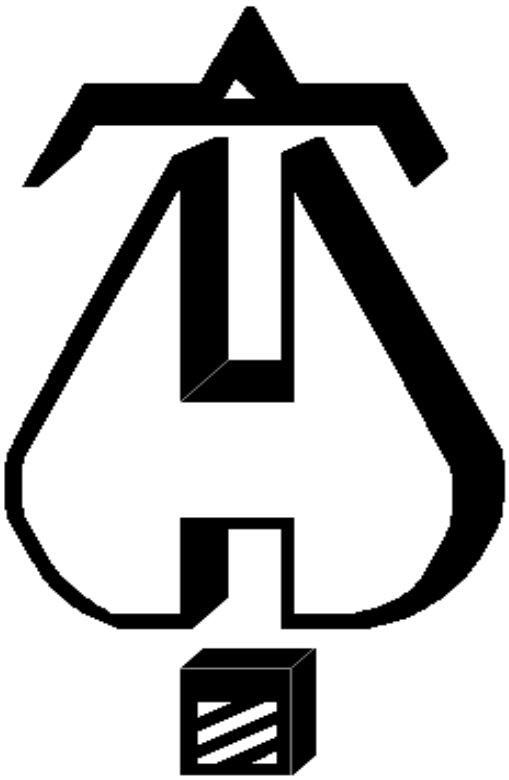


. . . Fire Protection by Computer Design

High Tech Fire Protection
PO Box 156
Minot, ME 04258
(207) 998-2551

Job Name	:	Second Floor Calc.
Building	:	42 Lafayette Street
Location	:	42 Lafayette Street
System	:	NFPA 13R
Contract	:	NA
Data File	:	Second Floor Calc.wxf

HYDRAULIC DESIGN INFORMATION SHEET

Name - Second Floor Calc. Date - 08/31/2017
Location - 42 Lafayette Street
Building - 42 Lafayette Street System No. - NFPA 13R
Contractor - High Tech Fire Protection Contract No. - NA
Calculated By - Jeremy A Foss Drawing No. - FP-1.1
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8'-0"
OCCUPANCY - Residential - Apartlment

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 14 Gpm System Type
Listed Pres. at Start Point - 10.2 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16' x 16' ( ) Deluge ( ) PreAction
Domestic Flow Added - Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make Reliable Model F1Res 44
Elevation at Highest Outlet - 26 Feet Size 1/2" K-Factor 4.4
Note: Temperature Rating 155

Calculation Summary — Gpm Required 57 | Psi Required 44 | At Test
C-Factor Used: Overhead 150 | Underground 150

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 06/09/2017	Rated Cap.	Cap.
Time of Test -	@ Psi	Elev.
Static (Psi) - 51	Elev.	
Residual (Psi) - 48	Other	Well
Flow (Gpm) - 838		Proof Flow Gpm
Elevation - -6		

Location: Test Hydrant Located on Congress Street - 800' from Site

Source of Information: Portland Water District

Water Supply Curve (C)

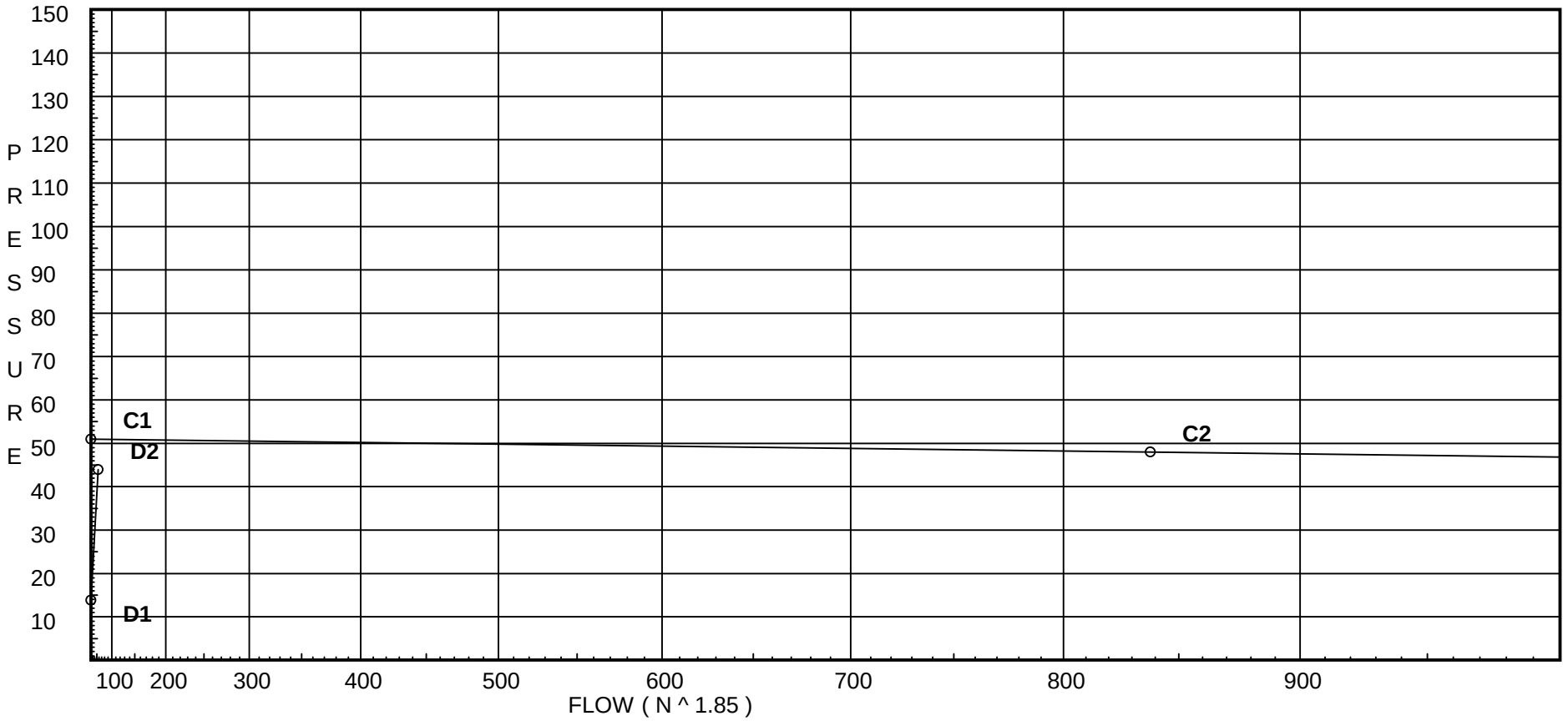
High Tech Fire Protection
Second Floor Calc.

Date 08/31/2017

City Water Supply:
- C1 - Static Pressure : 51
- C2 - Residual Pressure: 48
- C2 - Residual Flow : 838

Demand:

D1 - Elevation	:	13.859
D2 - System Flow	:	56.883
D2 - System Pressure	:	43.954
Hose (Demand)	:	
D3 - System Demand	:	56.883
Safety Margin	:	7.025



Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
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
V	90' Ell Firelock #001	0	0	0	0	3.5	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
Zik	Wilkins 950XL	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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
401	26.0	4.4	10.2	na	14.05	0.05	196	10.2
402	26.0	4.4	10.5	na	14.26	0.05	196	10.2
403	26.0	4.4	10.67	na	14.37	0.05	196	10.2
B1	26.0		10.88	na				
404	26.0	4.4	10.42	na	14.2	0.05	196	10.2
B2	26.0		10.96	na				
B3	26.0		14.3	na				
B4	26.0		19.9	na				
WF1	6.0		29.21	na				
TOR	6.0		30.22	na				
BOR	1.0		38.94	na				
H1	0.0		41.32	na				
H2	-3.0		42.65	na				
H3	-6.0		43.95	na				
TEST	-6.0		43.95	na				

The maximum velocity is 9.1 and it occurs in the pipe between nodes B2 and B3

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	14.05	1.101	1N	7.0	1.400	10.200		K Factor = 4.40
to		150.0		0.0	7.000	0.0		
402	14.05	0.0355		0.0	8.400	0.298		Vel = 4.73
402	14.26	1.394		0.0	9.300	10.498		K Factor = 4.40
to		150.0		0.0	0.0	0.0		
B1	28.31	0.0410		0.0	9.300	0.381		Vel = 5.95
	0.0							
	28.31					10.879		K Factor = 8.58
403	14.37	1.101	1O	5.0	0.700	10.668		K Factor = 4.40
to		150.0		0.0	5.000	0.0		
B1	14.37	0.0370		0.0	5.700	0.211		Vel = 4.84
B1	28.31	1.394		0.0	0.900	10.879		
to		150.0		0.0	0.0	0.0		
B2	42.68	0.0878		0.0	0.900	0.079		Vel = 8.97
	0.0							
	42.68					10.958		K Factor = 12.89
404	14.20	1.101	1O	5.0	9.900	10.420		K Factor = 4.40
to		150.0		0.0	5.000	0.0		
B2	14.2	0.0361		0.0	14.900	0.538		Vel = 4.79
B2	42.68	1.598	1N	9.0	34.600	10.958		
to		150.0		0.0	9.000	0.0		
B3	56.88	0.0767		0.0	43.600	3.343		Vel = 9.10
B3	0.0	1.682	1Fsp	0.0	6.500	14.301		
to		120.0	1G	1.237	22.274	3.000		* Fixed loss = 3
B4	56.88	0.0903	1S	11.137	28.774	2.598		Vel = 8.21
			1T	9.9				
B4	0.0	2.157	1V	4.307	20.000	19.899		
to		120.0		0.0	4.307	8.662		
WF1	56.88	0.0269		0.0	24.307	0.653		Vel = 4.99
WF1	0.0	2.157	1E	6.153	18.900	29.214		
to		120.0	1T	12.307	18.460	0.0		
TOR	56.88	0.0269		0.0	37.360	1.005		Vel = 4.99
TOR	0.0	2.157	1Zik	0.0	5.000	30.219		
to		120.0	1E	6.153	6.153	8.421		* Fixed loss = 6.255
BOR	56.88	0.0268		0.0	11.153	0.299		Vel = 4.99
BOR	0.0	1.917	1G	1.047	50.000	38.939		
to		150.0	1T	10.47	11.517	0.433		
H1	56.88	0.0316		0.0	61.517	1.944		Vel = 6.32
H1	0.0	8.23	1T	29.011	525.000	41.316		
to		100.0		0.0	29.010	1.299		
H2	56.88	0.0001		0.0	554.010	0.031		Vel = 0.34
H2	0.0	12.24	1T	48.362	275.000	42.646		
to		100.0		0.0	48.362	1.299		
H3	56.88	0.0		0.0	323.362	0.003		Vel = 0.16
H3	0.0	6.14	1E	10.608	15.000	43.948		
to		100.0	1G	2.273	12.881	0.0		
TEST	56.88	0.0002		0.0	27.881	0.006		Vel = 0.62

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
	0.0									
	56.88					43.954		K Factor =	8.58	