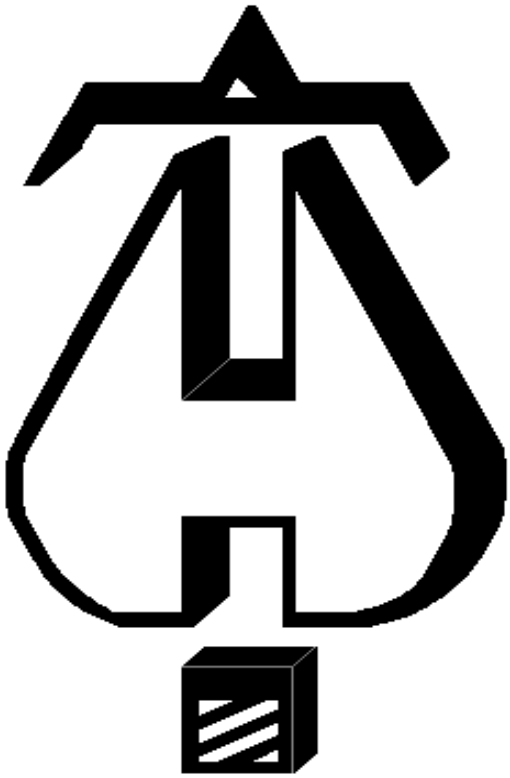

. . . Fire Protection by Computer Design

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

Job Name : JOKER'S ADDITION
Building : 2012 ADDITION
Location : 510-512 WARREN AVENUE, PORTLAND, MAINE 04103
System : 3 OF 3
Contract : 12066
Data File : 12066JOKERSADDNPTLD1.WXF

Hydraulic Design Information Sheet

Name - JOKER'S ADDITION Date - 9-19-2012
Location - 510-512 WARREN AVENUE, PORTLAND, MAINE 04103
Building - 2012 ADDITION System No. - 3 OF 3
Contractor - OWNER Contract No. - 12066
Calculated By - SCOTT E. GARLAND Drawing No. - 1 OF 1
Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - VARIES
Occupancy - INDOOR SPORTS CENTER - LIGHT HAZARD

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 SF
Density - .10
Area Per Sprinkler - 166.7
Elevation at Highest Outlet - 138.5
Hose Allowance - Inside -
Rack Sprinkler Allowance -
Hose Allowance - Outside - 100

System Type
( ) Wet
(X) Dry
( ) Deluge
( ) Preaction
( ) Other

Sprinkler/Nozzle
Make RELIABLE
Model F1FR56
Size 1/2 X 1/2
K-Factor 5.6
Temp.Rat.155 DEG

Note DESIGN AREA #1 - ROOF

Calculation Summary: Flow Required - 226.022 Press Required - 67.742 AT BASE OF RISER
C-Factor Used: 100 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:
Date of Test - 5-13-2009
Time of Test -
Static Press - 82
Residual Press - 81
Flow - 1352
Elevation - 100.0

Pump Data:
Rated Cap.-
@ Press -
Elev. -

Tank or Reservoir:
Cap. -
Elev.-

Well
Proof Flow

Location - ON WARREN AVENUE IN FRONT OF BUILDING

Source of Information - PORTLAND WATER DISTRICT

STORAGE

Commodity
Storage Ht.
Storage Method: Solid Piled % Palletized % Rack

Class
Area

Location
Aisle W.

( ) Single Row ( ) Conven. Pallet ( ) Auto. Storage ( ) Encap.
( ) Double Row ( ) Slave Pallet ( ) Solid Shelf ( ) Non
( ) Mult. Row ( ) Open Shelf

RACK

Flue Spacing
Longitudinal

Clearance:Storage to Ceiling
Transverse

Horizontal Barriers Provided:

Fittings Used Summary

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
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

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	138.5	5.6	8.86	na	16.67	0.1	166.7	8.862
2	137.375	5.6	9.72	na	17.46	0.1	166.7	8.862
3	136.25	5.6	11.59	na	19.07	0.1	166.7	8.862
4	135.125	5.6	15.23	na	21.86	0.1	166.7	8.862
AT	133.917		23.39	na				
5	138.5	5.6	8.9	na	16.71	0.1	166.7	8.862
6	137.375	5.6	9.76	na	17.49	0.1	166.7	8.862
7	136.25	5.6	11.64	na	19.11	0.1	166.7	8.862
8	135.125	5.6	15.29	na	21.9	0.1	166.7	8.862
BT	133.917		23.48	na				
9	138.5	5.6	9.05	na	16.84	0.1	166.7	8.862
10	137.375	5.6	9.91	na	17.63	0.1	166.7	8.862
11	136.25	5.6	11.81	na	19.24	0.1	166.7	8.862
12	135.125	5.6	15.51	na	22.05	0.1	166.7	8.862
CT	133.917		23.8	na				
A	129.417		29.68	na				
B	129.375		29.81	na				
C	129.333		30.2	na				
D	129.292		31.03	na				
E	129.125		38.38	na				
F	128.875		46.36	na				
TDV	112.917		58.83	na				
G	107.5		61.97	na				
BASE	101.0		67.74	na				
1000	100.0		68.86	na	100.0			
TEST	100.0		69.2	na				

The maximum velocity is 14.89 and it occurs in the pipe between nodes 12 and CT

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
1	16.67	1.442		0.0	13.333	8.862		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
2	16.67	0.0277		0.0	13.333	0.369		Vel = 3.27
2	17.46	1.442		0.0	13.333	9.718		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
3	34.13	0.1040		0.0	13.333	1.387		Vel = 6.70
3	19.06	1.442		0.0	13.333	11.592		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
4	53.19	0.2366		0.0	13.333	3.154		Vel = 10.45
4	21.86	1.442	1E	2.652	14.417	15.233		K Factor = 5.60
to		100.0		0.0	2.652	0.523		
AT	75.05	0.4471		0.0	17.069	7.631		Vel = 14.74
AT	0.0	1.442	1T	5.304	4.417	23.387		
to		100.0		0.0	5.304	1.949		
A	75.05	0.4471		0.0	9.721	4.346		Vel = 14.74
	0.0							
	75.05					29.682		K Factor = 13.78
5	16.71	1.442		0.0	13.333	8.902		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
6	16.71	0.0278		0.0	13.333	0.370		Vel = 3.28
6	17.49	1.442		0.0	13.333	9.759		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
7	34.2	0.1045		0.0	13.333	1.393		Vel = 6.72
7	19.11	1.442		0.0	13.333	11.639		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
8	53.31	0.2375		0.0	13.333	3.166		Vel = 10.47
8	21.90	1.442	1E	2.652	14.417	15.292		K Factor = 5.60
to		100.0		0.0	2.652	0.523		
BT	75.21	0.4488		0.0	17.069	7.661		Vel = 14.78
BT	0.0	1.442	1T	5.304	4.417	23.476		
to		100.0		0.0	5.304	1.967		
B	75.21	0.4488		0.0	9.721	4.363		Vel = 14.78
	0.0							
	75.21					29.806		K Factor = 13.78
9	16.84	1.442		0.0	13.333	9.045		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
10	16.84	0.0282		0.0	13.333	0.376		Vel = 3.31
10	17.63	1.442		0.0	13.333	9.908		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
11	34.47	0.1061		0.0	13.333	1.414		Vel = 6.77
11	19.24	1.442		0.0	13.333	11.809		K Factor = 5.60
to		100.0		0.0	0.0	0.487		
12	53.71	0.2408		0.0	13.333	3.210		Vel = 10.55
12	22.06	1.442	1E	2.652	14.417	15.506		K Factor = 5.60
to		100.0		0.0	2.652	0.523		
CT	75.77	0.4550		0.0	17.069	7.767		Vel = 14.89
CT	0.0	1.442	1T	5.304	4.417	23.796		
to		100.0		0.0	5.304	1.985		
C	75.77	0.4550		0.0	9.721	4.423		Vel = 14.89

Final Calculations - Hazen-Williams

Sprinkler Systems Inc.
JOKER'S ADDITION

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	75.77					30.204		K Factor = 13.79
A	75.05	3.26		0.0	12.500	29.682		
to		100.0		0.0	0.0	0.018		
B	75.05	0.0085		0.0	12.500	0.106		Vel = 2.88
B	75.21	3.26		0.0	12.500	29.806		
to		100.0		0.0	0.0	0.018		
C	150.26	0.0304		0.0	12.500	0.380		Vel = 5.78
C	75.76	3.26		0.0	12.500	30.204		
to		100.0		0.0	0.0	0.018		
D	226.02	0.0646		0.0	12.500	0.808		Vel = 8.69
D	0.0	3.26	1E	6.714	105.750	31.030		
to		100.0		0.0	6.714	0.072		
E	226.02	0.0647		0.0	112.464	7.278		Vel = 8.69
E	0.0	3.26	1T	14.388	107.333	38.380		
to		100.0		0.0	14.387	0.108		
F	226.02	0.0647		0.0	121.720	7.876		Vel = 8.69
F	0.0	4.26	7E	65.781	250.333	46.364		
to		100.0		0.0	65.781	6.911		
TDV	226.02	0.0176		0.0	316.114	5.559		Vel = 5.09
TDV	0.0	4.26	3E	28.192	16.583	58.834		
to		100.0		0.0	28.192	2.346		
G	226.02	0.0176		0.0	44.775	0.787		Vel = 5.09
G	0.0	6.357	1Zac	0.0	6.500	61.967		
to		120.0		0.0	0.0	5.763		* Fixed loss = 2.948
BASE	226.02	0.0018		0.0	6.500	0.012		Vel = 2.28
BASE	0.0	6.16	1E	20.084	360.000	67.742		
to		140.0	1F	10.042	77.467	0.433		
1000	226.02	0.0016	1G	4.304	437.467	0.685		Vel = 2.43
			1T	43.037				
1000	100.00	8.27	1E	28.468	380.000	68.860		Qa = 100
to		140.0	1T	55.354	83.822	0.0		
TEST	326.02	0.0007		0.0	463.822	0.341		Vel = 1.95
	0.0							
	326.02					69.201		K Factor = 39.19

Water Supply Curve (C)

Sprinkler Systems Inc.
JOKER'S ADDITION

Page 7
Date 9-19-2012

City Water Supply:
- C1 - Static Pressure : 82
- C2 - Residual Pressure: 81
- C2 - Residual Flow : 1352

Demand:
- D1 - Elevation : 16.674
- D2 - System Flow : 226.022
- D2 - System Pressure : 69.201
- Hose (Adj City) : _____
- Hose (Demand) : 100
- D3 - System Demand : 326.022
- Safety Margin : 12.727