 13.387 37.637	18.688 0.0 4.201		Vel = 8.81
D to E	0.0 26.13	1.101 150 0.1116	1E 3.825 0.0	20.583 3.825 24.408	22.889 0.0 2.725		Vel = 8.81
E to RT	0.0 26.13	1.101 150 0.1116	1E 3.825 0.0	1.417 3.825 5.242	25.614 0.0 0.585		Vel = 8.81
RT to RB	0.0 26.13	1.38 120 0.0562	1Z 3.0 0.0	8.500 3.000 11.500	26.199 8.681 0.646		* Fixed loss = 5 Vel = 5.60
RB to X	0.0 26.13	1.314 150 0.0472	1E 2.247 1T 4.495	80.000 6.742 86.742	35.526 0.0 4.091		Vel = 6.18
X to X1	0.0 26.13	6.16 140 0.0	1T 43.037 0.0	360.000 43.037 403.037	39.617 0.0 0.012		Vel = 0.28
X1 to X2	0.0 26.13	12.34 140 0.0	1T 93.767 0.0	390.000 93.767 483.767	39.629 0.0 0.001		Vel = 0.07
X2 to TEST	0.0 26.13	6.16 140 0.0	0.0 0.0 0.0	30.000 0.0 30.000	39.630 0.433 0.001		Vel = 0.28

Final Calculations - Standard

Sprinkler Systems, Inc.
KING RESIDENCE

Page 6
Date 12-9-2011

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 26.13					40.064		K Factor =	4.13

Water Supply Curve (C)

Sprinkler Systems, Inc.
KING RESIDENCE

Page 7
Date 12-9-2011

City Water Supply:
C1 - Static Pressure : 92
C2 - Residual Pressure: 89
C2 - Residual Flow : 1433

Demand:
D1 - Elevation : 8.734
D2 - System Flow : 26.1349
D2 - System Pressure : 40.064
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 26.1349
Safety Margin : 51.935

