

. . . Fire Protection by Computer Design

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

Job Name : 62 INDIA ST.
Drawing : WOOD/STEEL
Location : UNIT 306
Remote Area : 3
Contract : 5583
Data File : 62 INDIA ST. 3RD FL. 306 WET CALC..WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 62 INDIA ST. Date - 6/7/17
Location - UNIT 306
Building - WOOD/STEEL System No. - 3
Contractor - EASTERN FIRE Contract No. - 5583
Calculated By - EWM Drawing No. - 2 OF 3
Construction: (X) Combustible () Non-Combustible Ceiling Height 8'-6"
OCCUPANCY - RESIDENTIAL

S Type of Calculation: (X)NFPA 13 Residential ()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 - 20 Gpm System Type
Listed Pres. at Start Point - 16.7 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 20 x 20 () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - 250 Gpm Make RELIABLE Model RFC49
I Elevation at Highest Outlet - 65.85Feet Size 1/2" K-Factor 4.9
G Note: Temperature Rating 165*
N

Calculation Gpm Required 183.651 Psi Required 89.604 At Test
Summary C-Factor Used: Overhead 150 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 7/6/16 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 95 Elev.
R Residual (Psi) - 88 Other Well
Flow (Gpm) - 1582 Proof Flow Gpm
S Elevation - 99

P Location: PORTLAND, ME.

P
L Source of Information: PORTLAND WATER DISTRICT
Y

Water Supply Curve C

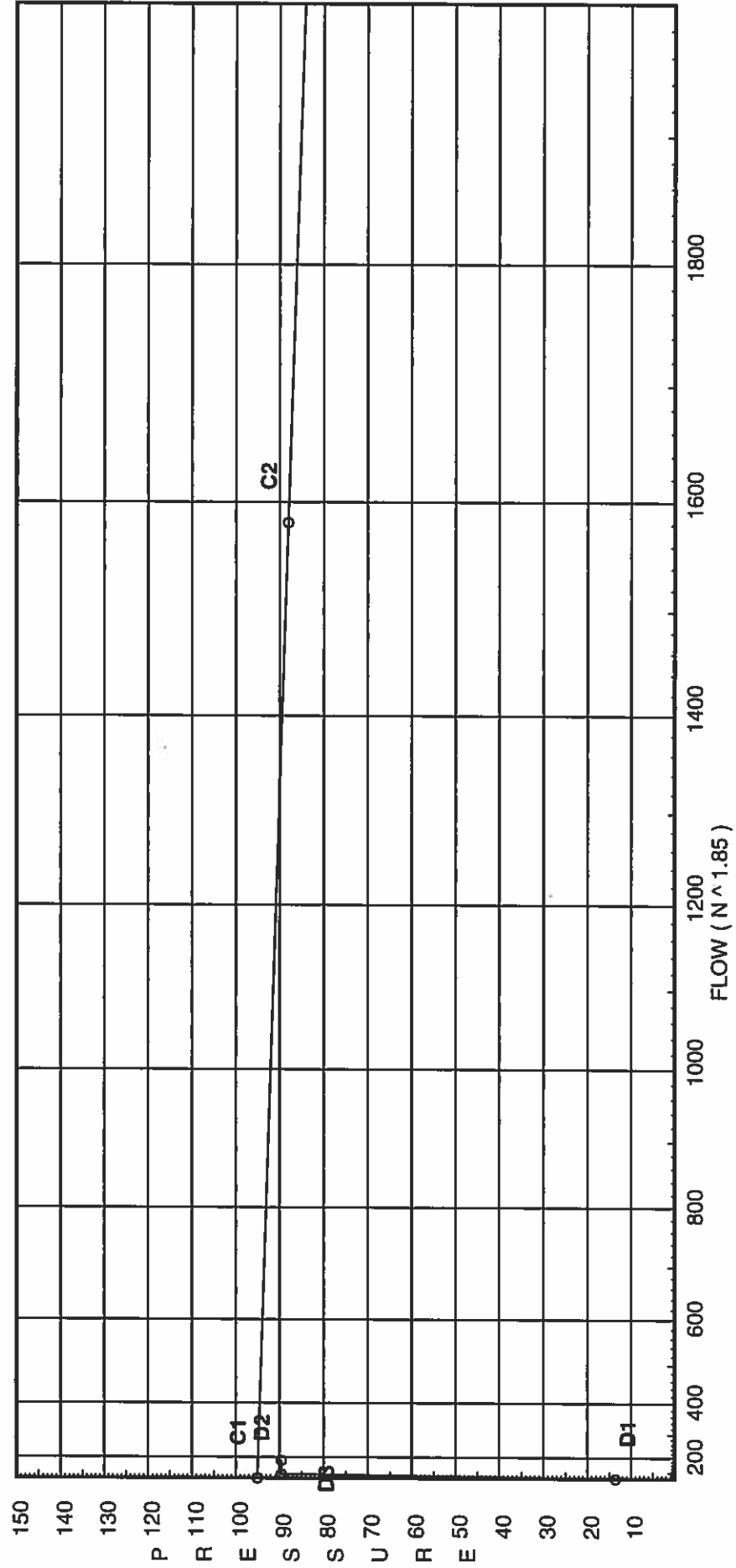
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City Water Supply:

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

Demand:

D1 - Elevation : 13.578
D2 - System Flow : 83.651
D2 - System Pressure : 89.604
Hose (Demand) : 100
D3 - System Demand : 183.651
Safety Margin : 5.266



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
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Fitting generates a Fixed Loss Based on Flow																			
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
I	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
J	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
N*	7	7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O*	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65	71	81	91	101	121
T	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

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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	94.87	183.65	89.604

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	4.9	16.7	20.02	
HEAD2	0.0	4.4	16.7	17.98	
300	65.85	4.31	17.42	17.98	K=K @ LIN2
301	65.85	4.31	17.74	18.15	K=K @ LIN2
302	65.85		18.12		
303	64.85	4.84	19.53	21.39	K=K @ LIN1
304	64.85	4.84	29.14	26.13	K=K @ LIN1
305	65.85		54.52		
306	65.85		61.98		
307	65.85		67.41		
114	44.44		76.78		
TOR1	44.44		77.1		
HDR1	37.5		80.26		
BASE	34.5		89.58		
TEST	34.5		89.6	100.0	

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	*****
HEAD1 to LIN1	0 0	4.90	20.02 20.02	1 1.101	O	5.0 0.0 0.0	1.000 5.000 6.000	150 0.0682	16.700 0.0 0.409			Vel = 6.75
LIN1			0.0 20.02						17.109		K Factor = 4.84	
HEAD2 to LIN2	0 0	4.40	17.98 17.98	1 1.049	T	5.0 0.0 0.0	1.750 5.000 6.750	120 0.1068	16.700 0.0 0.721			Vel = 6.67
LIN2			0.0 17.98						17.421		K Factor = 4.31	
300 to 302	65.850 65.850	4.31	17.98 17.98	1 1.101	O	5.0 0.0 0.0	7.420 5.000 12.420	150 0.0560	17.421 0.0 0.695		K = K @ LIN2	Vel = 6.06
302			0.0 17.98						18.116		K Factor = 4.22	
301 to 302	65.850 65.850	4.31	18.15 18.15	1 1.101	O	5.0 0.0 0.0	1.580 5.000 6.580	150 0.0568	17.742 0.0 0.374		K = K @ LIN2	Vel = 6.12
302 to 303	65.850 64.850		17.98 36.13	1 1.101		0.0 0.0 0.0	4.830 0.0 4.830	150 0.2031	18.116 0.433 0.981			Vel = 12.18
303 to 304	64.850 64.850	4.84	21.39 57.52	1 1.101		0.0 0.0 0.0	20.000 0.0 20.000	150 0.4803	19.530 0.0 9.606		K = K @ LIN1	Vel = 19.38
304 to 305	64.850 65.850	4.84	26.13 83.65	1.25 1.394	2N O	16.0 6.0 0.0	62.830 22.000 84.830	150 0.3044	29.136 -0.433 25.819		K = K @ LIN1	Vel = 17.58
305 to 306	65.850 65.850		0.0 83.65	2 2.003	2N O	22.0 10.0 0.0	111.140 32.000 143.140	150 0.0521	54.522 0.0 7.456			Vel = 8.52
306 to 307	65.850 65.850		0.0 83.65	2 2.157	B I S Fsp	7.384 4.307 12.307 13.537 0.0	6.790 37.535 44.325	120 0.0549	61.978 3.000 2.432		** Fixed Loss = 3	Vel = 7.34
307 to 114	65.850 44.440		0.0 83.65	4 4.26	T	26.334 0.0 0.0	21.420 26.334 47.754	120 0.0020	67.410 9.273 0.095			Vel = 1.88
114 to TOR1	44.440 44.440		0.0 83.65	4 4.26	B 3I J	15.8 27.651 21.067	95.360 64.518 159.878	120 0.0020	76.778 0.0 0.319			Vel = 1.88
TOR1 to HDR1	44.440 37.500		0.0 83.65	4 4.26	B S T	15.8 28.968 26.334	6.940 71.102 78.042	120 0.0020	77.097 3.006 0.156			Vel = 1.88
HDR1 to BASE	37.500 34.500		0.0 83.65	4 4.26		0.0 0.0 0.0	9.250 0.0 9.250	120 0.0019	80.259 9.299 0.018		** Fixed Loss = 8	Vel = 1.88
BASE to TEST	34.500 34.500		0.0 83.65	6 6.16	E T 2G	20.084 43.037 8.607	40.000 71.728 111.728	140 0.0003	89.576 0.0 0.028			Vel = 0.90

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	*****
TEST			100.00 183.65						89.604		Qa = 100.00 K Factor = 19.40	