



**... Fire Protection by Computer Design**

High Tech Fire Protection  
84 Hackett Mills Road Poland  
P.O. Box 154 Minot, ME  
Poland, ME 04274  
207-998-2551

Job Name : 3RD FLOOR SHALOM HOUSE  
Building : Shalom House  
Location : 503 Woodford Street Portland  
System : zone 2  
Contract :  
Data File : 3rd floor.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - Shalom House 3rd Floor HSW Date - 9/13/13  
Location - 503 Woodford Street Portland  
Building - Shalom House System No. - zone 2  
Contractor - High Tech Fire Protection Contract No. -  
Calculated By - Ed Poulin Drawing No. - FP-01  
Construction: (x) Combustible ( ) Non-Combustible Ceiling Height 8'  
OCCUPANCY - Residential 13R

S Type of Calculation: ( )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 - 16 Gpm System Type  
Listed Pres. at Start Point - 13.2 Psi (x) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction  
E Domestic Flow Added - na Gpm Sprinkler or Nozzle  
S Additional Flow Added - na Gpm Make GLOBE Model GL4431  
I Elevation at Highest Outlet - 34 Feet Size 1/2" K-Factor 4.4  
G Note: Temperature Rating 155  
N

Calculation Gpm Required 67 Psi Required 76 At Test  
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 9-14-13 Rated Cap. Cap.  
T Time of Test - 8:30 am @ Psi Elev.  
E Static (Psi) - 84 Elev.  
R Residual (Psi) - 82 Other Well  
Flow (Gpm) - 1186 Proof Flow Gpm  
S Elevation - 5

P Location: Test Hydrant # 01978 on Woodford Street

P  
L Source of Information: Portland Water District  
Y

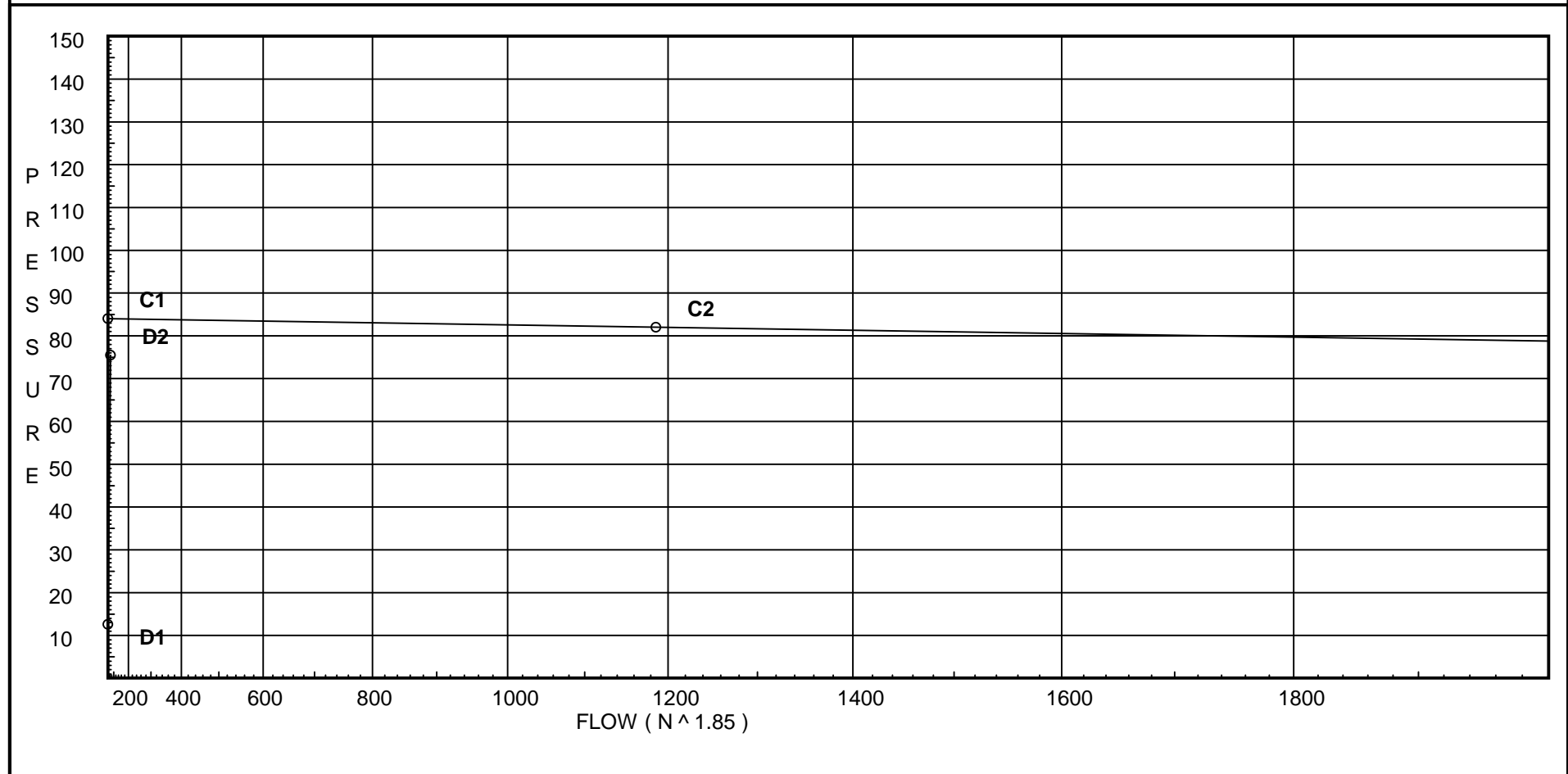
# Water Supply Curve (C)

High Tech Fire Protection  
3RD FLOOR SHALOM HOUSE

Page 2  
Date 9/13/13

City Water Supply:  
C1 - Static Pressure : 84  
C2 - Residual Pressure: 82  
C2 - Residual Flow : 1186

Demand:  
D1 - Elevation : 12.560  
D2 - System Flow : 66.495  
D2 - System Pressure : 75.440  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 66.495  
Safety Margin : 8.550



# Fittings Used Summary

High Tech Fire Protection  
3RD FLOOR SHALOM HOUSE

Page 3  
Date 9/13/13

## 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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'El 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
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
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

High Tech Fire Protection  
3RD FLOOR SHALOM HOUSE

Page 4  
Date 9/13/13

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
50	34.0	4.4	14.85	na	16.96	0.05	256	13.2
60	34.0	4.4	15.22	na	17.16	0.05	256	13.2
70	34.0	4.4	13.2	na	15.99	0.05	256	13.2
71	34.0	4.4	13.87	na	16.39	0.05	256	13.2
51	26.5		18.86	na				
52	26.5		19.86	na				
53	26.0		20.45	na				
61	26.5		19.24	na				
62	26.5		20.13	na				
63	26.0		20.63	na				
72	26.0		19.82	na				
73	26.0		20.83	na				
AA	26.0		25.61	na				
AB	17.0		32.97	na				
AC	17.0		36.66	na				
AD	16.5		38.56	na				
AE	16.5		45.73	na				
AF	6.5		53.25	na				
AG	6.5		59.49	na				
BG	3.0		66.16	na				
BASE	0.0		73.73	na				
HOSE	0.0		77.6	na				
TEST	5.0		75.44	na				

The maximum velocity is 13.98 and it occurs in the pipe between nodes 73 and AA

# Final Calculations - Hazen-Williams

High Tech Fire Protection  
3RD FLOOR SHALOM HOUSE

Page 5  
Date 9/13/13

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
50 to 51	16.96	1.101 150.0 0.0501	1N	7.0 0.0 0.0	8.000 7.000 15.000	14.855 3.248 0.752			K Factor = 4.40 Vel = 5.72	
	0.0 16.96					18.855			K Factor = 3.91	
60 to 61	17.16	1.101 150.0 0.0513	1N	7.0 0.0 0.0	8.000 7.000 15.000	15.218 3.248 0.769			K Factor = 4.40 Vel = 5.78	
	0.0 17.16					19.235			K Factor = 3.91	
70 to 71	15.99	1.101 150.0 0.0450	1N 1O	7.0 5.0 0.0	2.900 12.000 14.900	13.200 0.0 0.670			K Factor = 4.40 Vel = 5.39	
71 to 72	16.38	1.101 150.0 0.1658	1N	7.0 0.0 0.0	8.000 7.000 15.000	13.870 3.465 2.487			K Factor = 4.40 Vel = 10.91	
	0.0 32.37					19.822			K Factor = 7.27	
51 to 52	16.96	1.101 150.0 0.0501	2N	14.0 0.0 0.0	6.000 14.000 20.000	18.855 0.0 1.003			Vel = 5.72	
52 to 53	0.0	1.101 150.0 0.0501	1N	7.0 0.0 0.0	0.500 7.000 7.500	19.858 0.217 0.376			Vel = 5.72	
53 to 63	0.0	1.101 150.0 0.0500		0.0 0.0 0.0	3.600 0.0 3.600	20.451 0.0 0.180			Vel = 5.72	
	0.0 16.96					20.631			K Factor = 3.73	
61 to 62	17.16	1.101 150.0 0.0513	1N 1O	7.0 5.0 0.0	5.500 12.000 17.500	19.235 0.0 0.897			Vel = 5.78	
62 to 63	0.0	1.101 150.0 0.0513	1O	5.0 0.0 0.0	0.500 5.000 5.500	20.132 0.217 0.282			Vel = 5.78	
63 to 73	16.96	1.394 150.0 0.0580		0.0 0.0 0.0	3.500 0.0 3.500	20.631 0.0 0.203			Vel = 7.17	
	0.0 34.12					20.834			K Factor = 7.48	
72 to 73	32.37	1.101 150.0 0.1659	1O	5.0 0.0 0.0	1.100 5.000 6.100	19.822 0.0 1.012			Vel = 10.91	
73 to AA	34.13	1.394 150.0 0.1990	1N	8.0 0.0 0.0	16.000 8.000 24.000	20.834 0.0 4.777			Vel = 13.98	
AA to AB	0.0	1.394 150.0 0.1991	1N	8.0 0.0 0.0	9.400 8.000 17.400	25.611 3.898 3.464			Vel = 13.98	

# Final Calculations - Hazen-Williams

High Tech Fire Protection  
3RD FLOOR SHALOM HOUSE

Page 6  
Date 9/13/13

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
AB to AC	0.0 66.5	1.394 150.0 0.1990	1N	8.0 0.0 0.0	10.500 8.000 18.500	32.973 0.0 3.682		Vel = 13.98		
AC to AD	0.0 66.5	1.394 150.0 0.1991	1N	8.0 0.0 0.0	0.500 8.000 8.500	36.655 0.217 1.692		Vel = 13.98		
AD to AE	0.0 66.5	1.394 150.0 0.1991	3N	24.0 0.0 0.0	12.000 24.000 36.000	38.564 0.0 7.166		Vel = 13.98		
AE to AF	0.0 66.5	1.394 150.0 0.1991	1N	8.0 0.0 0.0	8.000 8.000 16.000	45.730 4.331 3.185		Vel = 13.98		
AF to AG	0.0 66.5	1.682 120.0 0.1205	3E	14.849 0.0 0.0	37.000 14.849 51.849	53.246 0.0 6.248		Vel = 9.60		
AG to BG	0.0 66.5	1.682 120.0 0.1205	1E 1T 1Fsp	4.95 9.9 0.0	3.000 14.850 17.850	59.494 4.516 2.151		* Fixed loss = 3 Vel = 9.60		
BG to BASE	0.0 66.5	2.157 120.0 0.0360	1Zik	0.0 0.0 0.0	2.000 0.0 2.000	66.161 7.499 0.072		* Fixed loss = 6.2 Vel = 5.84		
BASE to HOSE	0.0 66.5	1.917 150.0 0.0422	1G 1E 1T	1.047 5.235 10.47	75.000 16.752 91.752	73.732 0.0 3.871		Vel = 7.39		
HOSE to TEST	0.0 66.5	12.46 140.0 0.0	1G 1E 1T	9.829 44.231 98.292	375.000 152.352 527.352	77.603 -2.166 0.003		Vel = 0.17		
	0.0 66.50					75.440		K Factor = 7.66		