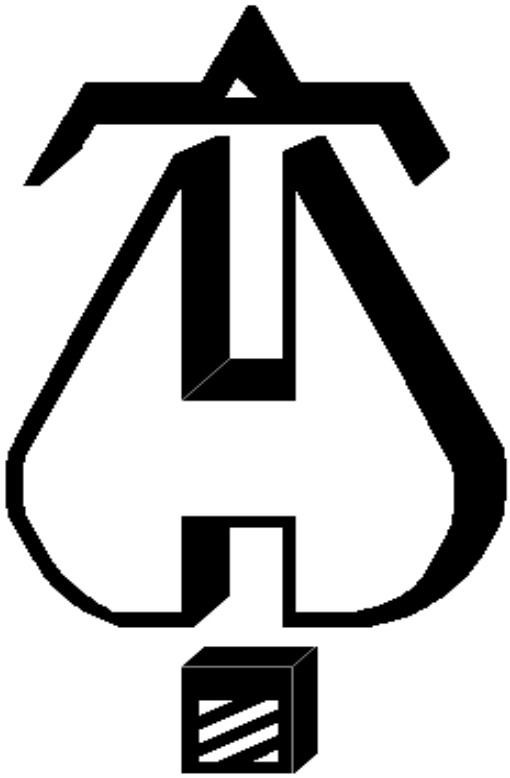

. . . Fire Protection by Computer Design

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

Job Name	:	MURRAY HOUSE
Building	:	
Location	:	104 NORTH STREET, PORTLAND, MAINE 04101
System	:	1 OF 1
Contract	:	12111
Data File	:	12111MURRAYHOUSEA1.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - MURRAY HOUSE Date - 2-5-2013
Location - 104 NORTH STREET, PORTLAND, MAINE 04101
Building - System No. - 1 OF 1
Contractor - REDFERN PROPERTIES Contract No. - 12111
Calculated By - SCOTT E. GARLAND Drawing No. - 1,2 OF 2
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8-5
OCCUPANCY - RESIDENTIAL - SINGLE FAMILY DWELLING

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: ( )1 (X)2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 13.0 Gpm System Type
Listed Pres. at Start Point - 7.0 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction
Domestic Flow Added - Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make RELIABLE Model F1RES49
Elevation at Highest Outlet - 184.0Feet Size 1/2 X 1/2 K-Factor 4.9
Note: Temperature Rating 155 DEG
DESIGN AREA #1 - 3RD FLOOR OFFICE

Calculation Summary — Gpm Required 26.775 Psi Required 39.960 AT BASE OF RISER
C-Factor Used: Overhead 150 Underground 140

WATER SUPPLY

Water Flow Test:
Date of Test - 3-27-2006
Time of Test -
Static (Psi) - 44
Residual (Psi) - 37
Flow (Gpm) - 1518
Elevation - 157.0

Pump Data:
Rated Cap.
@ Psi
Elev.
Other

Tank or Reservoir:
Cap.
Elev.

Well
Proof Flow Gpm

Location: ON NORTH STREET, APPROXIMATELY 700'-0" FROM THE BUILDING

Source of Information: PORTLAND WATER DISTRICT

Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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																			
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

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	184.0	K = K @ DROP	7.35	na	13.0			
2	184.0	K = K @ DROP	8.25	na	13.77			
A	183.0		9.04	na				
B	174.417		14.07	na				
C	174.417		14.76	na				
D	164.5		19.6	na				
E	164.5		19.91	na				
F	154.5		24.81	na				
RT	154.5		25.05	na				
TV	150.5		30.05	na				
RB	146.25		39.96	na				
X1	152.0		39.28	na				
TEST	157.0		37.12	na				

The maximum velocity is 6.33 and it occurs in the pipe between nodes RB and X1

Final Calculations - Hazen-Williams

Sprinkler Systems Inc. Page 5
MURRAY HOUSE Date 2-5-2013

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	13.00	1.101	1T	9.563	0.500	7.039		K Factor = 4.90
to		150.0		0.0	9.562	0.0		
DROP	13.0	0.0306		0.0	10.062	0.308		Vel = 4.38
	0.0							
	13.00					7.347		K Factor = 4.80
1	13.00	1.101	2E	7.65	21.750	7.347		K Factor @ node DROP
to		150.0		0.0	7.650	0.0		
2	13.0	0.0307		0.0	29.400	0.902		Vel = 4.38
2	13.77	1.394	1E	4.762	5.000	8.249		K Factor @ node DROP
to		150.0		0.0	4.761	0.433		
A	26.77	0.0370		0.0	9.761	0.361		Vel = 5.63
A	0.0	1.394	2E	9.523	16.250	9.043		
to		150.0	1T	9.523	19.046	3.717		
B	26.77	0.0370		0.0	35.296	1.306		Vel = 5.63
B	0.0	1.598	1T	11.656	24.833	14.066		
to		150.0		0.0	11.656	0.0		
C	26.77	0.0190		0.0	36.489	0.694		Vel = 4.28
C	0.0	1.598	1E	5.828	11.250	14.760		
to		150.0	1T	11.656	17.484	4.295		
D	26.77	0.0190		0.0	28.734	0.547		Vel = 4.28
D	0.0	1.598	1T	11.656	4.583	19.602		
to		150.0		0.0	11.656	0.0		
E	26.77	0.0190		0.0	16.239	0.308		Vel = 4.28
E	0.0	1.598	1E	5.828	12.250	19.910		
to		150.0	1T	11.656	17.484	4.331		
F	26.77	0.0190		0.0	29.734	0.566		Vel = 4.28
F	0.0	1.610		0.0	8.750	24.807		
to		120.0		0.0	0.0	0.0		
RT	26.77	0.0278		0.0	8.750	0.243		Vel = 4.22
RT	0.0	1.610	1E	4.0	5.667	25.050		
to		120.0	1Fsp	0.0	4.000	4.732		* Fixed loss = 3
TV	26.77	0.0277		0.0	9.667	0.268		Vel = 4.22
TV	0.0	1.610		0.0	2.500	30.050		
to		120.0		0.0	0.0	9.841		* Fixed loss = 8
RB	26.77	0.0276		0.0	2.500	0.069		Vel = 4.22
RB	0.0	1.314	1E	2.247	30.000	39.960		
to		150.0	1T	4.495	6.742	-2.490		
X1	26.77	0.0493		0.0	36.742	1.812		Vel = 6.33
X1	0.0	12.34		0.0	700.000	39.282		
to		140.0		0.0	0.0	-2.166		
TEST	26.77	0.0		0.0	700.000	0.001		Vel = 0.07
	0.0							
	26.77					37.117		K Factor = 4.39

Water Supply Curve (C)

Sprinkler Systems Inc.
MURRAY HOUSE

Date 2-5-2013

City Water Supply:
- C1 - Static Pressure : 44
- C2 - Residual Pressure: 37
- C2 - Residual Flow : 1518

Demand:

D1 - Elevation	:	11.694
D2 - System Flow	:	26.7745
D2 - System Pressure	:	37.117
Hose (Adj City)	:	_____
Hose (Demand)	:	_____
D3 - System Demand	:	26.7745
Safety Margin	:	6.879