



**... Fire Protection by Computer Design**

SPRINKLER SYSTEMS INC.  
4 AVON STREET  
P O BOX 1285  
LEWISTON, ME. 04243  
207-782-0104

Job Name : 3 CANAL PLAZA SECOND FLOOR AREA 1  
Building : EXISTING  
Location : 3 CANAL PLAZA PORTLAND, MAINE  
System : 1 WET  
Contract : 16-162  
Data File : 3 CANAL PLAZA SECOND FLOOR AREA 1.WXF

Hydraulic Design Information Sheet

Name - 3 CANAL PLAZA SECOND FLOOR AREA 1 Date - 12-16-16  
 Location - 3 CANAL PLAZA PORTLAND, MAINE  
 Building - EXISTING System No. - 1 WET  
 Contractor - SPRINKLER SYSTEMS INC Contract No. - 16-162  
 Calculated By - CDS Drawing No. - 1-2 OF 2  
 Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - VARIES  
 Occupancy - SECOND FLOOR

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.  
 Y ( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve

S Other

T Specific Ruling Made By Date

E				
M	Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 324	( ) Dry	Model F1FR QREC
E	Elevation at Highest Outlet	- 136	( ) Deluge	Size 17/32" X 3/4"
S	Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 8.0
I	Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.155 DEG.
G	Hose Allowance - Outside	- 100		

N Note

Calculation Flow Required - 284.34 Press Required - 90.01 AT PUMP  
 Summary C-Factor Used: 120 Overhead 120 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - N/A		Cap. -
T	Time of Test - N/A	Rated Cap.- 506	Elev.-
E	Static Press - N/A	@ Press - 130	
R	Residual Press - N/A	Elev. - 100	Well
	Flow - N/A		Proof Flow
S	Elevation - N/A		

U Location - PUMP FLOW TEST DATED 8/21/15

P Source of Information - OWNER

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	Solid Piled %	Palletized % Rack
M	( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage ( ) Encap.
S	( ) Double Row	( ) Slave Pallet	( ) Solid Shelf ( ) Non
T	( ) Mult. Row		( ) Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling  
 A Longitudinal Transverse

E Horizontal Barriers Provided:

# Fittings Used Summary

SPRINKLER SYSTEMS INC.  
3 CANAL PLAZA SECOND FLOOR AREA 1

Page 2  
Date

Fitting Legend		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
Bvcb	B Fly Vic 705W	0	0	0	0	0	0	5	5	0	12	12	8	11	12	14	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
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65	71	81	91	101	121
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

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

# Pressure / Flow Summary - STANDARD

SPRINKLER SYSTEMS INC.  
3 CANAL PLAZA SECOND FLOOR AREA 1

Page 3  
Date

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	8	17.0	na	32.98	0.1	324	17.0
TYP1	0.0	5.6	16.14	na	22.5	0.1	225	7.0
5	134.0	8	17.0	na	32.98	0.1	324	17.0
6	134.0		25.37	na				
7	134.0	K = K @ ARM	25.56	na	33.83			
8	134.0	K = K @ ARM	28.78	na	35.89			
1	136.0	K = K @ ARM1	27.87	na	26.73			
2	136.0	K = K @ ARM1	28.31	na	26.94			
3	136.0	K = K @ ARM1	30.49	na	27.96			
4	136.0		47.08	na				
9	134.0		49.25	na				
10	134.0		57.84	na				
11	134.0		65.97	na				
E	135.0		72.36	na				
F	123.0		77.66	na				
G	109.75		83.51	na				
HOSE	100.0		90.0	na	100.0			
PUMP	100.0		90.01	na				

The maximum velocity is 21.59 and it occurs in the pipe between nodes 8 and 9

# Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.  
3 CANAL PLAZA SECOND FLOOR AREA 1

Page 4  
Date

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 ARM	32.98	1.049 120.0	T EqL	5.0 17.0	0.250 22.000	17.000 0.0		K Factor = 8.00	
	32.98	0.3284		0.0	22.250	7.306		Vel = 12.24	
	0.0								
	32.98					24.306		K Factor = 6.69	
TYP1 to ARM1	22.50	1.049 120.0	T EqL	5.0 17.0	0.250 22.000	16.143 0.0		K Factor = 5.60	
	22.5	0.1618		0.0	22.250	3.601		Vel = 8.35	
	0.0								
	22.50					19.744		K Factor = 5.06	
5 to 6	32.98	1.049 120.0	T EqL	5.0 17.0	3.500 22.000	17.000 0.0		K Factor = 8.00	
	32.98	0.3284		0.0	25.500	8.373		Vel = 12.24	
6 to 7	0.0	1.394 150.0		0.0 0.0	3.500 0.0	25.373 0.0			
	32.98	0.0546		0.0	3.500	0.191		Vel = 6.93	
7 to 8	33.83	1.394 150.0		0.0 0.0	16.000 0.0	25.564 0.0		K Factor @ node ARM	
	66.81	0.2008		0.0	16.000	3.213		Vel = 14.04	
8 to 9	35.89	1.394 150.0	T	9.523 0.0	36.500 9.523	28.777 0.0		K Factor @ node ARM	
	102.7	0.4449		0.0	46.023	20.474		Vel = 21.59	
	0.0								
	102.70					49.251		K Factor = 14.63	
1 to 2	26.73	1.394 150.0		0.0 0.0	12.000 0.0	27.869 0.0		K Factor @ node ARM1	
	26.73	0.0368		0.0	12.000	0.442		Vel = 5.62	
2 to 3	26.95	1.394 150.0		0.0 0.0	16.250 0.0	28.311 0.0		K Factor @ node ARM1	
	53.68	0.1340		0.0	16.250	2.177		Vel = 11.28	
3 to 4	27.95	1.394 150.0	2E T	9.523 9.523	38.000 19.046	30.488 0.0		K Factor @ node ARM1	
	81.63	0.2909		0.0	57.046	16.596		Vel = 17.16	
4 to 9	0.0	2.157 120.0	2E	12.307 0.0	12.500 12.307	47.084 0.866			
	81.63	0.0524		0.0	24.807	1.301		Vel = 7.17	
9 to 10	102.71	2.157 120.0	T	12.307 0.0	24.000 12.307	49.251 0.0			
	184.34	0.2367		0.0	36.307	8.594		Vel = 16.18	
10 to 11	0.0	2.157 120.0	T	12.307 0.0	22.000 12.307	57.845 0.0			
	184.34	0.2367		0.0	34.307	8.120		Vel = 16.18	
11 to E	0.0	2.635 120.0	Fsp Bvcb	0.0 6.864	3.000 39.812	65.965 2.567		** Fixed Loss = 3	
	184.34	0.0893	2T	32.948	42.812	3.823		Vel = 10.85	

# Final Calculations - Hazen-Williams

SPRINKLER SYSTEMS INC.  
3 CANAL PLAZA SECOND FLOOR AREA 1

Page 5  
Date

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
E	0.0	4.26		12.000	72.355				
to		120.0		0.0	5.197				
F	184.34	0.0087		12.000	0.104		Vel = 4.15		
F	0.0	4.26		13.330	77.656				
to		120.0		0.0	5.739				
G	184.34	0.0086		13.330	0.114		Vel = 4.15		
G	0.0	4.26	10E	131.671	100.000	83.509			
to		120.0	G	2.633	163.272	4.223			
HOSE	184.34	0.0086	S	28.968	263.272	2.265	Vel = 4.15		
HOSE	100.00	4.026		0.0	0.500	89.997	Qa = 100.0		
to		120.0		0.0	0.0	0.0			
PUMP	284.34	0.0260		0.0	0.500	0.013	Vel = 7.17		
	0.0								
	284.34					90.010	K Factor = 29.97		

# Water Supply Curve C

SPRINKLER SYSTEMS INC.  
3 CANAL PLAZA SECOND FLOOR AREA 1

Page 6  
Date

Pump Data:  
 P1 - Pump Churn Pressure : 141  
 P2 - Pump Rated Pressure : 130  
 P2 - Pump Rated Flow : 506  
 P3 - Pump Pressure @ Max Flow : 119  
 P3 - Pump Max Flow : 750

Demand:  
 D1 - Elevation : 14.725  
 D2 - System Flow : 184.337  
 D2 - System Pressure : 90.010  
 Hose ( Demand ) : 100  
 D3 - System Demand : 284.337  
 Safety Margin : 47.394

