



... **Fire Protection by Computer Design**

SPRINKLER SYSTEMS INC.  
4 AVON STREET  
P O BOX 1285  
LEWISTON, ME. 04243  
207-782-0104

Job Name : ENVIROLOGIX AREA 1  
Building : EXISTING  
Location : 530 RIVERSIDE INDUSTRIAL PARKWAY PORTLAND, MAINE  
System : 1 WET  
Contract : 11099  
Data File : Envirologix area 1.WXF

Hydraulic Design Information Sheet

Name - ENVIROLOGIX 2011 - 2012 RENOVATION Date - 01/30/12  
 Location - 530 RIVERSIDE INDUSTRIAL PARKWAY PORTLAND, MAINE  
 Building - EXISTING System No. - 1 WET  
 Contractor - SPRINKLER SYSTEMS INC. Contract No. - 11099  
 Calculated By - CDS Drawing No. - 1-2 OF 2  
 Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - VARIES  
 Occupancy - STORAGE

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

S Other

T Specific Ruling Made By Date

E				
M	Area of Sprinkler Operation	- 945	System Type	Sprinkler/Nozzle
	Density	- .20	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 130	( ) Dry	Model F1FR56
E	Elevation at Highest Outlet	- 109	( ) Deluge	Size 1/2" X 1/2"
S	Hose Allowance - Inside	- 0	( ) Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	- 0	( ) Other	Temp.Rat.155 DEG.
G	Hose Allowance - Outside	- 250		

N Note

Calculation Flow Required - 307.33 Press Required - 51.948 AT BASE  
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 07/08/08		Cap. -
T	Time of Test - AM	Rated Cap.-	Elev.-
E	Static Press - 80	@ Press -	
R	Residual Press - 79	Elev. -	Well
	Flow - 2466		Proof Flow
S	Elevation - 90.0'		

U  
 P Location - RIVERSIDE INDUSTRIAL PARKWAY

P  
 L Source of Information - OWNER AND WATER DISTRICT

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
M	( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage ( ) Encap.
S	( ) Double Row	( ) Slave Pallet	( ) Solid Shelf ( ) Non
T	( ) 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		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	
A	Alarm Rel E1 & E3							7.7	21.5		17		27	29								
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61	61
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28	28
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																				
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121	121

## Units Summary

Diameter Units           Inches  
 Length Units             Feet  
 Flow Units                US Gallons per Minute  
 Pressure Units           Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

# Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
TYP	0.0	5.6	21.56	na	26.0	0.2	130	7.0
113	109.0	K = K @ SPRG	31.65	na	30.48			
114	109.0	K = K @ SPRG	31.73	na	30.51			
106	109.0	5.6	21.56	na	26.0	0.2	130	7.0
107	109.0	5.6	21.94	na	26.23	0.2	130	7.0
108	109.0		24.41	na				
109	109.0	K = K @ SPRG	24.63	na	26.88			
110	109.0	K = K @ SPRG	24.99	na	27.08			
111	109.0	K = K @ SPRG	25.8	na	27.51			
ARM	109.0	5.6	24.27	na	27.59	0.2	130	7.0
101	109.0		26.99	na				
102	109.0	K = K @ SPRG	27.06	na	28.18			
103	109.0	K = K @ SPRG	27.29	na	28.3			
104	109.0	K = K @ SPRG	27.81	na	28.57			
105	109.0		32.65	na				
112	109.0		32.76	na				
115	109.0		33.36	na				
116	109.0		37.59	na				
54	118.5		37.39	na				
55	123.25		35.42	na				
56	123.25		36.58	na				
50	118.5		37.64	na				
51	123.25		35.66	na				
52	123.25		36.65	na				
45	118.5		37.83	na				
46	123.25		35.84	na				
47	123.25		36.76	na				
41	118.5		37.96	na				
42	123.25		35.96	na				
43	123.25		36.64	na				
37	118.5		38.06	na				
38	123.25		36.05	na				
39	123.25		36.55	na				
33	118.5		38.14	na				
34	123.25		36.11	na				
35	123.25		36.49	na				
29	118.5		38.19	na				
30	123.25		36.15	na				
31	123.25		36.45	na				
25	118.5		38.22	na				
26	123.25		36.18	na				
27	123.25		36.42	na				
21	118.5		38.25	na				
22	123.25		36.21	na				
23	123.25		36.39	na				
17	118.5		38.27	na				
18	123.25		36.22	na				
19	123.25		36.38	na				
13	118.5		38.28	na				
14	123.25		36.24	na				
15	123.25		36.37	na				
9	118.5		38.29	na				
10	123.25		36.24	na				
11	123.25		36.36	na				
5	118.5		38.29	na				
6	123.25		36.24	na				
7	123.25		36.36	na				
58	118.5		37.19	na				
1	118.5		38.29	na				
2	123.25		36.25	na				
3	123.25		36.36	na				
4	118.5		38.42	na				
8	118.5		38.42	na				
12	118.5		38.43	na				
16	118.5		38.43	na				

# Flow Summary - Standard

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
20	118.5		38.45	na				
24	118.5		38.47	na				
28	118.5		38.49	na				
32	118.5		38.53	na				
36	118.5		38.58	na				
40	118.5		38.65	na				
44	118.5		38.75	na				
48	118.5		38.89	na				
59	118.5		37.56	na				
60	123.25		35.58	na				
61	123.25		36.56	na				
63	118.5		37.68	na				
64	123.25		35.69	na				
65	123.25		36.53	na				
67	118.5		37.76	na				
68	123.25		35.76	na				
69	123.25		36.52	na				
71	118.5		37.8	na				
72	123.25		35.8	na				
73	123.25		36.51	na				
75	118.5		37.83	na				
76	123.25		35.82	na				
77	123.25		36.51	na				
79	118.5		37.83	na				
80	123.25		35.83	na				
81	123.25		36.51	na				
82	118.5		38.62	na				
78	118.5		38.62	na				
74	118.5		38.62	na				
70	118.5		38.63	na				
66	118.5		38.66	na				
62	118.5		38.69	na				
57	118.5		38.73	na				
53	118.5		38.79	na				
49	118.5		39.03	na				
TAV	105.0		48.82	na				
BASE	100.0		51.95	na				
HOSE	90.0		58.15	na	250.0			
1000	90.0		58.65	na				
TEST	90.0		58.84	na				

The maximum velocity is 11.81 and it occurs in the pipe between nodes 115 and 116

# 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	*****
TYP to SPRG	26.00 26.0	1.049 120.0 0.2114	1T	5.0 0.0 0.0	2.000 5.000 7.000	21.556 0.0 1.480			K Factor = 5.60	
	0.0 26.00								23.036	K Factor = 5.42
113 to 114	30.48 30.48	2.157 120.0 0.0084		0.0 0.0 0.0	9.500 0.0 9.500	31.649 0.0 0.080			K Factor @ node SPRG	Vel = 2.68
114 to 115	30.51 60.99	2.157 120.0 0.0306	1T	12.307 0.0 0.0	41.000 12.307 53.307	31.729 0.0 1.631			K Factor @ node SPRG	Vel = 5.35
	0.0 60.99								33.360	K Factor = 10.56
106 to 108	26.00 26.0	1.049 120.0 0.2114	1E 1T	2.0 5.0 0.0	6.500 7.000 13.500	21.556 0.0 2.854			K Factor = 5.60	Vel = 9.65
	0.0 26.00								24.410	K Factor = 5.26
107 to 108	26.23 26.23	1.049 120.0 0.2149	1E 1T	2.0 5.0 0.0	4.500 7.000 11.500	21.939 0.0 2.471			K Factor = 5.60	Vel = 9.74
108 to 109	26.00 52.23	2.157 120.0 0.0231		0.0 0.0 0.0	9.500 0.0 9.500	24.410 0.0 0.219				Vel = 4.59
109 to 110	26.88 79.11	2.157 120.0 0.0495		0.0 0.0 0.0	7.250 0.0 7.250	24.629 0.0 0.359			K Factor @ node SPRG	Vel = 6.95
110 to 111	27.08 106.19	2.157 120.0 0.0853		0.0 0.0 0.0	9.500 0.0 9.500	24.988 0.0 0.810			K Factor @ node SPRG	Vel = 9.32
111 to 112	27.52 133.71	2.157 120.0 0.1307	1T	12.307 0.0 0.0	41.000 12.307 53.307	25.798 0.0 6.966			K Factor @ node SPRG	Vel = 11.74
	0.0 133.71								32.764	K Factor = 23.36
ARM to 101	27.59 27.59	1.049 120.0 0.2360	1E 1T	2.0 5.0 0.0	4.500 7.000 11.500	24.274 0.0 2.714			K Factor = 5.60	Vel = 10.24
101 to 102	0.0 27.59	2.157 120.0 0.0070		0.0 0.0 0.0	10.500 0.0 10.500	26.988 0.0 0.074				Vel = 2.42
102 to 103	28.18 55.77	2.157 120.0 0.0259		0.0 0.0 0.0	8.750 0.0 8.750	27.062 0.0 0.227			K Factor @ node SPRG	Vel = 4.90
103 to 104	28.30 84.07	2.157 120.0 0.0554		0.0 0.0 0.0	9.500 0.0 9.500	27.289 0.0 0.526			K Factor @ node SPRG	Vel = 7.38

# 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	*****
104 to 105	28.57 112.64	2.157 120.0 0.0951	1T	12.307 0.0	38.500 12.307 50.807	27.815 0.0 4.834			K Factor @ node SPRG	
105 to 112	0.0 112.64	3.26 120.0 0.0128		0.0 0.0	9.000 0.0 9.000	32.649 0.0 0.115			Vel = 9.89	
112 to 115	133.71 246.35	3.26 120.0 0.0542		0.0 0.0	11.000 0.0 11.000	32.764 0.0 0.596			Vel = 4.33	
115 to 116	60.98 307.33	3.26 120.0 0.0815	1E	9.408 0.0	42.500 9.408 51.908	33.360 0.0 4.232			Vel = 11.81	
116 to 58	0.0 307.33	3.26 120.0 0.0815	1E 1T	9.408 20.159 0.0	16.000 29.567 45.567	37.592 -4.114 3.715			Vel = 11.81	
	0.0 307.33					37.193			K Factor = 50.39	
54 to 55	24.99 24.99	2.067 120.0 0.0072	1T	10.0 0.0	2.500 10.000 12.500	37.389 -2.057 0.090			Vel = 2.39	
55 to 56	0.0 24.99	2.067 120.0 0.0072	2T	20.0 0.0	141.000 20.000 161.000	35.422 0.0 1.163			Vel = 2.39	
56 to 57	0.0 24.99	2.067 120.0 0.0072	1T	10.0 0.0	2.500 10.000 12.500	36.585 2.057 0.090			Vel = 2.39	
	0.0 24.99					38.732			K Factor = 4.02	
50 to 51	22.96 22.96	2.067 120.0 0.0062	1T	10.0 0.0	2.500 10.000 12.500	37.639 -2.057 0.077			Vel = 2.20	
51 to 52	0.0 22.96	2.067 120.0 0.0062	2T	20.0 0.0	141.000 20.000 161.000	35.659 0.0 0.994			Vel = 2.20	
52 to 53	0.0 22.96	2.067 120.0 0.0062	1T	10.0 0.0	2.500 10.000 12.500	36.653 2.057 0.078			Vel = 2.20	
	0.0 22.96					38.788			K Factor = 3.69	
45 to 46	21.99 21.99	2.067 120.0 0.0057	1T	10.0 0.0	2.500 10.000 12.500	37.828 -2.057 0.071			Vel = 2.10	
46 to 47	0.0 21.99	2.067 120.0 0.0057	2T	20.0 0.0	141.000 20.000 161.000	35.842 0.0 0.918			Vel = 2.10	

# 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	*****
47	0.0	2.067	1T	10.0	2.500	36.760				
to		120.0		0.0	10.000	2.057				
48	21.99	0.0057		0.0	12.500	0.071		Vel = 2.10		
	0.0									
	21.99					38.888		K Factor = 3.53		
41	18.70	2.067	1T	10.0	2.500	37.965				
to		120.0		0.0	10.000	-2.057				
42	18.7	0.0042		0.0	12.500	0.052		Vel = 1.79		
42	0.0	2.067	2T	20.0	141.000	35.960				
to		120.0		0.0	20.000	0.0				
43	18.7	0.0042		0.0	161.000	0.681		Vel = 1.79		
43	0.0	2.067	1T	10.0	2.500	36.641				
to		120.0		0.0	10.000	2.057				
44	18.7	0.0042		0.0	12.500	0.053		Vel = 1.79		
	0.0									
	18.70					38.751		K Factor = 3.00		
37	15.97	2.067	1T	10.0	2.500	38.064				
to		120.0		0.0	10.000	-2.057				
38	15.97	0.0031		0.0	12.500	0.039		Vel = 1.53		
38	0.0	2.067	2T	20.0	141.000	36.046				
to		120.0		0.0	20.000	0.0				
39	15.97	0.0032		0.0	161.000	0.509		Vel = 1.53		
39	0.0	2.067	1T	10.0	2.500	36.555				
to		120.0		0.0	10.000	2.057				
40	15.97	0.0031		0.0	12.500	0.039		Vel = 1.53		
	0.0									
	15.97					38.651		K Factor = 2.57		
33	13.73	2.067	1T	10.0	2.500	38.136				
to		120.0		0.0	10.000	-2.057				
34	13.73	0.0024		0.0	12.500	0.030		Vel = 1.31		
34	0.0	2.067	2T	20.0	141.000	36.109				
to		120.0		0.0	20.000	0.0				
35	13.73	0.0024		0.0	161.000	0.384		Vel = 1.31		
35	0.0	2.067	1T	10.0	2.500	36.493				
to		120.0		0.0	10.000	2.057				
36	13.73	0.0024		0.0	12.500	0.030		Vel = 1.31		
	0.0									
	13.73					38.580		K Factor = 2.21		
29	11.91	2.067	1T	10.0	2.500	38.187				
to		120.0		0.0	10.000	-2.057				
30	11.91	0.0018		0.0	12.500	0.023		Vel = 1.14		
30	0.0	2.067	2T	20.0	141.000	36.153				
to		120.0		0.0	20.000	0.0				
31	11.91	0.0018		0.0	161.000	0.295		Vel = 1.14		
31	0.0	2.067	1T	10.0	2.500	36.448				
to		120.0		0.0	10.000	2.057				
32	11.91	0.0018		0.0	12.500	0.023		Vel = 1.14		



Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftnng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 11.91					38.528		K Factor = 1.92	
25 to 26	10.47	2.067 120.0 0.0014	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	38.224 -2.057 0.017		Vel = 1.00	
26 to 27	0.0 10.47	2.067 120.0 0.0014	2T 0.0 0.0	20.0 0.0 0.0	141.000 20.000 161.000	36.184 0.0 0.233		Vel = 1.00	
27 to 28	0.0 10.47	2.067 120.0 0.0014	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	36.417 2.057 0.018		Vel = 1.00	
	0.0 10.47					38.492		K Factor = 1.69	
21 to 22	9.32	2.067 120.0 0.0011	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	38.250 -2.057 0.014		Vel = 0.89	
22 to 23	0.0 9.32	2.067 120.0 0.0012	2T 0.0 0.0	20.0 0.0 0.0	141.000 20.000 161.000	36.207 0.0 0.187		Vel = 0.89	
23 to 24	0.0 9.32	2.067 120.0 0.0012	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	36.394 2.057 0.015		Vel = 0.89	
	0.0 9.32					38.466		K Factor = 1.50	
17 to 18	8.32	2.067 120.0 0.0010	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	38.270 -2.057 0.012		Vel = 0.80	
18 to 19	0.0 8.32	2.067 120.0 0.0009	2T 0.0 0.0	20.0 0.0 0.0	141.000 20.000 161.000	36.225 0.0 0.152		Vel = 0.80	
19 to 20	0.0 8.32	2.067 120.0 0.0010	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	36.377 2.057 0.012		Vel = 0.80	
	0.0 8.32					38.446		K Factor = 1.34	
13 to 14	7.64	2.067 120.0 0.0008	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	38.283 -2.057 0.010		Vel = 0.73	
14 to 15	0.0 7.64	2.067 120.0 0.0008	2T 0.0 0.0	20.0 0.0 0.0	141.000 20.000 161.000	36.236 0.0 0.130		Vel = 0.73	
15 to 16	0.0 7.64	2.067 120.0 0.0008	1T 0.0 0.0	10.0 0.0 0.0	2.500 10.000 12.500	36.366 2.057 0.010		Vel = 0.73	
	0.0								

# 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	*****
	7.64					38.433			K Factor = 1.23	
9 to 10	7.23	2.067 120.0	1T	10.0 0.0	2.500 10.000	38.290 -2.057				
	7.23	0.0007		0.0	12.500	0.009			Vel = 0.69	
10 to 11	0.0	2.067 120.0	2T	20.0 0.0	141.000 20.000	36.242 0.0				
	7.23	0.0007		0.0	161.000	0.117			Vel = 0.69	
11 to 12	0.0	2.067 120.0	1T	10.0 0.0	2.500 10.000	36.359 2.057				
	7.23	0.0008		0.0	12.500	0.010			Vel = 0.69	
	0.0 7.23					38.426			K Factor = 1.17	
5 to 6	7.03	2.067 120.0	1T	10.0 0.0	2.500 10.000	38.294 -2.057				
	7.03	0.0006		0.0	12.500	0.008			Vel = 0.67	
6 to 7	0.0	2.067 120.0	2T	20.0 0.0	141.000 20.000	36.245 0.0				
	7.03	0.0007		0.0	161.000	0.111			Vel = 0.67	
7 to 8	0.0	2.067 120.0	1T	10.0 0.0	2.500 10.000	36.356 2.057				
	7.03	0.0007		0.0	12.500	0.009			Vel = 0.67	
	0.0 7.03					38.422			K Factor = 1.13	
58 to 54	187.25	3.26 120.0		0.0 0.0	6.000 0.0	37.193 0.0				
	187.25	0.0327		0.0	6.000	0.196			Vel = 7.20	
54 to 50	-24.99	3.26 120.0		0.0 0.0	10.000 0.0	37.389 0.0				
	162.26	0.0250		0.0	10.000	0.250			Vel = 6.24	
50 to 45	-22.96	3.26 120.0		0.0 0.0	10.000 0.0	37.639 0.0				
	139.3	0.0189		0.0	10.000	0.189			Vel = 5.35	
45 to 41	-21.99	3.26 120.0		0.0 0.0	10.000 0.0	37.828 0.0				
	117.31	0.0137		0.0	10.000	0.137			Vel = 4.51	
41 to 37	-18.71	3.26 120.0		0.0 0.0	10.000 0.0	37.965 0.0				
	98.6	0.0099		0.0	10.000	0.099			Vel = 3.79	
37 to 33	-15.97	3.26 120.0		0.0 0.0	10.000 0.0	38.064 0.0				
	82.63	0.0072		0.0	10.000	0.072			Vel = 3.18	
33 to 29	-13.73	3.26 120.0		0.0 0.0	10.000 0.0	38.136 0.0				
	68.9	0.0051		0.0	10.000	0.051			Vel = 2.65	
29 to 25	-11.90	3.26 120.0		0.0 0.0	10.000 0.0	38.187 0.0				
	57.0	0.0037		0.0	10.000	0.037			Vel = 2.19	

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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	*****
25 to 21	-10.48 46.52	3.26 120.0 0.0025		0.0 0.0 0.0	10.500 0.0 10.500	38.224 0.0 0.026		Vel = 1.79		
21 to 17	-9.32 37.2	3.26 120.0 0.0016		0.0 0.0 0.0	12.500 0.0 12.500	38.250 0.0 0.020		Vel = 1.43		
17 to 13	-8.32 28.88	3.26 120.0 0.0010		0.0 0.0 0.0	12.500 0.0 12.500	38.270 0.0 0.013		Vel = 1.11		
13 to 9	-7.64 21.24	3.26 120.0 0.0006		0.0 0.0 0.0	12.500 0.0 12.500	38.283 0.0 0.007		Vel = 0.82		
9 to 5	-7.23 14.01	3.26 120.0 0.0003		0.0 0.0 0.0	12.500 0.0 12.500	38.290 0.0 0.004		Vel = 0.54		
5 to 1	-7.03 6.98	3.26 120.0 0.0		0.0 0.0 0.0	12.500 0.0 12.500	38.294 0.0 0.0		Vel = 0.27		
1 to 2	0.0 6.98	2.067 120.0 0.0007	1T	10.0 0.0 0.0	2.500 10.000 12.500	38.294 -2.057 0.009		Vel = 0.67		
2 to 3	0.0 6.98	2.067 120.0 0.0007	2T	20.0 0.0 0.0	141.000 20.000 161.000	36.246 0.0 0.110		Vel = 0.67		
3 to 4	0.0 6.98	2.067 120.0 0.0006	1T	10.0 0.0 0.0	2.500 10.000 12.500	36.356 2.057 0.008		Vel = 0.67		
4 to 8	0.0 6.98	3.26 120.0 0.0001		0.0 0.0 0.0	12.500 0.0 12.500	38.421 0.0 0.001		Vel = 0.27		
8 to 12	7.03 14.01	3.26 120.0 0.0003		0.0 0.0 0.0	12.500 0.0 12.500	38.422 0.0 0.004		Vel = 0.54		
12 to 16	7.23 21.24	3.26 120.0 0.0006		0.0 0.0 0.0	12.500 0.0 12.500	38.426 0.0 0.007		Vel = 0.82		
16 to 20	7.64 28.88	3.26 120.0 0.0010		0.0 0.0 0.0	12.500 0.0 12.500	38.433 0.0 0.013		Vel = 1.11		
20 to 24	8.32 37.2	3.26 120.0 0.0016		0.0 0.0 0.0	12.500 0.0 12.500	38.446 0.0 0.020		Vel = 1.43		
24 to 28	9.32 46.52	3.26 120.0 0.0025		0.0 0.0 0.0	10.500 0.0 10.500	38.466 0.0 0.026		Vel = 1.79		

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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	*****
28	10.48	3.26		0.0	10.000	38.492				
to		120.0		0.0	0.0	0.0				
32	57.0	0.0036		0.0	10.000	0.036		Vel =	2.19	
32	11.90	3.26		0.0	10.000	38.528				
to		120.0		0.0	0.0	0.0				
36	68.9	0.0052		0.0	10.000	0.052		Vel =	2.65	
36	13.73	3.26		0.0	10.000	38.580				
to		120.0		0.0	0.0	0.0				
40	82.63	0.0071		0.0	10.000	0.071		Vel =	3.18	
40	15.97	3.26		0.0	10.000	38.651				
to		120.0		0.0	0.0	0.0				
44	98.6	0.0100		0.0	10.000	0.100		Vel =	3.79	
44	18.71	3.26		0.0	10.000	38.751				
to		120.0		0.0	0.0	0.0				
48	117.31	0.0137		0.0	10.000	0.137		Vel =	4.51	
48	21.99	4.26	1T	26.334	2.250	38.888				
to		120.0		0.0	26.334	0.0				
49	139.3	0.0051		0.0	28.584	0.147		Vel =	3.14	
	0.0									
	139.30					39.035		K Factor =	22.30	
59	22.73	2.067	1T	10.0	2.500	37.561				
to		120.0		0.0	10.000	-2.057				
60	22.73	0.0060		0.0	12.500	0.075		Vel =	2.17	
60	0.0	2.067	2T	20.0	141.000	35.579				
to		120.0		0.0	20.000	0.0				
61	22.73	0.0061		0.0	161.000	0.977		Vel =	2.17	
61	0.0	2.067	1T	10.0	2.500	36.556				
to		120.0		0.0	10.000	2.057				
62	22.73	0.0060		0.0	12.500	0.075		Vel =	2.17	
	0.0									
	22.73					38.688		K Factor =	3.65	
63	20.99	2.067	1T	10.0	2.500	37.682				
to		120.0		0.0	10.000	-2.057				
64	20.99	0.0053		0.0	12.500	0.066		Vel =	2.01	
64	0.0	2.067	2T	20.0	141.000	35.691				
to		120.0		0.0	20.000	0.0				
65	20.99	0.0052		0.0	161.000	0.842		Vel =	2.01	
65	0.0	2.067	1T	10.0	2.500	36.533				
to		120.0		0.0	10.000	2.057				
66	20.99	0.0053		0.0	12.500	0.066		Vel =	2.01	
	0.0									
	20.99					38.656		K Factor =	3.38	
67	19.81	2.067	1T	10.0	2.500	37.760				
to		120.0		0.0	10.000	-2.057				
68	19.81	0.0047		0.0	12.500	0.059		Vel =	1.89	

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftnng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
68 to 69	0.0 19.81	2.067 120.0 0.0047	2T	20.0 0.0 0.0	141.000 20.000 161.000	35.762 0.0 0.756		Vel = 1.89		
69 to 70	0.0 19.81	2.067 120.0 0.0047	1T	10.0 0.0 0.0	2.500 10.000 12.500	36.518 2.057 0.059		Vel = 1.89		
	0.0 19.81					38.634		K Factor = 3.19		
71 to 72	19.11 19.11	2.067 120.0 0.0044	1T	10.0 0.0 0.0	2.500 10.000 12.500	37.804 -2.057 0.055		Vel = 1.83		
72 to 73	0.0 19.11	2.067 120.0 0.0044	2T	20.0 0.0 0.0	141.000 20.000 161.000	35.802 0.0 0.708		Vel = 1.83		
73 to 74	0.0 19.11	2.067 120.0 0.0044	1T	10.0 0.0 0.0	2.500 10.000 12.500	36.510 2.057 0.055		Vel = 1.83		
	0.0 19.11					38.622		K Factor = 3.07		
75 to 76	18.77 18.77	2.067 120.0 0.0042	1T	10.0 0.0 0.0	2.500 10.000 12.500	37.825 -2.057 0.053		Vel = 1.79		
76 to 77	0.0 18.77	2.067 120.0 0.0043	2T	20.0 0.0 0.0	141.000 20.000 161.000	35.821 0.0 0.685		Vel = 1.79		
77 to 78	0.0 18.77	2.067 120.0 0.0043	1T	10.0 0.0 0.0	2.500 10.000 12.500	36.506 2.057 0.054		Vel = 1.79		
	0.0 18.77					38.617		K Factor = 3.02		
58 to 59	120.09 120.09	3.26 120.0 0.0143	1T	20.159 0.0 0.0	5.500 20.159 25.659	37.193 0.0 0.368		Vel = 4.62		
59 to 63	-22.73 97.36	3.26 120.0 0.0097		0.0 0.0 0.0	12.500 0.0 12.500	37.561 0.0 0.121		Vel = 3.74		
63 to 67	-20.99 76.37	3.26 120.0 0.0062		0.0 0.0 0.0	12.500 0.0 12.500	37.682 0.0 0.078		Vel = 2.94		
67 to 71	-19.81 56.56	3.26 120.0 0.0035		0.0 0.0 0.0	12.500 0.0 12.500	37.760 0.0 0.044		Vel = 2.17		
71 to 75	-19.11 37.45	3.26 120.0 0.0017		0.0 0.0 0.0	12.500 0.0 12.500	37.804 0.0 0.021		Vel = 1.44		

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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	*****
75 to 79	-18.77 18.68	3.26 120.0 0.0005		0.0 0.0 0.0	12.500 0.0 12.500	37.825 0.0 0.006			Vel = 0.72	
79 to 80	0.0 18.68	2.067 120.0 0.0042	1T	10.0 0.0 0.0	2.500 10.000 12.500	37.831 -2.057 0.052			Vel = 1.79	
80 to 81	0.0 18.68	2.067 120.0 0.0042	2T	20.0 0.0 0.0	141.000 20.000 161.000	35.826 0.0 0.679			Vel = 1.79	
81 to 82	0.0 18.68	2.067 120.0 0.0042	1T	10.0 0.0 0.0	2.500 10.000 12.500	36.505 2.057 0.053			Vel = 1.79	
82 to 78	0.0 18.68	4.26 120.0 0.0002		0.0 0.0 0.0	12.500 0.0 12.500	38.615 0.0 0.002			Vel = 0.42	
78 to 74	18.77 37.45	4.26 120.0 0.0004		0.0 0.0 0.0	12.500 0.0 12.500	38.617 0.0 0.005			Vel = 0.84	
74 to 70	19.11 56.56	4.26 120.0 0.0010		0.0 0.0 0.0	12.500 0.0 12.500	38.622 0.0 0.012			Vel = 1.27	
70 to 66	19.81 76.37	4.26 120.0 0.0018		0.0 0.0 0.0	12.500 0.0 12.500	38.634 0.0 0.022			Vel = 1.72	
66 to 62	20.99 97.36	4.26 120.0 0.0026		0.0 0.0 0.0	12.500 0.0 12.500	38.656 0.0 0.032			Vel = 2.19	
62 to 57	22.73 120.09	4.26 120.0 0.0039		0.0 0.0 0.0	11.250 0.0 11.250	38.688 0.0 0.044			Vel = 2.70	
57 to 53	24.98 145.07	4.26 120.0 0.0056		0.0 0.0 0.0	10.000 0.0 10.000	38.732 0.0 0.056			Vel = 3.27	
53 to 49	22.96 168.03	4.26 120.0 0.0072	1T	26.334 0.0 0.0	7.750 26.334 34.084	38.788 0.0 0.247			Vel = 3.78	
49 to TAV	139.30 307.33	4.26 120.0 0.0222	1Fsp 2E	0.0 26.334 0.0	16.000 26.334 42.334	39.035 8.847 0.938		* Fixed loss = 3	Vel = 6.92	
TAV to BASE	0.0 307.33	4.026 120.0 0.0292	1A 1B	17.0 12.0 0.0	4.000 29.000 33.000	48.820 2.166 0.962			Vel = 7.75	
BASE to HOSE	0.0 307.33	6.16 140.0 0.0028	1E 1T 1G	20.084 43.037 4.304	610.000 67.425 677.425	51.948 4.331 1.873			Vel = 3.31	

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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	*****
HOSE	250.01	12.34	1F	20.316	1750.000	58.152		Qa = 250.0	
to		140.0		0.0	20.316	0.0			
1000	557.34	0.0003		0.0	1770.316	0.499		Vel = 1.50	
1000	0.0	16.41	1F	39.14	2680.000	58.651			
to		140.0		0.0	39.140	0.0			
TEST	557.34	0.0001		0.0	2719.140	0.191		Vel = 0.85	
	0.0								
	557.34					58.842		K Factor = 72.66	

# Water Supply Curve (C)

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City Water Supply:  
C1 - Static Pressure : 80  
C2 - Residual Pressure: 79  
C2 - Residual Flow : 2466

Demand:  
D1 - Elevation : 8.229  
D2 - System Flow : 307.335  
D2 - System Pressure : 58.842  
Hose ( Demand ) : 250  
D3 - System Demand : 557.335  
Safety Margin : 21.094

