



. . . 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 HC2
Building : 171 & 169 NEAL STREET
Location : PORTLAND, MAINE 04102
System : #1 AREA #4
Contract :
Data File : 171 & 169 NEAL STREET HC4.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 #4
Contractor - FREEDOM FIRE PROTECTION Contract No. -
Calculated By - MICHAEL NOBLIT Drawing No. - FP-2
Construction: (X) Combustible () Non-Combustible Ceiling Height 7'-8"
OCCUPANCY - APARTMENT

S Type of Calculation: (X)NFPA 13 Residential (X)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 - 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 - 6.166Feet Size 1/2" K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 53.812 Psi Required 47.983 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

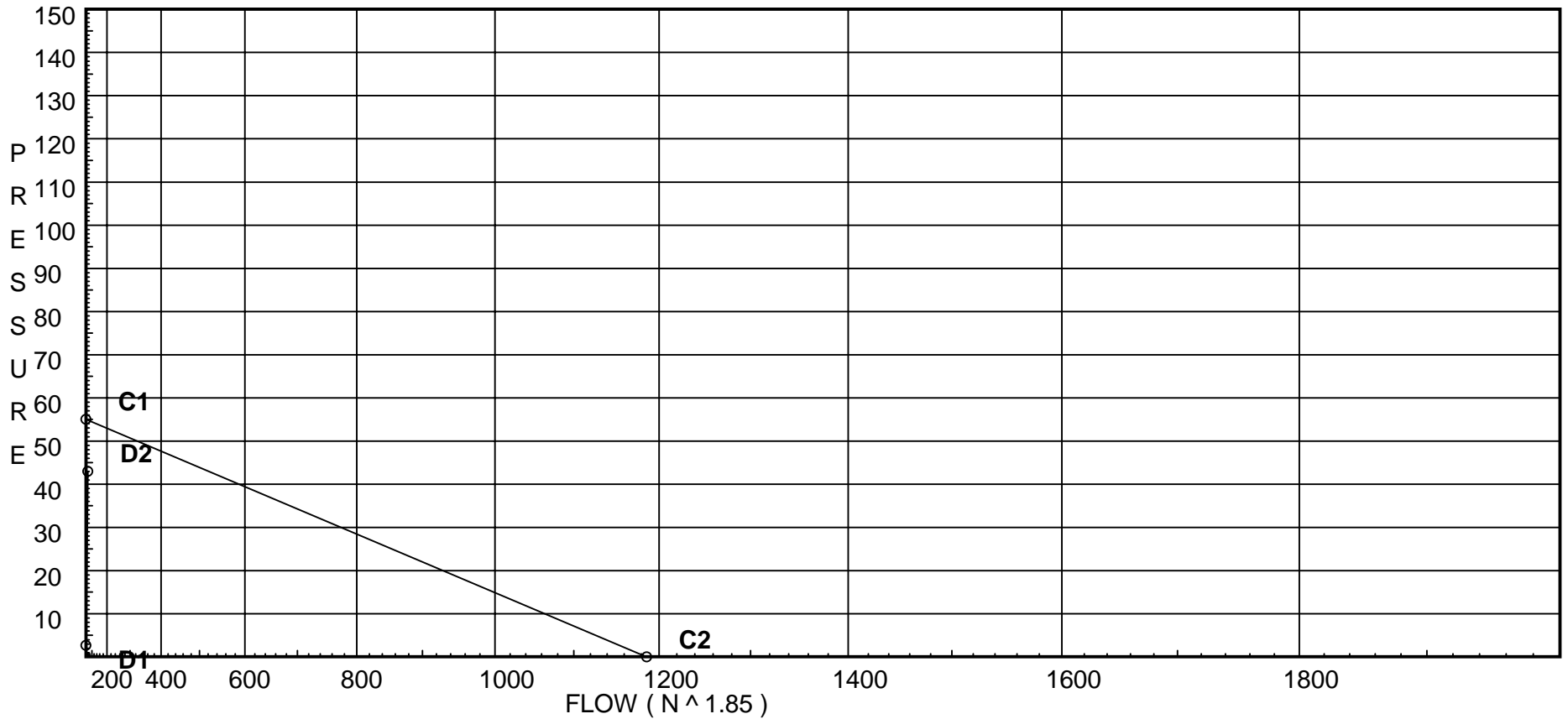
Water Supply Curve (C)

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET HC2

Page 2
Date 12/17/12

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

Demand:
D1 - Elevation : 2.670
D2 - System Flow : 53.8117
D2 - System Pressure : 42.983
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 53.8117
Safety Margin : 11.837



Fittings Used Summary

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET HC2

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 HC2

Page 4
Date 12/17/12

| Node No. | Elevation | K-Fact | Pt Actual | Pn | Flow Actual | Density | Area | Press Req. |
|----------|-----------|--------|-----------|----|-------------|---------|------|------------|
| 402 | 6.166 | 4.9 | 7.28 | na | 13.22 | 0.05 | 256 | 7.0 |
| 401 | 6.166 | 4.9 | 8.24 | na | 14.06 | 0.05 | 256 | 7.0 |
| 404 | 6.166 | 4.9 | 7.0 | na | 12.96 | 0.05 | 256 | 7.0 |
| 403 | 6.166 | 4.9 | 7.66 | na | 13.56 | 0.05 | 256 | 7.0 |
| 42 | 6.166 | | 17.92 | na | | | | |
| 41 | 6.166 | | 18.66 | na | | | | |
| 40 | 6.166 | | 21.47 | na | | | | |
| 2 | 6.166 | | 24.25 | na | | | | |
| 1 | 0.0 | | 32.45 | na | | | | |
| 0 | 0.0 | | 42.98 | na | | | | |
| TEST | 0.0 | | 42.98 | na | | | | |

The maximum velocity is 11.54 and it occurs in the pipe between nodes 41 and 40

Final Calculations - Hazen-Williams

FREEDOM FIRE PROTECTION INC.
171 & 169 NEAL STREET HC2

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 | ***** |
|-----------------|----------|-------------------|---------------------|-------------------|-------------|-------------|-------|----------------------|-------|
| 402 | 13.22 | 1.049 | | 0.0 | 15.830 | 7.280 | | K Factor = 4.90 | |
| to | | 120 | | 0.0 | 0.0 | 0.0 | | | |
| 401 | 13.22 | 0.0605 | | 0.0 | 15.830 | 0.958 | | Vel = 4.91 | |
| 401 | 14.06 | 1.049 | 1T | 5.0 | 40.083 | 8.238 | | K Factor = 4.90 | |
| to | | 120 | | 0.0 | 5.000 | 0.0 | | | |
| 41 | 27.28 | 0.2312 | | 0.0 | 45.083 | 10.422 | | Vel = 10.13 | |
| | 0.0 | | | | | | | | |
| | 27.28 | | | | | 18.660 | | K Factor = 6.32 | |
| 404 | 12.96 | 1.049 | | 0.0 | 11.330 | 7.000 | | K Factor = 4.90 | |
| to | | 120 | | 0.0 | 0.0 | 0.0 | | | |
| 403 | 12.96 | 0.0583 | | 0.0 | 11.330 | 0.661 | | Vel = 4.81 | |
| 403 | 13.57 | 1.049 | 1E | 2.0 | 44.750 | 7.661 | | K Factor = 4.90 | |
| to | | 120 | | 0.0 | 2.000 | 0.0 | | | |
| 42 | 26.53 | 0.2194 | | 0.0 | 46.750 | 10.258 | | Vel = 9.85 | |
| 42 | 0.0 | 1.38 | | 0.0 | 12.830 | 17.919 | | | |
| to | | 120 | | 0.0 | 0.0 | 0.0 | | | |
| 41 | 26.53 | 0.0578 | | 0.0 | 12.830 | 0.741 | | Vel = 5.69 | |
| 41 | 27.28 | 1.38 | 1T | 6.0 | 7.166 | 18.660 | | | |
| to | | 120 | | 0.0 | 6.000 | 0.0 | | | |
| 40 | 53.81 | 0.2136 | | 0.0 | 13.166 | 2.812 | | Vel = 11.54 | |
| 40 | 0.0 | 1.38 | 1E | 3.0 | 4.000 | 21.472 | | | |
| to | | 120 | 1T | 6.0 | 9.000 | 0.0 | | | |
| 2 | 53.81 | 0.2135 | | 0.0 | 13.000 | 2.776 | | Vel = 11.54 | |
| 2 | 0.0 | 1.61 | 1Zaa | 0.0 | 6.166 | 24.248 | | | |
| to | | 120 | | 0.0 | 0.0 | 7.583 | | * Fixed loss = 4.912 | |
| 1 | 53.81 | 0.1009 | | 0.0 | 6.166 | 0.622 | | Vel = 8.48 | |
| 1 | 0.0 | 1.481 | | 0.0 | 31.000 | 32.453 | | | |
| to | | 140 | | 0.0 | 0.0 | 7.000 | | * Fixed loss = 7 | |
| 0 | 53.81 | 0.1138 | | 0.0 | 31.000 | 3.529 | | Vel = 10.02 | |
| 0 | 0.0 | 12.34 | 1T | 93.767 | 150.000 | 42.982 | | | |
| to | | 140 | | 0.0 | 93.767 | 0.0 | | | |
| TEST | 53.81 | 0.0 | | 0.0 | 243.767 | 0.001 | | Vel = 0.14 | |
| | 0.0 | | | | | | | | |
| | 53.81 | | | | | 42.983 | | K Factor = 8.21 | |