

... Fire Protection by Computer Design

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

Job Name : 62 INDIA ST. 1ST FLOOR WET SYSTEM
Drawing : 2 OF 2
Location : PORTLAND, ME.
Remote Area : 1
Contract : 5583-SP-17
Data File : 62 INDIA ST. 1ST STAIR B WET CALC..WXF

HYDRAULIC CALCULATIONS
for

Project name: 62 INDIA ST. 1ST FLOOR WET SYSTEM
Location: PORTLAND, ME.
Drawing no: 2 OF 2
Date: 6/7/17

Design

Remote area number: 1
Remote area location: STAIR "B" MIXED USE "C"
Occupancy classification: OHII
Density: .2 - Gpm/SqFt
Area of application: 1,022 - SqFt
Coverage per sprinkler: 130 - SqFt
Type of sprinklers calculated: RELIABLE F1FR56 200* QUICK RESPONSE UPRIGHT
No. of sprinklers calculated: 10
In-rack demand: - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 563.726 - GPM @ 74.211 - Psi
Type of system: WET
Volume of dry or preaction system: - 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 REDUCED PER NFPA13 (2016) SEC. 11.2.3.2.3.1

Water Supply Curve C

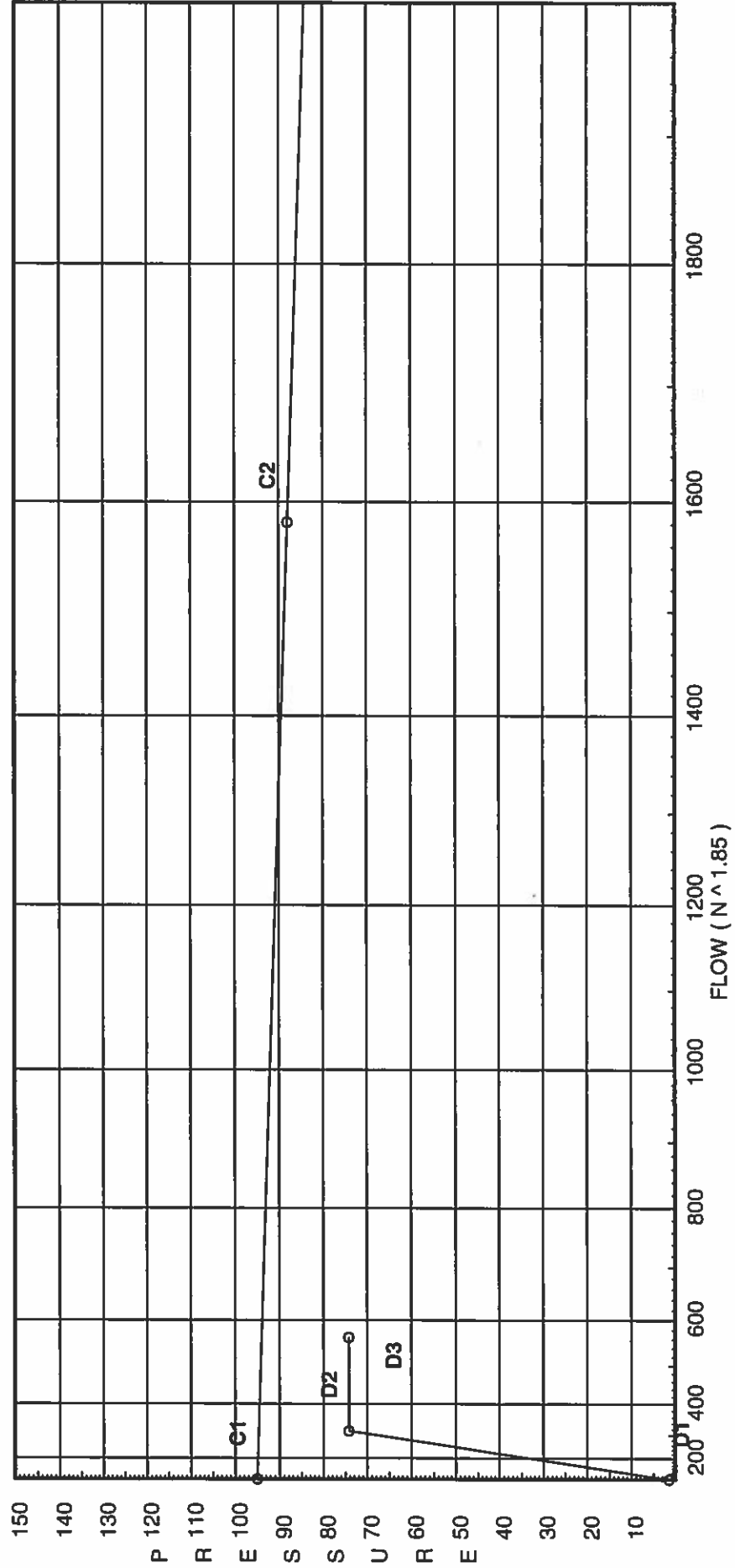
EASTERN FIRE PROTECTION
62 INDIA ST. 1ST FLOOR WET SYSTEM

City Water Supply:

C1 - Static Pressure : 95
C2 - Residual Pressure: 88
C2 - Residual Flow : 1582

Demand:

D1 - Elevation : 1.542
D2 - System Flow : 313.726
D2 - System Pressure : 74.211
Hose (Demand) : 250
D3 - System Demand : 563.726
Safety Margin : 19.752



Fittings Used Summary

EASTERN FIRE PROTECTION
62 INDIA ST. 1ST FLOOR WET SYSTEM

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
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
I 90° Grnd-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
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

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.

Flow Summary - NFPA 2007

EASTERN FIRE PROTECTION
62 INDIA ST. 1ST FLOOR WET SYSTEM

Page 4
Date 6/7/17

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	95.0	88	1582.0	93.962	563.73	74.211

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
HEAD1	0.0	5.6	12.13	19.5	
100	38.06	5.6	24.48	27.71	
101	38.06	5.6	21.56	26.0	
102	38.06		25.37		
103	42.31		29.18		
104	42.31	5.6	29.22	30.27	
105	42.31	5.6	30.92	31.14	
106	42.31	5.6	35.34	33.29	
107	42.31	5.6	35.65	33.43	
108	42.31		36.96		
109	42.31	5.6	33.49	32.41	
110	42.31	5.6	33.76	32.54	
111	42.31	5.6	34.76	33.02	
112	42.31	5.6	36.7	33.93	
113	42.31		37.33		
114	42.31		56.16		
TOR1	44.44		59.58		
HDR1	37.5		64.38		
BASE	34.5		73.89		
TEST	34.5		74.21	250.0	

Final Calculations - Hazen-Williams - 2007

EASTERN FIRE PROTECTION
62 INDIA ST. 1ST FLOOR WET SYSTEM

Page 5
Date 6/7/17

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 to LIN1	0 0	5.60	19.50 19.5	1 1.049	2T	7.137 0.0	1.000 7.137	100 0.1740	12.125 0.0			
			0.0			0.0	8.137		1.416	Vel = 7.24		
LIN1			19.50						13.541	K Factor = 5.30		
100 to 102	38.060 38.060	5.60	27.71 27.71	1 1.049		0.0 0.0	3.750 0.0	120 0.2376	24.479 0.0			Vel = 10.29
102			0.0			0.0			25.370	K Factor = 5.50		
101 to 102	38.060 38.060	5.60	26.00 26.0	1 1.049	2E T	4.0 5.0	9.040 9.000	120 0.2114	21.556 0.0			Vel = 9.65
102 to 103	38.060 42.310		27.71 53.71	1.25 1.38	3E T	9.0 6.0	11.540 15.000	120 0.2128	25.370 -1.841			Vel = 11.52
103 to 104	42.310 42.310		0.0 53.71	1.5 1.682		0.0 0.0	0.500 0.0	120 0.0800	29.178 0.0			Vel = 7.76
104 to 105	42.310 42.310	5.60	30.27 83.98	1.5 1.682		0.0 0.0	9.170 9.170	120 0.1856	29.218 1.702			Vel = 12.13
105 to 108	42.310 42.310	5.60	31.14 115.12	1.5 1.682	T	9.9 0.0	8.250 9.900	120 0.3327	30.920 0.0			Vel = 16.62
108			0.0			0.0	18.150		6.038	Vel = 16.62		
			115.12						36.958	K Factor = 18.94		
106 to 107	42.310 42.310	5.60	33.29 33.29	1.5 1.682		0.0 0.0	9.170 9.170	120 0.0336	35.338 0.0			Vel = 4.81
107 to 108	42.310 42.310	5.60	33.43 66.72	1.5 1.682	T	9.9 0.0	0.920 9.900	120 0.1213	35.646 0.0			Vel = 9.63
108 to 113	42.310 42.310		115.12 181.84	3 3.26		0.0 0.0	12.000 0.0	120 0.0308	36.958 0.0			Vel = 6.99
113			0.0			0.0	12.000		0.370	Vel = 6.99		
			181.84						37.328	K Factor = 29.76		
109 to 110	42.310 42.310	5.60	32.41 32.41	1.5 1.682		0.0 0.0	8.670 8.670	120 0.0319	33.485 0.0			Vel = 4.68
110 to 111	42.310 42.310	5.60	32.53 64.94	1.5 1.682		0.0 0.0	8.670 8.670	120 0.1153	33.762 1.000			Vel = 9.38
111 to 113	42.310 42.310	5.60	33.02 97.96	1.5 1.682	T	9.9 0.0	0.500 9.900	120 0.2467	34.762 0.0			Vel = 14.14
			0.0			0.0	10.400		2.566	Vel = 14.14		

Final Calculations - Hazen-Williams

EASTERN FIRE PROTECTION
62 INDIA ST. 1ST FLOOR WET SYSTEM

Page 6
Date 6/7/17

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	*****
113			97.96						37.328		K Factor = 16.03	
112 to 113	42.310 42.310	5.60	33.93	1.5	T	9.9 0.0	8.170 9.900	120	36.701 0.0			
113 to 114	42.310 42.310		33.93	1.682		0.0	18.070	0.0347	0.627		Vel = 4.90	
113 to 114	42.310 42.310		279.80	3	B J	13.44 17.471	129.625 92.733	120	37.328 0.0			
114 to TOR1	42.310 44.440		313.73	3.26	2T S	40.319 21.503	222.358	0.0847	18.835		Vel = 12.06	
114 to TOR1	42.310 44.440		0.0	4	3I J	27.651 21.067	97.495 90.852	120	56.163 -0.923			
TOR1 to HDR1	44.440 37.500		313.73	4.26	T B	26.334 15.8	188.347	0.0230	4.336		Vel = 7.06	
TOR1 to HDR1	44.440 37.500		0.0	4	B S	15.8 28.968	6.940 71.102	120	59.576 3.006			
HDR1 to BASE	37.500 34.500		313.73	4.26	T	26.334	78.042	0.0230	1.796		Vel = 7.06	
HDR1 to BASE	37.500 34.500		0.0	4		0.0 0.0	9.250 0.0	120	64.378 9.299		** Fixed Loss = 8	
BASE to TEST	34.500 34.500		313.73	4.26		0.0	9.250	0.0230	0.213		Vel = 7.06	
BASE to TEST	34.500 34.500		0.0	6	E T	20.084 43.037	40.000 71.728	140	73.890 0.0			
TEST			313.73	6.16	2G	8.607	111.728	0.0029	0.321		Vel = 3.38	
TEST			250.00								Qa = 250.00	
TEST			563.73						74.211		K Factor = 65.44	