

. . . Fire Protection by Computer Design

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

Job Name : 191 PINE STREET PORTLAND HC4
Building : 191 PINE STREET
Location : PORTLAND, MAINE 04104
System : #1 AREA#4
Contract :
Data File : 191 PINE STREET PORTLAND HC4.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 191 PINE STREET PORTLAND Date - 9/14/12
Location - PORTLAND, MAINE 04104
Building - 191 PINE STREET System No. - #1 AREA#4
Contractor - Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-3
Construction: (X) Combustible () Non-Combustible Ceiling Height 11'-6"
OCCUPANCY - TOWNHOUSE

S Type of Calculation: (X)NFPA 13 Residential (X)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 - 19 Gpm System Type
Listed Pres. at Start Point - 18.6 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 18' x 18' () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make TYCO Model LFII
I Elevation at Highest Outlet - 17'-0"Feet Size 1/2" K-Factor 4.4
G Note: Temperature Rating 155
N

Calculation Gpm Required 58.695 Psi Required 40.068 At Test
Summary C-Factor Used: Overhead 120 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 8/31/12 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 46 Elev.
R Residual (Psi) - 24 Other Well
Flow (Gpm) - 780 Proof Flow Gpm
S Elevation -

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

Water Supply Curve (C)

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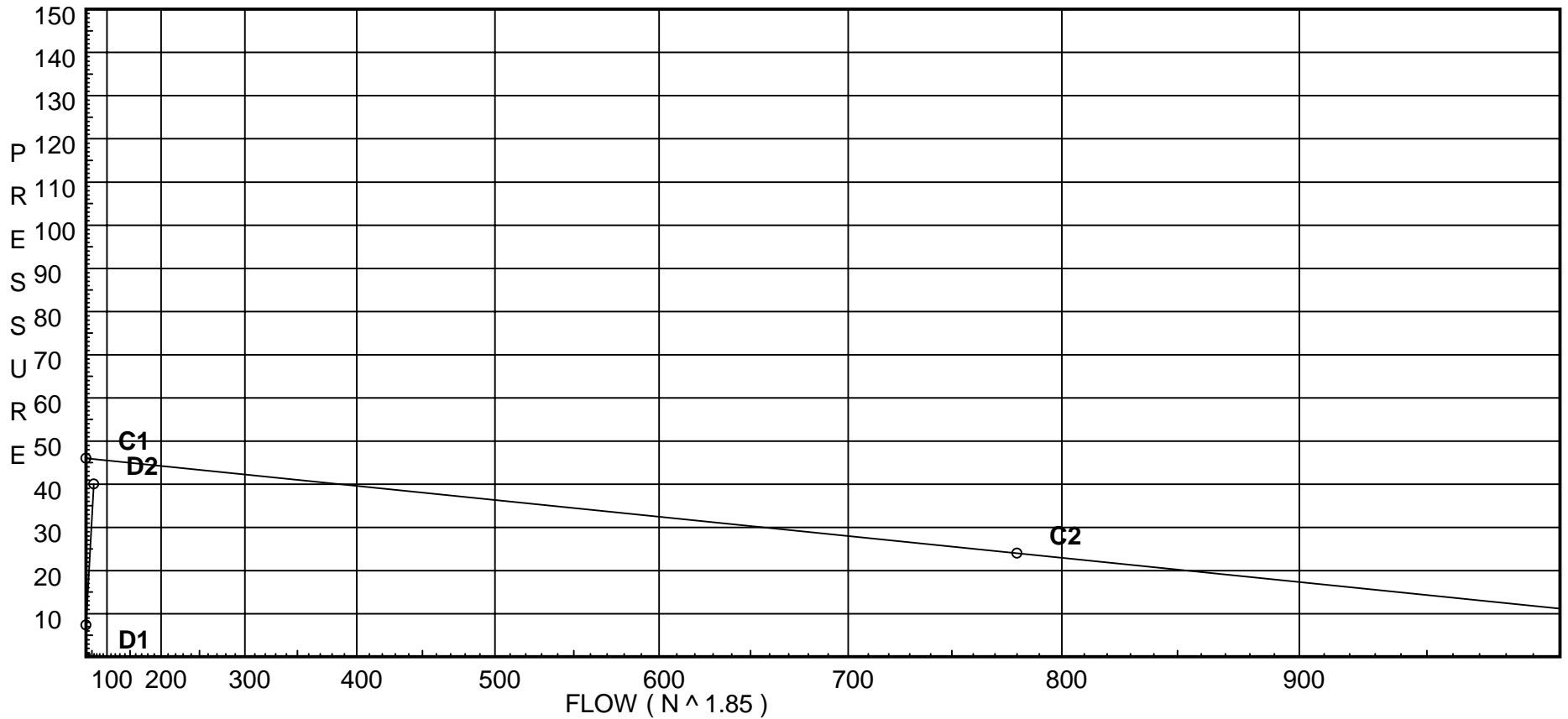
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City Water Supply:

C1 - Static Pressure : 46
C2 - Residual Pressure: 24
C2 - Residual Flow : 780

Demand:

D1 - Elevation : 7.363
D2 - System Flow : 58.6947
D2 - System Pressure : 40.068
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 58.6947
Safety Margin : 5.749



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

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
401	17.0	4.4	20.79	na	20.06	0.05	0.001	18.6
44	17.0		22.6	na				
43	17.0		22.91	na				
403	17.0	4.4	18.6	na	18.98	0.05	0.001	18.6
402	17.0	4.4	19.96	na	19.66	0.05	0.001	18.6
42	17.0		21.56	na				
41	17.0		22.16	na				
40	17.0		23.08	na				
31	17.0		23.87	na				
30	4.5		29.82	na				
5	4.5		30.38	na				
4	4.5		31.83	na				
3	4.5		31.95	na				
2	4.5		32.31	na				
1	0.0		38.47	na				
0	0.0		40.05	na				
TEST	0.0		40.07	na				

The maximum velocity is 8.47 and it occurs in the pipe between nodes 40 and 31

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 *****
401 to 44	20.06 20.06	1.049 120 0.1309	2E 4.0 1T 5.0	4.830 9.000 13.830	20.789 0.0 1.810		K Factor = 4.40 Vel = 7.45
44 to 43	0.0 20.06	1.38 120 0.0345	1T 6.0	3.166 6.000 9.166	22.599 0.0 0.316		Vel = 4.30
43 to 40	0.0 20.06	1.61 120 0.0162	1T 8.0	2.330 8.000 10.330	22.915 0.0 0.167		Vel = 3.16
	0.0 20.06					23.082	K Factor = 4.18
403 to 402	18.98 18.98	1.049 120 0.1181	2E 4.0 1T 5.0	2.500 9.000 11.500	18.600 0.0 1.358		K Factor = 4.40 Vel = 7.05
402 to 42	19.65 38.63	1.38 120 0.1157	1T 6.0	7.830 6.000 13.830	19.958 0.0 1.600		K Factor = 4.40 Vel = 8.29
42 to 41	0.0 38.63	1.61 120 0.0546	1E 4.0	7.000 4.000 11.000	21.558 0.0 0.601		Vel = 6.09
41 to 40	0.0 38.63	1.61 120 0.0546		16.916 0.0 16.916	22.159 0.0 0.923		Vel = 6.09
40 to 31	20.06 58.69	1.682 120 0.0958	1E 4.95	3.330 4.950 8.280	23.082 0.0 0.793		Vel = 8.47
31 to 30	0.0 58.69	2.157 120 0.0285	1E 6.153	12.500 6.153 18.653	23.875 5.414 0.531		Vel = 5.15
30 to 5	0.0 58.69	2.157 120 0.0285		19.500 0.0 19.500	29.820 0.0 0.555		Vel = 5.15
5 to 4	0.0 58.69	2.157 120 0.0285	1E 6.153 1T 12.307	32.458 18.460 50.918	30.375 0.0 1.451		Vel = 5.15
4 to 3	0.0 58.69	2.157 120 0.0286		4.330 0.0 4.330	31.826 0.0 0.124		Vel = 5.15
3 to 2	0.0 58.69	2.157 120 0.0284	1E 6.153	6.330 6.153 12.483	31.950 0.0 0.355		Vel = 5.15
2 to 1	0.0 58.69	2.157 120 0.0285		7.500 0.0 7.500	32.305 5.949 0.214		* Fixed loss = 4 Vel = 5.15

Final Calculations - Standard

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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 *****
1 to 0	0.0 58.69	2.009 140 0.0303	3E 0.0	17.368 0.0 17.368	35.000 0.0 17.368	38.468 0.0 0.0	Vel = 5.94
0 to TEST	0.0 58.69	8.27 140 0.0	1T 0.0	55.354 0.0 55.354	400.000 0.0 55.354	40.054 0.0 0.014	Vel = 0.35
	0.0 58.69					40.068	K Factor = 9.27