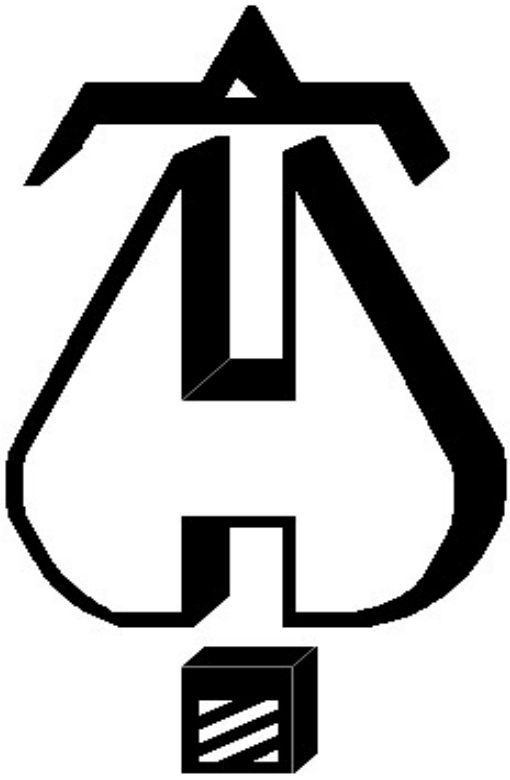


. . . Fire Protection by Computer Design

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

Job Name	:	23 OCEAN AVE
Drawing	:	FIRST FLOOR
Location	:	PORTLAND, ME
Remote Area	:	FIRST FLOOR
Contract	:	1-5744-SP-17
Data File	:	5744 1ST.WXF

HYDRAULIC CALCULATIONS
for

Project name: 23 OCEAN AVE
Location: PORTLAND, ME
Drawing no: FIRST FLOOR
Date: 1/25/2018

Design

Remote area number: FIRST FLOOR
Remote area location: FIRST FLOOR
Occupancy classification: LIGHT HAZARD
Density: .10 - Gpm/SqFt
Area of application: 908 - SqFt
Coverage per sprinkler: 196 - SqFt
Type of sprinklers calculated: RELIABLE 5.6K F1FR56 1/2" 200 DEGREE
No. of sprinklers calculated: 10
In-rack demand: - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 307.432 - GPM @ 72.302 - Psi
Type of system: WET
Volume of dry or preaction system: - Gal

Water supply information

Date: 6/22/2016
Location: PLEASANT & FORREST
Source: PORTLAND WATER DISTRICT

Name of contractor: EASTERN FIRE PROTECTION
Address: 170 KITTYHAWK AVE AUBURN, ME 04210
Phone number: 207-784-1507
Name of designer: S. COTE
Authority having jurisdiction: PORTLAND FIRE DEPARTMENT
Notes: (Include peaking information or gridded systems here.)

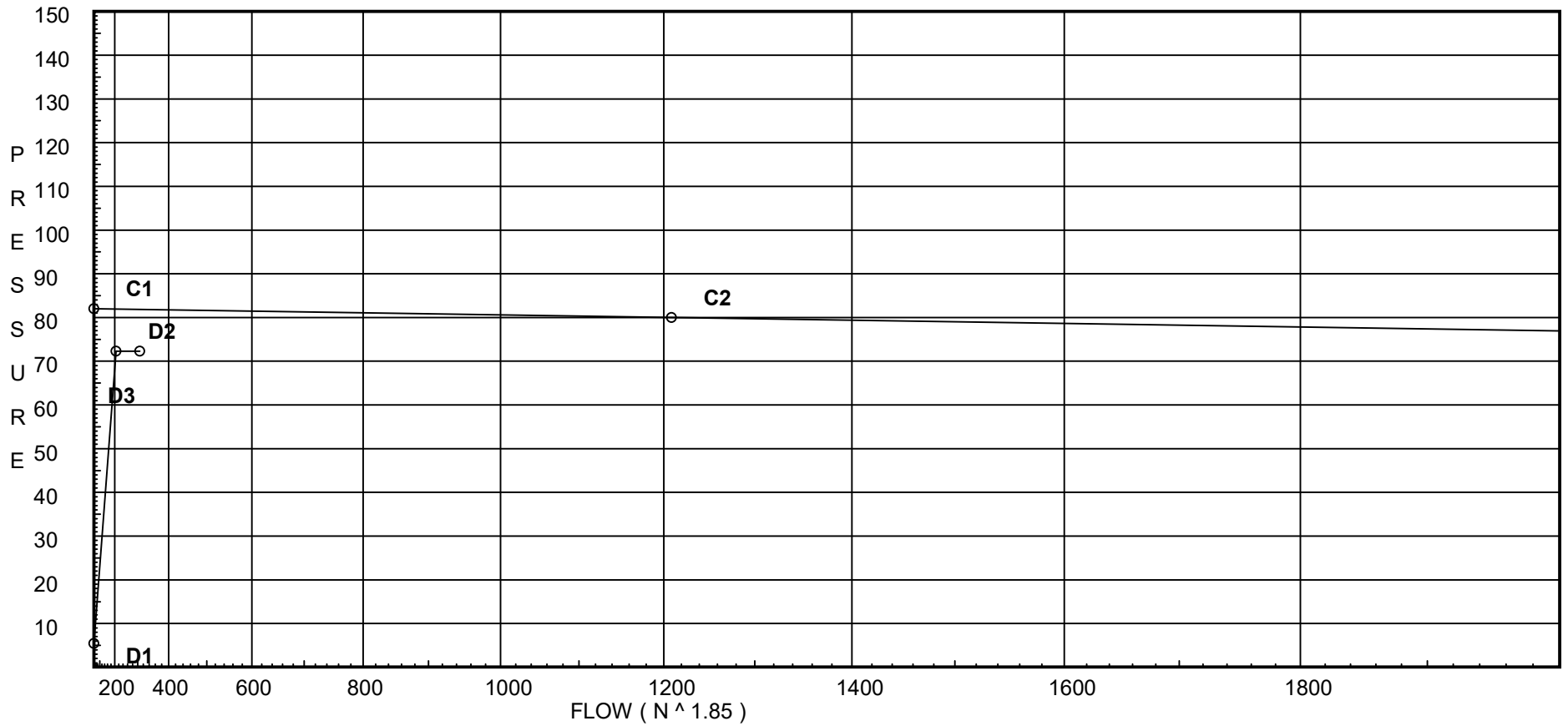
Water Supply Curve C

EASTERN FIRE PROTECTION
23 OCEAN AVE

Date 1/25/2018

City Water Supply:
- C1 - Static Pressure : 82
- C2 - Residual Pressure: 80
- C2 - Residual Flow : 1209

Demand:
- D1 - Elevation : 5.414
- D2 - System Flow : 207.432
- D2 - System Pressure : 72.302
- Hose (Demand) : 100
- D3 - System Demand : 307.432
- Safety Margin : 9.539



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
J	90'Tee-Branch Grv Vic #20	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
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

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	82.0	80	1209.0	81.841	307.43	72.302

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
FP1	0.0	5.6	12.25	19.6	
F1	110.5	5.45	13.32	19.88	K=K @ FP2
F2	110.5	5.45	12.94	19.6	K=K @ FP2
F3	110.5	5.45	13.79	20.23	K=K @ FP2
F4	110.5	5.45	13.11	19.73	K=K @ FP2
F5	110.5	5.45	13.6	20.09	K=K @ FP2
F6	110.5	5.45	14.57	20.8	K=K @ FP2
F7	110.5	5.45	14.39	20.67	K=K @ FP2
F8	110.5	5.45	14.72	20.9	K=K @ FP2
F9	110.5	5.45	16.93	22.41	K=K @ FP2
F10	110.5	5.45	18.02	23.12	K=K @ FP2
100	109.166		15.32		
101	109.166		15.33		
102	109.166		15.45		
103	109.166		15.63		
104	109.166		16.07		
105	109.166		16.3		
106	109.166		17.25		
107	109.166		17.68		
108	109.166		19.33		
109	109.166		20.74		
110	109.166		39.0		
111	109.166		40.65		
10	99.5		47.99		
11	98.666		60.89		
TOW	98.666		63.42		
HDW	92.666		69.58		
BASE	91.666		74.35		
TEST	98.0		72.3	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 ******
FP1	0	5.60	19.60	1	T	9.563	1.000	150	12.250	
to						0.0	9.562		0.0	
FP2	0		19.6	1.101		0.0	10.562	0.0655	0.692	Vel = 6.60
			0.0							
FP2			19.60						12.942	K Factor = 5.45
F1	110.500	5.45	19.88	1	E	3.022	6.166	150	13.317	K = K @ FP2
to					T	7.555	10.577		0.578	
100	109.166		19.88	1.049		0.0	16.743	0.0852	1.426	Vel = 7.38
			0.0							
100			19.88						15.321	K Factor = 5.08
F2	110.500	5.45	19.60	1	2E	6.044	8.250	150	12.942	K = K @ FP2
to					T	7.555	13.599		0.578	
101	109.166		19.6	1.049		0.0	21.849	0.0830	1.813	Vel = 7.28
			0.0							
101			19.60						15.333	K Factor = 5.01
F3	110.500	5.45	20.23	1	E	3.022	1.833	150	13.785	K = K @ FP2
to					T	7.555	10.577		0.578	
102	109.166		20.23	1.049		0.0	12.410	0.0879	1.091	Vel = 7.51
			0.0							
102			20.23						15.454	K Factor = 5.15
F4	110.500	5.45	19.73	1	E	3.022	12.500	150	13.113	K = K @ FP2
to					T	7.555	10.577		0.578	
103	109.166		19.73	1.049		0.0	23.077	0.0839	1.937	Vel = 7.32
			0.0							
103			19.73						15.628	K Factor = 4.99
F5	110.500	5.45	20.09	1	2E	6.044	8.250	150	13.597	K = K @ FP2
to					T	7.555	13.599		0.578	
104	109.166		20.09	1.049		0.0	21.849	0.0868	1.897	Vel = 7.46
			0.0							
104			20.09						16.072	K Factor = 5.01
F6	110.500	5.45	20.80	1	E	3.022	1.833	150	14.570	K = K @ FP2
to					T	7.555	10.577		0.578	
105	109.166		20.8	1.049		0.0	12.410	0.0925	1.148	Vel = 7.72
			0.0							
105			20.80						16.296	K Factor = 5.15
F7	110.500	5.45	20.67	1	E	3.022	14.375	150	14.390	K = K @ FP2
to					T	7.555	10.577		0.578	
106	109.166		20.67	1.049		0.0	24.952	0.0915	2.284	Vel = 7.67
			0.0							
106			20.67						17.252	K Factor = 4.98
F8	110.500	5.45	20.90	1	2E	6.044	11.916	150	14.717	K = K @ FP2
to					T	7.555	13.599		0.578	
107	109.166		20.9	1.049		0.0	25.515	0.0934	2.384	Vel = 7.76
			0.0							
107			20.90						17.679	K Factor = 4.97
F9	110.500	5.45	22.41	1	E	3.022	6.625	150	16.926	K = K @ FP2
to					T	7.555	10.577		0.578	
108	109.166		22.41	1.049		0.0	17.202	0.1063	1.829	Vel = 8.32

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 ******
			0.0							
108			22.41						19.333	K Factor = 5.10
F10	110.500	5.45	23.12	1	2E	6.044	5.416	150	18.016	K = K @ FP2
to					T	7.555	13.599		0.578	
109	109.166		23.12	1.049		0.0	19.015	0.1126	2.141	Vel = 8.58
			0.0							
109			23.12						20.735	K Factor = 5.08
100	109.166		19.88	1.5		0.0	1.333	150	15.321	
to						0.0	0.0		0.0	
101	109.166		19.88	1.682		0.0	1.333	0.0090	0.012	Vel = 2.87
101	109.166		19.60	1.5		0.0	4.000	150	15.333	
to						0.0	0.0		0.0	
102	109.166		39.48	1.682		0.0	4.000	0.0302	0.121	Vel = 5.70
102	109.166		20.23	1.5		0.0	2.666	150	15.454	
to						0.0	0.0		0.0	
103	109.166		59.71	1.682		0.0	2.666	0.0653	0.174	Vel = 8.62
103	109.166		19.73	1.5		0.0	4.000	150	15.628	
to						0.0	0.0		0.0	
104	109.166		79.44	1.682		0.0	4.000	0.1110	0.444	Vel = 11.47
104	109.166		20.09	1.5		0.0	1.333	150	16.072	
to						0.0	0.0		0.0	
105	109.166		99.53	1.682		0.0	1.333	0.1680	0.224	Vel = 14.37
105	109.166		20.79	1.5		0.0	4.000	150	16.296	
to						0.0	0.0		0.0	
106	109.166		120.32	1.682		0.0	4.000	0.2390	0.956	Vel = 17.37
106	109.166		20.67	1.5		0.0	1.333	150	17.252	
to						0.0	0.0		0.0	
107	109.166		140.99	1.682		0.0	1.333	0.3203	0.427	Vel = 20.36
107	109.166		20.90	1.5		0.0	4.000	150	17.679	
to						0.0	0.0		0.0	
108	109.166		161.89	1.682		0.0	4.000	0.4135	1.654	Vel = 23.38
108	109.166		22.42	1.5		0.0	2.666	150	19.333	
to						0.0	0.0		0.0	
109	109.166		184.31	1.682		0.0	2.666	0.5259	1.402	Vel = 26.61
109	109.166		23.12	1.5	J	14.959	12.958	150	20.735	
to						0.0	14.960		0.0	
110	109.166		207.43	1.682		0.0	27.918	0.6544	18.269	Vel = 29.95
			0.0							
110			207.43						39.004	K Factor = 33.21
110	109.166		207.43	2	V	6.509	1.958	150	39.004	
to						0.0	6.509		0.0	
111	109.166		207.43	2.157		0.0	8.467	0.1949	1.650	Vel = 18.21
111	109.166		0.0	2	V	6.509	9.666	150	40.654	
to						0.0	6.509		4.186	
10	99.500		207.43	2.157		0.0	16.175	0.1949	3.152	Vel = 18.21
			0.0							
10			207.43						47.992	K Factor = 29.94

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 ******
10	99.500		207.43	2	2V	8.615	9.333	120	47.992	
to					2T	24.613	33.228		0.361	
11	98.666		207.43	2.157		0.0	42.561	0.2945	12.533	Vel = 18.21
11	98.666		0.0	2.5	V	5.903	16.916	120	60.886	
to						0.0	5.903		0.0	
TOW	98.666		207.43	2.635		0.0	22.819	0.1110	2.534	Vel = 12.20
TOW	98.666		0.0	2.5	B	9.61	6.000	120	63.420	
to					T	16.474	26.084		2.599	
HDW	92.666		207.43	2.635		0.0	32.084	0.1111	3.564	Vel = 12.20
HDW	92.666		0.0	4	2E	26.334	5.000	120	69.583	
to						0.0	26.334		4.433	* * Fixed Loss = 4
BASE	91.666		207.43	4.26		0.0	31.334	0.0107	0.336	Vel = 4.67
BASE	91.666		0.0	4	E	14.534	25.000	140	74.352	
to					T	29.067	46.508		-2.743	
TEST	98		207.43	4.1	G	2.907	71.508	0.0097	0.693	Vel = 5.04
			100.00							Qa = 100.00
TEST			307.43						72.302	K Factor = 36.16