

... 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.

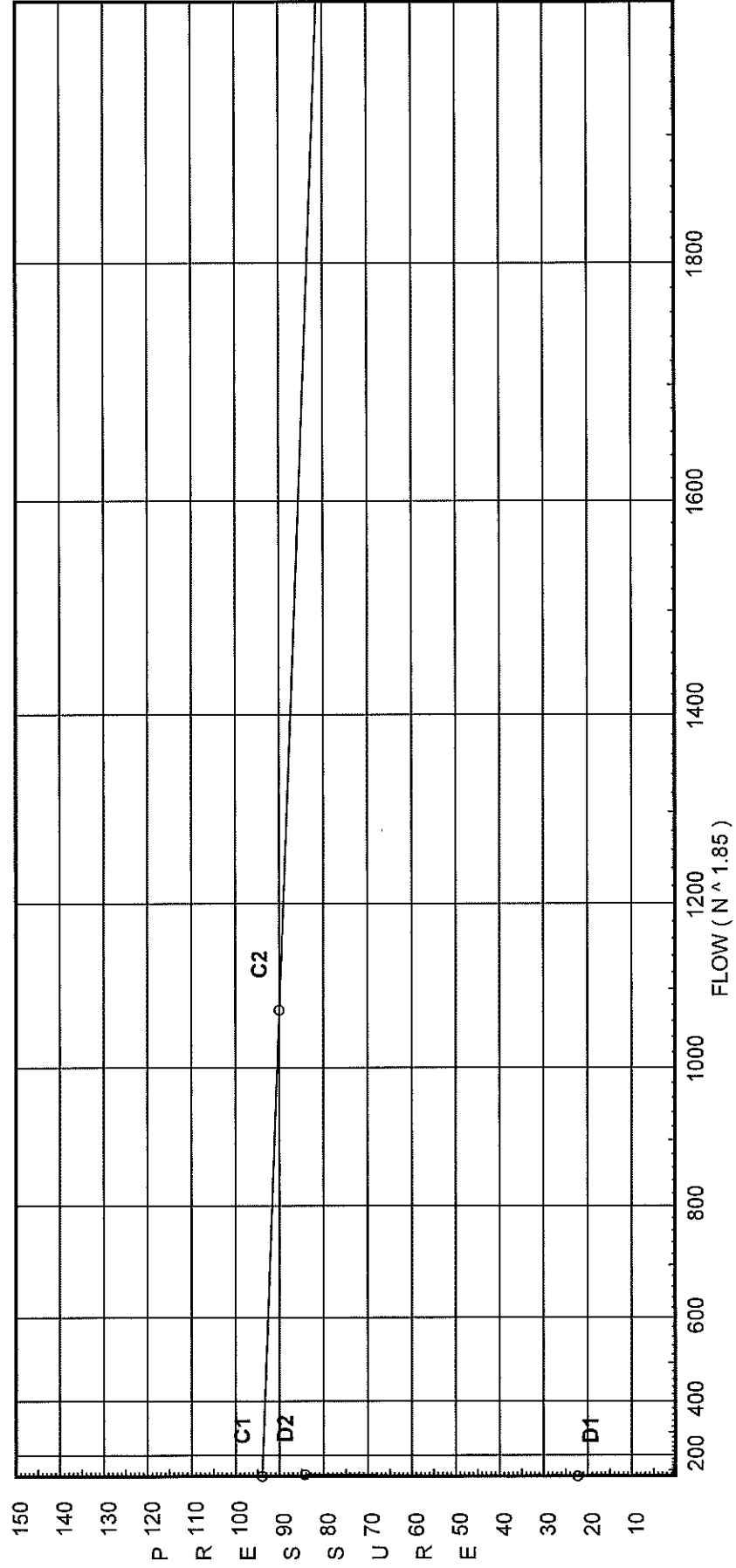
P
L Source of Information: Portland Water District
Y

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° Ell Harvet-Spears	3	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	12.96	1.101	E	3.825	1.000	7.000			K Factor = 4.90	
to		150.0		0.0	3.825	0.0				
LN1	12.96	0.0305		0.0	4.825	0.147			Vel = 4.37	
	0.0									
	12.96					7.147			K Factor = 4.85	
1	14.05	1.101		0.0	12.500	10.200			K Factor = 4.40	
to		150.0		0.0	0.0	0.0				
2	14.05	0.0354		0.0	12.500	0.443			Vel = 4.73	
2	14.36	1.101	2N	14.0	16.380	10.643			K Factor = 4.40	
to		150.0	O	5.0	19.000	3.554				
3	28.41	0.1302		0.0	35.380	4.607			Vel = 9.57	
	0.0									
	28.41					18.804			K Factor = 6.55	
4	19.77	1.101	2N	14.0	13.830	16.618			K Factor @ node LN1	
to		150.0	O	5.0	19.000	0.0				
3	19.77	0.0666		0.0	32.830	2.186			Vel = 6.66	
3	28.40	1.101	N	7.0	23.840	18.804				
to		150.0		0.0	7.000	3.917				
5	48.17	0.3460		0.0	30.840	10.671			Vel = 16.23	
5	0.0	1.101	O	5.0	1.625	33.392				
to		150.0		0.0	5.000	6.063				
6	48.17	0.3460		0.0	6.625	2.292			Vel = 16.23	
6	0.0	1.101	O	5.0	8.670	41.747				
to		150.0		0.0	5.000	0.0				
7	48.17	0.3460		0.0	13.670	4.730			Vel = 16.23	
7	0.0	1.049	3E	6.0	16.495	46.477				
to		120.0		0.0	6.000	0.359				
TOR	48.17	0.6618		0.0	22.495	14.887			Vel = 17.88	
TOR	0.0	1.38	Fsp	0.0	6.000	61.723				
to		120.0		0.0	0.0	5.707			** Fixed Loss = 3	
BFP	48.17	0.1740		0.0	6.000	1.044			Vel = 10.33	
BFP	0.0	1.38	Zaa	0.0	3.000	68.474				
to		120.0		0.0	0.0	6.474			** Fixed Loss = 5.175	
BASE	48.17	0.1740		0.0	3.000	0.522			Vel = 10.33	
BASE	0.0	1.72	2E	6.174	100.000	75.470				
to		150.0	G	0.617	12.967	4.331				
TEST	48.17	0.0394	T	6.174	112.967	4.452			Vel = 6.65	
	0.0									
	48.17					84.253			K Factor = 5.25	