

. . . 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 HC2
Building : 191 PINE STREET
Location : PORTLAND, MAINE 04104
System : #1 AREA #2
Contract :
Data File : 191 PINE STREET PORTLAND HC2.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 #2
Contractor - Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-4
Construction: (X) Combustible () Non-Combustible Ceiling Height VARIES
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 - 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 - Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make TYCO Model LFII
I Elevation at Highest Outlet - 52'-0"Feet Size 1/2" K-Factor 4.4
G Note: Temperature Rating 155
N

Calculation Gpm Required 28.556 Psi Required 38.935 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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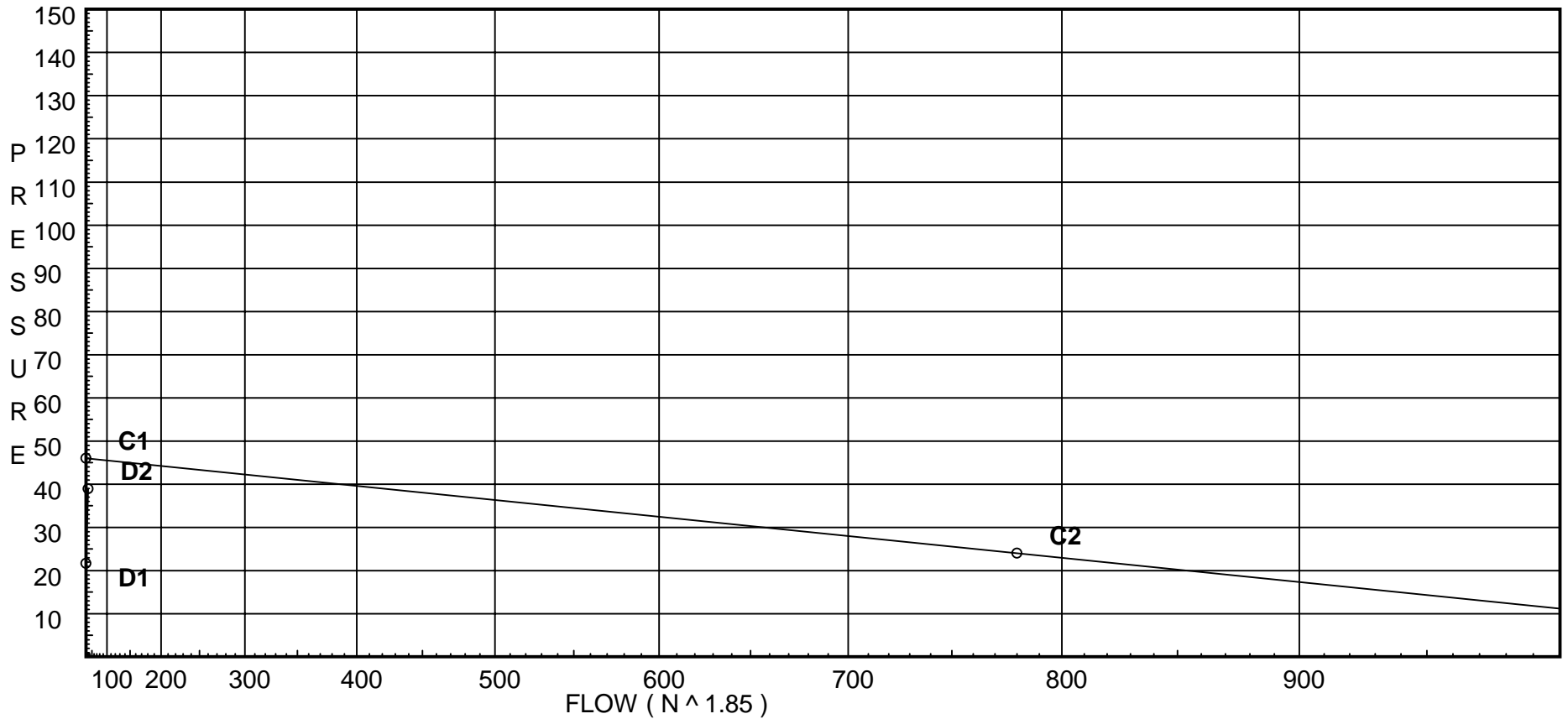
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City Water Supply:

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

Demand:

D1 - Elevation : 21.655
D2 - System Flow : 28.5555
D2 - System Pressure : 38.935
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 28.5555
Safety Margin : 7.016



Fittings Used Summary

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Fitting Legend		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	
Abbrev.	Name																					
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.
202	50.0	4.4	10.1	na	13.98	0.05	0.001	10.1
21	50.0		10.77	na				
201	50.0	4.4	10.97	na	14.57	0.05	0.001	10.1
20	50.0		11.15	na				
6	50.0		11.88	na				
5	4.5		32.0	na				
4	4.5		32.38	na				
3	4.5		32.41	na				
2	4.5		32.51	na				
1	0.0		38.51	na				
0	0.0		38.93	na				
TEST	0.0		38.94	na				

The maximum velocity is 5.19 and it occurs in the pipe between nodes 202 and 21

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	*****
202	13.98	1.049	1E 2.0	3.000	10.100			K Factor = 4.40	
to		120	1T 5.0	7.000	0.0				
21	13.98	0.0671		10.000	0.671			Vel = 5.19	
21	0.0	1.38	1T 6.0	5.166	10.771				
to		120		0.0	6.000	0.0			
201	13.98	0.0176		11.166	0.197			Vel = 3.00	
201	14.58	1.61	1E 4.0	1.830	10.968			K Factor = 4.40	
to		120		0.0	4.000	0.0			
20	28.56	0.0312		5.830	0.182			Vel = 4.50	
20	0.0	1.61	1T 8.0	15.250	11.150				
to		120		0.0	8.000	0.0			
6	28.56	0.0312		23.250	0.726			Vel = 4.50	
6	0.0	2.003	1T 12.965	45.500	11.876				
to		150		0.0	12.965	19.706			
5	28.56	0.0071		58.465	0.417			Vel = 2.91	
5	0.0	2.157	1E 6.153	32.458	31.999				
to		120	1T 12.307	18.460	0.0				
4	28.56	0.0075		50.918	0.383			Vel = 2.51	
4	0.0	2.157		0.0	4.330	32.382			
to		120		0.0	0.0	0.0			
3	28.56	0.0074		4.330	0.032			Vel = 2.51	
3	0.0	2.157	1E 6.153	6.330	32.414				
to		120		0.0	6.153	0.0			
2	28.56	0.0075		12.483	0.094			Vel = 2.51	
2	0.0	2.157		0.0	7.500	32.508			
to		120		0.0	0.0	5.949		* Fixed loss = 4	
1	28.56	0.0075		7.500	0.056			Vel = 2.51	
1	0.0	2.009	3E 17.368	35.000	38.513				
to		140		0.0	17.368	0.0			
0	28.56	0.0080		52.368	0.419			Vel = 2.89	
0	0.0	8.27	1T 55.354	400.000	38.932				
to		140		0.0	55.354	0.0			
TEST	28.56	0.0		455.354	0.003			Vel = 0.17	
	0.0								
	28.56				38.935			K Factor = 4.58	