



... Fire Protection by Computer Design

EASTERN FIRE PROTECTION  
170 KITTY HAWK AVE  
LEW/AUB IND PARK  
AUBURN, MAINE 04210  
207-784-1508

Job Name : 22 EASTERN PROM  
Drawing : 3RD FLOOR  
Location : PORTLAND, MAINE  
Remote Area : WET  
Contract : 5729  
Data File : 5729 THIRD.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 22 EASTERN PROM Date - 1/29/2018  
Location - PORTLAND, MAINE  
Building - 3RD FLOOR System No. - WET  
Contractor - EASTERN FIRE Contract No. - 5729  
Calculated By - S. COTE Drawing No. - 1 OF1  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES  
OCCUPANCY - RESIDENTIAL LIGHT HAZARD

S Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D  
Y Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )  
S ( )Other  
T ( )Specific Ruling Made by Date  
E  
M Listed Flow at Start Point - 18 Gpm System Type  
Listed Pres. at Start Point - 18.4 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 16 x 18 ( ) Deluge ( ) PreAction  
E Domestic Flow Added - Gpm Sprinkler or Nozzle  
S Additional Flow Added - Gpm Make RELIABLE Model RFS42  
I Elevation at Highest Outlet - 135 Feet Size 1/2" K-Factor 4.2  
G Note: Temperature Rating 165  
N

Calculation Gpm Required 76.364 Psi Required 71.632 At Test  
Summary C-Factor Used: Overhead 150 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 08/13/2011 Rated Cap. Cap.  
T Time of Test - AM @ Psi Elev.  
E Static (Psi) - 75 Elev.  
R Residual (Psi) - 64 Other Well  
Flow (Gpm) - 1034 Proof Flow Gpm  
S Elevation - 100'

P Location: EASTERN PROMONADE

L Source of Information: PORTLAND WATER DISTRICT

Y

# Water Supply Curve C

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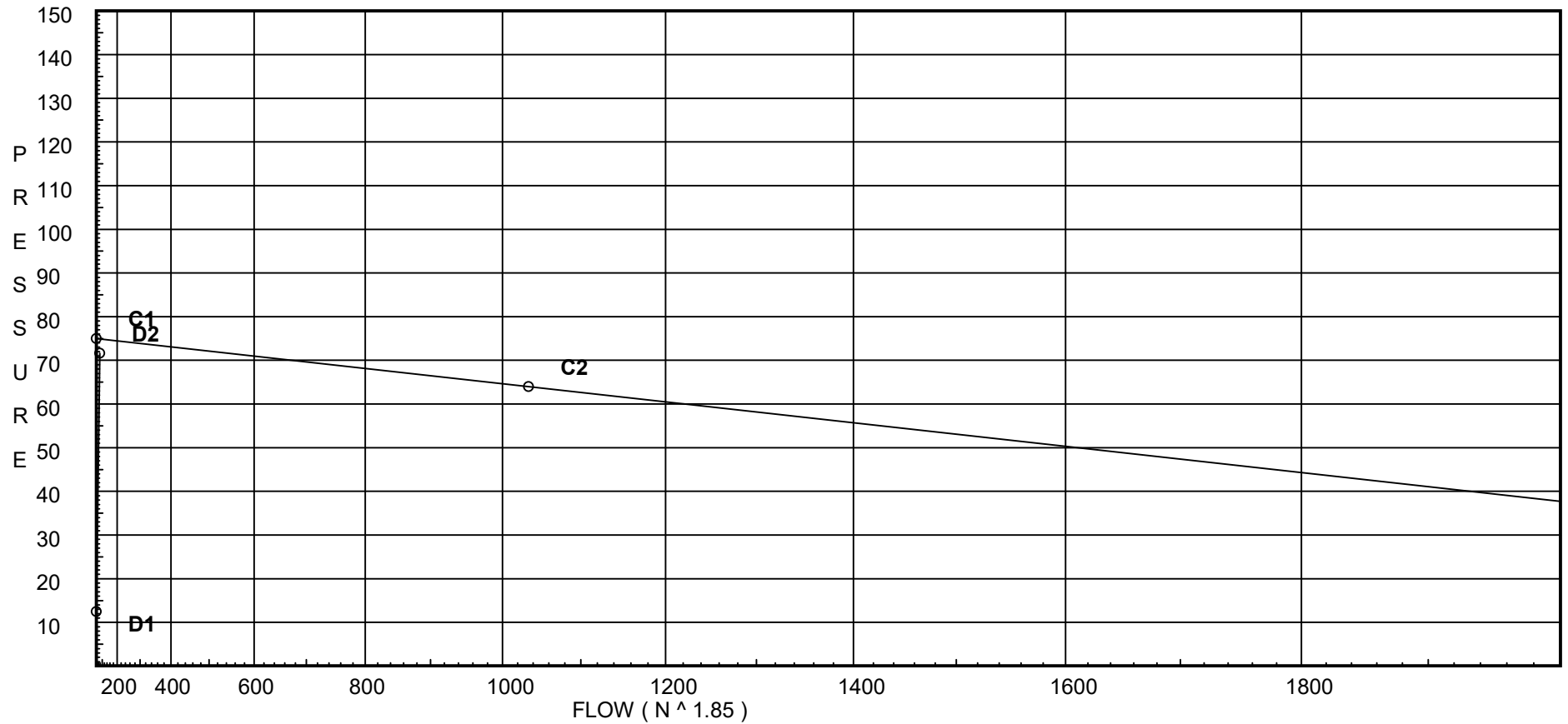
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## City Water Supply:

C1 - Static Pressure : 75  
C2 - Residual Pressure: 64  
C2 - Residual Flow : 1034

## Demand:

D1 - Elevation : 12.452  
D2 - System Flow : 76.364  
D2 - System Pressure : 71.632  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 76.364  
Safety Margin : 3.280



# 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	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
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
N *	CPVC 90'EI Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
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
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

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.

**SUPPLY ANALYSIS**

<b>Node at Source</b>	<b>Static Pressure</b>	<b>Residual Pressure</b>	<b>Flow</b>	<b>Available Pressure</b>	<b>Total Demand</b>	<b>Required Pressure</b>
TEST	75.0	64	1034.0	74.911	76.36	71.632

**NODE ANALYSIS**

<b>Node Tag</b>	<b>Elevation</b>	<b>Node Type</b>	<b>Pressure at Node</b>	<b>Discharge at Node</b>	<b>Notes</b>
1A	128.75	4.2	23.65	20.43	
1	128.75		26.11		
2	128.75	4.2	18.4	18.02	
3	135.0	4.2	16.93	17.28	
3A	135.0		19.68		
4	128.75	4.2	24.16	20.64	
100	128.75		26.71		
101	118.791		35.75		
102	118.791		38.6		
103	108.0		45.81		
104	98.25		55.43		
110	98.25		59.15		
111	109.0		57.28		
TOR	109.0		58.38		
BFP	109.0		61.61		
BASE	101.0		71.05		
TEST	100.0		71.63		

Final Calculations - Hazen-Williams - 2007

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
1A to 1	128.750 128.750	4.20	20.43 20.43	1 1.101	3N O	21.0 5.0 0.0	8.750 26.000 34.750	150 0.0707	23.653 0.0 2.458		Vel = 6.88	
1 to 100	128.750 128.750		0.0 20.43	1 1.101	O	5.0 0.0 0.0	3.458 5.000 8.458	150 0.0708	26.111 0.0 0.599		Vel = 6.88	
100			0.0 20.43						26.710		K Factor = 3.95	
2 to 3	128.750 135	4.20	18.02 18.02	1 1.101	2N	14.0 0.0 0.0	8.000 14.000 22.000	150 0.0561	18.400 -2.707 1.234		Vel = 6.07	
3 to 3A	135 135	4.20	17.28 35.3	1 1.101	N O	7.0 5.0 0.0	2.125 12.000 14.125	150 0.1946	16.927 0.0 2.749		Vel = 11.90	
3A to 4	135 128.750		0.0 35.3	1.25 1.394	N O	8.0 6.0 0.0	14.750 14.000 28.750	150 0.0617	19.676 2.707 1.773		Vel = 7.42	
4 to 100	128.750 128.750	4.20	20.64 55.94	1.25 1.394	2O	12.0 0.0 0.0	5.666 12.000 17.666	150 0.1446	24.156 0.0 2.554		Vel = 11.76	
100			0.0 55.94						26.710		K Factor = 10.82	
100 to 101	128.750 118.791		76.36 76.36	1.25 1.394	N	8.0 0.0 0.0	10.375 8.000 18.375	150 0.2571	26.710 4.313 4.725		Vel = 16.05	
101 to 102	118.791 118.791		0.0 76.36	1.5 1.598	O N	8.0 9.0 0.0	4.583 17.000 21.583	150 0.1322	35.748 0.0 2.853		Vel = 12.22	
102 to 103	118.791 108		0.0 76.36	1.5 1.598	N	9.0 0.0 0.0	10.208 9.000 19.208	150 0.1322	38.601 4.674 2.540		Vel = 12.22	
103 to 104	108 98.250		0.0 76.36	1.5 1.598	2N O	18.0 8.0 0.0	14.750 26.000 40.750	150 0.1322	45.815 4.223 5.387		Vel = 12.22	
104			0.0 76.36						55.425		K Factor = 10.26	
104 to 110	98.250 98.250		76.36 76.36	2 2.003	4N	44.0 0.0 0.0	40.708 44.000 84.708	150 0.0440	55.425 0.0 3.728		Vel = 7.77	
110 to 111	98.250 109		0.0 76.36	2 2.003	2N O	22.0 10.0 0.0	31.333 32.000 63.333	150 0.0440	59.153 -4.656 2.788		Vel = 7.77	
111 to TOR	109 109		0.0 76.36	2 2.003	N	11.0 0.0 0.0	13.958 11.000 24.958	150 0.0440	57.285 0.0 1.098		Vel = 7.77	
TOR to BFP	109 109		0.0 76.36	2 2.067	Fsp	0.0 0.0 0.0	4.000 0.0 4.000	120 0.0570	58.383 3.000 0.228		** Fixed Loss = 3 Vel = 7.30	

# Final Calculations - Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv. Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
BFP to BASE	109 101		0.0 76.36	2 2.067	Zaa	0.0 0.0 3.000	120 0.0570	61.611 9.269 0.171		** Fixed Loss = 5.804 Vel = 7.30	
BASE to TEST	101 100		0.0 76.36	4 4.1	E G T	14.534 2.907 29.067	50.000 46.508 96.508	140 0.433 0.148		Vel = 1.86	
TEST			0.0 76.36					71.632		K Factor = 9.02	