

**. . . Fire Protection by Computer Design**

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

Job Name : 62 INDIA ST. 2ND. FLOOR WET SYSTEM  
Drawing : WOOD/STEEL  
Location : UNIT 205  
Remote Area : 2  
Contract : 5583  
Data File : 62 INDIA ST. 2ND FL. 205 WET CALC..WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 62 INDIA ST. Date - 6/7/17  
Location - UNIT 205  
Building - WOOD/STEEL System No. - 2  
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 ( ) 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 - 55. Feet Size 1/2" K-Factor 4.9  
G Note: Temperature Rating 200\*  
N

Calculation Gpm Required 183.604 Psi Required 80.145 At Test  
Summary C-Factor Used: Overhead 150 Underground 150

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 - 34.5

P Location: PORTLAND, ME.

P  
L Source of Information: PORTLAND WATER DISTRICT  
Y

# Water Supply Curve C

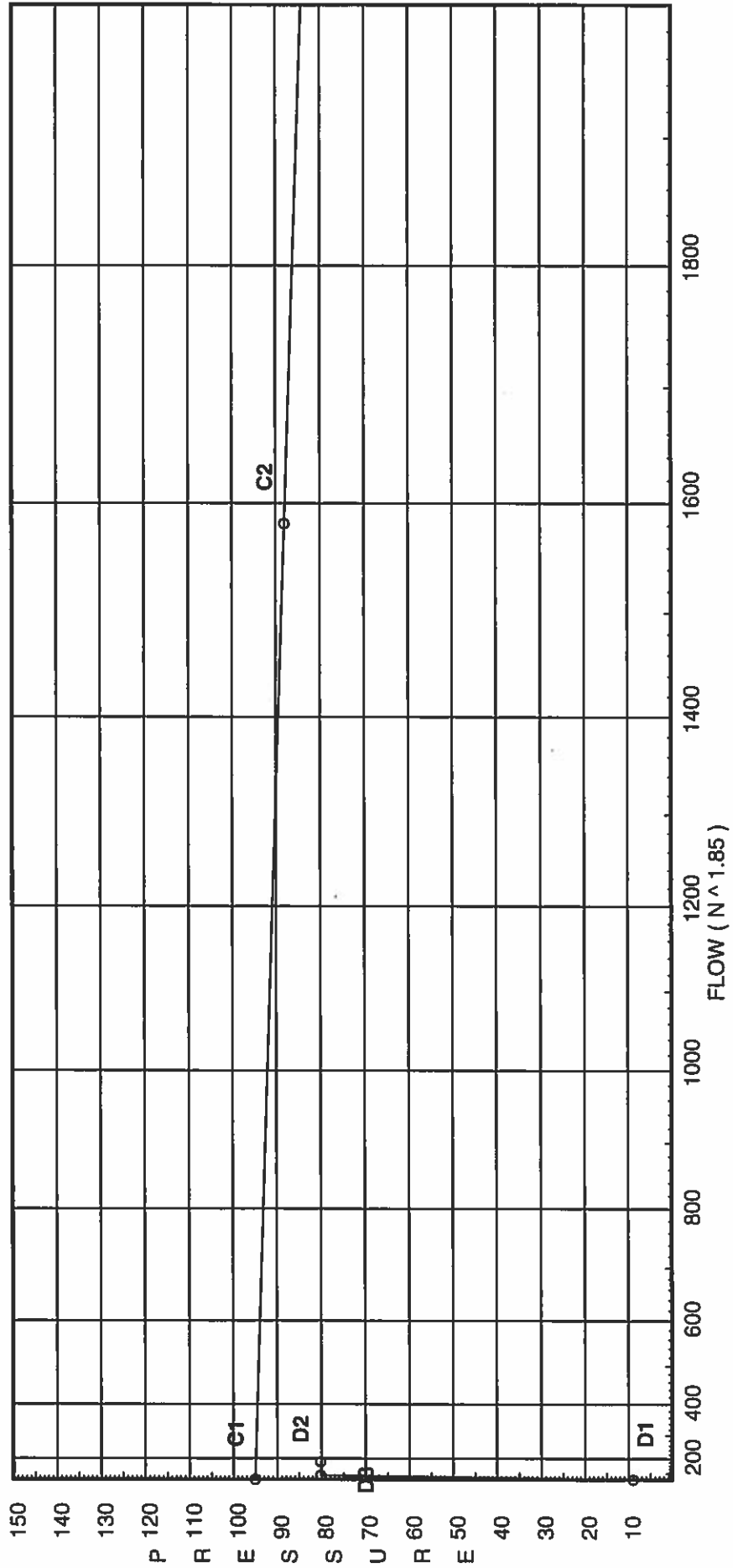
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### City Water Supply:

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

### Demand:

D1 - Elevation : 8.961  
D2 - System Flow : 83.604  
D2 - System Pressure : 80.145  
Hose ( Demand ) : 100  
D3 - System Demand : 183.604  
Safety Margin : 14.724



# Fittings Used Summary

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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	
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																				
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	0	0	
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	
N*	CPVC 90° Ell Harvet-Spears	7	7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0	
O*	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0	
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65	71	81	91	101	121	
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**

<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	183.6	80.145

**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	
200	55.19	4.31	17.42	17.98	K=K @ LIN2
201	55.19	4.31	17.74	18.15	K=K @ LIN2
202	55.19		18.12		
203	53.94	4.84	19.49	21.37	K=K @ LIN1
204	53.94	4.84	29.08	26.11	K=K @ LIN1
205	55.19		49.71		
206	55.19		57.16		
207	55.19		62.59		
114	44.44		67.32		
TOR1	44.44		67.64		
HDR1	37.5		70.8		
BASE	34.5		80.12		
TEST	34.5		80.15	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	*****
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	
200 to 202	55.190 55.190	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
202			0.0 17.98						18.116		K Factor = 4.22	
201 to 202	55.190 55.190	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
202 to 203	55.190 53.940		17.98 36.13	1 1.101		0.0 0.0 0.0	4.080 0.0 4.080	150 0.2032	18.116 0.541 0.829			Vel = 12.18
203 to 204	53.940 53.940	4.84	21.37 57.5	1 1.101		0.0 0.0 0.0	20.000 0.0 20.000	150 0.4800	19.486 0.0 9.599			K = K @ LIN1 Vel = 19.38
204 to 205	53.940 55.190	4.84	26.10 83.6	1.25 1.394	O	6.0 0.0 0.0	63.625 6.000 69.625	150 0.3040	29.085 -0.541 21.168			K = K @ LIN1 Vel = 17.57
205 to 206	55.190 55.190		0.0 83.6	2 2.003	2N O	22.0 10.0 0.0	111.140 32.000 143.140	150 0.0520	49.712 0.0 7.448			Vel = 8.51
206 to 207	55.190 55.190		0.0 83.6	2 2.157	B I T S Fsp	7.384 4.307 12.307 13.537 0.0	6.790 37.535 44.325	120 0.0548	57.160 3.000 2.430		** Fixed Loss = 3	Vel = 7.34
207 to 114	55.190 44.440		0.0 83.6	4 4.26	T	26.334 0.0 0.0	10.750 26.334 37.084	120 0.0020	62.590 4.656 0.074			Vel = 1.88
114 to TOR1	44.440 44.440		0.0 83.6	4 4.26	B 3I J	15.8 27.651 21.067	95.360 64.518 159.878	120 0.0020	67.320 0.0 0.318			Vel = 1.88
TOR1 to HDR1	44.440 37.500		0.0 83.6	4 4.26	B S T	15.8 28.968 26.334	6.940 71.102 78.042	120 0.0020	67.638 3.006 0.156			Vel = 1.88
HDR1 to BASE	37.500 34.500		0.0 83.6	4 4.26		0.0 0.0 0.0	9.250 0.0 9.250	120 0.0021	70.800 9.299 0.019		** Fixed Loss = 8	Vel = 1.88
BASE to TEST	34.500 34.500		0.0 83.6	6 6.16	E T 2G	20.084 43.037 8.607	40.000 71.728 111.728	140 0.0002	80.118 0.0 0.027			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	*****		
			100.00										Qa = 100.00	
TEST			183.60						80.145					K Factor = 20.51