



... Fire Protection by Computer Design

DEAN AND ALLYN, INC.
116 LEWISTON ROAD
GRAY MAINE 04039
207 657 5646

Job Name : 133 SPRING STREET BASEMENT REST. KITCHEN
Building : 133 SPRING ST.
Location : 133 SPRING STREET PORTLAND MAINE
System : ONE
Contract : C141186
Data File : 133SPRING.WXF

Hydraulic Design Information Sheet

Name - 133 SPRING STREET Date - 3-3-14
 Location - 133 SPRING STREET PORTLAND MAINE
 Building - 133 SPRING ST. System No. - ONE
 Contractor - DEAN AND ALLYN, INC. Contract No. - C141186
 Calculated By - H. KING Drawing No. - 1 OF 1
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - RESTAURANT AND APARTMENTS

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. (X) 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 - 130	System Type	Sprinkler/Nozzle
	Density - .10/.15	(X) Wet	Make RELIABLE
D	Area Per Sprinkler - 130	() Dry	Model FIFR
E	Elevation at Highest Outlet - 20	() Deluge	Size 1/2"
S	Hose Allowance - Inside -	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.155
G	Hose Allowance - Outside - 250		

N

Note CUSHION 11.5 PSI

Calculation Flow Required - 536.4 Press Required - 43.3 at
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 6-3-13	Rated Cap.-	Cap. -
T	Time of Test -	@ Press -	Elev.-
E	Static Press - 56	Elev. -	
R	Residual Press - 52		Well
	Flow - 1061		Proof Flow
S	Elevation - 0		

U

P Location - SPRING STREET

P

L Source of Information - PWD

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
S	() Double Row	() Slave Pallet	() Solid Shelf
R	() Mult. Row	() Open Shelf	() Non

O

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

G

E Horizontal Barriers Provided:

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
01A to 01	14.82 14.82	1.049 120 0.0747	1T 5.0 0.0 0.0	6.000 5.000 11.000	7.000 0.0 0.822			K Factor = 5.60 Vel = 5.50	
	0.0 14.82				7.822			K Factor = 5.30	
01 to 02	15.84 15.84	1.049 120 0.1707	0.0 0.0 0.0	13.000 0.0 13.000	7.822 0.0 2.219			K Factor @ node 01 Vel = 5.88	
02 to 03	16.79 32.63	1.38 120 0.0846	0.0 0.0 0.0	13.000 0.0 13.000	10.041 0.0 1.100			K Factor @ node 01 Vel = 7.00	
03 to 04	17.68 50.31	1.38 120 0.1886	0.0 0.0 0.0	13.000 0.0 13.000	11.141 0.0 2.452			K Factor @ node 01 Vel = 10.79	
04 to 50	19.53 69.84	1.61 120 0.1633	1E 4.0 0.0 0.0	6.000 4.000 10.000	13.593 0.0 1.633			K Factor @ node 01 Vel = 11.01	
	0.0 69.84				15.226			K Factor = 17.90	
05 to 06	15.53 15.53	1.049 120 0.0815	0.0 0.0 0.0	13.000 0.0 13.000	8.593 0.0 1.060			K Factor @ node 01 Vel = 5.77	
06 to 07	16.46 31.99	1.38 120 0.0816	0.0 0.0 0.0	13.000 0.0 13.000	9.653 0.0 1.061			K Factor @ node 01 Vel = 6.86	
07 to 08	17.34 49.33	1.38 120 0.1818	0.0 0.0 0.0	13.000 0.0 13.000	10.714 0.0 2.364			K Factor @ node 01 Vel = 10.58	
08 to 53	19.16 68.49	1.61 120 0.1574	1T 8.0 0.0 0.0	6.000 8.000 14.000	13.078 0.0 2.204			K Factor @ node 01 Vel = 10.79	
	0.0 68.49				15.282			K Factor = 17.52	
09 to 10	14.82 14.82	1.049 120 0.0747	0.0 0.0 0.0	11.300 0.0 11.300	7.822 0.0 0.844			K Factor @ node 01 Vel = 5.50	
10 to 55	15.59 30.41	1.049 120 0.2825	0.0 0.0 0.0	5.500 0.0 5.500	8.666 0.0 1.554			K Factor @ node 01 Vel = 11.29	
	0.0 30.41				10.220			K Factor = 9.51	

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
11 to 56	48.70 48.7	1.38 120 0.1776	1E 1T	3.0 6.0 0.0	13.500 9.000 22.500	11.915 5.197 3.996			K Factor @ node 01	
	0.0 48.70						21.108		K Factor = 10.60	
12 to 57	24.68 24.68	1.049 120 0.1920	1T	5.0 0.0 0.0	4.300 5.000 9.300	19.429 0.0 1.786			K Factor = 5.60	
	0.0 24.68						21.215		K Factor = 5.36	
13 to 58	23.81 23.81	1.049 120 0.1797	2E 1T	4.0 5.0 0.0	9.300 9.000 18.300	18.082 0.0 3.288			K Factor = 5.60	
	0.0 23.81						21.370		K Factor = 5.15	
14 to 59	24.88 24.88	1.049 120 0.1949	1T	5.0 0.0 0.0	4.300 5.000 9.300	19.737 0.0 1.813			K Factor = 5.60	
	0.0 24.88						21.550		K Factor = 5.36	
15 to 60	25.99 25.99	1.049 120 0.2113	1T	5.0 0.0 0.0	5.200 5.000 10.200	21.541 0.0 2.155			K Factor = 5.60	
	0.0 25.99						23.696		K Factor = 5.34	
16 to 61	286.39 286.39	3.26 120 0.0716	1E	9.408 0.0 0.0	6.800 9.408 16.208	24.849 0.0 1.160				Vel = 11.01
	0.0 286.39						26.009		K Factor = 56.16	
17 to 61	0.0 0.0	1.049 120 0.0	1T	5.0 0.0 0.0	5.000 5.000 10.000	26.009 0.0 0.0				Vel = 0
	0.0 0.0						26.009		K Factor = 0	
18 to TR	286.39 286.39	3.26 120 0.0716	2E	11.408 0.0 0.0	10.000 18.815 28.815	27.877 0.0 2.062				Vel = 11.01
	0.0 286.39						29.939		K Factor = 52.34	
50 to 53	69.84 69.84	3.068 120 0.0070		0.0 0.0 0.0	8.000 0.0 8.000	15.226 0.0 0.056				Vel = 3.03

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/UL	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
53 to 56	68.49 138.33	3.26 120 0.0187	2E 11.408 0.0 0.0	14.900 18.815 33.715	15.282 5.197 0.629		Vel = 5.32		
	0.0 138.33				21.108		K Factor = 30.11		
55 to 11	30.41 30.41	1.049 120 0.2825	0.0 0.0 0.0	6.000 0.0 6.000	10.220 0.0 1.695		Vel = 11.29		
	0.0 30.41				11.915		K Factor = 8.81		
56 to 57	187.03 187.03	3.26 120 0.0324	0.0 0.0 0.0	3.300 0.0 3.300	21.108 0.0 0.107		Vel = 7.19		
57 to 58	24.68 211.71	3.26 120 0.0408	0.0 0.0 0.0	3.800 0.0 3.800	21.215 0.0 0.155		Vel = 8.14		
58 to 59	23.81 235.52	3.26 120 0.0500	0.0 0.0 0.0	3.600 0.0 3.600	21.370 0.0 0.180		Vel = 9.05		
59 to 60	24.88 260.4	3.26 120 0.0600	1E 9.408 1T 20.159 0.0	6.200 29.567 35.767	21.550 0.0 2.146		Vel = 10.01		
60 to 16	25.99 286.39	3.26 120 0.0716	1E 9.408 0.0 0.0	6.700 9.408 16.108	23.696 0.0 1.153		Vel = 11.01		
	0.0 286.39				24.849		K Factor = 57.45		
61 to 18	286.39 286.39	3.26 120 0.0715	2E 11.408 0.0 0.0	7.300 18.815 26.115	26.009 0.0 1.868		Vel = 11.01		
	0.0 286.39				27.877		K Factor = 54.24		
TR to FF	286.39 286.39	3.26 120 0.0716	1E 9.408 1Z 9.408 0.0	6.000 18.815 24.815	29.939 8.465 1.776		* Fixed loss = 5.000 Vel = 11.01		
FF to CTY	0.0 286.39	4.1 120 0.0234	1G 2.186 1T 21.855 1E 10.928	100.000 34.968 134.968	40.180 0.0 3.162		Vel = 6.96		
	250.00 536.39				43.342		Qa = 250.00 K Factor = 81.48		

Fittings Used Summary

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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	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	0	0	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	90' Flow Thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
01A	20.0	5.6	7.0	na	14.82	.10	130	7.0
01	20.0	K = K @ 01	7.82	na	14.82			
02	20.0	K = K @ 01	10.04	na	16.79			
03	20.0	K = K @ 01	11.14	na	17.68			
04	20.0	K = K @ 01	13.59	na	19.53			
05	20.0	K = K @ 01	8.59	na	15.53			
06	20.0	K = K @ 01	9.65	na	16.46			
07	20.0	K = K @ 01	10.71	na	17.34			
08	20.0	K = K @ 01	13.08	na	19.16			
09	20.0	K = K @ 01	7.82	na	14.82			
10	20.0	K = K @ 01	8.67	na	15.6			
11	20.0	K = K @ 01	11.92	na	18.29			
12	8.0	5.6	19.43	na	24.68	.15	130	7.0
13	8.0	5.6	18.08	na	23.81	.15	130	7.0
14	8.0	5.6	19.74	na	24.88	.15	130	7.0
15	8.0	5.6	21.54	na	25.99	.15	130	7.0
16	8.0		24.85	na				
17	8.0		26.01	na				
18	8.0		27.88	na				
50	20.0		15.23	na				
53	20.0		15.28	na				
55	20.0		10.22	na				
56	8.0		21.11	na				
57	8.0		21.21	na				
58	8.0		21.37	na				
59	8.0		21.55	na				
60	8.0		23.7	na				
61	8.0		26.01	na				
TR	8.0		29.94	na				
FF	0.0		40.18	na				
CTY	0.0		43.34	na	250.0			

The maximum velocity is 11.29 and it occurs in the pipe between nodes 10 and 55

Water Supply Curve (C)

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City Water Supply:
 C1 - Static Pressure : 56
 C2 - Residual Pressure: 52
 C2 - Residual Flow : 1061

