



. . . Fire Protection by Computer Design

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

Job Name : 135 CONGRESS STREET
Building :
Location : 135 CONGRESS STREET, PORTLAND, MAINE 04104
System : 1 OF 1
Contract : 13087
Data File : 13087135CONGRESSSTA3.WXF

Hydraulic Design Information Sheet

Name - 135 CONGRESS STREET Date - 10-11-2013
 Location - 135 CONGRESS STREET, PORTLAND, MAINE 04104
 Building - System No. - 1 OF 1
 Contractor - OWNER Contract No. - 13087
 Calculated By - SCOTT E. GARLAND Drawing No. - 1-3 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - GROCERY STORE - ORDINARY HAZARD GP 2

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 (X) 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 - 951	System Type	Sprinkler/Nozzle
	Density - .20	(X) Wet	Make RELIABLE
D	Area Per Sprinkler - 130	() Dry	Model F1FR
E	Elevation at Highest Outlet - 111.583	() Deluge	Size 17/32 X 1/2
S	Hose Allowance - Inside -	() Preaction	K-Factor 8.0
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.200 DEG
G	Hose Allowance - Outside - 250		

N

Note DESIGN AREA #3 - GROCERY STORE FIRST FLOOR

Calculation Flow Required - 253.449 Press Required - 36.597 AT BASE OF RISER
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 11-2-1999		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 50	@ Press -	
R	Residual Press - 44	Elev. -	Well
	Flow - 1047		Proof Flow
S	Elevation - 100.0		

U

P Location - NEXT TO THE BUILDING ON NORTH STREET

P

L Source of Information - PORTLAND 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	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

O

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

G

E Horizontal Barriers Provided:

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	4.9	7.04	na	13.0	0.05	260	7.0
11	111.583	8	8.28	na	23.02	0.2	115	8.266
12	111.583	8	8.37	na	23.15	0.2	115	8.266
13	111.583	8	9.05	na	24.06	0.2	115	8.266
14	111.583	8	10.52	na	25.94	0.2	115	8.266
AT	111.583		13.9	na				
16	111.583	8	8.27	na	23.0	0.2	115	8.266
17	111.583	8	8.35	na	23.12	0.2	115	8.266
18	111.583	8	9.09	na	24.12	0.2	115	8.266
19	111.583	8	10.69	na	26.15	0.2	115	8.266
BT	111.583		13.99	na				
20	111.583	8	14.34	na	30.3	0.2	130	10.563
21	111.583	8	14.61	na	30.58	0.2	130	10.563
CT	111.583		16.02	na				
AA	109.583		17.61	na				
BB	109.583		17.7	na				
CC	109.583		18.1	na				
DD	109.583		19.59	na				
GG	98.75		27.26	na				
RT	98.75		27.84	na				
TV	96.833		31.7	na				
RB	92.417		36.6	na				
X1	92.417		36.76	na	250.0			
TEST	100.0		33.48	na				

The maximum velocity is 13.92 and it occurs in the pipe between nodes 19 and BT

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	*****
TYP to DROP	13.00 13.0	1.109 150.0 0.0296	1T	9.906 0.0 0.0	0.750 9.905 10.655	7.039 0.0 0.315			K Factor = 4.90 Vel = 4.32	
	0.0 13.00						7.354		K Factor = 4.79	
11 to 12	23.02 23.02	1.682 120.0 0.0170		0.0 0.0 0.0	5.292 0.0 5.292	8.283 0.0 0.090			K Factor = 8.00 Vel = 3.32	
12 to 13	23.15 46.17	1.682 120.0 0.0614		0.0 0.0 0.0	11.000 0.0 11.000	8.373 0.0 0.675			K Factor = 8.00 Vel = 6.67	
13 to 14	24.07 70.24	1.682 120.0 0.1334		0.0 0.0 0.0	11.000 0.0 11.000	9.048 0.0 1.467			K Factor = 8.00 Vel = 10.14	
14 to AT	25.94 96.18	1.682 120.0 0.2386	1T	9.9 0.0 0.0	4.292 9.900 14.192	10.515 0.0 3.386			K Factor = 8.00 Vel = 13.89	
AT to AA	0.0 96.18	1.682 120.0 0.2386	1T	9.9 0.0 0.0	2.000 9.900 11.900	13.901 0.866 2.839			Vel = 13.89	
	0.0 96.18						17.606		K Factor = 22.92	
16 to 17	23.00 23.0	1.682 120.0 0.0170		0.0 0.0 0.0	5.125 0.0 5.125	8.266 0.0 0.087			K Factor = 8.00 Vel = 3.32	
17 to 18	23.12 46.12	1.682 120.0 0.0612		0.0 0.0 0.0	12.000 0.0 12.000	8.353 0.0 0.735			K Factor = 8.00 Vel = 6.66	
18 to 19	24.12 70.24	1.682 120.0 0.1333		0.0 0.0 0.0	12.000 0.0 12.000	9.088 0.0 1.600			K Factor = 8.00 Vel = 10.14	
19 to BT	26.15 96.39	1.682 120.0 0.2396	1T	9.9 0.0 0.0	3.875 9.900 13.775	10.688 0.0 3.300			K Factor = 8.00 Vel = 13.92	
BT to BB	0.0 96.39	1.682 120.0 0.2395	1T	9.9 0.0 0.0	2.000 9.900 11.900	13.988 0.866 2.850			Vel = 13.92	
	0.0 96.39						17.704		K Factor = 22.91	
20 to 21	30.30 30.3	1.682 120.0 0.0281		0.0 0.0 0.0	9.500 0.0 9.500	14.343 0.0 0.267			K Factor = 8.00 Vel = 4.38	
21 to CT	30.58 60.88	1.682 120.0 0.1024	1T	9.9 0.0 0.0	3.833 9.900 13.733	14.610 0.0 1.406			K Factor = 8.00 Vel = 8.79	
CT to CC	0.0 60.88	1.682 120.0 0.1024	1T	9.9 0.0 0.0	2.000 9.900 11.900	16.016 0.866 1.218			Vel = 8.79	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftn'g's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 60.88					18.100			K Factor = 14.31	
AA to BB	96.18	3.26 120.0		0.0	10.333	17.606 0.0				
BB to CC	96.18	0.0095		0.0	10.333	0.098			Vel = 3.70	
BB to CC	96.39	3.26 120.0		0.0	11.542	17.704 0.0				
CC to DD	192.57	0.0343		0.0	11.542	0.396			Vel = 7.40	
CC to DD	60.88	3.26 120.0	1T	20.159	6.000	18.100 0.0				
DD to GG	253.45	0.0571		0.0	26.159	1.494			Vel = 9.74	
DD to GG	0.0	3.26 120.0	1E	9.408	22.542	19.594 4.692				
GG to RT	253.45	0.0571		0.0	52.109	2.974			Vel = 9.74	
GG to RT	0.0	4.26 120.0	1E	13.167	24.125	27.260 0.0				
RT to TV	253.45	0.0155		0.0	37.292	0.578			Vel = 5.71	
RT to TV	0.0	4.26 120.0	1Fsp	0.0	1.917	27.838 3.830			* Fixed loss = 3	
TV to RB	253.45	0.0156		0.0	1.917	0.030			Vel = 5.71	
TV to RB	0.0	4.26 120.0	1Zac	0.0	4.417	31.698 4.831			* Fixed loss = 2.918	
RB to X1	253.45	0.0154		0.0	4.417	0.068			Vel = 5.71	
RB to X1	0.0	6.16 140.0	1G	4.304	35.000	36.597 0.0				
X1 to TEST	253.45	0.0019		0.0	82.341	0.159			Vel = 2.73	
X1 to TEST	250.00	12.34 140.0		0.0	20.000	36.756 -3.284			Qa = 250	
TEST	503.45	0.0002		0.0	20.000	0.005			Vel = 1.35	
	0.0 503.45					33.477			K Factor = 87.01	

Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 50
C2 - Residual Pressure: 44
C2 - Residual Flow : 1047

Demand:
D1 - Elevation : 5.017
D2 - System Flow : 253.449
D2 - System Pressure : 33.477
Hose (Adj City) : _____
Hose (Demand) : 250
D3 - System Demand : 503.449
Safety Margin : 14.975

