



... 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 : 2CND FLOOR - Portland, Maine
System : WX6
Contract : C770
Data File : CALC.WX6

Hydraulic Design Information Sheet

Name - 129 Morning Street Date - 4/7/08
 Location - 2CND FLOOR - Portland, Maine
 Building - 129 Morning Street System No. - WX6
 Contractor - Dean & Allyn, Inc Contract No. - C770
 Calculated By - James R White Drawing No. - 1 OF 1
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 8'-0"
 Occupancy - RESIDENTIAL APARTMENTS

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

S Other NFPA 13 R

T Specific Ruling Made By Date

E
 M Area of Sprinkler Operation - 4 HEADS System Type Sprinkler/Nozzle
 Density - .05 (X) Wet Make TYCO
 D Area Per Sprinkler - 140 () Dry Model TY2596
 E Elevation at Highest Outlet - 26'-5" () Deluge Size 1/2"
 S Hose Allowance - Inside - 0 () Preaction K-Factor 4.2
 I Rack Sprinkler Allowance - 0 () Other Temp.Rat.155 DEGRE
 G Hose Allowance - Outside - 0

N Note SAFETY MARGIN = 19.22 LBS PSI

Calculation Flow Required - 65.09 Press Required - 52.75
 Summary C-Factor Used: 150 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
 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 R () Double Row () Slave Pallet () Solid Shelf () Non
 T A () Mult. Row () Open Shelf
 O C

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
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																			
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.
D501	26.5	4.2	14.56	na	16.02	0.05	140	14.5
D502	26.5	4.2	14.5	na	15.99	0.05	140	14.5
D503	26.5	4.2	15.39	na	16.48	0.05	140	14.5
D504	26.5	4.2	15.62	na	16.6	0.05	140	14.5
76	27.0		14.56	na				
75	27.0		15.4	na				
72	27.0		14.5	na				
73	27.0		15.31	na				
74	27.0		19.86	na				
61	27.0		15.64	na				
54	27.0		15.82	na				
55	27.0		16.06	na				
56	20.0		23.22	na				
129	20.0		24.13	na				
57	20.0		24.22	na				
58	20.0		24.62	na				
59	20.0		24.94	na				
60	20.0		26.45	na				
16	20.0		26.71	na				
71	20.0		26.77	na				
126	20.0		26.98	na				
17	6.5		34.47	na				
18	6.5		34.85	na				
TOR	6.5		38.02	na				
BOR	6.5		44.44	na				
19	6.5		44.73	na				
TEST	6.0		52.75	na				

The maximum velocity is 11.89 and it occurs in the pipe between nodes 74 and 71

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	*****
D501 to 76	16.02 16.02	1.101 150 0.0454	1E	3.825 0.0 0.0	1.000 3.825 4.825	14.555 -0.217 0.219			K Factor = 4.20	
	0.0 16.02						14.557		K Factor = 4.20	
D502 to 72	15.99 15.99	1.101 150 0.0450	1E	3.825 0.0 0.0	1.000 3.825 4.825	14.500 -0.217 0.217			K Factor = 4.20	
	0.0 15.99						14.500		K Factor = 4.20	
D503 to 75	16.48 16.48	1.101 150 0.0477	1E	3.825 0.0 0.0	1.000 3.825 4.825	15.389 -0.217 0.230			K Factor = 4.20	
	0.0 16.48						15.402		K Factor = 4.20	
D504 to 61	16.60 16.6	1.101 150 0.0483	1E	3.825 0.0 0.0	1.000 3.825 4.825	15.619 -0.217 0.233			K Factor = 4.20	
	0.0 16.60						15.635		K Factor = 4.20	
76 to 73	16.02 16.02	1.101 150 0.0452	1E 1T	3.825 9.563 0.0	3.200 13.387 16.587	14.557 0.0 0.749				Vel = 5.40
	0.0 16.02						15.306		K Factor = 4.09	
75 to 55	16.48 16.48	1.101 150 0.0476	2E	7.65 0.0 0.0	6.250 7.650 13.900	15.402 0.0 0.661				Vel = 5.55
	0.0 16.48						16.063		K Factor = 4.11	
72 to 73	15.99 15.99	1.101 150 0.0450	1T	9.563 0.0 0.0	8.330 9.562 17.892	14.500 0.0 0.806				Vel = 5.39
73 to 74	16.03 32.02	1.101 150 0.1625	2E	7.65 0.0 0.0	20.410 7.650 28.060	15.306 0.0 4.559				Vel = 10.79
74 to 71	0.0 32.02	1.049 120 0.3108	1E 1T	2.0 5.0 0.0	5.450 7.000 12.450	19.865 3.032 3.869				Vel = 11.89
	0.0 32.02						26.766		K Factor = 6.19	
61 to 54	16.60 16.6	1.101 150 0.0483		0.0 0.0 0.0	3.830 0.0 3.830	15.635 0.0 0.185				Vel = 5.59
54 to 55	0.0 16.6	1.101 150 0.0482		0.0 0.0 0.0	5.040 0.0 5.040	15.820 0.0 0.243				Vel = 5.59

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	*****
55	16.48	1.101	1E	3.825	20.080	16.063				
to		150		0.0	3.825	3.032				
56	33.08	0.1725		0.0	23.905	4.124		Vel = 11.15		
56	0.0	1.38	1E	3.0	1.500	23.219				
to		120	1T	6.0	9.000	0.0				
129	33.08	0.0869		0.0	10.500	0.912		Vel = 7.10		
129	0.0	1.38		0.0	1.040	24.131				
to		120		0.0	0.0	0.0				
57	33.08	0.0865		0.0	1.040	0.090		Vel = 7.10		
57	0.0	1.38	1E	3.0	1.540	24.221				
to		120		0.0	3.000	0.0				
58	33.08	0.0868		0.0	4.540	0.394		Vel = 7.10		
58	0.0	1.38	1E	3.0	0.750	24.615				
to		120		0.0	3.000	0.0				
59	33.08	0.0869		0.0	3.750	0.326		Vel = 7.10		
59	0.0	1.38	1E	3.0	8.410	24.941				
to		120	1T	6.0	9.000	0.0				
60	33.08	0.0868		0.0	17.410	1.511		Vel = 7.10		
60	0.0	1.682		0.0	7.660	26.452				
to		120		0.0	0.0	0.0				
16	33.08	0.0330		0.0	7.660	0.253		Vel = 4.78		
16	0.0	2.067		0.0	4.950	26.705				
to		120		0.0	0.0	0.0				
71	33.08	0.0123		0.0	4.950	0.061		Vel = 3.16		
71	32.01	2.067		0.0	5.040	26.766				
to		120		0.0	0.0	0.0				
126	65.09	0.0425		0.0	5.040	0.214		Vel = 6.22		
126	0.0	2.067	2E	10.0	28.660	26.980				
to		120		0.0	10.000	5.847				
17	65.09	0.0424		0.0	38.660	1.641		Vel = 6.22		
17	0.0	2.067	1E	5.0	3.910	34.468				
to		120		0.0	5.000	0.0				
18	65.09	0.0424		0.0	8.910	0.378		Vel = 6.22		
18	0.0	2.067	1Fsp	0.0	4.042	34.846				
to		120		0.0	0.0	3.000		* Fixed loss = 3		
TOR	65.09	0.0426		0.0	4.042	0.172		Vel = 6.22		
TOR	0.0	2.067	1E	5.0	10.500	38.018				
to		120	1Zaa	0.0	5.000	5.760		* Fixed loss = 5.76		
BOR	65.09	0.0425		0.0	15.500	0.658		Vel = 6.22		
BOR	0.0	2.067	1E	5.0	2.000	44.436				
to		120		0.0	5.000	0.0				
19	65.09	0.0424		0.0	7.000	0.297		Vel = 6.22		
19	0.0	1.985		0.0	227.870	44.733				
to		150		0.0	0.0	0.217				
TEST	65.09	0.0342		0.0	227.870	7.798		Vel = 6.75		
	0.0									
	65.09					52.748		K Factor = 8.96		

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 : 8.879
D2 - System Flow : 65.0917
D2 - System Pressure : 52.748
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 65.0917
Safety Margin : 19.222

