



... 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 : 133 MORNING ST
Building : 129 Morning Street
Location : 3RD FLOOR - Portland, Maine
System : WX3
Contract : C780
Data File : 133-Morn.WX3

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.
D201	36.75	4.2	19.46	na	18.53	0.05	225	7.0
D202	36.75	4.2	15.14	na	16.34	0.05	225	7.0
D203	36.75	4.2	7.17	na	11.25	0.05	225	7.0
D204	36.75	4.2	7.25	na	11.31	0.05	225	7.0
86	37.208		7.11	na				
75	37.208		15.21	na				
76	37.208		15.58	na				
77	37.208		16.46	na				
78	37.208		17.57	na				
79	37.208		18.05	na				
80	37.208		18.4	na				
81	37.208		19.46	na				
82	37.208		19.62	na				
83	37.208		19.92	na				
84	37.208		20.01	na				
85	37.208		20.16	na				
45	37.208		19.6	na				
40	37.208		20.4	na				
41	37.208		20.54	na				
42	37.208		21.1	na				
43	37.208		21.27	na				
44	17.292		30.17	na				
14A	17.292		31.9	na				
14	7.333		36.57	na				
BAL	1.0		39.38	na				
TAL	6.833		36.96	na				
64	37.208		7.19	na				
65	37.208		7.59	na				
66	37.208		9.5	na				
67	37.208		12.82	na				
68	37.208		14.73	na				
69	37.208		15.82	na				
70	37.208		16.24	na				
71	37.208		18.64	na				
72	37.208		20.51	na				
73	26.5		26.69	na				
74	26.5		28.31	na				
BTR	6.833		37.0	na				
BR	1.0		42.88	na				
UC	-5.0		52.34	na				
TEST	-10.0		61.5	na				

The maximum velocity is 8.37 and it occurs in the pipe between nodes 65 and 66

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	*****
D201 to 45	18.53 18.53	1.049 120 0.1127	1E	2.0 0.0 0.0	1.000 2.000 3.000	19.456 -0.198 0.338			K Factor = 4.20	
	0.0 18.53						19.596		K Factor = 4.19	
D202 to 75	16.34 16.34	1.049 120 0.0897	1E	2.0 0.0 0.0	1.000 2.000 3.000	15.137 -0.198 0.269			K Factor = 4.20	
	0.0 16.34						15.208		K Factor = 4.19	
D203 to 86	11.25 11.25	1.049 120 0.0447	1E	2.0 0.0 0.0	1.000 2.000 3.000	7.175 -0.198 0.134			K Factor = 4.20	
	0.0 11.25						7.111		K Factor = 4.22	
D204 to 64	11.31 11.31	1.049 120 0.0453	1E	2.0 0.0 0.0	1.000 2.000 3.000	7.252 -0.198 0.136			K Factor = 4.20	
	0.0 11.31						7.190		K Factor = 4.22	
86 to 65	11.25 11.25	1.049 120 0.0449	1E	2.0 0.0 0.0	8.750 2.000 10.750	7.111 0.0 0.483				Vel = 4.18
	0.0 11.25						7.594		K Factor = 4.08	
75 to 76	16.34 16.34	1.049 120 0.0894		0.0 0.0 0.0	4.160 0.0 4.160	15.208 0.0 0.372				Vel = 6.07
76 to 77	0.0 16.34	1.097 120 0.0720	1E	2.487 0.0 0.0	9.750 2.487 12.237	15.580 0.0 0.881				Vel = 5.55
77 to 78	0.0 16.34	1.049 120 0.0895	1E 1T	2.0 5.0 0.0	5.330 7.000 12.330	16.461 0.0 1.104				Vel = 6.07
78 to 79	0.0 16.34	1.049 120 0.0895		0.0 0.0 0.0	5.450 0.0 5.450	17.565 0.0 0.488				Vel = 6.07
79 to 80	0.0 16.34	1.049 120 0.0895	1E	2.0 0.0 0.0	1.910 2.000 3.910	18.053 0.0 0.350				Vel = 6.07
80 to 81	0.0 16.34	1.049 120 0.0896	1E	2.0 0.0 0.0	9.750 2.000 11.750	18.403 0.0 1.053				Vel = 6.07
81 to 82	0.0 16.34	1.38 120 0.0234	1E	3.0 0.0 0.0	3.830 3.000 6.830	19.456 0.0 0.160				Vel = 3.50
82 to 83	0.0 16.34	1.38 120 0.0236	1E	3.0 0.0 0.0	9.750 3.000 12.750	19.616 0.0 0.301				Vel = 3.50

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	*****
83 to 84	0.0 16.34	1.38 120 0.0235	1E	3.0 0.0 0.0	0.830 3.000 3.830	19.917 0.0 0.090			Vel = 3.50	
84 to 85	0.0 16.34	1.38 120 0.0236	1T	6.0 0.0 0.0	0.700 6.000 6.700	20.007 0.0 0.158			Vel = 3.50	
85 to 72	0.0 16.34	1.38 120 0.0235		0.0 0.0 0.0	14.750 0.0 14.750	20.165 0.0 0.347			Vel = 3.50	
	0.0 16.34					20.512			K Factor = 3.61	
45 to 40	18.53 18.53	1.049 120 0.1131	1T	5.0 0.0 0.0	2.120 5.000 7.120	19.596 0.0 0.805			Vel = 6.88	
40 to 41	0.0 18.53	1.38 120 0.0296	1E	3.0 0.0 0.0	1.660 3.000 4.660	20.401 0.0 0.138			Vel = 3.97	
41 to 42	0.0 18.53	1.442 120 0.0240	1E	3.716 0.0 0.0	19.500 3.716 23.216	20.539 0.0 0.557			Vel = 3.64	
42 to 43	0.0 18.53	1.38 120 0.0297	1E	3.0 0.0 0.0	3.000 3.000 6.000	21.096 0.0 0.178			Vel = 3.97	
43 to 44	0.0 18.53	1.38 120 0.0297	2E	6.0 0.0 0.0	3.000 6.000 9.000	21.274 8.626 0.267			Vel = 3.97	
44 to 14A	0.0 18.53	1.38 120 0.0297	4E	12.0 0.0 0.0	46.450 12.000 58.450	30.167 0.0 1.736			Vel = 3.97	
14A to 14	0.0 18.53	1.61 120 0.0140	1T	8.0 0.0 0.0	17.000 8.000 25.000	31.903 4.313 0.351			Vel = 2.92	
14 to BAL	0.0 18.53	2.067 120 0.0041	3E	15.0 0.0 0.0	1.000 15.000 16.000	36.567 2.743 0.066			Vel = 1.77	
BAL to TAL	0.0 18.53	2.067 120 0.0041	2E 1S	10.0 11.0 0.0	6.500 21.000 27.500	39.376 -2.526 0.114			Vel = 1.77	
TAL to BTR	0.0 18.53	2.067 120 0.0041	1G 1E	1.0 5.0 0.0	1.500 6.000 7.500	36.964 0.0 0.031			Vel = 1.77	
	0.0 18.53					36.995			K Factor = 3.05	
64 to 65	11.31 11.31	1.049 120 0.0453	1E	2.0 0.0 0.0	6.910 2.000 8.910	7.190 0.0 0.404			Vel = 4.20	
65 to 66	11.25 22.56	1.049 120 0.1626	1E	2.0 0.0 0.0	9.750 2.000 11.750	7.594 0.0 1.910			Vel = 8.37	

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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	*****
66 to 67	0.0 22.56	1.049 120 0.1626	2E 2T	4.0 10.0 0.0	6.370 14.000 20.370	9.504 0.0 3.313		Vel =	8.37	
67 to 68	0.0 22.56	1.049 120 0.1626	1E	2.0 0.0 0.0	9.750 2.000 11.750	12.817 0.0 1.911		Vel =	8.37	
68 to 69	0.0 22.56	1.049 120 0.1625	1T	5.0 0.0 0.0	1.700 5.000 6.700	14.728 0.0 1.089		Vel =	8.37	
69 to 70	0.0 22.56	1.049 120 0.1628	1E	2.0 0.0 0.0	0.580 2.000 2.580	15.817 0.0 0.420		Vel =	8.37	
70 to 71	0.0 22.56	1.049 120 0.1626	1T	5.0 0.0 0.0	9.750 5.000 14.750	16.237 0.0 2.398		Vel =	8.37	
71 to 72	0.0 22.56	1.049 120 0.1627	2T	10.0 0.0 0.0	1.540 10.000 11.540	18.635 0.0 1.877		Vel =	8.37	
72 to 73	16.34 38.9	1.61 120 0.0553		0.0 0.0 0.0	27.910 0.0 27.910	20.512 4.638 1.543		Vel =	6.13	
73 to 74	0.0 38.9	1.61 120 0.0553	1E 2T	4.0 16.0 0.0	9.146 20.000 29.146	26.693 0.0 1.613		Vel =	6.13	
74 to BTR	0.0 38.9	2.067 120 0.0163	1T	10.0 0.0 0.0	0.500 10.000 10.500	28.306 8.518 0.171		Vel =	3.72	
BTR to BR	18.53 57.43	2.067 120 0.0337	1Fsp 1E	0.0 5.0 0.0	5.583 5.000 10.583	36.995 5.526 0.357		* Fixed loss = 3 Vel =	5.49	
BR to UC	0.0 57.43	2.067 120 0.0337	6E 1Zaa	30.0 0.0 0.0	3.688 30.000 33.688	42.878 8.327 1.134		* Fixed loss = 5.728 Vel =	5.49	
UC to TEST	0.0 57.43	1.917 150 0.0322	2E	10.47 0.0 0.0	206.950 10.470 217.420	52.339 2.166 6.993		Vel =	6.38	
	0.0 57.43					61.498		K Factor =	7.32	

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 : 20.247
D2 - System Flow : 57.4269
D2 - System Pressure : 61.498
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 57.4269
Safety Margin : 10.478

