



. . . Fire Protection by Computer Design

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

Job Name : OAK STREET LOFTS HC3
Building : 72 OAK STREET
Location : PORTLAND, MAINE 04101
System : #1 AREA #3
Contract :
Data File : OAK STREET LOFTS HC3.WXF

Hydraulic Design Information Sheet

Name - OAK STREET LOFTS Date - 6/14/11
Location - PORTLAND, MAINE 04101
Building - 72 OAK STREET System No. - #1 AREA #3
Contractor - Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-2
Construction: (X) Combustible () Non-Combustible Ceiling Height - 8'-0"
Occupancy - APARTMENT COMMON AREA

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	- 731	System Type	Sprinkler/Nozzle
	Density	- .10	(X) Wet	Make TYCO
D	Area Per Sprinkler	- 130	() Dry	Model TY-FRB
E	Elevation at Highest Outlet	- 23'-4"	() 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 - 93.691 Press Required - 58.344 At Test
Summary C-Factor Used: 150 Overhead 140 Underground

W Water Flow Test:

Pump Data:

Tank or Reservoir:

A Date of Test - 5/7/10

Cap. -

T Time of Test -

Rated Cap.-

Elev.-

E Static Press - 66

@ Press -

R Residual Press - 62

Elev. -

Well

Flow - 1186

Proof Flow

S Elevation - 0

U

P Location -

P

L Source of Information - PORTLAND WATER DISTRICT

Y

Water Supply Curve (C)

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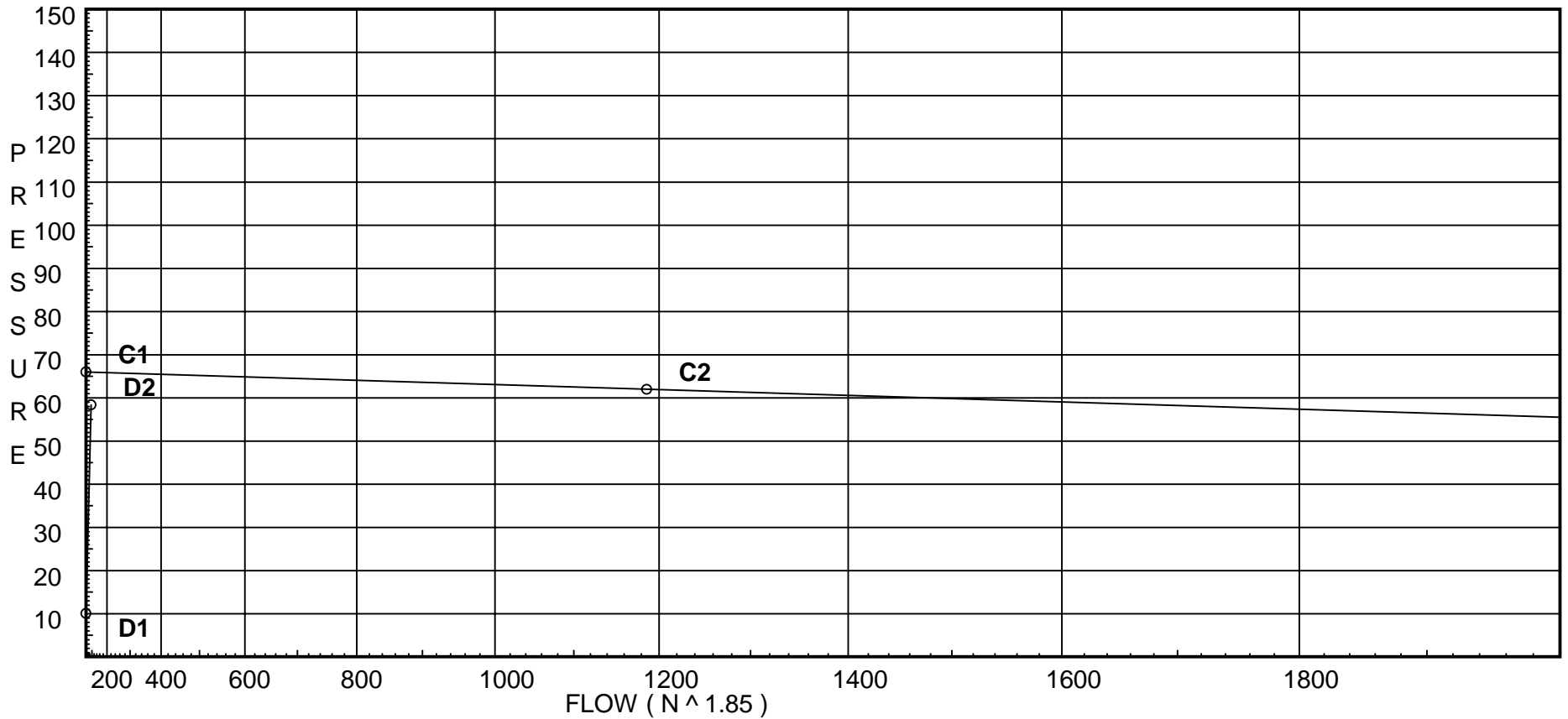
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City Water Supply:

C1 - Static Pressure : 66
C2 - Residual Pressure: 62
C2 - Residual Flow : 1186

Demand:

D1 - Elevation : 10.070
D2 - System Flow : 93.6906
D2 - System Pressure : 58.344
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 93.6906
Safety Margin : 7.620



Fittings Used Summary

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Fitting Legend																					
Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
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.
301	23.25	5.6	8.33	na	16.17	0.1	130	7.0
302	23.25	5.6	7.12	na	14.94	0.1	130	7.0
303	23.25	5.6	7.0	na	14.82	0.1	130	7.0
39	23.25		7.54	na				
38	23.25		8.82	na				
37	23.25		15.7	na				
304	23.25	5.6	9.01	na	16.81	0.1	130	7.0
305	23.25	5.6	7.71	na	15.54	0.1	130	7.0
306	23.25	5.6	7.58	na	15.41	0.1	130	7.0
36	23.25		8.16	na				
35	23.25		9.53	na				
34	23.25		24.81	na				
33	23.25		25.48	na				
32	23.25		29.37	na				
31	23.25		37.31	na				
30	23.25		40.92	na				
6	12.76		46.64	na				
5	12.76		47.52	na				
4	12.76		50.26	na				
3	4.42		53.96	na				
2	4.42		54.03	na				
1	0.0		58.2	na				
TEST	0.0		58.34	na				

The maximum velocity is 16.1 and it occurs in the pipe between nodes 35 and 34

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 *****
301 to 38	16.17	1.101 150	1T	9.563 0.0	1.000 9.562	8.333 0.0	K Factor = 5.60
	16.17	0.0458		0.0	10.562	0.484	Vel = 5.45
	0.0						
	16.17					8.817	K Factor = 5.45
302 to 39	14.94	1.101 150	1T	9.563 0.0	1.000 9.562	7.121 0.0	K Factor = 5.60
	14.94	0.0397		0.0	10.562	0.419	Vel = 5.03
	0.0						
	14.94					7.540	K Factor = 5.44
303 to 39	14.82	1.101 150	1E	3.825 0.0	10.000 3.825	7.000 0.0	K Factor = 5.60
	14.82	0.0391		0.0	13.825	0.540	Vel = 4.99
39 to 38	14.94	1.101 150		0.0 0.0	9.000 0.0	7.540 0.0	
	29.76	0.1419		0.0	9.000	1.277	Vel = 10.03
38 to 37	16.16	1.101 150	1E 1T	3.825 9.563	8.330 13.387	8.817 0.0	
	45.92	0.3167		0.0	21.717	6.878	Vel = 15.47
37 to 33	0.0	1.101 150	1T	9.563 0.0	21.330 9.562	15.695 0.0	
	45.92	0.3167		0.0	30.892	9.784	Vel = 15.47
	0.0						
	45.92					25.479	K Factor = 9.10
304 to 35	16.81	1.101 150	1T	9.563 0.0	1.000 9.562	9.009 0.0	K Factor = 5.60
	16.81	0.0493		0.0	10.562	0.521	Vel = 5.66
	0.0						
	16.81					9.530	K Factor = 5.45
305 to 36	15.54	1.101 150	1T	9.563 0.0	1.000 9.562	7.705 0.0	K Factor = 5.60
	15.54	0.0427		0.0	10.562	0.451	Vel = 5.24
	0.0						
	15.54					8.156	K Factor = 5.44
306 to 36	15.41	1.101 150	1E	3.825 0.0	10.000 3.825	7.575 0.0	K Factor = 5.60
	15.41	0.0420		0.0	13.825	0.581	Vel = 5.19
36 to 35	15.55	1.101 150		0.0 0.0	9.000 0.0	8.156 0.0	
	30.96	0.1527		0.0	9.000	1.374	Vel = 10.43
35 to 34	16.81	1.101 150	2E 1T	7.65 9.563	27.660 17.212	9.530 0.0	
	47.77	0.3406		0.0	44.872	15.283	Vel = 16.10

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	*****
34	0.0	1.598		12.000	24.813				
to		150		0.0	0.0				
33	47.77	0.0555		12.000	0.666		Vel =	7.64	
33	45.92	1.598	1T	11.656	8.500	25.479			
to		150		0.0	11.656	0.0			
32	93.69	0.1930		0.0	20.156	3.890	Vel =	14.99	
32	0.0	1.598	1E	5.828	35.330	29.369			
to		150		0.0	5.828	0.0			
31	93.69	0.1930		0.0	41.158	7.944	Vel =	14.99	
31	0.0	2.003	1E	6.482	18.500	37.313			
to		150		0.0	6.482	2.000		* Fixed loss = 2	
30	93.69	0.0642		0.0	24.982	1.605	Vel =	9.54	
30	0.0	2.157	1E	6.153	11.250	40.918			
to		120		0.0	6.153	4.543			
6	93.69	0.0677		0.0	17.403	1.178	Vel =	8.23	
6	0.0	2.157	1T	12.307	0.750	46.639			
to		120		0.0	12.307	0.0			
5	93.69	0.0677		0.0	13.057	0.884	Vel =	8.23	
5	0.0	2.157	3E	18.46	22.000	47.523			
to		120		0.0	18.460	0.0			
4	93.69	0.0677		0.0	40.460	2.738	Vel =	8.23	
4	0.0	4.26	1E	13.167	8.250	50.261			
to		120	1B	15.8	28.967	3.612			
3	93.69	0.0025		0.0	37.217	0.092	Vel =	2.11	
3	0.0	4.26	1T	26.334	2.000	53.965			
to		120		0.0	26.334	0.0			
2	93.69	0.0024		0.0	28.334	0.069	Vel =	2.11	
2	0.0	4.026	1Zac	0.0	3.420	54.034			
to		120		0.0	0.0	4.154		* Fixed loss = 2.24	
1	93.69	0.0035		0.0	3.420	0.012	Vel =	2.36	
1	0.0	4.1	1E	14.534	50.000	58.200			
to		140		0.0	14.534	0.0			
TEST	93.69	0.0022		0.0	64.534	0.144	Vel =	2.28	
	0.0								
	93.69				58.344		K Factor =	12.27	