



. . . Fire Protection by Computer Design

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

Job Name : SAGAMORE VILLAGE COMMUNITY BUILDING
Building :
Location : 21 POPHAM STREET, PORTLAND, MAINE 04102
System : 1 OF 1
Contract : 12074
Data File : 12074SAGAMOREVILLCOMMBLDG.WXF

Hydraulic Design Information Sheet

Name - SAGAMORE VILLAGE COMMUNITY BUILDING Date - 11-30-2012
 Location - 21 POPHAM STREET, PORTLAND, MAINE 04102
 Building - System No. - 1 OF 1
 Contractor - JARR MANAGEMENT Contract No. - 12074
 Calculated By - SCOTT E. GARLAND Drawing No. - 1-3 OF 3
 Construction: (X) Combustible () Non-Combustible Ceiling Height - VARIES
 Occupancy - ROOF SPACE - 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 - 7 HD CALC	System Type	Sprinkler/Nozzle
	Density - .10	() Wet	Make TYCO
D	Area Per Sprinkler - 250	(X) Dry	Model BB1 TY3180
E	Elevation at Highest Outlet - 122.0	() Deluge	Size 1/2 X 1/2
S	Hose Allowance - Inside -	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance -	() Other	Temp.Rat.212 DEG
G	Hose Allowance - Outside - 100		

N

Note DESIGN AREA #1 - FAR ROOF

Calculation Flow Required - 180.337 Press Required - 65.303 AT BASE OF RISER
 Summary C-Factor Used: 100 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 5-21-2004		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 79	@ Press -	
R	Residual Press - 77	Elev. -	Well
	Flow - 1677		Proof Flow
S	Elevation - 94.5		

U

P Location - ON BRIGHTON AVENUE AT CABOT STREET, 340'-0" AWAY FROM THE BUILDING

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:

Fittings Used Summary

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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	
D	Dry Rel D										28		47									
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	
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 Valve	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130	
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

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	122.0	5.6	21.02	na	25.67	0.1	250	20.0
2	121.0	5.6	20.0	na	25.04	0.1	250	20.0
3	121.0	5.6	20.05	na	25.08	0.1	250	20.0
4	121.0	5.6	20.23	na	25.19	0.1	250	20.0
P	122.0		21.07	na				
5	122.0	5.6	21.18	na	25.77	0.1	250	20.0
6	122.0	5.6	22.18	na	26.38	0.1	250	20.0
7	122.0	5.6	23.6	na	27.21	0.1	250	20.0
QQ	121.958		30.27	na				
Q	121.875		33.64	na				
G	117.917		38.89	na				
F	117.958		39.63	na				
H	118.0		41.5	na				
J	119.75		47.85	na				
JK	118.667		50.73	na				
K	118.625		51.02	na				
L	118.542		53.72	na				
M	118.417		55.65	na				
N	118.417		55.91	na				
DD	117.083		56.63	na				
Z	106.75		61.84	na				
TDV	105.667		62.69	na				
RB	101.292		65.3	na				
X1	94.5		68.36	na	100.0			
TEST	94.5		68.4	na				

The maximum velocity is 15.88 and it occurs in the pipe between nodes 7 and QQ

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	*****
1 to P	25.67 25.67	2.154 100.0 0.0088		0.0 0.0 0.0	6.000 0.0 6.000	21.019 0.0 0.053			K Factor = 5.60 Vel = 2.26	
	0.0 25.67					21.072			K Factor = 5.59	
2 to 3	25.04 25.04	2.154 100.0 0.0083		0.0 0.0 0.0	6.000 0.0 6.000	20.000 0.0 0.050			K Factor = 5.60 Vel = 2.20	
3 to 4	25.08 50.12	2.154 100.0 0.0300		0.0 0.0 0.0	6.000 0.0 6.000	20.050 0.0 0.180			K Factor = 5.60 Vel = 4.41	
4 to P	25.19 75.31	2.154 100.0 0.0637	1E 1T	4.362 8.724 0.0	6.917 13.085 20.002	20.230 -0.433 1.275			K Factor = 5.60 Vel = 6.63	
	0.0 75.31					21.072			K Factor = 16.41	
P to 5	100.98 100.98	2.154 100.0 0.1090		0.0 0.0 0.0	1.000 0.0 1.000	21.072 0.0 0.109			Vel = 8.89	
5 to 6	25.77 126.75	2.154 100.0 0.1670		0.0 0.0 0.0	6.000 0.0 6.000	21.181 0.0 1.002			K Factor = 5.60 Vel = 11.16	
6 to 7	26.38 153.13	2.154 100.0 0.2370		0.0 0.0 0.0	6.000 0.0 6.000	22.183 0.0 1.422			K Factor = 5.60 Vel = 13.48	
7 to QQ	27.21 180.34	2.154 100.0 0.3206	1T	8.724 0.0 0.0	12.000 8.724 20.724	23.605 0.018 6.645			K Factor = 5.60 Vel = 15.88	
QQ to Q	0.0 180.34	2.635 100.0 0.1201	1T	11.758 0.0 0.0	16.000 11.757 27.757	30.268 0.036 3.334			Vel = 10.61	
Q to G	0.0 180.34	2.635 100.0 0.1201	2E 1T	11.758 11.758 0.0	5.958 23.514 29.472	33.638 1.714 3.541			Vel = 10.61	
G to F	0.0 180.34	2.635 100.0 0.1202		0.0 0.0 0.0	6.250 0.0 6.250	38.893 -0.018 0.751			Vel = 10.61	
F to H	0.0 180.34	2.635 100.0 0.1201		0.0 0.0 0.0	15.750 0.0 15.750	39.626 -0.018 1.892			Vel = 10.61	
H to J	0.0 180.34	2.635 100.0 0.1201	3E 1T	17.636 11.758 0.0	29.750 29.394 59.144	41.500 -0.758 7.106			Vel = 10.61	
J to JK	0.0 180.34	3.26 100.0 0.0426	3E	20.143 0.0 0.0	36.583 20.143 56.726	47.848 0.469 2.417			Vel = 6.93	
JK to K	0.0 180.34	3.26 100.0 0.0426		0.0 0.0 0.0	6.167 0.0 6.167	50.734 0.018 0.263			Vel = 6.93	

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	*****
K to L	0.0 180.34	3.26 100.0 0.0426	2E	13.428 0.0	49.250 13.429	51.015 0.036		Vel = 6.93	
L to M	0.0 180.34	3.26 100.0 0.0426	2E	13.428 0.0	30.500 13.429	53.722 0.054		Vel = 6.93	
M to N	0.0 180.34	4.26 100.0 0.0116	1T	18.795 0.0	3.667 18.795	55.648 0.0		Vel = 4.06	
N to DD	0.0 180.34	4.26 100.0 0.0116	1E	9.397 0.0	2.833 9.397	55.908 0.578		Vel = 4.06	
DD to Z	0.0 180.34	4.26 100.0 0.0116	2E 1T	18.795 18.795	26.167 37.590	56.628 4.475		Vel = 4.06	
Z to TDV	0.0 180.34	4.26 100.0 0.0116	2E	18.795 0.0	13.750 18.795	61.841 0.469		Vel = 4.06	
TDV to RB	0.0 180.34	4.26 120.0 0.0083	1D 1G 1E 1S	36.868 2.633 13.167 28.968	5.667 81.636 87.303	62.687 1.895 0.721		Vel = 4.06	
RB to X1	0.0 180.34	6.16 140.0 0.0010	1T 1G	43.037 4.304	65.000 47.341	65.303 2.942		Vel = 1.94	
X1 to TEST	100.00 280.34	12.34 140.0 0.0001	2T	187.534 0.0	275.000 187.534	68.361 0.0		Qa = 100 Vel = 0.75	
	0.0 280.34					68.397		K Factor = 33.90	

Water Supply Curve (C)

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City Water Supply:

C1 - Static Pressure : 79
C2 - Residual Pressure: 77
C2 - Residual Flow : 1677

Demand:

D1 - Elevation : 11.477
D2 - System Flow : 180.337
D2 - System Pressure : 68.397
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 280.337
Safety Margin : 10.530

