

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

EASTERN FIRE PROTECTION  
170 KITTYHAWK AVE  
P.O. BOX 1390  
AUBURN MAINE, 04210  
207-784-1507

Job Name : AU-5463-16 48 HANCOCK  
Building : WOOD CONSTRUCTION  
Location : 48 HANCOCK, PORTLAND MAINE  
System : WET  
Contract : AU-5463-16  
Data File : 5463 48 HANCOCK STREET UNIT 5.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - AU-5463-16 48 HANCOCK Date - 12/06/2016  
Location - 48 HANCOCK, PORTLAND MAINE  
Building - WOOD CONSTRUCTION System No. - WET  
Contractor - EASTERN FIRE PROTECTION Contract No. - AU-5463-16  
Calculated By - JML Drawing No. - 1  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES  
OCCUPANCY - LIGHT HAZARD

S Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R ( )NFPA 13D  
Y Number of Sprinklers Flowing: ( )1 ( )2 ( )4 (X)3  
S ( )Other  
T ( )Specific Ruling Made by Date  
E  
M Listed Flow at Start Point - 14 Gpm System Type  
Listed Pres. at Start Point - 10.2 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 14 x 14 ( ) Deluge ( ) PreAction  
E Domestic Flow Added - Gpm Sprinkler or Nozzle  
S Additional Flow Added - Gpm Make RELIABLE Model F1RES44  
I Elevation at Highest Outlet - 92.330Feet Size 7/16" K-Factor 4.4  
G Note: Temperature Rating 155  
N

Calculation Gpm Required 48.175 Psi Required 84.253 At Test  
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 08/12/2016 Rated Cap. Cap.  
T Time of Test - 6:40 A.M. @ Psi Elev.  
E Static (Psi) - 94 Elev.  
R Residual (Psi) - 90 Other Well  
Flow (Gpm) - 1074 Proof Flow Gpm  
S Elevation - 100

P Location: See plot plan.

L Source of Information: Portland Water District

Y

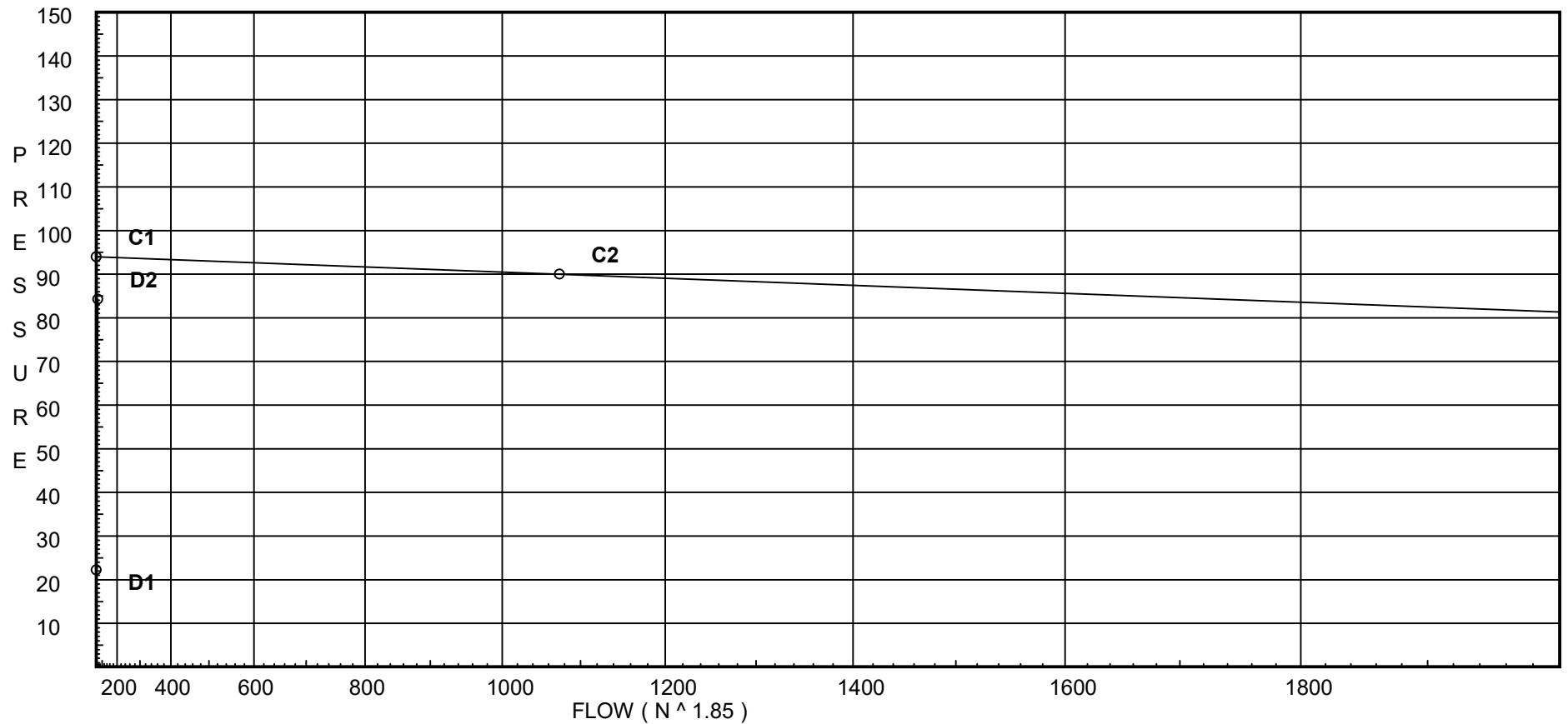
# Water Supply Curve C

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City Water Supply:  
C1 - Static Pressure : 94  
C2 - Residual Pressure: 90  
C2 - Residual Flow : 1074

Demand:  
D1 - Elevation : 22.231  
D2 - System Flow : 48.175  
D2 - System Pressure : 84.253  
Hose ( Demand ) :  
D3 - System Demand : 48.175  
Safety Margin : 9.735



# 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
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	11	13
N *	CPVC 90'El Harvel-Spears		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
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
Zaa	Ames 2000B	Fitting generates a Fixed Loss Based on Flow																			

## 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.

# Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
HD1	0.0	4.9	7.0	na	12.96	0.05	1	7.0
1	92.33	4.4	10.2	na	14.05	0.05	1	10.2
2	92.33	4.4	10.64	na	14.35	0.05	1	10.2
4	84.125	K = K @ LN1	16.62	na	19.77			
3	84.125		18.8	na				
5	75.08		33.39	na				
6	61.08		41.75	na				
7	61.08		46.48	na				
TOR	60.25		61.72	na				
BFP	54.0		68.47	na				
BASE	51.0		75.47	na				
TEST	41.0		84.25	na				

The maximum velocity is 17.88 and it occurs in the pipe between nodes 7 and TOR

# Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
HD1 to LN1	12.96 12.96	1.101 150.0 0.0305	E	3.825 0.0	1.000 3.825	7.000 0.0			K Factor = 4.90	
	0.0 12.96						7.147		K Factor = 4.85	
1 to 2	14.05 14.05	1.101 150.0 0.0354		0.0 0.0	12.500 0.0	10.200 0.0			K Factor = 4.40	
				0.0	12.500	0.443			Vel = 4.73	
2 to 3	14.36 28.41	1.101 150.0 0.1302	2N O	14.0 5.0 0.0	16.380 19.000 35.380	10.643 3.554 4.607			K Factor = 4.40	
	0.0 28.41						18.804		K Factor = 6.55	
4 to 3	19.77 19.77	1.101 150.0 0.0666	2N O	14.0 5.0 0.0	13.830 19.000 32.830	16.618 0.0 2.186			K Factor @ node LN1	
				0.0	32.830	2.186			Vel = 6.66	
3 to 5	28.40 48.17	1.101 150.0 0.3460	N	7.0 0.0 0.0	23.840 7.000 30.840	18.804 3.917 10.671				Vel = 16.23
5 to 6	0.0 48.17	1.101 150.0 0.3460	O	5.0 0.0 0.0	1.625 5.000 6.625	33.392 6.063 2.292				Vel = 16.23
6 to 7	0.0 48.17	1.101 150.0 0.3460	O	5.0 0.0 0.0	8.670 5.000 13.670	41.747 0.0 4.730				Vel = 16.23
7 to TOR	0.0 48.17	1.049 120.0 0.6618	3E	6.0 0.0 0.0	16.495 6.000 22.495	46.477 0.359 14.887				Vel = 17.88
TOR to BFP	0.0 48.17	1.38 120.0 0.1740	Fsp	0.0 0.0 0.0	6.000 0.0 6.000	61.723 5.707 1.044			** Fixed Loss = 3	Vel = 10.33
BFP to BASE	0.0 48.17	1.38 120.0 0.1740	Zaa	0.0 0.0 0.0	3.000 0.0 3.000	68.474 6.474 0.522			** Fixed Loss = 5.175	Vel = 10.33
BASE to TEST	0.0 48.17	1.72 150.0 0.0394	2E G T	6.174 0.617 6.174	100.000 12.967 112.967	75.470 4.331 4.452				Vel = 6.65
	0.0 48.17						84.253		K Factor = 5.25	