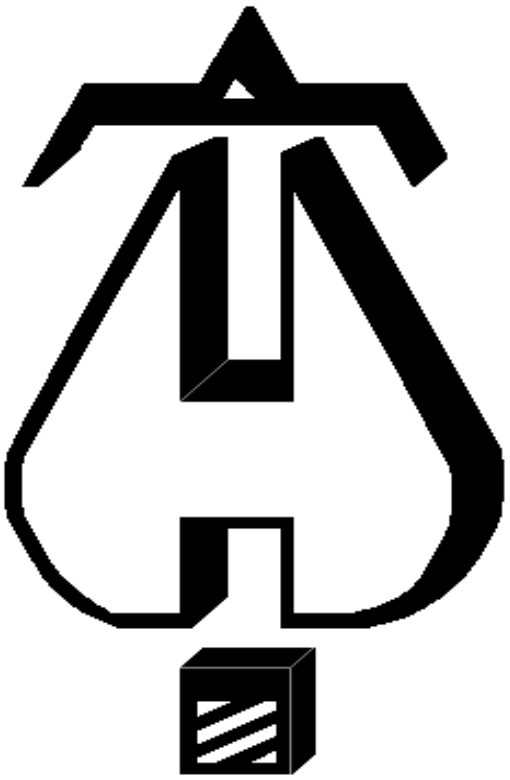

. . . Fire Protection by Computer Design

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

Job Name	:	100 Commercial Street Wet Systems Area 1
Building	:	Existing
Location	:	100 Commercial Street Portland, Maine
System	:	1 Wet
Contract	:	15-095
Data File	:	100 Commercial Street Wet System Area 1.WXF

Hydraulic Design Information Sheet

Name - 100 Commercial Street Date - 11-16-15
Location - 100 Commercial Street Portland, Maine
Building - Existing System No. - 1 Wet
Contractor - Sprinkler Systems Inc. Contract No. - 15-095
Calculated By - CDS Drawing No. - 1-3 of 3
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - varies
Occupancy - Office Building

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	- 1950	System Type	Sprinkler/Nozzle
Density	- .10	(X) Wet	Make Reliable
Area Per Sprinkler	- 168	( ) Dry	Model F1FR56
Elevation at Highest Outlet	- 151	( ) Deluge	Size 1/2" x 1/2"
Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 5.6
Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.200 Deg.
Hose Allowance - Outside	- 100		

Note

Calculation Summary: Flow Required - 248.18 Press Required - 85.803 AT BASE
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:		Pump Data:		Tank or Reservoir:	
Date of Test	- 10-06-15			Cap. -	
Time of Test	- AM	Rated Cap.-		Elev.-	
Static Press	- 110	@ Press	-		
Residual Press	- 48	Elev.	-		Well
Flow	- 1162				Proof Flow
Elevation	- 100.0'				

Location - ON SITE

Source of Information - OWNER AND 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		

RACK STORAGE

Flue Spacing Clearance:Storage to Ceiling
Longitudinal Transverse

Horizontal Barriers Provided:

Fitting Legend

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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	9.0	na	16.8	0.1	168	7.0
TYP1	0.0	5.6	9.0	na	16.8	0.1	168	7.0
15	151.0	K = K @ SPRG	12.37	na	17.39			
16	151.0	K = K @ SPRG	12.65	na	17.59			
17	151.0	K = K @ DROP	13.57	na	18.25			
10	151.0	K = K @ SPRG	12.15	na	17.24			
11	151.0	K = K @ SPRG	12.23	na	17.29			
12	151.0	K = K @ SPRG	12.76	na	17.67			
5	151.0	K = K @ SPRG	11.54	na	16.8			
6	151.0	K = K @ SPRG	11.6	na	16.84			
7	151.0	K = K @ DROP	11.88	na	17.08			
8	151.0	K = K @ DROP	12.54	na	17.54			
1	151.0	K = K @ DROP	13.2	na	18.0			
2	151.0	K = K @ DROP	13.41	na	18.14			
3	151.0		14.56	na				
4	151.0	K = K @ DROP	14.6	na	18.93			
9	151.0		14.61	na				
13	151.0		14.79	na				
14	151.0	K = K @ DROP	15.38	na	19.43			
18	151.0		15.46	na				
19	151.0		38.9	na				
A	151.0		51.47	na				
B	139.5		56.61	na				
C	128.5		61.94	na				
D	116.5		68.38	na				
E	116.5		69.24	na				
F	105.5		74.37	na				
TWR	105.5		75.11	na				
BWR	101.5		80.5	na				
BKFL	101.5		80.54	na				
BASE	100.0		85.8	na				
HOSE	100.0		86.02	na	100.0			
TEST	100.0		86.42	na				

The maximum velocity is 14.6 and it occurs in the pipe between nodes 18 and 19

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	16.80	1.049	E	2.0	1.000	9.000		K Factor = 5.60
to		120.0	T	5.0	26.000	0.0		
SPRG	16.8	0.0943	Eql	19.0	27.000	2.545		Vel = 6.24
	0.0							
	16.80					11.545		K Factor = 4.94
TYP1	16.80	1.049	E	2.0	0.500	9.000		K Factor = 5.60
to		120.0	T	5.0	26.000	0.0		
DROP	16.8	0.0943	Eql	19.0	26.500	2.498		Vel = 6.24
	0.0							
	16.80					11.498		K Factor = 4.95
15	17.39	1.442		0.0	13.500	12.366		K Factor @ node SPRG
to		120.0		0.0	0.0	0.0		
16	17.39	0.0213		0.0	13.500	0.288		Vel = 3.42
16	17.59	1.442		0.0	11.750	12.654		K Factor @ node SPRG
to		120.0		0.0	0.0	0.0		
17	34.98	0.0777		0.0	11.750	0.913		Vel = 6.87
17	18.24	1.442	T	7.432	3.750	13.567		K Factor @ node DROP
to		120.0		0.0	7.432	0.0		
18	53.22	0.1689		0.0	11.182	1.889		Vel = 10.46
	0.0							
	53.22					15.456		K Factor = 13.54
10	17.24	1.442		0.0	3.750	12.154		K Factor @ node SPRG
to		120.0		0.0	0.0	0.0		
11	17.24	0.0211		0.0	3.750	0.079		Vel = 3.39
11	17.29	1.442		0.0	7.000	12.233		K Factor @ node SPRG
to		120.0		0.0	0.0	0.0		
12	34.53	0.0759		0.0	7.000	0.531		Vel = 6.78
12	17.67	1.442	T	7.432	5.000	12.764		K Factor @ node SPRG
to		120.0		0.0	7.432	0.0		
13	52.2	0.1630		0.0	12.432	2.026		Vel = 10.25
	0.0							
	52.20					14.790		K Factor = 13.57
5	16.80	1.682		0.0	5.500	11.545		K Factor @ node SPRG
to		120.0		0.0	0.0	0.0		
6	16.8	0.0095		0.0	5.500	0.052		Vel = 2.43
6	16.84	1.682		0.0	8.250	11.597		K Factor @ node SPRG
to		120.0		0.0	0.0	0.0		
7	33.64	0.0342		0.0	8.250	0.282		Vel = 4.86
7	17.07	1.682		0.0	9.000	11.879		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
8	50.71	0.0730		0.0	9.000	0.657		Vel = 7.32
8	17.55	1.682	T	9.9	6.500	12.536		K Factor @ node DROP
to		120.0		0.0	9.900	0.0		
9	68.26	0.1265		0.0	16.400	2.074		Vel = 9.86
	0.0							

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	68.26					14.610		K Factor = 17.86
1	18.00	1.442		0.0	9.000	13.202		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
2	18.0	0.0228		0.0	9.000	0.205		Vel = 3.54
2	18.14	1.442	T	7.432	6.500	13.407		K Factor @ node DROP
to		120.0		0.0	7.432	0.0		
3	36.14	0.0825		0.0	13.932	1.150		Vel = 7.10
3	0.0	2.635		0.0	8.750	14.557		
to		120.0		0.0	0.0	0.0		
4	36.14	0.0045		0.0	8.750	0.039		Vel = 2.13
4	18.93	2.635		0.0	1.500	14.596		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
9	55.07	0.0093		0.0	1.500	0.014		Vel = 3.24
9	68.26	2.635		0.0	4.250	14.610		
to		120.0		0.0	0.0	0.0		
13	123.33	0.0424		0.0	4.250	0.180		Vel = 7.26
13	52.19	2.635		0.0	7.250	14.790		
to		120.0		0.0	0.0	0.0		
14	175.52	0.0817		0.0	7.250	0.592		Vel = 10.33
14	19.44	2.635		0.0	0.750	15.382		K Factor @ node DROP
to		120.0		0.0	0.0	0.0		
18	194.96	0.0987		0.0	0.750	0.074		Vel = 11.47
18	53.22	2.635	T	16.474	135.000	15.456		
to		120.0		0.0	16.474	0.0		
19	248.18	0.1548		0.0	151.474	23.448		Vel = 14.60
19	0.0	2.635	E	8.237	11.000	38.904		
to		120.0	T	16.474	50.795	3.000		* * Fixed Loss = 3
A	248.18	0.1548	S	19.22	61.795	9.566		Vel = 14.60
			Bvcb	6.864				
			Fsp	0.0				
A	0.0	4.26		0.0	11.000	51.470		
to		120.0		0.0	0.0	4.981		
B	248.18	0.0149		0.0	11.000	0.164		Vel = 5.59
B	0.0	4.26	T	26.334	11.000	56.615		
to		120.0		0.0	26.334	4.764		
C	248.18	0.0149		0.0	37.334	0.557		Vel = 5.59
C	0.0	4.26	2E	26.334	31.000	61.936		
to		120.0	T	26.334	52.668	5.197		
D	248.18	0.0149		0.0	83.668	1.249		Vel = 5.59
D	0.0	4.26	2E	26.334	31.500	68.382		
to		120.0		0.0	26.334	0.0		
E	248.18	0.0149		0.0	57.834	0.862		Vel = 5.59
E	0.0	4.26	E	13.167	11.250	69.244		
to		120.0		0.0	13.167	4.764		
F	248.18	0.0149		0.0	24.417	0.365		Vel = 5.59

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
F	0.0	4.26	2E	26.334	23.000	74.373		
to		120.0		0.0	26.334	0.0		
TWR	248.18	0.0149		0.0	49.334	0.736		Vel = 5.59
TWR	0.0	4.26	Bvcb	15.8	2.000	75.109		
to		120.0	T	26.334	42.134	4.732		* * Fixed Loss = 3
BWR	248.18	0.0149	Fsp	0.0	44.134	0.659		Vel = 5.59
BWR	0.0	4.26		0.0	3.000	80.500		
to		120.0		0.0	0.0	0.0		
BKFL	248.18	0.0147		0.0	3.000	0.044		Vel = 5.59
BKFL	0.0	4.026	3E	30.0	1.000	80.544		
to		120.0		0.0	30.000	4.650		* * Fixed Loss = 4
BASE	248.18	0.0196		0.0	31.000	0.609		Vel = 6.25
BASE	0.0	6.16	G	4.304	50.000	85.803		
to		140.0	T	43.037	67.425	0.0		
HOSE	248.18	0.0019	E	20.084	117.425	0.219		Vel = 2.67
HOSE	100.00	8.27		0.0	480.000	86.022		Qa = 100
to		140.0		0.0	0.0	0.0		
TEST	348.18	0.0008		0.0	480.000	0.398		Vel = 2.08
	0.0							
	348.18					86.420		K Factor = 37.45

City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 48
C2 - Residual Flow : 1162

Demand:
D1 - Elevation : 22.088
D2 - System Flow : 248.18
D2 - System Pressure : 86.420
Hose (Demand) : 100
D3 - System Demand : 348.18
Safety Margin : 16.911