

. . . Fire Protection by Computer Design

Sprinkler Systems Inc.
2-4 Avon Street
P. O. Box 1285
Lewiston, Maine 04243
207-782-0104

Job Name : 136 Commercial Street Area 3
Building : Existing
Location : 136 Commercial Street Portland, Maine
System : 1 WET
Contract : 15-142
Data File : 136 Commercial Street Area 3 SEG.WXF

Hydraulic Design Information Sheet

Name - 136 Commercial Street Area 3 Date - 12-23-2016
 Location - 136 Commercial Street Portland, Maine
 Building - Existing System No. - 1 WET
 Contractor - Sprinkler Systems Inc Contract No. - 15-142
 Calculated By - Scott E. Garland Drawing No. - 1-3 of TBD
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - 5th Floor Unit - Light Hazard

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 - 148.162 () Dry Model F1FR56
 E Elevation at Highest Outlet - 159.875 () Deluge Size 1/2" X 1/2"
 S Hose Allowance - Inside - 0 () Preaction K-Factor 5.6
 I Rack Sprinkler Allowance - 0 () Other Temp.Rat.155 DEG.
 G Hose Allowance - Outside - 100
 N

Note Design Area #3 - 5th Floor Unit

Calculation Flow Required - 300.82 Press Required - 88.826 AT BASE
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
 A Date of Test - 10/06/15 Cap. -
 T Time of Test - AM Rated Cap.- Elev.-
 E Static Press - 110 @ Press -
 R Residual Press - 102 Elev. - Well
 Flow - 1162 Proof Flow
 S Elevation - 100.0'

U
 P Location - ON SITE

P
 L Source of Information - OWNER AND WATER DISTRICT
 Y

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 R () Double Row () Slave Pallet () Solid Shelf () Non
 T A () Mult. Row () Open Shelf
 O C

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

G
 E Horizontal Barriers Provided:

Fittings Used Summary

Sprinkler Systems Inc.
136 Commercial Street Area 3

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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	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
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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

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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	11.2	7.2	na	30.05	0.1	300	7.2
TYP1	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP2	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP3	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP4	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP5	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP6	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
101	158.958	K = K @ DROP	10.9	na	35.45			
102	158.958	K = K @ DROP	10.96	na	35.54			
ZA	158.958		14.34	na				
ZB	158.875		20.95	na				
103	159.875	K = K @ DRP1	11.57	na	18.49			
104	159.875	K = K @ DRP2	11.7	na	18.0			
105	159.875	K = K @ DRP1	16.75	na	22.25			
ZCT	159.875		20.49	na				
ZC	158.875		26.65	na				
106	159.875	K = K @ DRP3	18.29	na	22.87			
107	159.875	K = K @ DRP4	19.84	na	23.61			
ZD	158.875		27.06	na				
108	158.875	K = K @ DRP5	27.47	na	27.58			
109	159.875	K = K @ DRP1	7.43	na	14.82			
110	159.875	K = K @ DRP1	8.02	na	15.39			
111	159.875	K = K @ DRP1	9.83	na	17.04			
112	159.875	K = K @ DRP1	7.87	na	15.25			
ZG	159.875		9.62	na				
113	159.875	K = K @ DRP1	9.77	na	16.99			
114	159.875	K = K @ DRP6	10.72	na	17.55			
ZET	159.875		14.94	na				
ZE	158.875		29.88	na				
ZF	159.875		47.51	na				
A	118.25		67.52	na				
B	118.25		68.44	na				
C	118.25		69.38	na				
D	104.0		76.15	na				
TOR	106.0		79.96	na				
BKFL	104.0		83.87	na				
BASE	100.0		88.83	na				
HOSE	100.0		89.14	na	100.0			
1000	100.0		89.28	na				
2000	100.0		89.34	na				
TEST	100.0		89.85	na				

The maximum velocity is 36.03 and it occurs in the pipe between nodes ZET and ZE

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
TYP to DROP	30.05	1.101 150.0 0.1445	E 3.825 0.0 0.0	0.583 3.825 4.408	7.200 0.0 0.637			K Factor = 11.20 Vel = 10.13	
	0.0 30.05					7.837		K Factor = 10.73	
TYP1 to DRP1	14.82	1.049 120.0 0.0748	T 5.0 0.0 0.0	0.750 5.000 5.750	7.000 0.0 0.430			K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.430		K Factor = 5.44	
TYP2 to DRP2	14.82	1.049 120.0 0.0747	2E T 4.0 5.0 0.0	3.458 9.000 12.458	7.000 0.0 0.931			K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.931		K Factor = 5.26	
TYP3 to DRP3	14.82	1.049 120.0 0.0748	3E 6.0 0.0 0.0	3.083 6.000 9.083	7.000 0.0 0.679			K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.679		K Factor = 5.35	
TYP4 to DRP4	14.82	1.049 120.0 0.0747	2E T 4.0 5.0 0.0	1.917 9.000 10.917	7.000 0.0 0.816			K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.816		K Factor = 5.30	
TYP5 to DRP5	14.82	1.049 120.0 0.0747	2E T 4.0 5.0 0.0	3.417 9.000 12.417	7.000 0.0 0.928			K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.928		K Factor = 5.26	
TYP6 to DRP6	14.82	1.049 120.0 0.0747	E T 2.0 5.0 0.0	1.542 7.000 8.542	7.000 0.0 0.638			K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.638		K Factor = 5.36	
101 to ZA	35.45	1.101 150.0 0.1961	T 9.563 0.0 0.0	7.958 9.562 17.520	10.902 0.0 3.436			K Factor @ node DROP Vel = 11.95	
	0.0 35.45					14.338		K Factor = 9.36	
102 to ZA	35.54	1.101 150.0 0.1971	T 9.563 0.0 0.0	7.583 9.562 17.145	10.959 0.0 3.379			K Factor @ node DROP Vel = 11.98	
	0.0 35.54					14.338		K Factor = 9.39	
ZA to ZB	70.98	1.101 150.0 0.7088	2E 7.65 0.0 0.0	1.625 7.650 9.275	14.338 0.036 6.574			Vel = 23.92	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
ZB to ZC	0.0 70.98	1.049 120.0 1.3557	E 0.0 0.0	2.209 2.000 4.209	20.948 0.0 5.706			Vel = 26.35	
	0.0 70.98					26.654		K Factor = 13.75	
103 to 104	18.49 18.49	1.049 120.0 0.1129	0.0 0.0 0.0	1.125 0.0 1.125	11.574 0.0 0.127			K Factor @ node DRP1 Vel = 6.86	
104 to ZCT	18.00 36.49	1.049 120.0 0.3958	T 5.0 0.0 0.0	17.209 5.000 22.209	11.701 0.0 8.790			K Factor @ node DRP2 Vel = 13.55	
	0.0 36.49					20.491		K Factor = 8.06	
105 to ZCT	22.25 22.25	1.049 120.0 0.1584	T 5.0 0.0 0.0	18.625 5.000 23.625	16.748 0.0 3.743			K Factor @ node DRP1 Vel = 8.26	
	0.0 22.25					20.491		K Factor = 4.92	
ZCT to ZC	58.73 58.73	1.049 120.0 0.9550	T 5.0 0.0 0.0	1.000 5.000 6.000	20.491 0.433 5.730			Vel = 21.80	
ZC to ZD	70.99 129.72	2.157 120.0 0.1233	0.0 0.0 0.0	3.292 0.0 3.292	26.654 0.0 0.406			Vel = 11.39	
	0.0 129.72					27.060		K Factor = 24.94	
106 to 107	22.87 22.87	1.049 120.0 0.1668	0.0 0.0 0.0	9.292 0.0 9.292	18.292 0.0 1.550			K Factor @ node DRP3 Vel = 8.49	
107 to ZD	23.61 46.48	1.049 120.0 0.6192	E 2.0 T 5.0 0.0	3.958 7.000 10.958	19.842 0.433 6.785			K Factor @ node DRP4 Vel = 17.25	
	0.0 46.48					27.060		K Factor = 8.94	
ZD to 108	176.19 176.19	2.157 120.0 0.2176	0.0 0.0 0.0	1.875 0.0 1.875	27.060 0.0 0.408			Vel = 15.47	
108 to ZE	27.58 203.77	2.157 120.0 0.2849	0.0 0.0 0.0	8.458 0.0 8.458	27.468 0.0 2.410			K Factor @ node DRP5 Vel = 17.89	
	0.0 203.77					29.878		K Factor = 37.28	
109 to 110	14.82 14.82	1.049 120.0 0.0747	0.0 0.0 0.0	7.875 0.0 7.875	7.430 0.0 0.588			K Factor @ node DRP1 Vel = 5.50	
110 to 111	15.39 30.21	1.049 120.0 0.2791	0.0 0.0 0.0	6.500 0.0 6.500	8.018 0.0 1.814			K Factor @ node DRP1 Vel = 11.21	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
111 to ZET	17.04 47.25	1.049 120.0 0.6385	T	5.0 0.0 0.0	3.000 5.000 8.000	9.832 0.0 5.108			K Factor @ node DRP1	
	0.0 47.25						14.940		K Factor = 12.22	
112 to ZG	15.25 15.25	1.049 120.0 0.0788	3E T	6.0 5.0 0.0	11.209 11.000 22.209	7.870 0.0 1.750			K Factor @ node DRP1	
ZG to 113	0.0 15.25	1.049 120.0 0.0787		0.0 0.0 0.0	1.958 0.0 1.958	9.620 0.0 0.154			Vel = 5.66	
113 to 114	16.99 32.24	1.049 120.0 0.3150		0.0 0.0 0.0	3.000 0.0 3.000	9.774 0.0 0.945			K Factor @ node DRP1	
114 to ZET	17.55 49.79	1.049 120.0 0.7035	T	5.0 0.0 0.0	1.000 5.000 6.000	10.719 0.0 4.221			K Factor @ node DRP6	
	0.0 49.79						14.940		K Factor = 12.88	
ZET to ZE	97.05 97.05	1.049 120.0 2.4175	T	5.0 0.0 0.0	1.000 5.000 6.000	14.940 0.433 14.505			Vel = 36.03	
	0.0 97.05						29.878		K Factor = 17.75	
ZE to ZF	300.82 300.82	2.157 120.0 0.5857	3E F	18.46 2.461 0.0	9.917 20.921 30.838	29.878 -0.433 18.062			Vel = 26.41	
ZF to A	0.0 300.82	4.26 120.0 0.0213	3E 2F	39.501 10.534 0.0	43.417 50.035 93.452	47.507 18.028 1.990			Vel = 6.77	
A to B	0.0 300.82	4.26 120.0 0.0213	E T	13.167 26.334 0.0	3.500 39.501 43.001	67.525 0.0 0.916			Vel = 6.77	
B to C	0.0 300.82	4.26 120.0 0.0213	2E	26.334 0.0 0.0	18.000 26.334 44.334	68.441 0.0 0.944			Vel = 6.77	
C to D	0.0 300.82	4.26 120.0 0.0213	E	13.167 0.0 0.0	14.500 13.167 27.667	69.385 6.172 0.589			Vel = 6.77	
D to TOR	0.0 300.82	4.26 120.0 0.0213	10E T	131.671 26.334 0.0	62.000 158.005 220.005	76.146 -0.866 4.685			Vel = 6.77	
TOR to BKFL	0.0 300.82	4.26 120.0 0.0210	Fsp	0.0 0.0 0.0	2.000 0.0 2.000	79.965 3.866 0.042			** Fixed Loss = 3 Vel = 6.77	
BKFL to BASE	0.0 300.82	4.026 120.0 0.0300	Zac	0.0 0.0 0.0	0.500 0.0 0.500	83.873 4.938 0.015			** Fixed Loss = 3.206 Vel = 7.58	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
BASE	0.0	6.16	E	20.084	50.000	88.826			
to		140.0	T	43.037	67.425	0.0			
HOSE	300.82	0.0027	G	4.304	117.425	0.312		Vel = 3.24	
HOSE	100.00	8.27	T	55.354	75.000	89.138		Qa = 100	
to		140.0		0.0	55.354	0.0			
1000	400.82	0.0011		0.0	130.354	0.140		Vel = 2.39	
1000	0.0	12.34	F	20.316	270.000	89.278			
to		140.0	T	93.767	114.083	0.0			
2000	400.82	0.0002		0.0	384.083	0.059		Vel = 1.08	
2000	0.0	8.27		0.0	480.000	89.337			
to		140.0		0.0	0.0	0.0			
TEST	400.82	0.0011		0.0	480.000	0.517		Vel = 2.39	
	0.0								
	400.82					89.854		K Factor = 42.28	

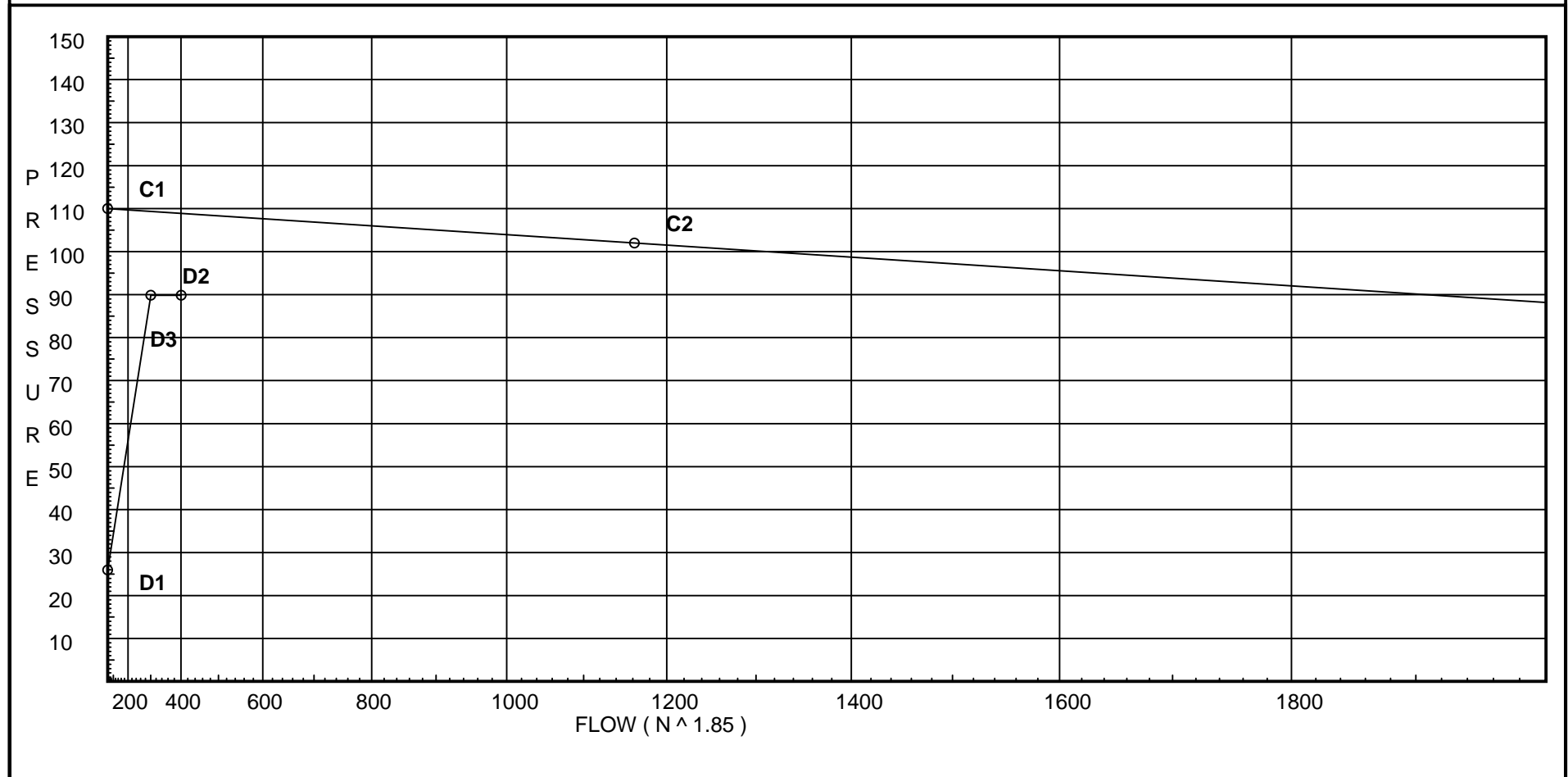
Water Supply Curve C

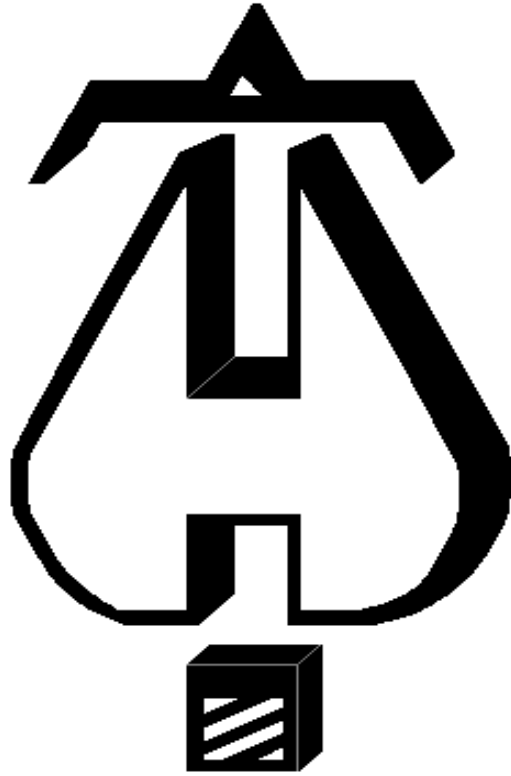
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City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 102
C2 - Residual Flow : 1162

Demand:
D1 - Elevation : 25.932
D2 - System Flow : 300.82
D2 - System Pressure : 89.854
Hose (Demand) : 100
D3 - System Demand : 400.82
Safety Margin : 19.030





. . . Fire Protection by Computer Design

Sprinkler Systems Inc.
2-4 Avon Street
P. O. Box 1285
Lewiston, Maine 04243
207-782-0104

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Location : 136 Commercial Street Portland, Maine
System : 1 WET
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Data File : 136 Commercial Street Area 4 SEG.WXF

Hydraulic Design Information Sheet

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 Calculated By - Scott E. Garland Drawing No. - 1-3 of TBD
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - 5th Floor Unit - Light Hazard

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 - LRG ROOM	System Type	Sprinkler/Nozzle
	Density - .10	(X) Wet	Make RELIABLE
D	Area Per Sprinkler - 148.162	() Dry	Model F1FR56
E	Elevation at Highest Outlet - 165.833	() Deluge	Size 1/2" X 1/2"
S	Hose Allowance - Inside - 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance - 0	() Other	Temp.Rat.155 DEG.
G	Hose Allowance - Outside - 100		
N	Note Design Area #4 - 5th Floor Master Bedroom		

Calculation Flow Required - 200.826 Press Required - 86.220 AT BASE OF RISER
 Summary C-Factor Used: 150 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 10/06/15		Cap. -
T	Time of Test - AM	Rated Cap.-	Elev.-
E	Static Press - 110	@ Press -	
R	Residual Press - 102	Elev. -	Well
S	Flow - 1162		Proof Flow
U	Elevation - 100.0'		
P	Location - ON SITE		
L	Source of Information - OWNER AND WATER DISTRICT		
Y			

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
M	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf
O			
R	Flue Spacing	Clearance:Storage to Ceiling	
A	Longitudinal	Transverse	
G	Horizontal Barriers Provided:		
E			

Fittings Used Summary

Sprinkler Systems Inc.
136 Commercial Street Area 3

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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
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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

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.
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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	7.0	na	14.82	0.1	148.167	7.0
TYP1	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP2	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
TYP3	0.0	5.6	7.0	na	14.82	0.1	148.162	7.0
121	161.042	K = K @ DROP	8.99	na	16.33			
122	161.042	K = K @ DROP	8.28	na	15.67			
ZH	161.042		9.03	na				
123	161.042	K = K @ DRP1	9.93	na	17.09			
124	161.042	K = K @ DROP	10.17	na	17.37			
ZJT	161.042		12.9	na				
ZJ	158.25		16.55	na				
ZK	158.25		16.88	na				
125	165.833	K = K @ DRP3	7.43	na	14.82			
126	165.833	K = K @ DRP3	7.95	na	15.33			
ZLT	165.833		10.36	na				
ZL	158.25		17.14	na				
127	158.25	K = K @ DRP2	17.39	na	21.94			
ZM	158.25		19.21	na				
128	165.833	K = K @ DRP3	11.42	na	18.37			
129	165.833	K = K @ DRP3	12.44	na	19.17			
ZN	160.792		23.03	na				
130	160.292	K = K @ DRP3	16.33	na	21.97			
131	160.292	K = K @ DRP3	17.57	na	22.78			
ZR	160.292		19.32	na				
ZQT	160.292		20.96	na				
ZQ	158.125		26.03	na				
ZP	160.792		25.92	na				
ZS	160.792		32.69	na				
ZT	158.875		50.78	na				
A	118.25		69.3	na				
B	118.25		69.74	na				
C	118.25		70.19	na				
D	104.0		76.64	na				
TOR	106.0		77.99	na				
BKFL	104.0		81.88	na				
BASE	100.0		86.22	na				
HOSE	100.0		86.37	na	100.0			
1000	100.0		86.45	na				
2000	100.0		86.48	na				
TEST	100.0		86.79	na				

The maximum velocity is 18.68 and it occurs in the pipe between nodes ZM and ZN

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
TYP to DROP	14.82	1.101 150.0 0.0391	T	9.563 0.0 0.0	0.750 9.562 10.312	7.000 0.0 0.403		K Factor = 5.60 Vel = 4.99	
	0.0 14.82					7.403		K Factor = 5.45	
TYP1 to DRP1	14.82	1.101 150.0 0.0391	T	9.563 0.0 0.0	2.417 9.562 11.979	7.000 0.0 0.468		K Factor = 5.60 Vel = 4.99	
	0.0 14.82					7.468		K Factor = 5.42	
TYP2 to DRP2	14.82	1.049 120.0 0.0747	2E T	4.0 5.0 0.0	3.458 9.000 12.458	7.000 0.0 0.931		K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.931		K Factor = 5.26	
TYP3 to DRP3	14.82	1.049 120.0 0.0748	T	5.0 0.0 0.0	0.750 5.000 5.750	7.000 0.0 0.430		K Factor = 5.60 Vel = 5.50	
	0.0 14.82					7.430		K Factor = 5.44	
121 to ZH	16.33	1.101 150.0 0.0467		0.0 0.0 0.0	0.750 0.0 0.750	8.993 0.0 0.035		K Factor @ node DROP Vel = 5.50	
	0.0 16.33					9.028		K Factor = 5.43	
122 to ZH	15.67	1.101 150.0 0.0433	E T	3.825 9.563 0.0	3.958 13.387 17.345	8.277 0.0 0.751		K Factor @ node DROP Vel = 5.28	
	0.0 15.67					9.028		K Factor = 5.22	
ZH to 123	32.00	1.101 150.0 0.1623		0.0 0.0 0.0	5.583 0.0 5.583	9.028 0.0 0.906		Vel = 10.78	
123 to 124	17.09	1.101 150.0 0.3583		0.0 0.0 0.0	0.667 0.0 0.667	9.934 0.0 0.239		K Factor @ node DRP1 Vel = 16.54	
124 to ZJT	17.36	1.394 150.0 0.1988	T	9.523 0.0 0.0	4.167 9.523 13.690	10.173 0.0 2.722		K Factor @ node DROP Vel = 13.97	
ZJT to ZJ	0.0	1.394 150.0 0.1989	T	9.523 0.0 0.0	2.792 9.523 12.315	12.895 1.209 2.449		Vel = 13.97	
ZJ to ZK	0.0	1.682 150.0 0.0798		0.0 0.0 0.0	4.125 0.0 4.125	16.553 0.0 0.329		Vel = 9.59	
ZK to ZL	0.0	1.682 150.0 0.0796		0.0 0.0 0.0	3.292 0.0 3.292	16.882 0.0 0.262		Vel = 9.59	

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 66.45						17.144		K Factor = 16.05	
125 to 126	14.82	1.049 120.0		0.0	7.000	7.430 0.0			K Factor @ node DRP3	
126 to ZLT	14.82	0.0746		0.0	7.000	0.522			Vel = 5.50	
126 to ZLT	15.32	1.049 120.0	T	5.0	3.667	7.952			K Factor @ node DRP3	
ZLT to ZL	30.14	0.2781		0.0	8.667	2.410			Vel = 11.19	
ZLT to ZL	0.0	1.049 120.0	T	5.0	7.583	10.362				
ZL	30.14	0.2780		0.0	12.583	3.498			Vel = 11.19	
	0.0 30.14						17.144		K Factor = 7.28	
ZL to 127	96.60	1.682 150.0		0.0	1.542	17.144				
127 to ZM	96.6	0.1589		0.0	1.542	0.245			Vel = 13.95	
127 to ZM	21.94	1.682 150.0		0.0	7.833	17.389			K Factor @ node DRP2	
ZM to ZN	118.54	0.2325		0.0	7.833	1.821			Vel = 17.12	
ZM to ZN	0.0	1.61 120.0	2E	8.0	3.333	19.210				
ZN	118.54	0.4346		0.0	11.333	4.925			Vel = 18.68	
	0.0 118.54						23.034		K Factor = 24.70	
128 to 129	18.37	1.049 120.0		0.0	9.209	11.416			K Factor @ node DRP3	
129 to ZN	18.37	0.1111		0.0	9.209	1.023			Vel = 6.82	
129 to ZN	19.17	1.049 120.0	E T	2.0 5.0	13.167 7.000	12.439 2.183			K Factor @ node DRP3	
ZN	37.54	0.4171		0.0	20.167	8.412			Vel = 13.94	
	0.0 37.54						23.034		K Factor = 7.82	
ZN to ZP	156.08	2.157 120.0	T	12.307	4.292	23.034				
ZP	156.08	0.1739		0.0	16.599	2.887			Vel = 13.70	
	0.0 156.08						25.921		K Factor = 30.66	
130 to 131	21.97	1.049 120.0		0.0	7.958	16.334			K Factor @ node DRP3	
131 to ZR	21.97	0.1548		0.0	7.958	1.232			Vel = 8.16	
131 to ZR	22.78	1.049 120.0		0.0	3.042	17.566			K Factor @ node DRP3	
ZR to ZQT	44.75	0.5773		0.0	3.042	1.756			Vel = 16.61	
ZR to ZQT	0.0	1.049 120.0	E	2.0	0.833	19.322				
ZQT to ZQ	44.75	0.5775		0.0	2.833	1.636			Vel = 16.61	
ZQT to ZQ	0.0	1.049 120.0	T	5.0	2.167	20.958				
ZQ	44.75	0.5772		0.0	7.167	4.137			Vel = 16.61	

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
ZQ to ZP	0.0 44.75	1.610 120.0 0.0717	2E	8.0 0.0	6.542 8.000	26.034 -1.155				
	0.0 44.75						25.921		Vel = 7.05	
ZP to ZS	200.83	2.157 120.0 0.2774	T	12.307 0.0	12.083 12.307	25.921 0.0				
	200.83			0.0	24.390	6.765			Vel = 17.63	
ZS to ZT	0.0 200.83	2.157 120.0 0.2773	3E 2T	18.46 24.613	19.167 43.073	32.686 0.830				
	200.83			0.0	62.240	17.262			Vel = 17.63	
ZT to A	0.0 200.83	4.26 120.0 0.0101	3E 2F	39.501 10.534	42.417 50.035	50.778 17.595				
	200.83			0.0	92.452	0.932			Vel = 4.52	
A to B	0.0 200.83	4.26 120.0 0.0101	E T	13.167 26.334	3.500 39.501	69.305 0.0				
	200.83			0.0	43.001	0.433			Vel = 4.52	
B to C	0.0 200.83	4.26 120.0 0.0101	2E	26.334 0.0	18.000 26.334	69.738 0.0				
	200.83			0.0	44.334	0.448			Vel = 4.52	
C to D	0.0 200.83	4.26 120.0 0.0100	E	13.167 0.0	14.500 13.167	70.186 6.172				
	200.83			0.0	27.667	0.278			Vel = 4.52	
D to TOR	0.0 200.83	4.26 120.0 0.0101	10E T	131.671 26.334	62.000 158.005	76.636 -0.866				
	200.83			0.0	220.005	2.219			Vel = 4.52	
TOR to BKFL	0.0 200.83	4.26 120.0 0.0100	Fsp	0.0 0.0	2.000 0.0	77.989 3.866			** Fixed Loss = 3	
	200.83			0.0	2.000	0.020			Vel = 4.52	
BKFL to BASE	0.0 200.83	4.026 120.0 0.0140	Zac	0.0 0.0	0.500 0.0	81.875 4.338			** Fixed Loss = 2.606	
	200.83			0.0	0.500	0.007			Vel = 5.06	
BASE to HOSE	0.0 200.83	6.16 140.0 0.0013	E T G	20.084 43.037 4.304	50.000 67.425 117.425	86.220 0.0 0.148				
	200.83								Vel = 2.16	
HOSE to 1000	100.00 300.83	8.27 140.0 0.0006	T	55.354 0.0	75.000 55.354	86.368 0.0			Qa = 100	
	300.83			0.0	130.354	0.082			Vel = 1.80	
1000 to 2000	0.0 300.83	12.34 140.0 0.0001	F T	20.316 93.767	270.000 114.083	86.450 0.0				
	300.83			0.0	384.083	0.035			Vel = 0.81	
2000 to TEST	0.0 300.83	8.27 140.0 0.0006		0.0 0.0	480.000 0.0	86.485 0.0				
	300.83			0.0	480.000	0.304			Vel = 1.80	
	0.0 300.83						86.789		K Factor = 32.29	

Water Supply Curve C

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City Water Supply:
C1 - Static Pressure : 110
C2 - Residual Pressure: 102
C2 - Residual Flow : 1162

Demand:
D1 - Elevation : 28.512
D2 - System Flow : 200.826
D2 - System Pressure : 86.789
Hose (Demand) : 100
D3 - System Demand : 300.826
Safety Margin : 22.554

