



... Fire Protection by Computer Design

DEAN & ALLYN, INC.
32 LEWISTON ROAD BUILDING 1C
P.O. BOX 709
GRAY, ME 04039
207-657-5646

Job Name : 129 MORNING STREET
Building : 129 Morning Street
Location : BASEMENT - Portland, Maine
System : WX5
Contract : C770
Data File : CALC.WX5

Hydraulic Design Information Sheet

Name - 129 Morning Street Date - 4/7/08
 Location - BASEMENT - Portland, Maine
 Building - 129 Morning Street System No. - WX5
 Contractor - Dean & Allyn, Inc Contract No. - C770
 Calculated By - James R White Drawing No. - 1 OF 1
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 6'-6"
 Occupancy - LAUNDRY/STORAGE

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other NFPA 13R

T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 4 HEADS	System Type	Sprinkler/Nozzle
	Density	- .15	(X) Wet	Make TYCO
D	Area Per Sprinkler	- 110	() Dry	Model TY3531/ 3331
E	Elevation at Highest Outlet	- 6'-6'	() Deluge	Size 1/2"
S	Hose Allowance - Inside	- 0	() Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	- 0	() Other	Temp.Rat.155 DEGRE
G	Hose Allowance - Outside	- 0		

N Note SAFETY MARGIN = 39.82 LBS PSI

Calculation Flow Required - 66.16 Press Required - 32.15
 Summary C-Factor Used: 120 Overhead 150 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 9/26/06		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 72	@ Press -	
R	Residual Press - 68	Elev. -	Well
	Flow - 903		Proof Flow
S	Elevation - 6		

U Location - HYDRANT # 413

P Source of Information - PORTLAND WATER DISTRICT
 L
 Y

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

O C Flue Spacing Clearance:Storage to Ceiling
 R A Longitudinal Transverse

G Horizontal Barriers Provided:
 E

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
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	Generic Gate Valve	0	0	0	0	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
S	Generic Swing Check Valve	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
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
Zaa	Ames 2000B	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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
D401	6.66	5.6	8.95	na	16.75	0.15	110	7.0
D402	6.66	5.6	8.68	na	16.5	0.15	110	7.0
D403	6.66	5.6	9.3	na	17.08	0.15	110	7.0
130	6.66		8.95	na				
128	6.66		9.6	na				
129	7.583		10.69	na				
57	7.583		10.7	na				
58	7.583		10.77	na				
59	7.583		10.83	na				
60	7.583		11.07	na				
127	6.66		9.23	na				
123	6.66	5.6	7.98	na	15.82	0.15	75	7.0
124	7.583		9.79	na				
125	7.583		10.17	na				
9	6.5		10.7	na				
10	6.5		10.81	na				
11	6.5		10.95	na				
12	6.5		11.06	na				
13	6.5		11.12	na				
14	6.5		11.18	na				
15	6.5		11.29	na				
16	6.5		11.64	na				
126	6.5		11.89	na				
17	6.5		13.58	na				
18	6.5		13.97	na				
TOR	6.5		17.15	na				
BOR	6.5		23.59	na				
19	6.5		23.9	na				
TEST	6.0		32.15	na				

The maximum velocity is 6.86 and it occurs in the pipe between nodes 19 and TEST

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	*****
D401 to 127	16.75 16.75	1.049 120 0.0937	1E	2.0 0.0 0.0	1.000 2.000 3.000	8.950 0.0 0.281			K Factor = 5.60	
	0.0 16.75						9.231		K Factor = 5.51	
D402 to 130	16.50 16.5	1.049 120 0.0913	1E	2.0 0.0 0.0	1.000 2.000 3.000	8.681 0.0 0.274			K Factor = 5.60	
	0.0 16.50						8.955		K Factor = 5.51	
D403 to 128	17.08 17.08	1.049 120 0.0970	1E	2.0 0.0 0.0	1.000 2.000 3.000	9.305 0.0 0.291			K Factor = 5.60	
	0.0 17.08						9.596		K Factor = 5.51	
130 to 15	16.50 16.5	1.049 120 0.0912	2E 1T	4.0 5.0 0.0	15.870 9.000 24.870	8.955 0.069 2.268				Vel = 6.13
	0.0 16.50						11.292		K Factor = 4.91	
128 to 129	17.08 17.08	1.049 120 0.0973	1E 1T	2.0 5.0 0.0	8.370 7.000 15.370	9.596 -0.400 1.495				Vel = 6.34
129 to 57	0.0 17.08	1.61 120 0.0115		0.0 0.0 0.0	1.040 0.0 1.040	10.691 0.0 0.012				Vel = 2.69
57 to 58	0.0 17.08	1.61 120 0.0121	1E	4.0 0.0 0.0	1.540 4.000 5.540	10.703 0.0 0.067				Vel = 2.69
58 to 59	0.0 17.08	1.61 120 0.0120	1E	4.0 0.0 0.0	0.750 4.000 4.750	10.770 0.0 0.057				Vel = 2.69
59 to 60	0.0 17.08	1.61 120 0.0121	1E 1T	4.0 8.0 0.0	8.410 12.000 20.410	10.827 0.0 0.247				Vel = 2.69
60 to 16	0.0 17.08	1.61 120 0.0120		0.0 0.0 0.0	7.660 0.0 7.660	11.074 0.469 0.092				Vel = 2.69
	0.0 17.08						11.635		K Factor = 5.01	
127 to 126	16.75 16.75	1.049 120 0.0938	3E 1T	6.0 5.0 0.0	16.620 11.000 27.620	9.231 0.069 2.590				Vel = 6.22
	0.0 16.75						11.890		K Factor = 4.86	
123 to 124	15.82 15.82	1.049 120 0.0844	3E	6.0 0.0 0.0	20.120 6.000 26.120	7.984 -0.400 2.204			K Factor = 5.60	
										Vel = 5.87

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	*****
124	0.0	1.38	1T	6.0	11.080	9.788				
to		120		0.0	6.000	0.0				
125	15.82	0.0222		0.0	17.080	0.379		Vel =	3.39	
125	0.0	1.61	1E	4.0	2.200	10.167				
to		120		0.0	4.000	0.469				
9	15.82	0.0105		0.0	6.200	0.065		Vel =	2.49	
9	0.0	1.61	1E	4.0	6.000	10.701				
to		120		0.0	4.000	0.0				
10	15.82	0.0105		0.0	10.000	0.105		Vel =	2.49	
10	0.0	1.61	1E	4.0	1.000	10.806				
to		120	1S	9.0	13.000	0.0				
11	15.82	0.0105		0.0	14.000	0.147		Vel =	2.49	
11	0.0	1.61	1E	4.0	6.000	10.953				
to		120		0.0	4.000	0.0				
12	15.82	0.0105		0.0	10.000	0.105		Vel =	2.49	
12	0.0	1.61	1E	4.0	1.000	11.058				
to		120	1G	1.0	5.000	0.0				
13	15.82	0.0103		0.0	6.000	0.062		Vel =	2.49	
13	0.0	1.61	1E	4.0	1.500	11.120				
to		120		0.0	4.000	0.0				
14	15.82	0.0105		0.0	5.500	0.058		Vel =	2.49	
14	0.0	1.61	1T	8.0	2.830	11.178				
to		120		0.0	8.000	0.0				
15	15.82	0.0105		0.0	10.830	0.114		Vel =	2.49	
15	16.50	1.61	1T	8.0	0.750	11.292				
to		120		0.0	8.000	0.0				
16	32.32	0.0392		0.0	8.750	0.343		Vel =	5.09	
16	17.09	2.067		0.0	10.000	11.635				
to		120		0.0	0.0	0.0				
126	49.41	0.0255		0.0	10.000	0.255		Vel =	4.72	
126	16.75	2.067	2E	10.0	28.660	11.890				
to		120		0.0	10.000	0.0				
17	66.16	0.0438		0.0	38.660	1.692		Vel =	6.33	
17	0.0	2.067	1E	5.0	3.910	13.582				
to		120		0.0	5.000	0.0				
18	66.16	0.0437		0.0	8.910	0.389		Vel =	6.33	
18	0.0	2.067	1Fsp	0.0	4.042	13.971				
to		120		0.0	0.0	3.000				* Fixed loss = 3
TOR	66.16	0.0438		0.0	4.042	0.177		Vel =	6.33	
TOR	0.0	2.067	1E	5.0	10.500	17.148				
to		120	1Zaa	0.0	5.000	5.764				* Fixed loss = 5.764
BOR	66.16	0.0437		0.0	15.500	0.678		Vel =	6.33	
BOR	0.0	2.067	1E	5.0	2.000	23.590				
to		120		0.0	5.000	0.0				
19	66.16	0.0439		0.0	7.000	0.307		Vel =	6.33	
19	0.0	1.985		0.0	227.870	23.897				
to		150		0.0	0.0	0.217				
TEST	66.16	0.0353		0.0	227.870	8.036		Vel =	6.86	

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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	*****
	0.0 66.16				32.150			K Factor = 11.67	

Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 72
C2 - Residual Pressure: 68
C2 - Residual Flow : 903

Demand:
D1 - Elevation : 0.286
D2 - System Flow : 66.1587
D2 - System Pressure : 32.150
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 66.1587
Safety Margin : 39.819

