

. . . Fire Protection by Computer Design

FREEDOM FIRE PROTECTION
77 BROWN ROAD
POLAND, MAINE 04274
(207) 998-9474

Job Name : GRISANTI CONDOMINIUMS HC1
Drawing : 60 MUNJOY STREET
Location : PORTLAND, MAINE 04101
Remote Area : #1 AREA #1
Contract :
Data File : GRISANTI CONDOMINIUMS HC1.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - GRISANTI CONDOMINIUMS Date - 10/20/17
Location - PORTLAND, MAINE 04101
Building - 60 MUNJOY STREET System No. - #1 AREA #1
Contractor - FREEDOM FIRE PROTECTION Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-3
Construction: (X) Combustible () Non-Combustible Ceiling Height 8'-6"
OCCUPANCY - CONDOMINIUMS

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 - 34.5 Feet Size 1/2" K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 59.202 Psi Required 50.493 At Test
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 5/25/2017 Rated Cap. Cap.
T Time of Test - @ Psi Elev.
E Static (Psi) - 57 Elev.
R Residual (Psi) - 54 Other Well
Flow (Gpm) - 1198 Proof Flow Gpm
S Elevation -

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

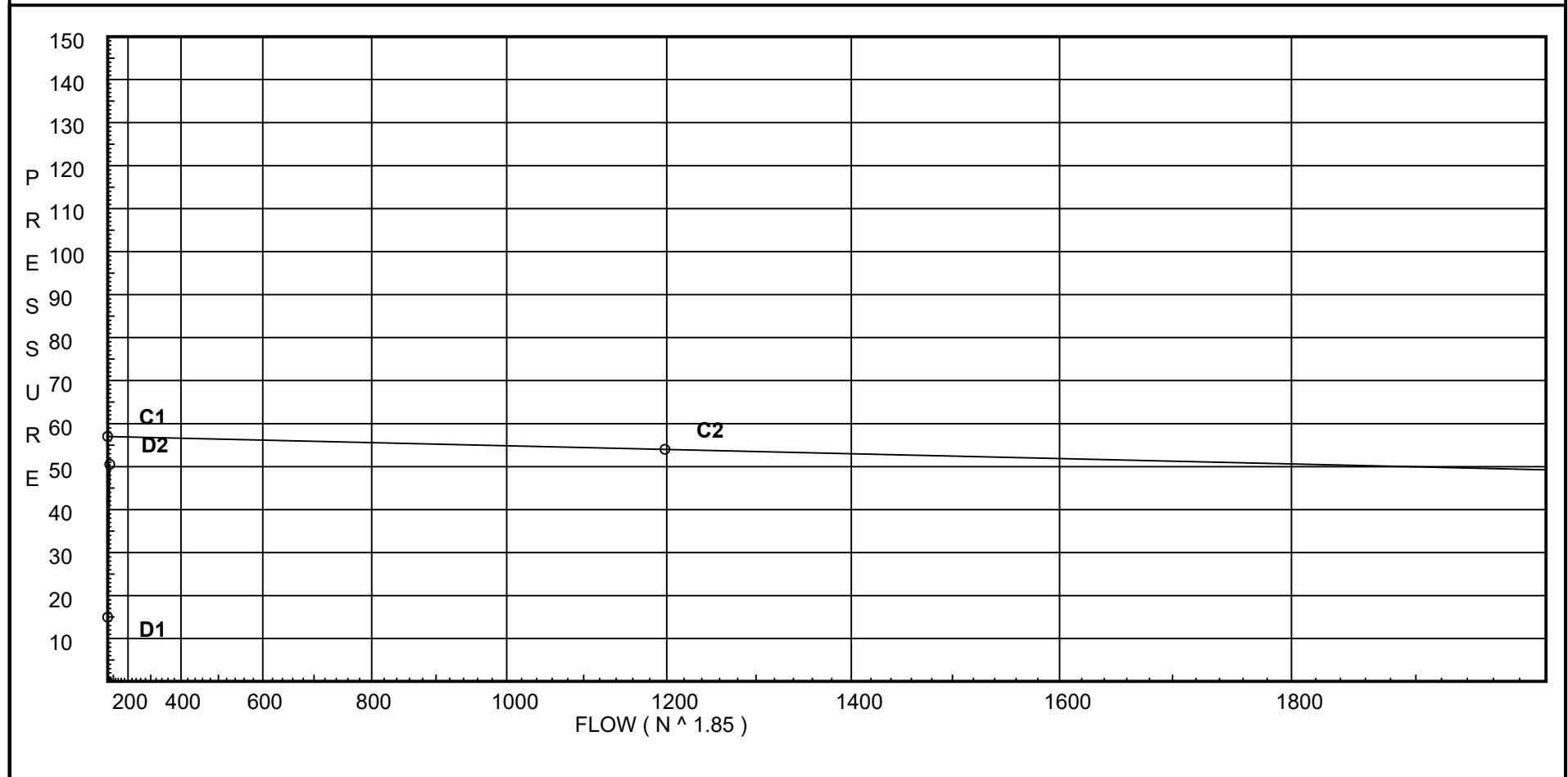
Water Supply Curve C

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City Water Supply:
C1 - Static Pressure : 57
C2 - Residual Pressure: 54
C2 - Residual Flow : 1198

Demand:
D1 - Elevation : 14.942
D2 - System Flow : 59.202
D2 - System Pressure : 50.493
Hose (Demand) : _____
D3 - System Demand : 59.202
Safety Margin : 6.495



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	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
T	NFPA 13 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																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
101	34.5	4.4	18.85	na	19.1	0.05	0.001	10.1
13	34.5		19.5	na				
12	5.166		34.63	na				
11	5.166		35.38	na				
10	5.166		35.84	na				
102	34.5	4.9	7.9	na	13.77	0.05	256	7.0
104	34.5	4.9	7.0	na	12.96	0.05	256	7.0
103	34.5	4.9	7.44	na	13.37	0.05	256	7.0
9	34.5		8.42	na				
8	34.5		12.52	na				
7	24.166		19.54	na				
6	5.166		33.4	na				
5	5.166		34.35	na				
4	5.166		36.08	na				
3	5.166		38.42	na				
2	5.166		40.64	na				
1	0.0		48.97	na				
0	0.0		49.62	na				
TEST	0.0		50.49	na				

The maximum velocity is 13.51 and it occurs in the pipe between nodes 9 and 8

Final Calculations - Hazen-Williams - 2007

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
101 to 13	34.500 34.500	4.40	19.10 19.1	1 1.101	T	9.563 0.0	0.830 9.562	150	18.847 0.0			
						0.0	10.392	0.0625	0.650	Vel =	6.44	
13 to 12	34.500 5.166		0.0 19.1	1 1.101	T	9.563 0.0	29.330 9.562	150	19.497 12.705			
						0.0	38.892	0.0625	2.430	Vel =	6.44	
12 to 11	5.166 5.166		0.0 19.1	1 1.049	T	5.0 0.0	1.250 5.000	120	34.632 0.0			
						0.0	6.250	0.1195	0.747	Vel =	7.09	
11 to 10	5.166 5.166		0.0 19.1	1.25 1.38	T	6.0 0.0	8.660 6.000	120	35.379 0.0			
						0.0	14.660	0.0314	0.461	Vel =	4.10	
10 to 4	5.166 5.166		0.0 19.1	1.25 1.38	T	6.0 0.0	1.660 6.000	120	35.840 0.0			
						0.0	7.660	0.0315	0.241	Vel =	4.10	
4			0.0 19.10						36.081	K Factor =	3.18	
102 to 9	34.500 34.500	4.90	13.77 13.77	1 1.101	T	9.563 0.0	5.750 9.562	150	7.897 0.0			
						0.0	15.312	0.0342	0.523	Vel =	4.64	
9			0.0 13.77						8.420	K Factor =	4.75	
104 to 103	34.500 34.500	4.90	12.96 12.96	1 1.101		0.0 0.0	14.416 0.0	150	7.000 0.0			
						0.0	14.416	0.0305	0.440	Vel =	4.37	
103 to 9	34.500 34.500	4.90	13.37 26.33	1 1.101		0.0 0.0	8.660 8.660	150	7.440 0.0			
						0.0	8.660	0.1132	0.980	Vel =	8.87	
9 to 8	34.500 34.500		13.77 40.1	1 1.101	T	9.563 0.0	7.083 9.562	150	8.420 0.0			
						0.0	16.645	0.2464	4.101	Vel =	13.51	
8 to 7	34.500 24.166		0.0 40.1	1 1.101		0.0 0.0	10.330 0.0	150	12.521 4.476			
						0.0	10.330	0.2465	2.546	Vel =	13.51	
7 to 6	24.166 5.166		0.0 40.1	1 1.101	E	3.825 0.0	19.000 3.825	150	19.543 8.229			
						0.0	22.825	0.2464	5.624	Vel =	13.51	
6 to 5	5.166 5.166		0.0 40.1	1.25 1.38	T	6.0 0.0	1.660 6.000	120	33.396 0.0			
						0.0	7.660	0.1239	0.949	Vel =	8.60	
5 to 4	5.166 5.166		0.0 40.1	1.25 1.38		0.0 0.0	14.000 0.0	120	34.345 0.0			
						0.0	14.000	0.1240	1.736	Vel =	8.60	
4 to 3	5.166 5.166		19.10 59.2	1.25 1.38	T	6.0 0.0	3.166 9.166	120	36.081 0.0			
						0.0	9.166	0.2549	2.336	Vel =	12.70	
3 to 2	5.166 5.166		0.0 59.2	1.5 1.61	E	4.0 0.0	14.500 4.000	120	38.417 0.0			
						0.0	18.500	0.1203	2.225	Vel =	9.33	

Final Calculations - Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv. Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
2 to 1	5.166 0		0.0 59.2	1.5 1.61	Zaa E	0.0 4.0 0.0	5.166 4.000 9.166	120 7.223 1.102		** Fixed Loss = 4.985 Vel = 9.33	
1 to 0	0 0		0.0 59.2	2 1.739		0.0 0.0 0.0	12.000 0.0 12.000	150 0.0 0.657		Vel = 8.00	
0 to TEST	0 0		0.0 59.2	2 1.959		0.0 0.0 0.0	25.000 0.0 25.000	140 0.0 0.869		Vel = 6.30	
TEST			0.0 59.20					50.493		K Factor = 8.33	