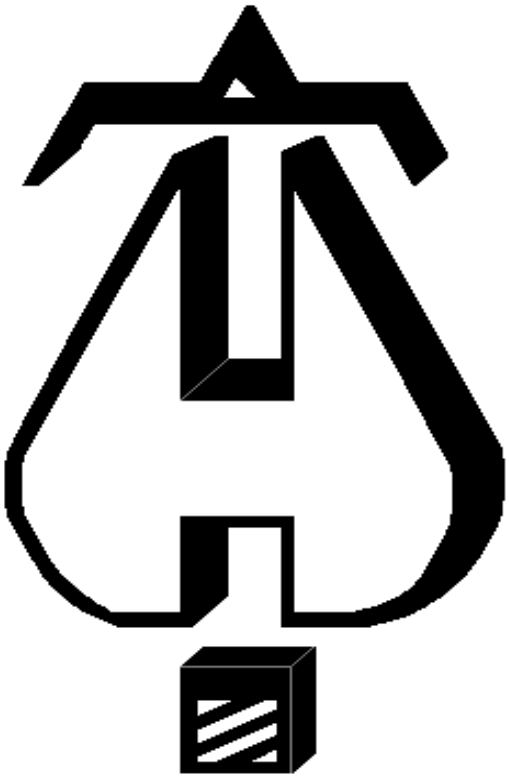


. . . Fire Protection by Computer Design

FREEDOM FIRE PROTECTION INC.
209 QUAKER RIDGE ROAD
CASCO, MAINE 04015
207-627-4109

Job Name : 178 MIDDLE STREET HC1
Building : 178 MIDDLE STREET
Location : PORTLAND, MAINE 04101
System : #1 AREA#1
Contract :
Data File : 178 MIDDLE STREET HC1.WXF

Hydraulic Design Information Sheet

Name - 178 MIDDLE STREET Date - 1/22/13
Location - PORTLAND, MAINE 04101
Building - 178 MIDDLE STREET System No. - #1 AREA#1
Contractor - Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-3
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - 9'-7"
Occupancy - OFFICES

SYSTEM DESIGN

(X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling Made By Date

Area of Sprinkler Operation - ROOM	System Type	Sprinkler/Nozzle	
Density - 0.10	(X) Wet	Make TYCO	
Area Per Sprinkler - 196	( ) Dry	Model TY-FRB	
Elevation at Highest Outlet - 55'-0"	( ) Deluge	Size 1/2"	
Hose Allowance - Inside -	( ) Preaction	K-Factor 5.6	
Rack Sprinkler Allowance -	( ) Other	Temp.Rat.155	
Hose Allowance - Outside - 100			

Note

Calculation Summary: Flow Required - 218.951 Press Required - 72.735 At Test
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 7/19/2009		Cap. -
Time of Test -	Rated Cap.-	Elev.-
Static Press - 83	@ Press -	
Residual Press - 0	Elev. -	Well
Flow - 1342		Proof Flow
Elevation -		

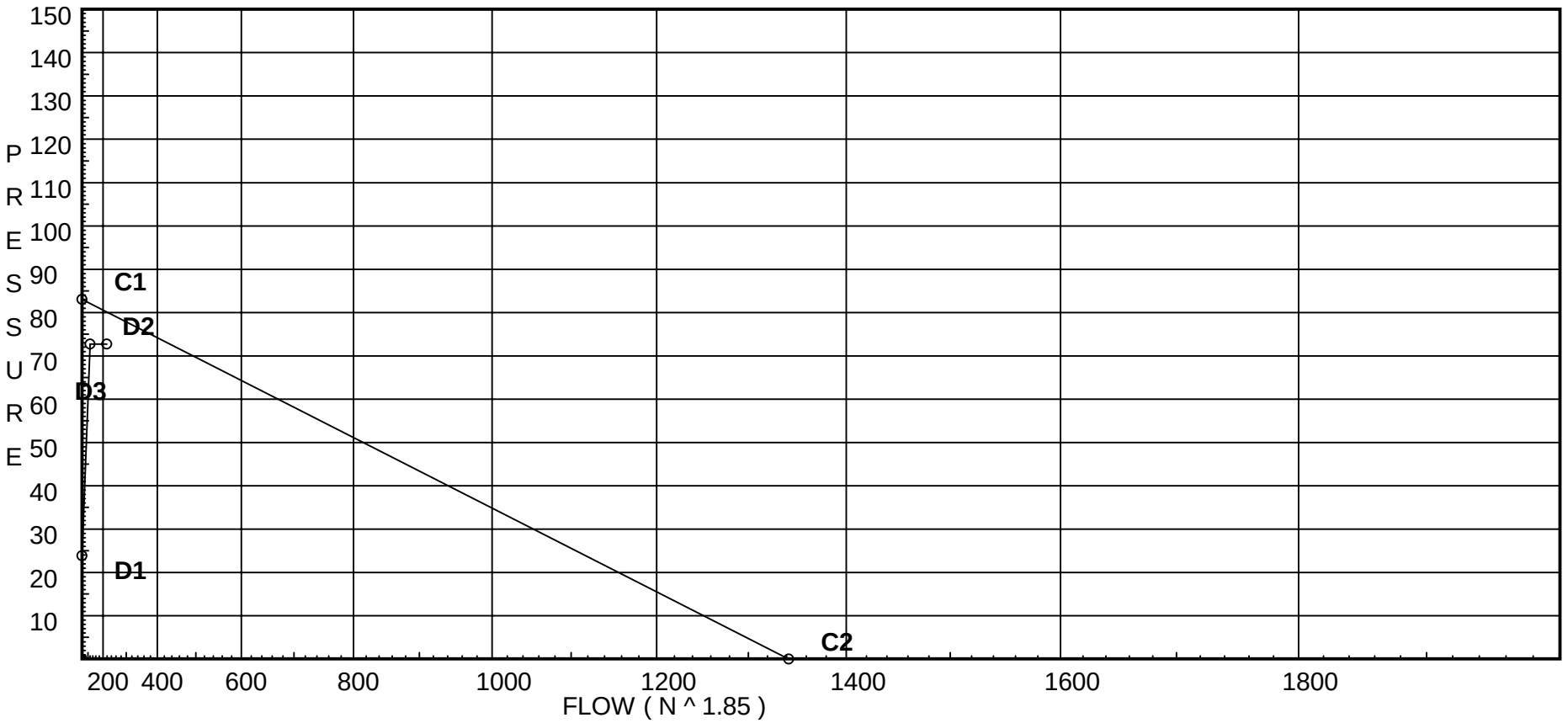
Location -

Source of Information - PORTLAND WATER DISTRICT

City Water Supply:
- C1 - Static Pressure : 83
- C2 - Residual Pressure: 0
- C2 - Residual Flow : 1342

Demand:

D1 - Elevation	:	23.820
D2 - System Flow	:	118.951
D2 - System Pressure	:	72.735
Hose (Adj City)	:	
Hose (Demand)	:	100
D3 - System Demand	:	218.951
Safety Margin	:	7.365



FREEDOM FIRE PROTECTION INC.
178 MIDDLE STREET HC1

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
A	Generic Alarm Valve	0	0	0	0	0	0	7.7	21.5	0	17	17	27	29	0	0	0	0	0	0	0
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
102	55.0	5.6	7.92	na	15.76	0.1	0.001	7.0
103	55.0	5.6	7.08	na	14.9	0.1	0.001	7.0
104	55.0	5.6	7.0	na	14.82	0.1	0.001	7.0
13	55.0		7.45	na				
12	55.0		8.13	na				
11	55.0		8.42	na				
10	55.0		10.71	na				
101	55.0	5.6	11.28	na	18.8	0.1	130	7.0
106	55.0	5.6	10.03	na	17.73	0.1	0.001	7.0
107	55.0	5.6	9.54	na	17.29	0.1	0.001	7.0
17	55.0		10.13	na				
16	55.0		10.51	na				
15	55.0		10.65	na				
14	55.0		12.07	na				
105	55.0	5.6	12.31	na	19.65	0.1	130	7.0
9	55.0		12.76	na				
8	55.0		29.61	na				
7	54.5		33.48	na				
6	54.5		43.33	na				
5	54.5		44.71	na				
4	6.416		67.79	na				
3	6.416		69.75	na				
2	6.416		69.82	na				
1	0.0		72.73	na				
TEST	0.0		72.74	na	100.0			

The maximum velocity is 19.03 and it occurs in the pipe between nodes 9 and 8

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
102	15.76	1.049	1T	5.0	1.000	7.916		K Factor = 5.60
to		120		0.0	5.000	0.0		
11	15.76	0.0837		0.0	6.000	0.502		Vel = 5.85
	0.0							
	15.76					8.418		K Factor = 5.43
103	14.90	1.049	1E	2.0	7.000	7.077		K Factor = 5.60
to		120	1T	5.0	7.000	0.0		
12	14.9	0.0754		0.0	14.000	1.056		Vel = 5.53
	0.0							
	14.90					8.133		K Factor = 5.22
104	14.82	1.049	1T	5.0	1.000	7.000		K Factor = 5.60
to		120		0.0	5.000	0.0		
13	14.82	0.0747		0.0	6.000	0.448		Vel = 5.50
13	0.0	1.049		0.0	9.166	7.448		
to		120		0.0	0.0	0.0		
12	14.82	0.0747		0.0	9.166	0.685		Vel = 5.50
12	14.89	1.38		0.0	4.000	8.133		
to		120		0.0	0.0	0.0		
11	29.71	0.0712		0.0	4.000	0.285		Vel = 6.37
11	15.76	1.38	1T	6.0	8.660	8.418		
to		120		0.0	6.000	0.0		
10	45.47	0.1563		0.0	14.660	2.292		Vel = 9.75
10	0.0	1.598		0.0	11.166	10.710		
to		150		0.0	0.0	0.0		
101	45.47	0.0507		0.0	11.166	0.566		Vel = 7.27
101	18.80	1.598	1T	11.656	3.750	11.276		K Factor = 5.60
to		150		0.0	11.656	0.0		
9	64.27	0.0961		0.0	15.406	1.481		Vel = 10.28
	0.0							
	64.27					12.757		K Factor = 17.99
106	17.73	1.049	1T	5.0	1.000	10.029		K Factor = 5.60
to		120		0.0	5.000	0.0		
15	17.73	0.1042		0.0	6.000	0.625		Vel = 6.58
	0.0							
	17.73					10.654		K Factor = 5.43
107	17.29	1.049	1T	5.0	1.000	9.537		K Factor = 5.60
to		120		0.0	5.000	0.0		
17	17.29	0.0995		0.0	6.000	0.597		Vel = 6.42
17	0.0	1.049		0.0	3.830	10.134		
to		120		0.0	0.0	0.0		
16	17.29	0.0995		0.0	3.830	0.381		Vel = 6.42

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
16	0.0	1.38		0.0	5.330	10.515		
to		120		0.0	0.0	0.0		
15	17.29	0.0261		0.0	5.330	0.139		Vel = 3.71
15	17.74	1.38	1T	6.0	8.660	10.654		
to		120		0.0	6.000	0.0		
14	35.03	0.0965		0.0	14.660	1.415		Vel = 7.51
14	0.0	1.598		0.0	7.750	12.069		
to		150		0.0	0.0	0.0		
105	35.03	0.0314		0.0	7.750	0.243		Vel = 5.60
105	19.65	1.598		0.0	6.250	12.312		K Factor = 5.60
to		150		0.0	0.0	0.0		
9	54.68	0.0712		0.0	6.250	0.445		Vel = 8.75
9	64.27	1.598	1E	5.828	50.330	12.757		
to		150		0.0	5.828	0.0		
8	118.95	0.3002		0.0	56.158	16.857		Vel = 19.03
8	0.0	1.598	1T	11.656	0.500	29.614		
to		150		0.0	11.656	0.217		
7	118.95	0.3002		0.0	12.156	3.649		Vel = 19.03
7	0.0	1.598	1E	5.828	27.000	33.480		
to		150		0.0	5.828	0.0		
6	118.95	0.3002		0.0	32.828	9.854		Vel = 19.03
6	0.0	2.157	1E	9.298	10.500	43.334		
to		150		0.0	9.298	0.0		
5	118.95	0.0697		0.0	19.798	1.379		Vel = 10.44
5	0.0	2.635	1E	8.237	48.583	44.713		
to		120		0.0	8.237	20.825		
4	118.95	0.0397		0.0	56.820	2.257		Vel = 7.00
4	0.0	2.635	2E	16.474	32.660	67.795		
to		120		0.0	16.474	0.0		
3	118.95	0.0397		0.0	49.134	1.951		Vel = 7.00
3	0.0	4.026	1E	10.0	5.000	69.746		
to		120		0.0	10.000	0.0		
2	118.95	0.0050		0.0	15.000	0.075		Vel = 3.00
2	0.0	4.026	1A	17.0	6.416	69.821		
to		120	1G	2.0	19.000	2.779		
1	118.95	0.0050		0.0	25.416	0.128		Vel = 3.00
1	0.0	6.16		0.0	15.000	72.728		
to		140		0.0	0.0	0.0		
TEST	118.95	0.0005		0.0	15.000	0.007		Vel = 1.28
	100.00							Qa = 100.00
	218.95					72.735		K Factor = 25.67