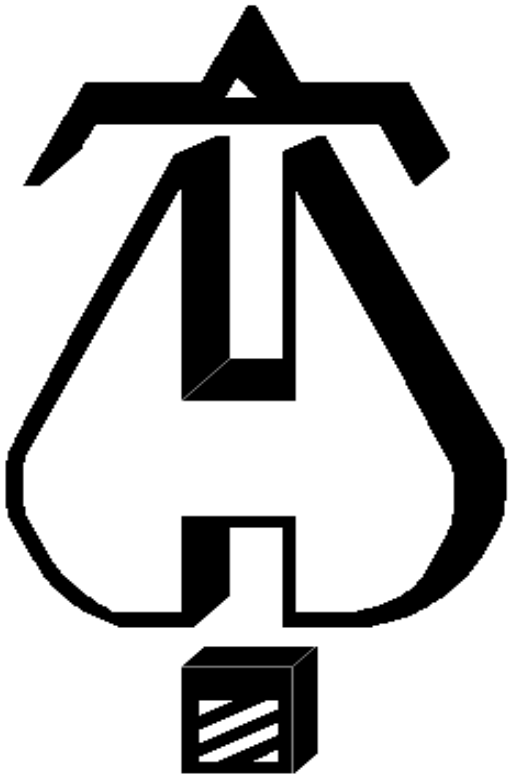

. . . Fire Protection by Computer Design

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

Job Name	:	NORMAN HANSON DETROY
Building	:	
Location	:	2 CANAL PLAZA, PORTLAND, MAINE 04101
System	:	1 OF 1
Contract	:	13011
Data File	:	13011NORMANHANSONDETROYA1.WXF

Hydraulic Design Information Sheet

Name - NORMAN HANSON DETROY Date - 5-7-2013
Location - 2 CANAL PLAZA, PORTLAND, MAINE 04101
Building - System No. - 1 OF 1
Contractor - MONAGHAN WOODWORKS Contract No. - 13011
Calculated By - SCOTT E. GARLAND Drawing No. - 1, 2 OF 2
Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - 8-6
Occupancy - LIGHT HAZARD - OFFICES

SYSTEM DESIGN

(X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling Made By Date

Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
Density	- .10	(X) Wet	Make RELIABLE
Area Per Sprinkler	- 225	( ) Dry	Model F1FR56
Elevation at Highest Outlet	- 159.667	( ) Deluge	Size 1/2 X 1/2
Hose Allowance - Inside	-	( ) Preaction	K-Factor 5.6
Rack Sprinkler Allowance	-	( ) Other	Temp.Rat.155 DEG
Hose Allowance - Outside	- 100		

Note DESIGN AREA #1 - 4TH FLOOR OFFICES

Calculation Summary: Flow Required - 144.014 Press Required - 75.421 AT BASE OF RISER
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:		Pump Data:		Tank or Reservoir:	
Date of Test	- 6-24-2008			Cap. -	
Time of Test	-	Rated Cap.-		Elev.-	
Static Press	- 90	@ Press	-		
Residual Press	- 88	Elev.	-		Well
Flow	- 1758				Proof Flow
Elevation	- 117.0				

Location - ON EXCHANGE STREET, 1500-0 FROM THE BUILDING

Source of Information - PORTLAND WATER DISTRICT

COMMODITY STORAGE

Commodity Class Location
Storage Ht. Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.	
( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non	
( ) Mult. Row		( ) Open Shelf		

Flue Spacing Clearance:Storage to Ceiling
Longitudinal Transverse

Horizontal Barriers Provided:

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
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
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
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	7.08	na	14.9	0.1	149	7.08
TYP1	0.0	8	17.02	na	33.0	0.1	330	17.0
1	159.667	K = K @ DROP	12.16	na	18.52			
2	159.667	K = K @ DROP	12.38	na	18.69			
3	159.667	K = K @ DROP	13.23	na	19.31			
4	159.667	K = K @ DROP	15.05	na	20.6			
A	159.667		18.3	na				
B	159.667		21.54	na				
5	159.667	K = K @ DRP1	20.47	na	33.0			
6	159.667	K = K @ DRP1	21.58	na	33.89			
E	159.667		25.71	na				
C	159.667		26.69	na				
D	159.667		29.24	na				
F	159.667		30.27	na				
G	159.667		35.94	na				
H	159.667		43.68	na				
S	109.167		65.97	na				
T	109.167		66.23	na				
U	109.167		66.65	na				
RT	108.0		67.42	na				
TV	105.083		71.7	na				
RB	101.75		75.42	na				
X1	101.75		75.9	na	100.0			
X2	101.75		75.93	na				
X3	117.0		69.38	na				
TEST	117.0		69.53	na				

The maximum velocity is 15.15 and it occurs in the pipe between nodes 4 and A

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	14.90	1.049	2E	4.0	1.500	7.080		K Factor = 5.60
to		120.0	1T	5.0	9.000	0.0		
DROP	14.9	0.0755		0.0	10.500	0.793		Vel = 5.53
	0.0							
	14.90					7.873		K Factor = 5.31
TYP1	33.00	1.049	2E	4.0	1.500	17.016		K Factor = 8.00
to		120.0	1T	5.0	9.000	0.0		
DRP1	33.0	0.3286		0.0	10.500	3.450		Vel = 12.25
	0.0							
	33.00					20.466		K Factor = 7.29
1	18.52	1.442		0.0	9.125	12.164		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
2	18.52	0.0240		0.0	9.125	0.219		Vel = 3.64
2	18.69	1.442		0.0	9.667	12.383		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
3	37.21	0.0872		0.0	9.667	0.843		Vel = 7.31
3	19.31	1.442		0.0	9.667	13.226		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
4	56.52	0.1888		0.0	9.667	1.825		Vel = 11.10
4	20.61	1.442		0.0	9.667	15.051		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
A	77.13	0.3356		0.0	9.667	3.244		Vel = 15.15
A	0.0	1.442		0.0	9.667	18.295		
to		120.0		0.0	0.0	0.0		
B	77.13	0.3357		0.0	9.667	3.245		Vel = 15.15
B	0.0	1.442	1T	7.432	7.917	21.540		
to		120.0		0.0	7.432	0.0		
C	77.13	0.3356		0.0	15.349	5.151		Vel = 15.15
	0.0							
	77.13					26.691		K Factor = 14.93
5	33.00	1.442		0.0	16.000	20.466		K Factor @ node DRP1
to		120.0		0.0	0.0	0.0		
6	33.0	0.0698		0.0	16.000	1.117		Vel = 6.48
6	33.89	1.442		0.0	16.000	21.583		K Factor @ node DRP1
to		120.0		0.0	0.0	0.0		
E	66.89	0.2579		0.0	16.000	4.126		Vel = 13.14
E	0.0	1.442	1T	7.432	6.250	25.709		
to		120.0		0.0	7.432	0.0		
D	66.89	0.2579		0.0	13.682	3.528		Vel = 13.14
	0.0							
	66.89					29.237		K Factor = 12.37
C	77.13	2.157	4E	24.613	17.000	26.691		
to		120.0	1T	12.307	36.920	0.0		
D	77.13	0.0472		0.0	53.920	2.546		Vel = 6.77
D	66.88	2.157		0.0	6.917	29.237		
to		120.0		0.0	0.0	0.0		
F	144.01	0.1499		0.0	6.917	1.037		Vel = 12.64
F	0.0	2.157	1T	12.307	25.458	30.274		
to		120.0		0.0	12.307	0.0		
G	144.01	0.1499		0.0	37.765	5.661		Vel = 12.64

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
G	0.0	2.157	1B	7.384	5.792	35.935		
to		120.0	1E	6.153	25.844	3.000		* Fixed loss = 3
H	144.01	0.1499	1Fsp	0.0	31.636	4.743		Vel = 12.64
			1T	12.307				
H	0.0	4.26	1T	26.334	50.500	43.678		
to		120.0		0.0	26.334	21.872		
S	144.01	0.0055		0.0	76.834	0.419		Vel = 3.24
S	0.0	4.26	1E	13.167	7.625	65.969		
to		120.0	1T	26.334	39.501	0.0		
T	144.01	0.0055		0.0	47.126	0.257		Vel = 3.24
T	0.0	4.26	1E	13.167	38.000	66.226		
to		120.0	1T	26.334	39.501	0.0		
U	144.01	0.0054		0.0	77.501	0.422		Vel = 3.24
U	0.0	4.26	3E	39.501	8.750	66.648		
to		120.0		0.0	39.501	0.505		
RT	144.01	0.0055		0.0	48.251	0.263		Vel = 3.24
RT	0.0	4.26	1Fsp	0.0	2.917	67.416		
to		120.0		0.0	0.0	4.263		* Fixed loss = 3
TV	144.01	0.0058		0.0	2.917	0.017		Vel = 3.24
TV	0.0	4.26	1Zac	0.0	3.333	71.696		
to		120.0		0.0	0.0	3.708		* Fixed loss = 2.264
RB	144.01	0.0051		0.0	3.333	0.017		Vel = 3.24
RB	0.0	4.1	1E	14.534	50.000	75.421		
to		140.0	1G	2.907	46.508	0.0		
X1	144.01	0.0049	1T	29.067	96.508	0.477		Vel = 3.50
X1	100.00	12.34	1E	42.195	350.000	75.898		Qa = 100
to		140.0	2T	187.534	229.729	0.0		
X2	244.01	0.0001		0.0	579.729	0.035		Vel = 0.65
X2	0.0	11.938	1T	60.0	500.000	75.933		
to		120.0		0.0	60.000	-6.605		
X3	244.01	0.0001		0.0	560.000	0.054		Vel = 0.70
X3	0.0	10.02		0.0	650.000	69.382		
to		120.0		0.0	0.0	0.0		
TEST	244.01	0.0002		0.0	650.000	0.146		Vel = 0.99
	0.0							
	244.01					69.528		K Factor = 29.26

Water Supply Curve (C)

Sprinkler Systems Inc.
NORMAN HANSON DETROY

Page 7
Date 5-7-2013

City Water Supply:
- C1 - Static Pressure : 90
- C2 - Residual Pressure: 88
- C2 - Residual Flow : 1758

Demand:

D1 - Elevation	:	18.479
D2 - System Flow	:	144.014
D2 - System Pressure	:	69.528
Hose (Adj City)	:	_____
Hose (Demand)	:	100
D3 - System Demand	:	244.014
Safety Margin	:	20.420