HYDRAULIC DESIGN INFORMATION SHEET

Name - Shalom House
Date - 9-2-14
Location - 3rd Floor
Building -
System No. - 1 of 1
Contractor - Residential Fire Protection
Contract No. - C14021
Calculated By - JAL
Drawing No. - 2 of 2
Construction: (X) Combustible ( ) Non-Combustible
Ceiling Height 7'-0"
OCCUPANCY - Residential

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 - 13 Gpm
Listed Pres. at Start Point - 7 Psi
MAXIMUM LISTED SPACING 16 x 16
Domestic Flow Added - Gpm
Additional Flow Added - Gpm
Elevation at Highest Outlet - 33.25Feet
Note:Safety Margin: 14.776

System Type
(X) Wet ( ) Dry
( ) Deluge ( ) PreAction
Sprinkler or Nozzle
Make Viking Model VK486
Size 1/2" K-Factor 4.9
Temperature Rating 155

Calculation Summary: Gpm Required 52.516 Psi Required 55.156 At Test
C-Factor Used: Overhead 150 Underground 150

WATER SUPPLY

Water Flow Test:
Date of Test - 10-31-13
Time of Test -
Static (Psi) - 70
Residual (Psi) - 62
Flow (Gpm) - 691
Elevation - -20

Pump Data:
Rated Cap.
@ Psi
Elev.
Other

Tank or Reservoir:
Cap.
Elev.

Well
Proof Flow Gpm

Location:

Source of Information:

Water Supply Curve (C)

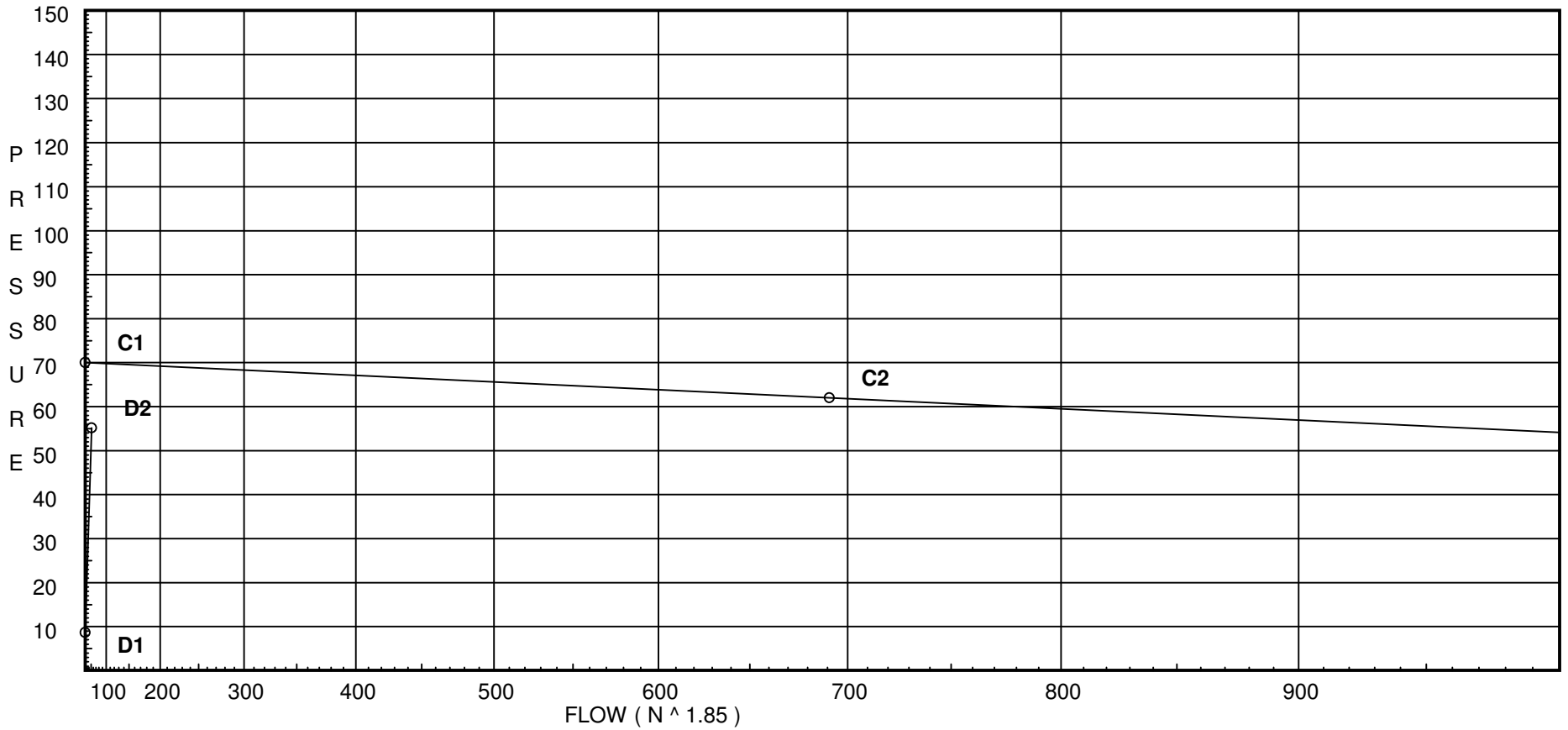
Residential Fire Protection
Shalom House 3rd floor unit

Date 9-2-14

City Water Supply:
- C1 - Static Pressure : 70
- C2 - Residual Pressure: 62
- C2 - Residual Flow : 691

Demand:

D1 - Elevation	:	8.662
D2 - System Flow	:	52.5157
D2 - System Pressure	:	55.156
Hose (Adj City)	:	_____
Hose (Demand)	:	_____
D3 - System Demand	:	52.5157
Safety Margin	:	14.776



Fittings Used Summary

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	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic 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'Ell Harvel-Spears	7	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	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zaa	Ames 2000B	Fitting generates a Fixed Loss Based on Flow																			

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	33.25	4.9	7.04	na	13.0	0.1	130	7.0
DP2	33.25	4.9	7.04	na	13.0	0.1	130	7.0
DP3	33.25	4.9	7.04	na	13.0	0.1	130	7.0
1	0.0	K = K @ DRP1	22.77	na	13.18			
1A	0.0		23.66	na				
2	0.0	K = K @ DRP1	22.15	na	13.0			
3	0.0	K = K @ DRP3	22.95	na	13.13			
4	0.0	K = K @ DRP1	22.86	na	13.21			
5	0.0		23.95	na				
6	0.0		24.16	na				
7	0.0		24.05	na				
8	0.0		24.04	na				
9	0.0		24.96	na				
10	0.0		25.48	na				
11	0.0		25.61	na				
20	0.0		25.82	na				
22	0.0		25.95	na				
21	0.0		26.36	na				
25	0.0		31.41	na				
26	0.0		36.19	na				
TR	0.0		37.87	na				
BR	0.0		43.84	na				
UG1	0.0		46.47	na				
TEST	-20.0		55.16	na				

The maximum velocity is 11.27 and it occurs in the pipe between nodes 21 and 25

Final Calculations - Hazen-Williams

Residential Fire Protection
Shalom House 3rd floor unit

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DP1	13.00	0.874	1N	7.0	0.500	7.039		K Factor = 4.90
to		150		0.0	7.000	14.401		
DRP1	13.0	0.0943		0.0	7.500	0.707		Vel = 6.95
	0.0							
	13.00					22.147		K Factor = 2.76
DP2	13.00	0.874	1O	3.0	0.500	7.039		K Factor = 4.90
to		150		0.0	3.000	14.401		
DRP2	13.0	0.0943		0.0	3.500	0.330		Vel = 6.95
	0.0							
	13.00					21.770		K Factor = 2.79
DP3	13.00	0.874	1N	7.0	1.350	7.039		K Factor = 4.90
to		150	1O	3.0	10.000	14.401		
DRP3	13.0	0.0944		0.0	11.350	1.071		Vel = 6.95
	0.0							
	13.00					22.511		K Factor = 2.74
1	13.18	0.874		0.0	9.210	22.772		K Factor @ node DRP1
to		150		0.0	0.0	0.0		
1A	13.18	0.0969		0.0	9.210	0.892		Vel = 7.05
1A	0.0	1.101	1O	5.0	4.080	23.664		
to		150		0.0	5.000	0.0		
5	13.18	0.0315		0.0	9.080	0.286		Vel = 4.44
	0.0							
	13.18					23.950		K Factor = 2.69
2	13.00	0.874		0.0	8.460	22.147		K Factor @ node DRP1
to		150		0.0	0.0	0.0		
3	13.0	0.0944		0.0	8.460	0.799		Vel = 6.95
3	13.13	1.101	1O	5.0	4.830	22.946		K Factor @ node DRP3
to		150		0.0	5.000	0.0		
8	26.13	0.1115		0.0	9.830	1.096		Vel = 8.81
	0.0							
	26.13					24.042		K Factor = 5.33
4	13.21	0.874	1O	3.0	9.170	22.863		K Factor @ node DRP1
to		150		0.0	3.000	0.0		
7	13.21	0.0973		0.0	12.170	1.184		Vel = 7.06
	0.0							
	13.21					24.047		K Factor = 2.69
5	13.18	1.101		0.0	6.650	23.950		
to		150		0.0	0.0	0.0		
6	13.18	0.0314		0.0	6.650	0.209		Vel = 4.44
6	-31.24	1.101		0.0	2.000	24.159		
to		150		0.0	0.0	0.0		
7	-18.06	-0.0560		0.0	2.000	-0.112		Vel = 6.09
7	13.20	1.101		0.0	0.850	24.047		
to		150		0.0	0.0	0.0		
8	-4.86	-0.0059		0.0	0.850	-0.005		Vel = 1.64
8	26.13	1.101		0.0	12.040	24.042		
to		150		0.0	0.0	0.0		
9	21.27	0.0762		0.0	12.040	0.918		Vel = 7.17

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							
	21.27					24.960		K Factor = 4.26
6	31.25	1.101		0.0	8.500	24.159		
to		150		0.0	0.0	0.0		
10	31.25	0.1554		0.0	8.500	1.321		Vel = 10.53
	0.0							
	31.25					25.480		K Factor = 6.19
9	21.27	1.101		0.0	8.500	24.960		
to		150		0.0	0.0	0.0		
11	21.27	0.0764		0.0	8.500	0.649		Vel = 7.17
	0.0							
	21.27					25.609		K Factor = 4.20
10	4.97	1.101	2O	10.0	14.900	25.480		
to		150		0.0	10.000	0.0		
11	4.97	0.0052		0.0	24.900	0.129		Vel = 1.67
	0.0							
	4.97					25.609		K Factor = 0.98
10	26.27	1.394		0.0	9.500	25.480		
to		150		0.0	0.0	0.0		
20	26.27	0.0357		0.0	9.500	0.339		Vel = 5.52
	0.0							
	26.27					25.819		K Factor = 5.17
11	26.24	1.394		0.0	9.500	25.609		
to		150		0.0	0.0	0.0		
22	26.24	0.0356		0.0	9.500	0.338		Vel = 5.52
	0.0							
	26.24					25.947		K Factor = 5.15
20	26.27	1.394	1O	6.0	9.250	25.819		
to		150		0.0	6.000	0.0		
21	26.27	0.0357		0.0	15.250	0.545		Vel = 5.52
	0.0							
	26.27					26.364		K Factor = 5.12
22	26.24	1.394	1O	6.0	5.690	25.947		
to		150		0.0	6.000	0.0		
21	26.24	0.0357		0.0	11.690	0.417		Vel = 5.52
21	26.28	1.38	2T	12.0	9.700	26.364		
to		120	1E	3.0	15.000	0.0		
25	52.52	0.2042		0.0	24.700	5.043		Vel = 11.27
25	0.0	1.38	1T	6.0	17.440	31.407		
to		120		0.0	6.000	0.0		
26	52.52	0.2041		0.0	23.440	4.785		Vel = 11.27
26	0.0	1.61	1E	4.0	5.460	36.192		
to		120	1T	8.0	12.000	0.0		
TR	52.52	0.0964		0.0	17.460	1.683		Vel = 8.28
TR	0.0	2.067	1Zaa	0.0	4.000	37.875		
to		120	1Z	5.0	5.000	5.712		* Fixed loss = 5.712
BR	52.52	0.0286		0.0	9.000	0.257		Vel = 5.02

Final Calculations - Standard

Residential Fire Protection
Shalom House 3rd floor unit

Date 9-2-14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
BR	0.0	1.72	1G	0.617	50.000	43.844		
to		150	1T	6.174	6.792	0.0		
UG1	52.52	0.0462		0.0	56.792	2.625		Vel = 7.25
UG1	0.0	8.27		0.0	1000.000	46.469		
to		140		0.0	0.0	8.662		
TEST	52.52	0.0		0.0	1000.000	0.025		Vel = 0.31
	0.0							
	52.52					55.156		K Factor = 7.07