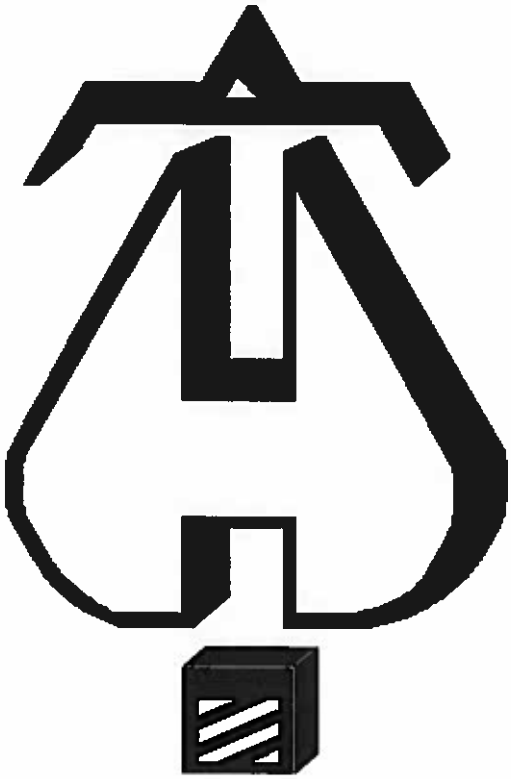


. . . Fire Protection by Computer Design

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

Job Name	:	62 INDIA ST.
Drawing	:	1 OF 3
Location	:	PORTLAND, ME.
Remote Area	:	1
Contract	:	5583-SP-17
Data File	:	62 INDIA ST. DRY CALC..WXF

HYDRAULIC CALCULATIONS
for

Project name: 62 INDIA ST. DRY SYSTEM
Location: PORTLAND, ME.
Drawing no: 1 OF 3
Date: 6/9/17

Design

Remote area number: 1
Remote area location: PARKING GARGE
Occupancy classification: OHI
Density: .15 - Gpm/SqFt
Area of application: 2,048 - SqFt
Coverage per sprinkler: 130 - SqFt
Type of sprinklers calculated: RELIABLE F3QR SIN#R5714 DRY PENDENT
No. of sprinklers calculated: 19
In-rack demand: - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 694.345 - GPM @ 87.327 - Psi
Type of system: DRY
Volume of dry or preaction system: 310 - Gal

Water supply information

Date: 7/6/16
Location: NEWBURY ST. 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 FIRE MARSHAL
Notes: (Include peaking information or gridded systems here.) REMOTE AREA INCREASED PER NFPA13 (2016) SEC. 11.2.3.2.5

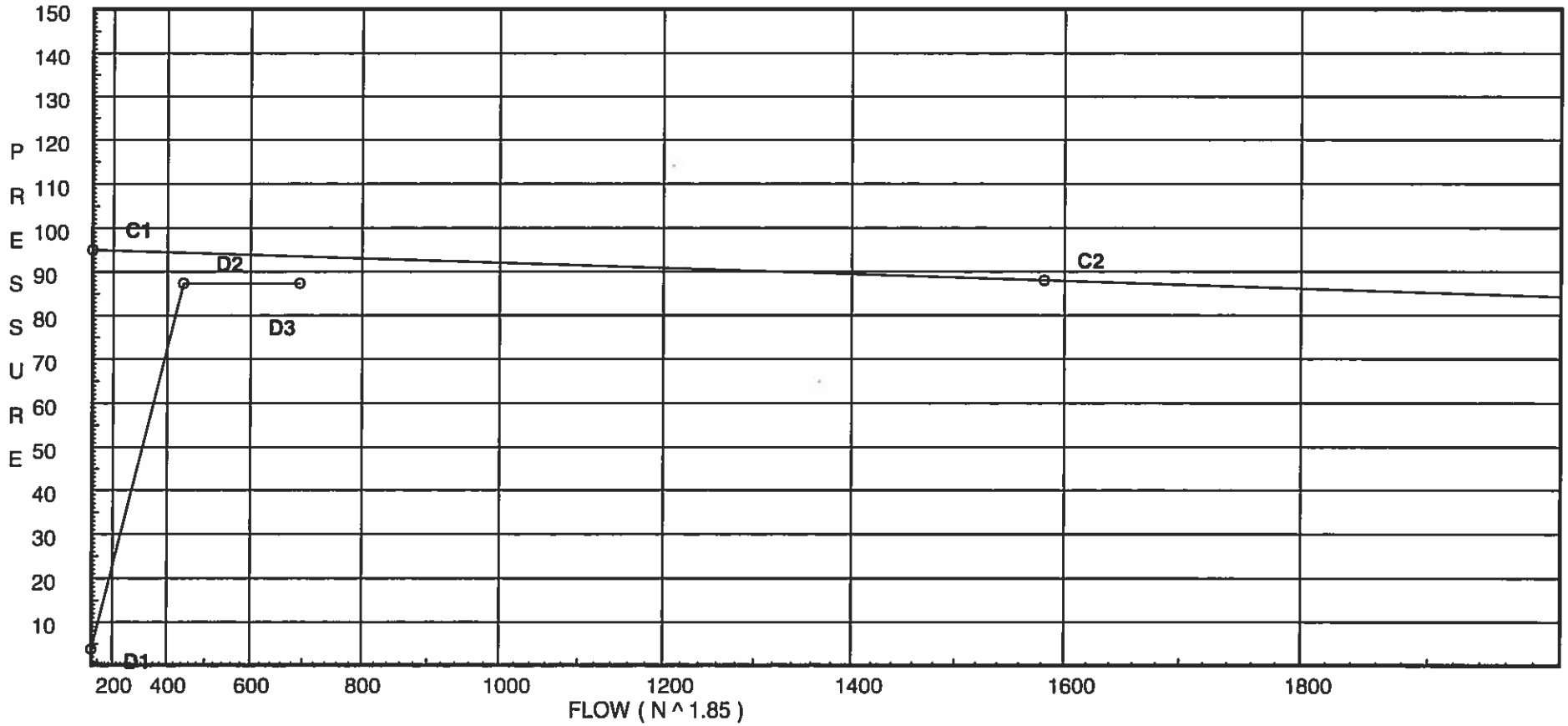
Water Supply Curve C

EASTERN FIRE PROTECTION
62 INDIA ST.

Date 6/9/17

City Water Supply:
- C1 - Static Pressure : 95
- C2 - Residual Pressure: 88
- C2 - Residual Flow : 1582

Demand:
- D1 - Elevation : 3.764
- D2 - System Flow : 444.345
- D2 - System Pressure : 87.327
- Hose (Demand) : 250
- D3 - System Demand : 694.345
- Safety Margin : 6.148



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
Dge	Dry Gem DPV-1							2.2	4.9		8.9		22								
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
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
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

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	95.0	88	1582.0	93.474	694.34	87.327

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
HEAD1	0.0	5.6	12.13	19.5	
1	43.19	5.3	21.83	24.76	K=K @ LIN1
2	43.19	5.3	22.59	25.19	K=K @ LIN1
3	43.19	5.3	28.21	28.14	K=K @ LIN1
5	43.19	5.3	13.54	19.5	K=K @ LIN1
6	44.08		13.91		
7	43.19	5.3	14.01	19.83	K=K @ LIN1
8	44.08		14.4		
9	43.19	5.3	15.32	20.74	K=K @ LIN1
10	44.08		15.96		
11	43.19	5.3	16.15	21.3	K=K @ LIN1
12	44.08		16.85		
13	43.19	5.3	23.53	25.71	K=K @ LIN1
4	44.08		45.87		
15	43.19	5.3	14.99	20.52	K=K @ LIN1
16	43.19	5.3	15.53	20.88	K=K @ LIN1
17	43.19	5.3	17.51	22.18	K=K @ LIN1
18	43.19	5.3	21.9	24.8	K=K @ LIN1
20	43.19	5.3	15.23	20.68	K=K @ LIN1
21	43.19	5.3	15.77	21.05	K=K @ LIN1
22	43.19	5.3	17.79	22.35	K=K @ LIN1
23	43.19	5.3	22.23	24.99	K=K @ LIN1
25	43.19	5.3	24.84	26.41	K=K @ LIN1
26	43.19	5.3	25.7	26.86	K=K @ LIN1
27	43.19	5.3	28.86	28.47	K=K @ LIN1
14	42.94		58.95		
19	42.94		59.06		
24	42.94		59.29		
28	42.94		59.62		
TOR2	42.565		72.33		
DPV	40.21		73.49		
HDR2	37.5		77.14		
BASE	34.5		86.74		
TEST	34.5		87.33	250.0	

EASTERN FIRE PROTECTION
62 INDIA ST.

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 ******
HEAD1	0	5.60	19.50	1	2T	7.137	1.000	100	12.125	
to						0.0	7.137		0.0	
LIN1	0		19.5	1.049		0.0	8.137	0.1740	1.416	Vel = 7.24
			0.0							
LIN1			19.50						13.541	K Factor = 5.30
1	43.190	5.3	24.76	1.25		0.0	13.330	100	21.827	K = K @ LIN1
to						0.0	0.0		0.0	
2	43.190		24.76	1.442		0.0	13.330	0.0575	0.766	Vel = 4.86
2	43.190	5.3	25.19	1.25		0.0	26.670	100	22.593	K = K @ LIN1
to						0.0	0.0		0.0	
3	43.190		49.95	1.442		0.0	26.670	0.2105	5.613	Vel = 9.81
3	43.190	5.3	28.14	1.25	3l	7.956	24.250	100	28.206	K = K @ LIN1
to					T	5.304	13.260		-0.385	
4	44.080		78.09	1.442		0.0	37.510	0.4811	18.047	Vel = 15.34
			0.0							
4			78.09						45.868	K Factor = 11.53
5	43.190	5.3	19.50	1	T	3.568	0.750	100	13.541	K = K @ LIN1
to						0.0	3.568		-0.385	
6	44.080		19.5	1.049		0.0	4.318	0.1739	0.751	Vel = 7.24
6	44.080		0.0	1.25		0.0	13.330	100	13.907	
to						0.0	0.0		0.0	
8	44.080		19.5	1.442		0.0	13.330	0.0369	0.492	Vel = 3.83
			0.0							
8			19.50						14.399	K Factor = 5.14
7	43.190	5.3	19.83	1	T	3.568	0.750	100	14.010	K = K @ LIN1
to						0.0	3.568		-0.385	
8	44.080		19.83	1.049		0.0	4.318	0.1792	0.774	Vel = 7.36
8	44.080		19.50	1.25		0.0	11.540	100	14.399	
to						0.0	0.0		0.0	
10	44.080		39.33	1.442		0.0	11.540	0.1354	1.562	Vel = 7.73
			0.0							
10			39.33						15.961	K Factor = 9.84
9	43.190	5.3	20.74	1	T	3.568	1.710	100	15.317	K = K @ LIN1
to						0.0	3.568		-0.385	
10	44.080		20.74	1.049		0.0	5.278	0.1950	1.029	Vel = 7.70
10	44.080		39.33	1.25		0.0	3.000	100	15.961	
to						0.0	0.0		0.0	
12	44.080		60.07	1.442		0.0	3.000	0.2960	0.888	Vel = 11.80
			0.0							
12			60.07						16.849	K Factor = 14.63
11	43.190	5.3	21.30	1	T	3.568	1.710	100	16.154	K = K @ LIN1
to						0.0	3.568		-0.385	
12	44.080		21.3	1.049		0.0	5.278	0.2046	1.080	Vel = 7.91
12	44.080		60.07	1.25		0.0	12.125	100	16.849	
to						0.0	0.0		0.385	
13	43.190		81.37	1.442		0.0	12.125	0.5193	6.296	Vel = 15.99
13	43.190	5.3	25.71	1.25	3l	7.956	18.380	100	23.530	K = K @ LIN1
to						0.0	7.956		-0.385	
4	44.080		107.08	1.442		0.0	26.336	0.8628	22.723	Vel = 21.04

EASTERN FIRE PROTECTION
62 INDIA ST.

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 ******
4	44.080		78.09	2	I	3.074	25.800	100	45.868	
to					T	8.783	11.857		0.494	
14	42.940		185.17	2.157		0.0	37.657	0.3344	12.592	Vel = 16.26
			0.0							
14			185.17						58.954	K Factor = 24.12
15	43.190	5.3	20.52	1.25		0.0	13.330	100	14.990	K = K @ LIN1
to						0.0	0.0		0.0	
16	43.190		20.52	1.442		0.0	13.330	0.0406	0.541	Vel = 4.03
16	43.190	5.3	20.88	1.25		0.0	13.330	100	15.531	K = K @ LIN1
to						0.0	0.0		0.0	
17	43.190		41.4	1.442		0.0	13.330	0.1488	1.983	Vel = 8.13
17	43.190	5.3	22.18	1.25		0.0	13.330	100	17.514	K = K @ LIN1
to						0.0	0.0		0.0	
18	43.190		63.58	1.442		0.0	13.330	0.3290	4.385	Vel = 12.49
18	43.190	5.3	24.80	1.25	4I	10.608	45.340	100	21.899	K = K @ LIN1
to					T	5.304	15.912		0.108	
19	42.940		88.38	1.442		0.0	61.252	0.6049	37.052	Vel = 17.36
			0.0							
19			88.38						59.059	K Factor = 11.50
20	43.190	5.3	20.68	1.25		0.0	13.330	100	15.226	K = K @ LIN1
to						0.0	0.0		0.0	
21	43.190		20.68	1.442		0.0	13.330	0.0412	0.549	Vel = 4.06
21	43.190	5.3	21.04	1.25		0.0	13.330	100	15.775	K = K @ LIN1
to						0.0	0.0		0.0	
22	43.190		41.72	1.442		0.0	13.330	0.1509	2.011	Vel = 8.20
22	43.190	5.3	22.35	1.25		0.0	13.330	100	17.786	K = K @ LIN1
to						0.0	0.0		0.0	
23	43.190		64.07	1.442		0.0	13.330	0.3337	4.448	Vel = 12.59
23	43.190	5.3	24.99	1.25	4I	10.608	44.300	100	22.234	K = K @ LIN1
to					T	5.304	15.912		0.108	
24	42.940		89.06	1.442		0.0	60.212	0.6136	36.948	Vel = 17.50
			0.0							
24			89.06						59.290	K Factor = 11.57
25	43.190	5.3	26.41	1.25		0.0	13.330	100	24.837	K = K @ LIN1
to						0.0	0.0		0.0	
26	43.190		26.41	1.442		0.0	13.330	0.0647	0.863	Vel = 5.19
26	43.190	5.3	26.86	1.25		0.0	13.330	100	25.700	K = K @ LIN1
to						0.0	0.0		0.0	
27	43.190		53.27	1.442		0.0	13.330	0.2371	3.161	Vel = 10.47
27	43.190	5.3	28.47	1.25	4I	10.608	42.630	100	28.861	K = K @ LIN1
to					T	5.304	15.912		0.108	
28	42.940		81.74	1.442		0.0	58.542	0.5236	30.653	Vel = 16.06
			0.0							
28			81.74						59.622	K Factor = 10.59
14	42.940		185.17	4		0.0	8.625	100	58.954	
to						0.0	0.0		0.0	
19	42.940		185.17	4.26		0.0	8.625	0.0122	0.105	Vel = 4.17

EASTERN FIRE PROTECTION
62 INDIA ST.

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 ******
19	42.940		88.37	4		0.0	9.210	100	59.059	
to						0.0	0.0		0.0	
24	42.940		273.54	4.26		0.0	9.210	0.0251	0.231	Vel = 6.16
24	42.940		89.06	4		0.0	7.875	100	59.290	
to						0.0	0.0		0.0	
28	42.940		362.6	4.26		0.0	7.875	0.0422	0.332	Vel = 8.16
28	42.940		81.74	4	4I	26.313	162.920	100	59.622	
to					J	15.036	41.348		0.162	
TOR2	42.565		444.34	4.26		0.0	204.268	0.0614	12.543	Vel = 10.00
TOR2	42.565		0.0	4		0.0	2.355	100	72.327	
to						0.0	0.0		1.020	
DPV	40.210		444.34	4.26		0.0	2.355	0.0616	0.145	Vel = 10.00
DPV	40.210		0.0	4	Dge	11.719	2.710	120	73.492	
to					B	15.8	53.853		1.174	
HDR2	37.500		444.34	4.26	T	26.334	56.563	0.0438	2.478	Vel = 10.00
HDR2	37.500		0.0	4		0.0	6.750	120	77.144	
to						0.0	0.0		9.299	* * Fixed Loss = 8
BASE	34.500		444.34	4.26		0.0	6.750	0.0439	0.296	Vel = 10.00
BASE	34.500		0.0	6	E	20.084	40.000	140	86.739	
to					T	43.037	67.425		0.0	
TEST	34.500		444.34	6.16	G	4.304	107.425	0.0055	0.588	Vel = 4.78
			250.00							Qa = 250.00
TEST			694.34						87.327	K Factor = 74.30