



**... 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 : WX2  
Contract : C780  
Data File : 133-Morn.WX2

# 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.
D101	36.75	4.2	7.0	na	11.11	0.05	75	7.0
D102	36.75	4.2	7.23	na	11.3	0.05	75	7.0
D103	36.75	4.2	8.27	na	12.08	0.05	75	7.0
D104	36.75	4.2	9.3	na	12.81	0.05	75	7.0
47	37.208		7.17	na				
46	37.208		8.22	na				
45	37.208		9.27	na				
37	37.208		6.93	na				
38	37.208		7.7	na				
39	37.208		8.76	na				
40	37.208		9.68	na				
41	37.208		10.46	na				
42	17.292		22.87	na				
43	17.292		23.88	na				
44	17.292		25.39	na				
14A	17.292		35.22	na				
14	7.333		41.52	na				
BAL	1.0		44.64	na				
TAL	6.833		42.76	na				
BTR	6.833		42.93	na				
BR	1.0		48.71	na				
UC	-5.0		57.72	na				
TEST	-10.0		64.76	na				

The maximum velocity is 10.14 and it occurs in the pipe between nodes 40 and 41

# 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	*****
D101 to 37	11.11 11.11	1.049 120 0.0437	1E	2.0 0.0 0.0	1.000 2.000 3.000	7.000 -0.198 0.131			K Factor = 4.20	
	0.0 11.11					6.933			K Factor = 4.22	
D102 to 47	11.30 11.3	1.049 120 0.0450	1E	2.0 0.0 0.0	1.000 2.000 3.000	7.233 -0.198 0.135			K Factor = 4.20	
	0.0 11.30					7.170			K Factor = 4.22	
D103 to 46	12.08 12.08	1.049 120 0.0510	1E	2.0 0.0 0.0	1.000 2.000 3.000	8.266 -0.198 0.153			K Factor = 4.20	
	0.0 12.08					8.221			K Factor = 4.21	
D104 to 45	12.81 12.81	1.049 120 0.0570	1E	2.0 0.0 0.0	1.000 2.000 3.000	9.297 -0.198 0.171			K Factor = 4.20	
	0.0 12.81					9.270			K Factor = 4.21	
47 to 38	11.30 11.3	1.049 120 0.0452	1E 1T	2.0 5.0 0.0	4.620 7.000 11.620	7.170 0.0 0.525				Vel = 4.19
	0.0 11.30					7.695			K Factor = 4.07	
46 to 39	12.08 12.08	1.049 120 0.0511	1E 1T	2.0 5.0 0.0	3.500 7.000 10.500	8.221 0.0 0.537				Vel = 4.48
	0.0 12.08					8.758			K Factor = 4.08	
45 to 40	12.81 12.81	1.049 120 0.0570	1T	5.0 0.0 0.0	2.120 5.000 7.120	9.270 0.0 0.406				Vel = 4.76
	0.0 12.81					9.676			K Factor = 4.12	
37 to 38	11.11 11.11	1.049 120 0.0439	2E	4.0 0.0 0.0	13.370 4.000 17.370	6.933 0.0 0.762				Vel = 4.12
38 to 39	11.30 22.41	1.049 120 0.1606		0.0 0.0 0.0	6.620 0.0 6.620	7.695 0.0 1.063				Vel = 8.32
39 to 40	12.07 34.48	1.38 120 0.0938	2E	6.0 0.0 0.0	3.790 6.000 9.790	8.758 0.0 0.918				Vel = 7.40
40 to 41	12.81 47.29	1.38 120 0.1682	1E	3.0 0.0 0.0	1.660 3.000 4.660	9.676 0.0 0.784				Vel = 10.14

# 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	*****
41 to 42	0.0 47.29	1.38 120 0.1681	1E	3.0 0.0 0.0	19.500 3.000 22.500	10.460 8.626 3.783			Vel = 10.14	
42 to 43	0.0 47.29	1.38 120 0.1682	1E	3.0 0.0 0.0	3.000 3.000 6.000	22.869 0.0 1.009			Vel = 10.14	
43 to 44	0.0 47.29	1.38 120 0.1682	2E	6.0 0.0 0.0	3.000 6.000 9.000	23.878 0.0 1.514			Vel = 10.14	
44 to 14A	0.0 47.29	1.38 120 0.1682	4E	12.0 0.0 0.0	46.450 12.000 58.450	25.392 0.0 9.830			Vel = 10.14	
14A to 14	0.0 47.29	1.61 120 0.0794	1T	8.0 0.0 0.0	17.000 8.000 25.000	35.222 4.313 1.984			Vel = 7.45	
14 to BAL	0.0 47.29	2.067 120 0.0235	3E	15.0 0.0 0.0	1.000 15.000 16.000	41.519 2.743 0.376			Vel = 4.52	
BAL to TAL	0.0 47.29	2.067 120 0.0235	2E 1S	10.0 11.0 0.0	6.500 21.000 27.500	44.638 -2.526 0.647			Vel = 4.52	
TAL to BTR	0.0 47.29	2.067 120 0.0235	1G 1E	1.0 5.0 0.0	1.500 6.000 7.500	42.759 0.0 0.176			Vel = 4.52	
BTR to BR	0.0 47.29	2.067 120 0.0235	1Fsp 1E	0.0 5.0 0.0	5.583 5.000 10.583	42.935 5.526 0.249			* Fixed loss = 3 Vel = 4.52	
BR to UC	0.0 47.29	2.067 120 0.0235	6E 1Zaa	30.0 0.0 0.0	3.688 30.000 33.688	48.710 8.215 0.792			* Fixed loss = 5.616 Vel = 4.52	
UC to TEST	0.0 47.29	1.917 150 0.0224	2E	10.47 0.0 0.0	206.950 10.470 217.420	57.717 2.166 4.881			Vel = 5.26	
	0.0 47.29					64.764			K Factor = 5.88	

# 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 : 47.2891  
D2 - System Pressure : 64.764  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 47.2891  
Safety Margin : 7.219

