



... 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 : 4th FLOOR - Portland, Maine
System : WX1
Contract : C780
Data File : 133-Morn.WX1

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.
D001	46.667	4.2	7.0	na	11.11	0.05	100	7.0
D002	46.667	4.2	7.19	na	11.26	0.05	125	7.0
D003	46.667	4.2	10.31	na	13.48	0.05	125	7.0
D004	46.667	4.2	7.96	na	11.85	0.05	100	7.0
20	47.667		6.87	na				
19	47.667		7.66	na				
15	47.667		10.04	na				
16	47.667		10.4	na				
17	47.667		10.51	na				
18	47.667		11.47	na				
1	47.667		6.68	na				
2	47.667		7.16	na				
3	47.667		7.94	na				
4	47.667		8.0	na				
5	47.667		11.16	na				
6	47.667		11.36	na				
7	47.667		11.49	na				
8	36.75		19.28	na				
9	36.75		20.2	na				
10	27.0		25.27	na				
11	27.0		25.66	na				
12	17.292		30.71	na				
13	17.292		31.32	na				
14	7.333		39.31	na				
BAL	1.0		42.43	na				
TAL	6.833		40.56	na				
BTR	6.833		40.74	na				
BR	1.0		46.52	na				
UC	-5.0		55.57	na				
TEST	-10.0		62.69	na				

The maximum velocity is 12.7 and it occurs in the pipe between nodes 4 and 5

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	*****
D001 to 1	11.11 11.11	1.049 150 0.0291	1E	3.022 0.0 0.0	1.000 3.022 4.022	7.000 -0.433 0.117			K Factor = 4.20 Vel = 4.12	
	0.0 11.11						6.684		K Factor = 4.30	
D002 to 20	11.26 11.26	1.049 150 0.0298	1E	3.022 0.0 0.0	1.000 3.022 4.022	7.185 -0.433 0.120			K Factor = 4.20 Vel = 4.18	
	0.0 11.26						6.872		K Factor = 4.30	
D003 to 15	13.48 13.48	1.049 150 0.0415	1E	3.022 0.0 0.0	1.000 3.022 4.022	10.308 -0.433 0.167			K Factor = 4.20 Vel = 5.00	
	0.0 13.48						10.042		K Factor = 4.25	
D004 to 19	11.85 11.85	1.049 150 0.0328	1E	3.022 0.0 0.0	1.000 3.022 4.022	7.959 -0.433 0.132			K Factor = 4.20 Vel = 4.40	
	0.0 11.85						7.658		K Factor = 4.28	
20 to 2	11.26 11.26	1.049 150 0.0297	1T	7.555 0.0 0.0	2.000 7.555 9.555	6.872 0.0 0.284			Vel = 4.18	
	0.0 11.26						7.156		K Factor = 4.21	
19 to 4	11.85 11.85	1.049 150 0.0327	1T	7.555 0.0 0.0	3.000 7.555 10.555	7.658 0.0 0.345			Vel = 4.40	
	0.0 11.85						8.003		K Factor = 4.19	
15 to 16	13.48 13.48	1.049 150 0.0415	1T	7.555 0.0 0.0	1.160 7.555 8.715	10.042 0.0 0.362			Vel = 5.00	
16 to 17	0.0 13.48	1.049 150 0.0415		0.0 0.0 0.0	2.580 0.0 2.580	10.404 0.0 0.107			Vel = 5.00	
17 to 18	0.0 13.48	1.049 150 0.0415	1E 1T	3.022 7.555 0.0	12.410 10.577 22.987	10.511 0.0 0.955			Vel = 5.00	
18 to 7	0.0 13.48	1.61 150 0.0051		0.0 0.0 0.0	4.480 0.0 4.480	11.466 0.0 0.023			Vel = 2.12	
	0.0 13.48						11.489		K Factor = 3.98	
1 to 2	11.11 11.11	1.049 150 0.0290	1E	3.022 0.0 0.0	13.250 3.022 16.272	6.684 0.0 0.472			Vel = 4.12	

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	*****
2	11.26	1.049		0.0	7.410	7.156				
to		150		0.0	0.0	0.0				
3	22.37	0.1059		0.0	7.410	0.785		Vel =	8.30	
3	0.0	1.049		0.0	0.580	7.941				
to		150		0.0	0.0	0.0				
4	22.37	0.1069		0.0	0.580	0.062		Vel =	8.30	
4	11.85	1.049	1T	7.555	6.000	8.003				
to		150		0.0	7.555	0.0				
5	34.22	0.2326		0.0	13.555	3.153		Vel =	12.70	
5	0.0	1.61	1E	6.044	1.000	11.156				
to		150		0.0	6.044	0.0				
6	34.22	0.0288		0.0	7.044	0.203		Vel =	5.39	
6	0.0	1.61		0.0	4.510	11.359				
to		150		0.0	0.0	0.0				
7	34.22	0.0288		0.0	4.510	0.130		Vel =	5.39	
7	13.48	1.61	1E	6.044	51.390	11.489				
to		150		0.0	6.044	4.728				
8	47.7	0.0534		0.0	57.434	3.067		Vel =	7.52	
8	0.0	1.61	2E	12.089	5.160	19.284				
to		150		0.0	12.089	0.0				
9	47.7	0.0533		0.0	17.249	0.920		Vel =	7.52	
9	0.0	1.61	1E	6.044	9.750	20.204				
to		150		0.0	6.044	4.223				
10	47.7	0.0534		0.0	15.794	0.843		Vel =	7.52	
10	0.0	1.61	1E	6.044	1.330	25.270				
to		150		0.0	6.044	0.0				
11	47.7	0.0534		0.0	7.374	0.394		Vel =	7.52	
11	0.0	1.61	1E	6.044	9.750	25.664				
to		150		0.0	6.044	4.205				
12	47.7	0.0534		0.0	15.794	0.843		Vel =	7.52	
12	0.0	1.61	1E	6.044	5.370	30.712				
to		150		0.0	6.044	0.0				
13	47.7	0.0534		0.0	11.414	0.609		Vel =	7.52	
13	0.0	1.61	3E	12.0	33.500	31.321				
to		120		0.0	12.000	4.313				
14	47.7	0.0807		0.0	45.500	3.671		Vel =	7.52	
14	0.0	2.067	3E	15.0	1.000	39.305				
to		120		0.0	15.000	2.743				
BAL	47.7	0.0239		0.0	16.000	0.382		Vel =	4.56	
BAL	0.0	2.067	2E	10.0	6.500	42.430				
to		120	1S	11.0	21.000	-2.526				
TAL	47.7	0.0239		0.0	27.500	0.657		Vel =	4.56	
TAL	0.0	2.067	1G	1.0	1.500	40.561				
to		120	1E	5.0	6.000	0.0				
BTR	47.7	0.0239		0.0	7.500	0.179		Vel =	4.56	
BTR	0.0	2.067	1Fsp	0.0	5.583	40.740				
to		120	1E	5.0	5.000	5.526		* Fixed loss = 3		
BR	47.7	0.0240		0.0	10.583	0.254		Vel =	4.56	

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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	*****
BR to UC	0.0 47.7	2.067 120 0.0239	6E 1Zaa	30.0 0.0	3.688 30.000 33.688	46.520 8.243 0.804			* Fixed loss = 5.644 Vel = 4.56	
UC to TEST	0.0 47.7	1.917 150 0.0228	2E	10.47 0.0	206.950 10.470 217.420	55.567 2.166 4.961			Vel = 5.30	
	0.0 47.70					62.694			K Factor = 6.02	

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 : 24.542
D2 - System Flow : 47.7042
D2 - System Pressure : 62.694
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 47.7042
Safety Margin : 9.288

