

. . . Fire Protection by Computer Design

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

Job Name : 767 CONGRESS STREET HC3
Building : 767 CONGRESS STREET
Location : PORTLAND, MAINE 04102
System : #1AREA#3
Contract :
Data File : 767 CONGRESS STREET HC3.WXF

Hydraulic Design Information Sheet

Name - 767 CONGRESS STREET Date - 5/13/14
Location - PORTLAND, MAINE 04102
Building - 767 CONGRESS STREET System No. - #1AREA#3
Contractor - Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-3
Construction: (X) Combustible () Non-Combustible Ceiling Height - 9'-9"
Occupancy - OFFICE

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

E
M Area of Sprinkler Operation - AREA System Type Sprinkler/Nozzle
Density - .10 (X) Wet Make TYCO
D Area Per Sprinkler - 225 () Dry Model TY-FRB
E Elevation at Highest Outlet - 30.75 () Deluge Size 1/2"
S Hose Allowance - Inside - () Preaction K-Factor 5.6
I Rack Sprinkler Allowance - () Other Temp.Rat.155
G Hose Allowance - Outside - 100

N Note

Calculation Flow Required - 186.117 Press Required - 48.824 At Test
Summary C-Factor Used: 140 Overhead 120 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 8/16/2010 Cap. -
T Time of Test - Rated Cap.- Elev.-
E Static Press - 55 @ Press -
R Residual Press - 0 Elev. - Well
Flow - 1186 Proof Flow
S Elevation - 0

U Location -

P
L Source of Information - PORTLAND WATER DISTRICT
Y

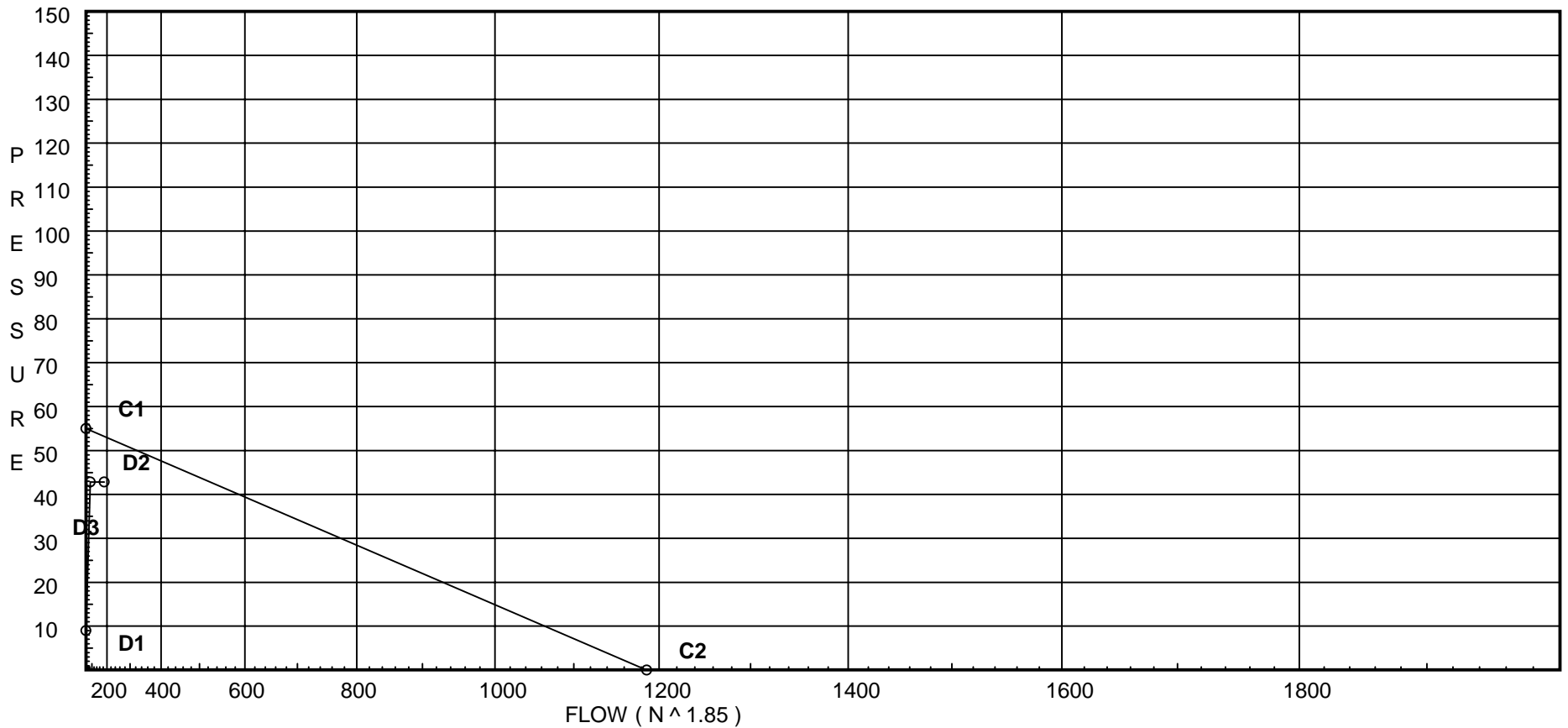
Water Supply Curve (C)

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

Demand:
D1 - Elevation : 8.987
D2 - System Flow : 86.117
D2 - System Pressure : 42.824
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 186.117
Safety Margin : 10.388



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 |
| Zac | Ames 2000SS | 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. |
|----------|-----------|--------|-----------|----|-------------|---------|------|------------|
| 302 | 30.75 | 5.6 | 12.69 | na | 19.95 | 0.1 | 175 | 7.0 |
| 301 | 30.75 | 5.6 | 13.86 | na | 20.85 | 0.1 | 175 | 7.0 |
| 303 | 30.75 | 5.6 | 16.6 | na | 22.82 | 0.1 | 225 | 7.0 |
| 304 | 30.75 | 5.6 | 16.14 | na | 22.5 | 0.1 | 225 | 7.0 |
| 33 | 30.75 | | 18.31 | na | | | | |
| 32 | 30.75 | | 18.83 | na | | | | |
| 31 | 30.75 | | 19.62 | na | | | | |
| 30 | 30.75 | | 22.33 | na | | | | |
| 7 | 30.75 | | 25.66 | na | | | | |
| 6 | 20.0 | | 31.29 | na | | | | |
| 5 | 20.0 | | 32.95 | na | | | | |
| 4 | 8.33 | | 39.03 | na | | | | |
| 3 | 8.33 | | 39.28 | na | | | | |
| 2 | 8.33 | | 40.63 | na | | | | |
| 1 | 0.0 | | 46.81 | na | | | | |
| TEST | 10.0 | | 42.82 | na | 100.0 | | | |

The maximum velocity is 15.15 and it occurs in the pipe between nodes 301 and 31

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 |
|---------|-------------|---------|------------|------------|-------|------------|-------------|----------|------------|---------|-------|----------|--------|------------|------------|------------|----------|
| 302 | 12.688 | 5.60 | 19.95 | 19.95 | 7.41 | 1.049 | 9.083 | | 0.0 | 9.083 | 120 | 0.1295 | 1.176 | 0.0 | 0.0 | 13.864 | 301 |
| 301 | 13.864 | 5.60 | 20.85 | 40.8 | 15.15 | 1.049 | 6.830 | 1T | 5.0 | 11.830 | 120 | 0.4866 | 5.757 | 0.0 | 0.0 | 19.621 | 31 |
| 31 | 19.621 | 9.21 | 0.0 | 40.80 | | | | | | | | | | | | | |
| 303 | 16.604 | 5.60 | 22.82 | 22.82 | 8.47 | 1.049 | 8.416 | 1T | 5.0 | 13.416 | 120 | 0.1661 | 2.228 | 0.0 | 0.0 | 18.832 | 32 |
| 32 | 18.832 | 5.26 | 0.0 | 22.82 | | | | | | | | | | | | | |
| 304 | 16.143 | 5.60 | 22.50 | 22.5 | 8.35 | 1.049 | 8.416 | 1T | 5.0 | 13.416 | 120 | 0.1618 | 2.171 | 0.0 | 0.0 | 18.314 | 33 |
| 33 | 18.314 | | 0.0 | 22.5 | 4.83 | 1.38 | 12.166 | | 0.0 | 12.166 | 120 | 0.0426 | 0.518 | 0.0 | 0.0 | 18.832 | 32 |
| 32 | 18.832 | | 22.82 | 45.32 | 7.14 | 1.61 | 10.750 | | 0.0 | 10.750 | 120 | 0.0734 | 0.789 | 0.0 | 0.0 | 19.621 | 31 |
| 31 | 19.621 | | 40.80 | 86.12 | 13.57 | 1.61 | 3.250 | 1T | 8.0 | 11.250 | 120 | 0.2406 | 2.707 | 0.0 | 0.0 | 22.328 | 30 |
| 30 | 22.328 | | 0.0 | 86.12 | 13.57 | 1.61 | 9.830 | 1E | 4.0 | 13.830 | 120 | 0.2406 | 3.327 | 0.0 | 0.0 | 25.655 | 7 |
| 7 | 25.655 | | 0.0 | 86.12 | 7.56 | 2.157 | 10.750 | 1E | 6.153 | 16.903 | 120 | 0.0579 | 0.979 | 4.656 | 0.0 | 31.290 | 6 |
| 6 | 31.290 | | 0.0 | 86.12 | 7.56 | 2.157 | 10.166 | 1E1T | 18.46 | 28.626 | 120 | 0.0579 | 1.658 | 0.0 | 0.0 | 32.948 | 5 |
| 5 | 32.948 | | 0.0 | 86.12 | 7.56 | 2.157 | 11.660 | 1E | 6.153 | 17.813 | 120 | 0.0579 | 1.031 | 5.054 | 0.0 | 39.033 | 4 |
| 4 | 39.033 | | 0.0 | 86.12 | 5.07 | 2.635 | 3.000 | 1E | 8.237 | 11.237 | 120 | 0.0219 | 0.246 | 0.0 | 0.0 | 39.279 | 3 |
| 3 | 39.279 | | 0.0 | 86.12 | 5.07 | 2.635 | 45.500 | 2E | 16.474 | 61.974 | 120 | 0.0218 | 1.354 | 0.0 | 0.0 | 40.633 | 2 |
| 2 | 40.633 | | 0.0 | 86.12 | 1.94 | 4.26 | 8.330 | 1Zac | 0.0 | 8.330 | 120 | 0.0020 | 0.017 | 3.608 | 2.555 | 46.813 | 1 |
| 1 | 46.813 | | 0.0 | 86.12 | 2.09 | 4.1 | 150.000 | 2E | 29.067 | 179.067 | 140 | 0.0019 | 0.342 | -4.331 | 0.0 | 42.824 | TEST |
| TEST | 42.824 | 28.44 | 100.00 | 186.12 | | | | | | | | | | | | | |