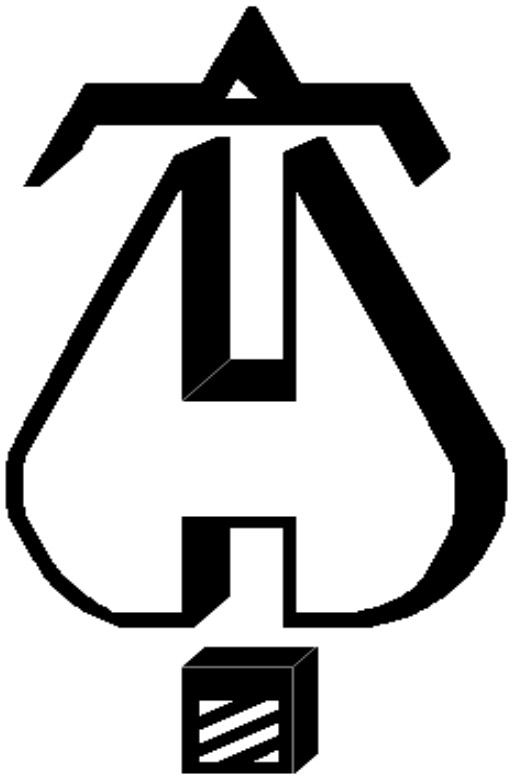


. . . Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTY HAWK AVE
AUBURN, ME 04210
207-784-1507

Job Name	:	24 PREBLE ST.
Drawing	:	2 OF 2
Location	:	4TH. FLOOR OFFICE
Remote Area	:	4
Contract	:	1-05637-SP-17
Data File	:	4TH. FLOOR CALC..WXF

HYDRAULIC CALCULATIONS
for

Project name: 24 PREBLE ST.
Location: 4TH. FLOOR OFFICE
Drawing no: 2 OF 2
Date: 8/11/2017

Design

Remote area number: 4
Remote area location: 4TH FLOOR OFFICE
Occupancy classification: LIGHT HAZARD
Density: .1 - Gpm/SqFt
Area of application: 936 - SqFt
Coverage per sprinkler: 225 - SqFt
Type of sprinklers calculated: RELIABLE F1FR56 200* K=5.6
No. of sprinklers calculated: 10
In-rack demand: - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 347.273 - GPM @ 69.784 - Psi
Type of system: WET
Volume of dry or preaction system: - Gal

Water supply information

Date: 7/6/16
Location: CUMBERLAND AVE. PORTLAND, ME.
Source: PORTLAND WATER DISTRICT

Name of contractor: EASTERN FIRE PROTECTION
Address: 170 KITTY HAWK AVE / / AUBURN, ME 04210
Phone number: 207-784-1507
Name of designer: EWM
Authority having jurisdiction: MAINE STATE FIRE MARSHAL
Notes: (Include peaking information or gridded systems here.) REMOTE AREA REDUCED PER NFPA 13 (2016) SEC. 11.2.3.2.3.1

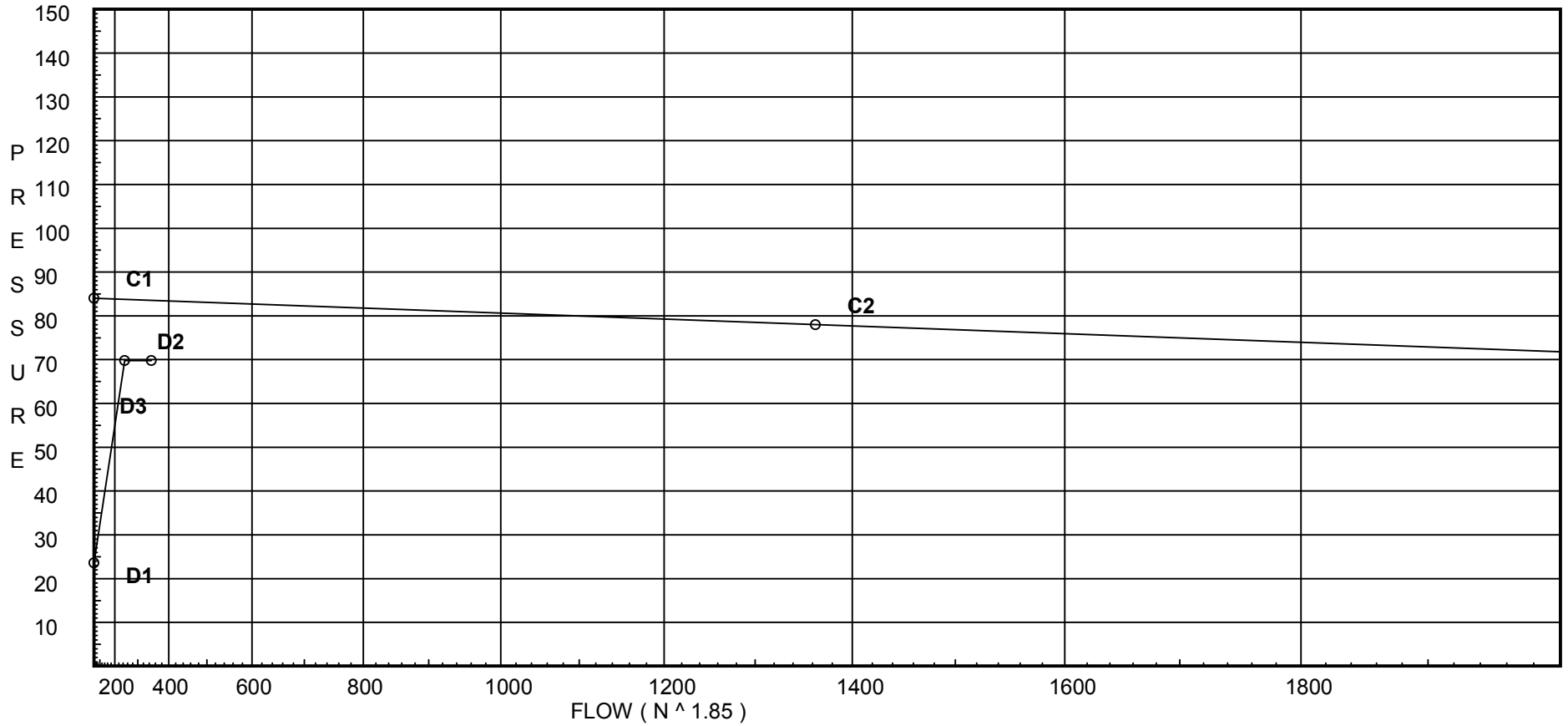
Water Supply Curve C

EASTERN FIRE PROTECTION
24 PREBLE ST.

Date 8/11/2017

City Water Supply:
- C1 - Static Pressure : 84
- C2 - Residual Pressure: 78
- C2 - Residual Flow : 1363

Demand:
- D1 - Elevation : 23.569
- D2 - System Flow : 247.273
- D2 - System Pressure : 69.784
- Hose (Demand) : 100
- D3 - System Demand : 347.273
- Safety Margin : 13.738



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
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
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
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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	0	0	0	0	0	0	0

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

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	84.0	78	1363.0	83.522	347.27	69.784

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
HEAD	0.0	5.6	16.14	22.5	
10	160.92	5.6	22.54	26.58	
11	157.92		27.48		
12	157.25	5.24	18.41	22.5	K=K @ LIN1
13	157.92		18.9		
14	157.25	5.24	19.46	23.13	K=K @ LIN1
15	157.92		20.44		
16	157.25	5.24	23.52	25.43	K=K @ LIN1
17	157.92		24.98		
18	157.92		27.48		
19	157.25	5.24	25.09	26.27	K=K @ LIN1
20	157.92		27.54		
21	157.25	5.24	25.99	26.73	K=K @ LIN1
22	157.92		27.58		
23	157.25	5.24	18.71	22.69	K=K @ LIN1
24	157.92		19.16		
25	157.25	5.24	19.14	22.94	K=K @ LIN1
26	157.92		20.41		
27	157.25	5.24	22.59	24.92	K=K @ LIN1
28	157.92		24.0		
29	157.92		27.72		
30	160.92	5.6	21.68	26.07	
30A	157.92		27.6		
31	157.92		28.02		
32	157.92		33.06		
33	153.42		36.37		
34	153.42		39.49		
35	141.42		44.87		
36	129.42		50.56		
37	116.0		56.86		
38	106.5		61.24		
39	106.5		62.09		
TOR	105.83		63.39		
BASE	102.83		69.73		
TEST	102.83		69.78	100.0	

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 ******
HEAD	0	5.60	22.50	1	E	2.0	12.000	120	16.143	
to						0.0	2.000		0.0	
LIN1	0		22.5	1.049		0.0	14.000	0.1619	2.266	Vel = 8.35
			0.0							
LIN1			22.50						18.409	K Factor = 5.24
10	160.920	5.60	26.58	1	2E	4.0	7.542	120	22.536	
to					T	5.0	9.000		1.299	
11	157.920		26.58	1.049		0.0	16.542	0.2203	3.645	Vel = 9.87
11	157.920		0.0	3		0.0	2.167	120	27.480	
to						0.0	0.0		0.0	
18	157.920		26.58	3.26		0.0	2.167	0.0009	0.002	Vel = 1.02
			0.0							
18			26.58						27.482	K Factor = 5.07
12	157.250	5.24	22.50	1	2E	4.0	0.830	120	18.409	K = K @ LIN1
to						0.0	4.000		-0.290	
13	157.920		22.5	1.049		0.0	4.830	0.1617	0.781	Vel = 8.35
13	157.920		0.0	1		0.0	9.540	120	18.900	
to						0.0	0.0		0.0	
15	157.920		22.5	1.049		0.0	9.540	0.1618	1.544	Vel = 8.35
			0.0							
15			22.50						20.444	K Factor = 4.98
14	157.250	5.24	23.13	1	E	2.0	0.500	120	19.456	K = K @ LIN1
to					T	5.0	7.000		-0.290	
15	157.920		23.13	1.049		0.0	7.500	0.1704	1.278	Vel = 8.59
15	157.920		22.50	1		0.0	7.580	120	20.444	
to						0.0	0.0		0.0	
17	157.920		45.63	1.049		0.0	7.580	0.5985	4.537	Vel = 16.94
			0.0							
17			45.63						24.981	K Factor = 9.13
16	157.250	5.24	25.43	1	E	2.0	1.625	120	23.520	K = K @ LIN1
to					T	5.0	7.000		-0.290	
17	157.920		25.43	1.049		0.0	8.625	0.2030	1.751	Vel = 9.44
17	157.920		45.63	1.25	T	6.0	1.000	120	24.981	
to						0.0	6.000		0.0	
18	157.920		71.06	1.38		0.0	7.000	0.3573	2.501	Vel = 15.24
18	157.920		26.59	3		0.0	6.420	120	27.482	
to						0.0	0.0		0.0	
20	157.920		97.65	3.26		0.0	6.420	0.0097	0.062	Vel = 3.75
			0.0							
20			97.65						27.544	K Factor = 18.61
19	157.250	5.24	26.27	1	2E	4.0	3.750	120	25.088	K = K @ LIN1
to					T	5.0	9.000		-0.290	
20	157.920		26.27	1.049		0.0	12.750	0.2154	2.746	Vel = 9.75
20	157.920		97.65	3		0.0	2.250	120	27.544	
to						0.0	0.0		0.0	
22	157.920		123.92	3.26		0.0	2.250	0.0156	0.035	Vel = 4.76
			0.0							
22			123.92						27.579	K Factor = 23.60

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 ******
21	157.250	5.24	26.73	1	E	2.0	1.460	120	25.986	K = K @ LIN1
to					T	5.0	7.000		-0.290	
22	157.920		26.73	1.049		0.0	8.460	0.2226	1.883	Vel = 9.92
22	157.920		123.92	3		0.0	6.290	120	27.579	
to						0.0	0.0		0.0	
29	157.920		150.65	3.26		0.0	6.290	0.0218	0.137	Vel = 5.79
			0.0							
29			150.65						27.716	K Factor = 28.62
23	157.250	5.24	22.69	1	2E	4.0	0.500	120	18.714	K = K @ LIN1
to						0.0	4.000		-0.290	
24	157.920		22.69	1.049		0.0	4.500	0.1644	0.740	Vel = 8.42
24	157.920		0.0	1		0.0	7.580	120	19.164	
to						0.0	0.0		0.0	
26	157.920		22.69	1.049		0.0	7.580	0.1642	1.245	Vel = 8.42
			0.0							
26			22.69						20.409	K Factor = 5.02
25	157.250	5.24	22.94	1	E	2.0	2.290	120	19.141	K = K @ LIN1
to					T	5.0	7.000		-0.290	
26	157.920		22.94	1.049		0.0	9.290	0.1677	1.558	Vel = 8.52
26	157.920		22.69	1		0.0	6.000	120	20.409	
to						0.0	0.0		0.0	
28	157.920		45.63	1.049		0.0	6.000	0.5985	3.591	Vel = 16.94
			0.0							
28			45.63						24.000	K Factor = 9.31
27	157.250	5.24	24.92	1	E	2.0	1.710	120	22.587	K = K @ LIN1
to					T	5.0	7.000		-0.290	
28	157.920		24.92	1.049		0.0	8.710	0.1955	1.703	Vel = 9.25
28	157.920		45.63	1.25	T	6.0	4.540	120	24.000	
to						0.0	6.000		0.0	
29	157.920		70.55	1.38		0.0	10.540	0.3526	3.716	Vel = 15.13
29	157.920		150.65	3		0.0	6.750	120	27.716	
to						0.0	0.0		0.0	
31	157.920		221.2	3.26		0.0	6.750	0.0443	0.299	Vel = 8.50
			0.0							
31			221.20						28.015	K Factor = 41.79
30	160.920	5.60	26.07	1	3E	6.0	15.750	120	21.677	
to						0.0	6.000		1.299	
30A	157.920		26.07	1.049		0.0	21.750	0.2125	4.622	Vel = 9.68
30A	157.920		0.0	1.25	T	6.0	1.460	120	27.598	
to						0.0	6.000		0.0	
31	157.920		26.07	1.38		0.0	7.460	0.0559	0.417	Vel = 5.59
31	157.920		221.20	3	2V	13.44	58.875	120	28.015	
to					T	20.159	33.599		0.0	
32	157.920		247.27	3.26		0.0	92.474	0.0545	5.043	Vel = 9.50
32	157.920		0.0	3	2V	13.44	11.540	120	33.058	
to						0.0	13.440		1.949	
33	153.420		247.27	3.26		0.0	24.980	0.0545	1.362	Vel = 9.50

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 ******
33	153.420		0.0	3	B	13.44	2.125	120	36.369	
to					S	21.503	55.102		0.0	
34	153.420		247.27	3.26	T	20.159	57.227	0.0545	3.121	Vel = 9.50
34	153.420		0.0	4		0.0	12.000	120	39.490	
to						0.0	0.0		5.197	
35	141.420		247.27	4.26		0.0	12.000	0.0148	0.178	Vel = 5.57
35	141.420		0.0	4	2V	17.907	15.670	120	44.865	
to						0.0	17.907		5.197	
36	129.420		247.27	4.26		0.0	33.577	0.0148	0.498	Vel = 5.57
36	129.420		0.0	4	2V	17.907	14.920	120	50.560	
to						0.0	17.907		5.812	
37	116		247.27	4.26		0.0	32.827	0.0148	0.487	Vel = 5.57
37	116		0.0	4	V	8.954	9.040	120	56.859	
to						0.0	8.954		4.114	
38	106.500		247.27	4.26		0.0	17.994	0.0148	0.267	Vel = 5.57
38	106.500		0.0	4	V	8.954	11.420	120	61.240	
to					X	21.067	45.821		0.0	
39	106.500		247.27	4.26	B	15.8	57.241	0.0148	0.848	Vel = 5.57
39	106.500		0.0	4	3V	26.861	14.835	120	62.088	
to					T	26.334	53.195		0.290	
TOR	105.830		247.27	4.26		0.0	68.030	0.0148	1.008	Vel = 5.57
TOR	105.830		0.0	4		0.0	3.000	120	63.386	
to						0.0	0.0		6.299	* * Fixed Loss = 5
BASE	102.830		247.27	4.26		0.0	3.000	0.0150	0.045	Vel = 5.57
BASE	102.830		0.0	8	L	20.56	40.000	140	69.730	
to					T	55.354	82.240		0.0	
TEST	102.830		247.27	8.27	G	6.326	122.240	0.0004	0.054	Vel = 1.48
			100.00							Qa = 100.00
TEST			347.27						69.784	K Factor = 41.57