

. . . Fire Protection by Computer Design

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

Job Name : 171 & 169 NEAL STREET 3
Building : 171 & 169 NEAL STREET
Location : PORTLAND, MAINE 04102
System : #1 AREA #3
Contract :
Data File : 171 & 169 NEAL STREET HC3.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 171 & 169 NEAL STREET Date - 12/17/12
Location - PORTLAND, MAINE 04102
Building - 171 & 169 NEAL STREET System No. - #1 AREA #3
Contractor - FREEDOM FIRE PROTECTION Contract No. -
Calculated By - MICHAEL NOBLIT Drawing No. - FP-3
Construction: (X) Combustible () Non-Combustible Ceiling Height 7'-9"
OCCUPANCY - APARTMENT

S Type of Calculation: (X)NFPA 13 Residential (X)NFPA 13R ()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 - 13 Gpm System Type
Listed Pres. at Start Point - 7 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16' x 16' () Deluge () PreAction
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
S Additional Flow Added - 0 Gpm Make TYCO Model LFII
I Elevation at Highest Outlet - 36'-0"Feet Size 1/2" K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 26.354 Psi Required 46.879 At Test
Summary C-Factor Used: Overhead 120 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 8/16/2008 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 55 Elev.
R Residual (Psi) - 0 Other Well
Flow (Gpm) - 1186 Proof Flow Gpm
S Elevation -

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

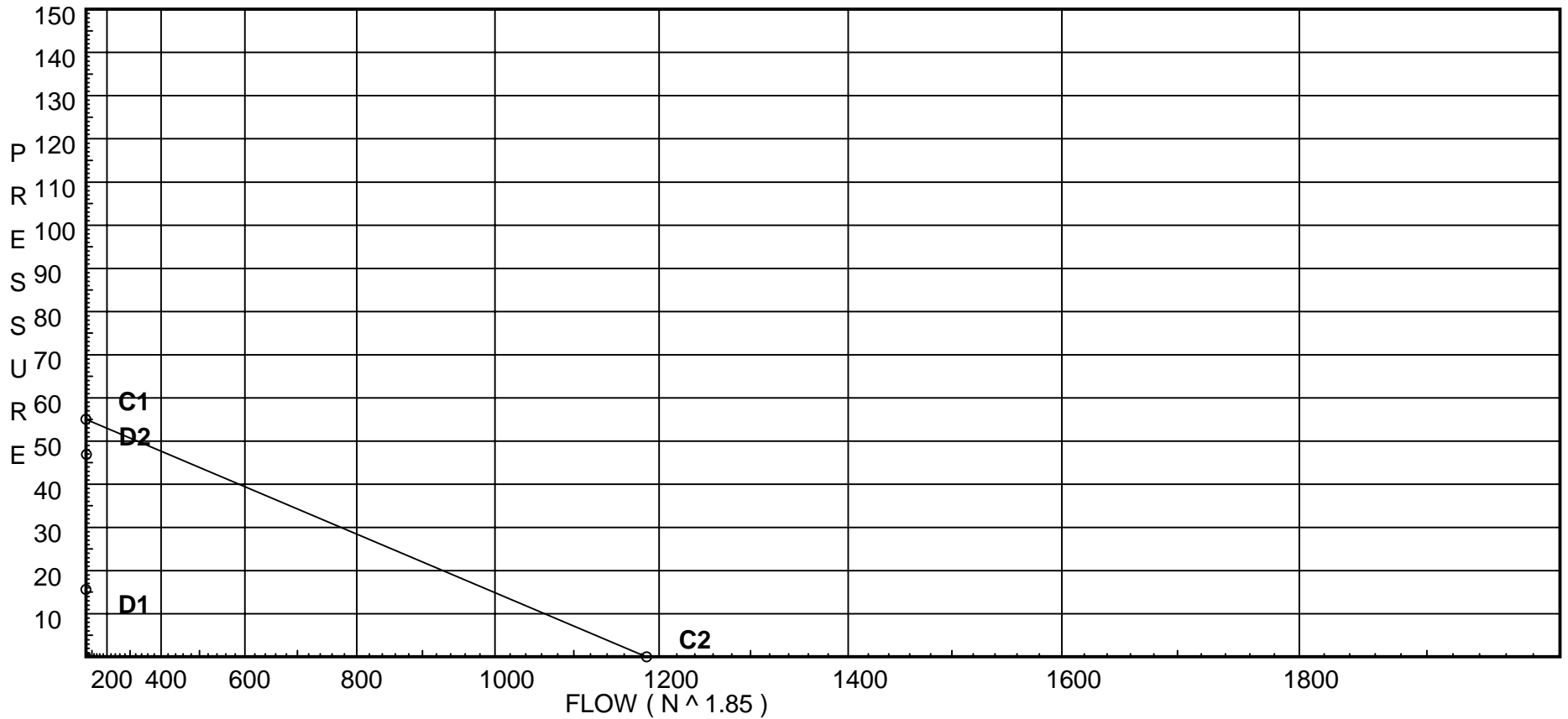
Water Supply Curve (C)

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET 3

Page 2
Date 12/17/12

City Water Supply:
C1 - Static Pressure : 55
C2 - Residual Pressure: 0
C2 - Residual Flow : 1186

Demand:
D1 - Elevation : 15.592
D2 - System Flow : 26.3537
D2 - System Pressure : 46.879
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 26.3537
Safety Margin : 8.073



Fittings Used Summary

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET 3

Page 3
Date 12/17/12

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET 3

Page 4
Date 12/17/12

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
302	36.0	4.9	7.0	na	12.96	0.05	256	7.0
301	36.0	4.9	7.47	na	13.39	0.05	256	7.0
12	36.0		8.66	na				
11	36.0		11.37	na				
10	36.0		11.59	na				
9	36.0		14.87	na				
8	36.0		19.57	na				
7	27.75		23.39	na				
6	16.66		28.57	na				
5	16.66		28.76	na				
4	6.166		33.69	na				
3	6.166		34.19	na				
2	6.166		34.6	na				
1	0.0		41.94	na				
0	0.0		46.88	na				
TEST	0.0		46.88	na				

The maximum velocity is 9.78 and it occurs in the pipe between nodes 301 and 12

Final Calculations - Hazen-Williams

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET 3

Page 5
Date 12/17/12

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
302 to 301	12.96	1.049 120		8.000 0.0	7.000 0.0			K Factor = 4.90	
301 to 12	12.96	0.0584		8.000	0.467			Vel = 4.81	
301 to 12	13.39	1.049 120	1E	2.0 0.0	3.500 2.000	7.467 0.0		K Factor = 4.90	
12 to 11	26.35	0.2167		5.500	1.192			Vel = 9.78	
12 to 11	0.0	1.049 120	1E	2.0 0.0	10.500 2.000	8.659 0.0			
11 to 10	26.35	0.2168		12.500	2.710			Vel = 9.78	
11 to 10	0.0	1.049 120		0.0 0.0	1.000 0.0	11.369 0.0			
10 to 9	26.35	0.2170		1.000	0.217			Vel = 9.78	
10 to 9	0.0	1.049 120	1E	2.0 0.0	13.166 2.000	11.586 0.0			
9 to 8	26.35	0.2168		15.166	3.288			Vel = 9.78	
9 to 8	0.0	1.049 120	1E	2.0 0.0	19.660 2.000	14.874 0.0			
8 to 7	26.35	0.2168		21.660	4.695			Vel = 9.78	
8 to 7	0.0	1.61 120		0.0 0.0	9.250 0.0	19.569 3.573			
7 to 6	26.35	0.0269		9.250	0.249			Vel = 4.15	
7 to 6	0.0	1.61 120	1E	4.0 0.0	10.083 4.000	23.391 4.803			
6 to 5	26.35	0.0269		14.083	0.379			Vel = 4.15	
6 to 5	0.0	1.61 120	1E	4.0 0.0	2.830 4.000	28.573 0.0			
5 to 4	26.35	0.0269		6.830	0.184			Vel = 4.15	
5 to 4	0.0	1.61 120	1E	4.0 0.0	10.500 4.000	28.757 4.545			
4 to 3	26.35	0.0269		14.500	0.390			Vel = 4.15	
4 to 3	0.0	1.61 120	1T	8.0 0.0	10.416 8.000	33.692 0.0			
3 to 2	26.35	0.0269		18.416	0.496			Vel = 4.15	
3 to 2	0.0	1.61 120	1T	8.0 0.0	7.166 8.000	34.188 0.0			
2 to 1	26.35	0.0269		15.166	0.408			Vel = 4.15	
2 to 1	0.0	1.61 120	1Zaa	0.0 0.0	6.166 0.0	34.596 7.175		* Fixed loss = 4.504	
1 to 0	26.35	0.0269		6.166	0.166			Vel = 4.15	
1 to 0	0.0	1.481 140		0.0 0.0	31.000 0.0	41.937 4.000		* Fixed loss = 4	
0	26.35	0.0304		31.000	0.942			Vel = 4.91	

Final Calculations - Standard

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET 3

Page 6
Date 12/17/12

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
0	0.0	12.34	1T	93.767	150.000	46.879			
to		140		0.0	93.767	0.0			
TEST	26.35	0.0		0.0	243.767	0.0		Vel = 0.07	
	0.0								
	26.35					46.879		K Factor = 3.85	