Inspections Division
Date: 11/19/13

. . . Fire Protection by Computer Design

ADVANCED FIRE PROTECTION
P.O. BOX 81
MINOT, MAINE
04258
(207) 513-6480

Job Name	:	NEW YARD YATCH BLDG CALC
Building	:	NEW YARD
Location	:	40 WEST COMMERCIAL ST
System	:	DRY
Contract	:	
Data File	:	NEW YARD 40 WEST COMMERCIAL ST.WXF

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Hydraulic Design Information Sheet

Name - NEW YARD YATCH BLDG. Date - 9-27-13
Location - 40 WEST COMMERCIAL ST
Building - NEW YARD System No. - DRY
Contractor - ADVANCED FIRE PROTECTION Contract No. -
Calculated By - TIM FORTIN Drawing No. - FP-1
Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - VARIES
Occupancy - BOAT STORAGE AND REPAIR

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 (X) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling Made By Date

Area of Sprinkler Operation - 2535	System Type	Sprinkler/Nozzle
Density - .2	( ) Wet	Make VIKING
Area Per Sprinkler - 130	(X) Dry	Model MICROMATIC
Elevation at Highest Outlet - 49	( ) Deluge	Size 3/4"
Hose Allowance - Inside -	( ) Preaction	K-Factor 8.0
Rack Sprinkler Allowance -	( ) Other	Temp.Rat.155
Hose Allowance - Outside - 250		

Note

Calculation Summary: Flow Required - 1062 Press Required - 94
C-Factor Used: 100 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 9-13-2011		Cap. -
Time of Test -	Rated Cap.-	Elev.-
Static Press - 106	@ Press -	
Residual Press - 100	Elev. -	Well
Flow - 1209		Proof Flow
Elevation - 0		

Location - COMMERCIAL ST 400'-0" EAST OF BEACH ST.

Source of Information - PORTLAND WATER DEPT.

COMMODITY STORAGE

Commodity BOATS Class Location
Storage Ht. 12'-0" Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

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

Flue Spacing Clearance:Storage to Ceiling
Longitudinal Transverse

Horizontal Barriers Provided:

Water Supply Curve (C)

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City Water Supply:
- C1 - Static Pressure : 106
- C2 - Residual Pressure: 100
- C2 - Residual Flow : 1209

Demand:

D1 - Elevation	:	20.789
D2 - System Flow	:	812.94
D2 - System Pressure	:	94.286
Hose (Adj City)	:	
Hose (Demand)	:	250
D3 - System Demand	:	1062.94
Safety Margin	:	6.986

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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
D	Dry Viking F1							3	3		5		49								
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	0	0	0	0	0	0	0
Zia	Wilkins 350	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.

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
10	48.0	8	10.56	na	26.0	0.2	130	7.0
11	45.0	8	11.92	na	27.62	0.2	130	7.0
12	39.0	8	14.96	na	30.94	0.2	130	7.0
13	33.0	8	18.58	na	34.48	0.2	130	7.0
14	26.0	8	23.53	na	38.81	0.2	130	7.0
15	21.0	8	28.93	na	43.03	0.2	130	7.0
16	18.5		31.68	na				
20	48.0	8	10.64	na	26.1	0.2	130	7.0
21	45.0	8	12.0	na	27.72	0.2	130	7.0
22	39.0	8	15.04	na	31.03	0.2	130	7.0
23	33.0	8	18.67	na	34.56	0.2	130	7.0
24	26.0	8	23.63	na	38.89	0.2	130	7.0
25	21.0	8	29.05	na	43.12	0.2	130	7.0
26	18.5		31.8	na				
30	48.0	8	10.93	na	26.45	0.2	130	7.0
31	45.0	8	12.29	na	28.05	0.2	130	7.0
32	39.0	8	15.34	na	31.34	0.2	130	7.0
33	33.0	8	18.99	na	34.86	0.2	130	7.0
34	26.0	8	23.99	na	39.18	0.2	130	7.0
35	21.0	8	29.47	na	43.43	0.2	130	7.0
36	18.5		32.25	na				
40	48.0	8	11.55	na	27.19	0.2	130	7.0
41	45.0	8	12.92	na	28.75	0.2	130	7.0
42	39.0	8	15.99	na	31.99	0.2	130	7.0
43	33.0	8	19.69	na	35.49	0.2	130	7.0
44	26.0	8	24.77	na	39.82	0.2	130	7.0
45	21.0	8	30.38	na	44.09	0.2	130	7.0
46	18.5		33.22	na				
M1	18.5		34.77	na				
M2	18.5		34.91	na				
M3	18.5		35.42	na				
M4	18.5		36.51	na				
M5	18.5		60.78	na				
TOR	6.0		66.78	na				
BOR	-3.0		75.34	na				
U1	-4.0		81.24	na				
U2	3.0		92.83	na				
TEST	0.0		94.29	na	250.0			

The maximum velocity is 18.3 and it occurs in the pipe between nodes M4 and M5

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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 ******
10	26.00	2.157		0.0	6.800	10.562		K Factor = 8.00
to		100.0		0.0	0.0	1.299		
11	26.0	0.0090		0.0	6.800	0.061		Vel = 2.28
11	27.62	2.157		0.0	13.000	11.922		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
12	53.62	0.0338		0.0	13.000	0.439		Vel = 4.71
12	30.94	2.157		0.0	13.000	14.960		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
13	84.56	0.0784		0.0	13.000	1.019		Vel = 7.42
13	34.49	2.157		0.0	13.000	18.578		K Factor = 8.00
to		100.0		0.0	0.0	3.032		
14	119.05	0.1477		0.0	13.000	1.920		Vel = 10.45
14	38.80	2.157		0.0	13.000	23.530		K Factor = 8.00
to		100.0		0.0	0.0	2.166		
15	157.85	0.2488		0.0	13.000	3.235		Vel = 13.86
15	43.03	2.157	1V	3.074	1.200	28.931		K Factor = 8.00
to		100.0		0.0	3.074	1.083		
16	200.88	0.3889		0.0	4.274	1.662		Vel = 17.64
16	0.0	2.157	1X	7.466	0.500	31.676		
to		100.0		0.0	7.465	0.0		
M1	200.88	0.3888		0.0	7.965	3.097		Vel = 17.64
	0.0							
	200.88					34.773		K Factor = 34.07
20	26.10	2.157		0.0	6.800	10.642		K Factor = 8.00
to		100.0		0.0	0.0	1.299		
21	26.1	0.0090		0.0	6.800	0.061		Vel = 2.29
21	27.71	2.157		0.0	13.000	12.002		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
22	53.81	0.0340		0.0	13.000	0.442		Vel = 4.72
22	31.03	2.157		0.0	13.000	15.043		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
23	84.84	0.0788		0.0	13.000	1.025		Vel = 7.45
23	34.57	2.157		0.0	13.000	18.667		K Factor = 8.00
to		100.0		0.0	0.0	3.032		
24	119.41	0.1485		0.0	13.000	1.931		Vel = 10.48
24	38.88	2.157		0.0	13.000	23.630		K Factor = 8.00
to		100.0		0.0	0.0	2.166		
25	158.29	0.2502		0.0	13.000	3.252		Vel = 13.90
25	43.12	2.157	1V	3.074	1.200	29.048		K Factor = 8.00
to		100.0		0.0	3.074	1.083		
26	201.41	0.3907		0.0	4.274	1.670		Vel = 17.68

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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 ******
26	0.0	2.157	1X	7.466	0.500	31.801		
to		100.0		0.0	7.465	0.0		
M2	201.41	0.3906		0.0	7.965	3.111		Vel = 17.68
	0.0							
	201.41					34.912		K Factor = 34.09
30	26.45	2.157		0.0	6.800	10.931		K Factor = 8.00
to		100.0		0.0	0.0	1.299		
31	26.45	0.0091		0.0	6.800	0.062		Vel = 2.32
31	28.05	2.157		0.0	13.000	12.292		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
32	54.5	0.0348		0.0	13.000	0.452		Vel = 4.79
32	31.33	2.157		0.0	13.000	15.343		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
33	85.83	0.0806		0.0	13.000	1.048		Vel = 7.54
33	34.87	2.157		0.0	13.000	18.990		K Factor = 8.00
to		100.0		0.0	0.0	3.032		
34	120.7	0.1515		0.0	13.000	1.969		Vel = 10.60
34	39.18	2.157		0.0	13.000	23.991		K Factor = 8.00
to		100.0		0.0	0.0	2.166		
35	159.88	0.2548		0.0	13.000	3.313		Vel = 14.04
35	43.43	2.157	1V	3.074	1.200	29.470		K Factor = 8.00
to		100.0		0.0	3.074	1.083		
36	203.31	0.3975		0.0	4.274	1.699		Vel = 17.85
36	0.0	2.157	1X	7.466	0.500	32.252		
to		100.0		0.0	7.465	0.0		
M3	203.31	0.3975		0.0	7.965	3.166		Vel = 17.85
	0.0							
	203.31					35.418		K Factor = 34.16
40	27.19	2.157		0.0	6.800	11.553		K Factor = 8.00
to		100.0		0.0	0.0	1.299		
41	27.19	0.0096		0.0	6.800	0.065		Vel = 2.39
41	28.75	2.157		0.0	13.000	12.917		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
42	55.94	0.0365		0.0	13.000	0.475		Vel = 4.91
42	31.99	2.157		0.0	13.000	15.991		K Factor = 8.00
to		100.0		0.0	0.0	2.599		
43	87.93	0.0843		0.0	13.000	1.096		Vel = 7.72
43	35.50	2.157		0.0	13.000	19.686		K Factor = 8.00
to		100.0		0.0	0.0	3.032		
44	123.43	0.1578		0.0	13.000	2.052		Vel = 10.84
44	39.81	2.157		0.0	13.000	24.770		K Factor = 8.00
to		100.0		0.0	0.0	2.166		
45	163.24	0.2648		0.0	13.000	3.443		Vel = 14.33

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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 ******
45	44.10	2.157	1V	3.074	1.200	30.379		K Factor = 8.00
to		100.0		0.0	3.074	1.083		
46	207.34	0.4123		0.0	4.274	1.762		Vel = 18.20
46	0.0	2.157	1X	7.466	0.500	33.224		
to		100.0		0.0	7.465	0.0		
M4	207.34	0.4122		0.0	7.965	3.283		Vel = 18.20
	0.0							
	207.34					36.507		K Factor = 34.32
M1	200.88	4.26		0.0	9.900	34.773		
to		100.0		0.0	0.0	0.0		
M2	200.88	0.0140		0.0	9.900	0.139		Vel = 4.52
M2	201.41	4.26		0.0	9.900	34.912		
to		100.0		0.0	0.0	0.0		
M3	402.29	0.0511		0.0	9.900	0.506		Vel = 9.06
M3	203.31	4.26		0.0	10.000	35.418		
to		100.0		0.0	0.0	0.0		
M4	605.6	0.1089		0.0	10.000	1.089		Vel = 13.63
M4	207.34	4.26	1V	6.39	122.900	36.507		
to		100.0		0.0	6.390	0.0		
M5	812.94	0.1877		0.0	129.290	24.271		Vel = 18.30
M5	0.0	6.357	1V	8.974	13.000	60.778		
to		100.0		0.0	8.974	5.414		
TOR	812.94	0.0267		0.0	21.974	0.587		Vel = 8.22
TOR	0.0	6.357	1D	61.61	6.000	66.779		
to		120.0	1Zia	0.0	61.610	7.272		* Fixed loss = 3.374
BOR	812.94	0.0191		0.0	67.610	1.290		Vel = 8.22
BOR	0.0	6.16	1E	15.101	195.000	75.341		
to		120.0	1T	32.359	50.696	0.433		
U1	812.94	0.0222	1G	3.236	245.696	5.462		Vel = 8.75
U1	0.0	6.16	3E	45.302	580.000	81.236		
to		120.0	1T	32.359	77.661	-3.032		
U2	812.94	0.0222		0.0	657.661	14.623		Vel = 8.75
U2	0.0	12.34	1E	42.195	400.000	92.827		
to		140.0	1T	93.767	135.962	1.155		
TEST	812.94	0.0006		0.0	535.962	0.304		Vel = 2.18
	250.00							Qa = 250.00
	1062.94					94.286		K Factor = 109.47