



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

FREEDOM FIRE PROTECTION INC.  
209 QUAKER RIDGE ROAD  
CASCO, MAINE 04015  
207-627-4109

Job Name : 82 CUMBERLAND AVENUE  
Building : 82 CUMBERLAND AVENUE  
Location : PORTLAND, MAINE 04101  
System : #1 AREA #1  
Contract :  
Data File : 82 CUMBERLAND AVENUE HC.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 82 CUMBERLAND AVENUE Date - 12/3/13  
Location - PORTLAND, MAINE 04101  
Building - 82 CUMBERLAND AVENUE System No. - #1 AREA #1  
Contractor - FREEDOM FIRE PROTECTION Contract No. -  
Calculated By - MICHAEL NOBLIT Drawing No. - FP-2  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES  
OCCUPANCY - HOUSE

S Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D  
Y Number of Sprinklers Flowing: ( )1 (X)2 ( )4 ( )  
S ( )Other  
T ( )Specific Ruling Made by Date  
E  
M Listed Flow at Start Point - 14 Gpm System Type  
Listed Pres. at Start Point - 10.1 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 14' x 14' ( ) Deluge ( ) PreAction  
E Domestic Flow Added - 20 Gpm Sprinkler or Nozzle  
S Additional Flow Added - 0 Gpm Make TYCO Model LFII  
I Elevation at Highest Outlet - 21.916Feet Size 1/2" K-Factor 4.4  
G Note: Temperature Rating 155  
N

Calculation Gpm Required 48.135 Psi Required 53.530 At Test  
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 7/16/2012 Rated Cap. Cap.  
T Time of Test - @ Psi Elev.  
E Static (Psi) - 60 Elev.  
R Residual (Psi) - 55 Other Well  
Flow (Gpm) - 871 Proof Flow Gpm  
S Elevation - +10'-0"

P Location:  
P  
L Source of Information: PORTLAND WATER DISTRICT  
Y

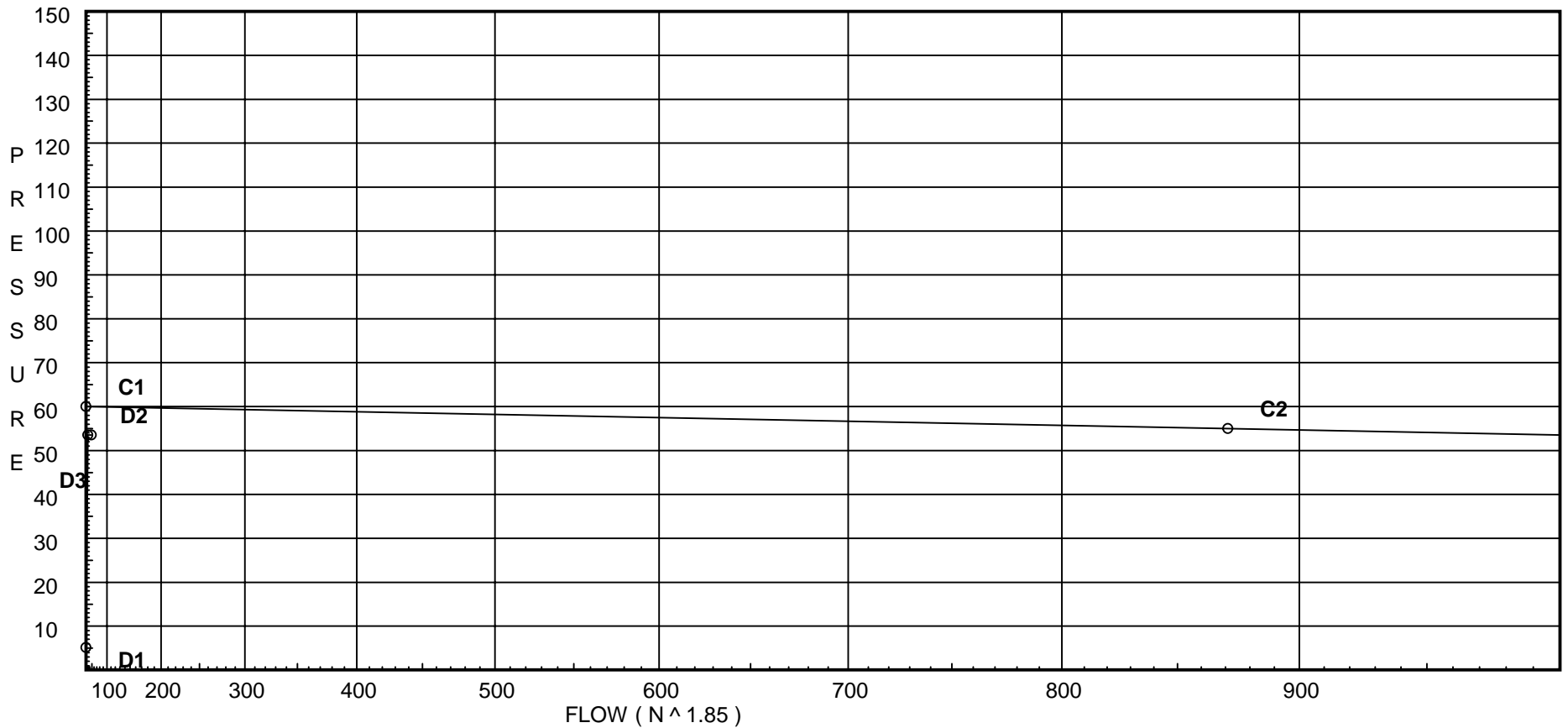
# Water Supply Curve (C)

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City Water Supply:  
C1 - Static Pressure : 60  
C2 - Residual Pressure: 55  
C2 - Residual Flow : 871

Demand:  
D1 - Elevation : 5.161  
D2 - System Flow : 28.1346  
D2 - System Pressure : 53.530  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : 20  
D3 - System Demand : 48.1346  
Safety Margin : 6.446



# 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	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
T	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																			

# Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
101	21.916	4.4	10.1	na	13.98	0.05	0.001	10.1
11	21.916		10.25	na				
10	14.083		14.05	na				
102	21.916	4.4	10.34	na	14.15	0.05	0.001	10.1
9	21.916		10.5	na				
8	14.083		14.31	na				
7	14.083		14.59	na				
6	14.083		15.12	na				
5	4.5		20.99	na				
4	4.5		21.29	na				
3	4.5		21.9	na				
2	4.5		22.15	na				
1	0.0		29.14	na				
0	0.0		57.86	na				
TEST	10.0		53.53	na	20.0			

The maximum velocity is 20.7 and it occurs in the pipe between nodes 1 and 0

Final Calculations - One-Line

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Ref Pt.	Press Total	K Fact.	Flow Added	Flow Total	Vel	Pipe Diam.	Pipe Length	Fit Sum.	Fit Length	Tot Len	C Fac	Pf perUL	Tot Pf	Elev Press	Fixed Loss	Next Press	Next Ref
101	10.100	4.40	13.98	13.98	4.71	1.101	0.500	1E	3.825	4.325	150	0.0351	0.152	0.0	0.0	10.252	11
11	10.252		0.0	13.98	4.71	1.101	7.830	1E	3.825	11.655	150	0.0351	0.409	3.392	0.0	14.053	10
10	14.053		0.0	13.98	4.71	1.101	2.000	1E1T	13.388	15.388	150	0.0351	0.540	0.0	0.0	14.593	7
7	14.593	3.66	0.0	13.98													
102	10.344	4.40	14.15	14.15	4.77	1.101	0.500	1E	3.825	4.325	150	0.0358	0.155	0.0	0.0	10.499	9
9	10.499		0.0	14.15	4.77	1.101	7.830	1E	3.825	11.655	150	0.0360	0.419	3.392	0.0	14.310	8
8	14.310		0.0	14.15	4.77	1.101	4.083	1E	3.825	7.908	150	0.0358	0.283	0.0	0.0	14.593	7
7	14.593		13.98	28.13	9.48	1.101	0.330	1E	3.825	4.155	150	0.1280	0.532	0.0	0.0	15.125	6
6	15.125		0.0	28.13	9.48	1.101	9.583	1E	3.825	13.408	150	0.1279	1.715	4.150	0.0	20.990	5
5	20.990		0.0	28.13	4.43	1.61	2.000	1T	8.0	10.000	120	0.0304	0.304	0.0	0.0	21.294	4
4	21.294		0.0	28.13	4.43	1.61	15.830	1E	4.0	19.830	120	0.0304	0.603	0.0	0.0	21.897	3
3	21.897		0.0	28.13	4.43	1.61	4.500	1E	4.0	8.500	120	0.0304	0.258	0.0	0.0	22.155	2
2	22.155		0.0	28.13	4.43	1.61	4.500	1E1T1Zaa	12.0	16.500	120	0.0304	0.501	1.949	4.535	29.140	1
1	29.140		0.0	28.13	20.70	0.745	30.000	3#	0.0	30.000	150	0.8572	25.715	0.0	3.000	57.855	0
0	57.855		0.0	28.13	0.30	6.16	180.000		0.0	180.000	140	0.0	0.006	-4.331	0.0	53.530	TEST
TEST	53.530	6.58	20.00	48.13													