

Hydraulic Design Information Sheet

Name - Shalom House Date - 9-2-14
 Location - Basement
 Building - System No. - 1 of 1
 Contractor - Residential Fire Protection Contract No. - C14021
 Calculated By - Drawing No. - 1 of 2
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 6'-7"
 Occupancy - Basement

S (X) NFPA 13 () 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

M	Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
	Density	- .1	(X) Wet	Make Viking
D	Area Per Sprinkler	- 120	() Dry	Model VK300
E	Elevation at Highest Outlet	- 7.500	() 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	-		

N Note Safety Margin: 7.679

Calculation Flow Required - 247.580 Press Required - 61.861
 Summary C-Factor Used: 120 Overhead 150 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 10-31-13		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 70	@ Press -	
R	Residual Press - 62	Elev. -	Well
S	Flow - 691		Proof Flow
U	Elevation - -21		

P Location -

L Source of Information -

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	%	Palletized % Rack
	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
 A Longitudinal Transverse

E Horizontal Barriers Provided:

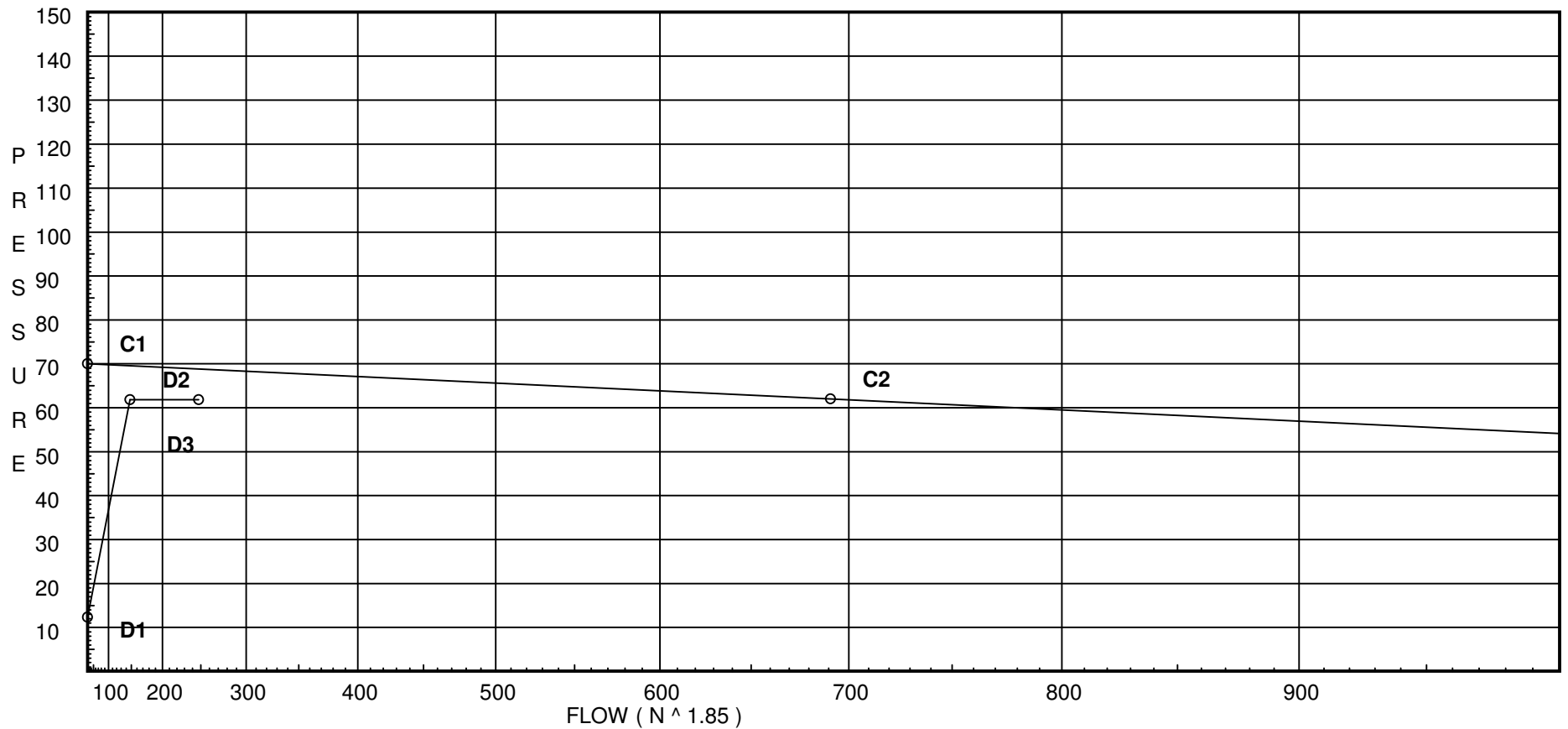
Water Supply Curve (C)

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

Demand:
D1 - Elevation : 12.343
D2 - System Flow : 147.58
D2 - System Pressure : 61.861
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 247.58
Safety Margin : 6.941



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	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
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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
50	7.5	5.6	7.0	na	14.82	0.1	120	7.0
51	7.5	5.6	7.6	na	15.44	0.1	120	7.0
52	7.5	5.6	8.19	na	16.02	0.1	120	7.0
53	7.5	5.6	9.48	na	17.24	0.1	120	7.0
54	7.5	5.6	11.8	na	19.24	0.1	120	7.0
55	0.0		17.57	na				
56	0.0		17.57	na				
57	7.5	5.6	14.32	na	21.19	0.1	120	7.0
58	7.5	5.6	14.63	na	21.42	0.1	120	7.0
59	7.5	5.6	15.74	na	22.22	0.1	120	7.0
60	0.0		22.78	na				
61	0.0		22.78	na				
62	0.0		22.78	na				
65	0.0		17.27	na				
26	0.0		20.4	na				
63	0.0		22.78	na				
64	0.0		22.78	na				
TR	0.0		31.79	na				
BR	0.0		39.53	na				
UG1	0.0		52.6	na				
TEST	-21.0		61.86	na	100.0			

The maximum velocity is 23.26 and it occurs in the pipe between nodes 26 and 64

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	*****
50	14.82	1.049		0.0	8.000	7.000			K Factor = 5.60	
to		120		0.0	0.0	0.0				
51	14.82	0.0748		0.0	8.000	0.598			Vel = 5.50	
51	15.43	1.38		0.0	8.000	7.598			K Factor = 5.60	
to		120		0.0	0.0	0.0				
52	30.25	0.0735		0.0	8.000	0.588			Vel = 6.49	
52	16.02	1.38		0.0	8.000	8.186			K Factor = 5.60	
to		120		0.0	0.0	0.0				
53	46.27	0.1616		0.0	8.000	1.293			Vel = 9.93	
53	17.25	1.38		0.0	8.000	9.479			K Factor = 5.60	
to		120		0.0	0.0	0.0				
54	63.52	0.2902		0.0	8.000	2.322			Vel = 13.63	
54	19.23	1.61	1T	8.0	1.940	11.801			K Factor = 5.60	
to		120		0.0	8.000	3.248				
65	82.75	0.2235		0.0	9.940	2.222			Vel = 13.04	
	0.0									
	82.75					17.271			K Factor = 19.91	
55	0.0	1.049		0.0	8.000	17.571				
to		120		0.0	0.0	0.0				
56	0.0	0.0		0.0	8.000	0.0			Vel = 0	
56	0.0	1.38		0.0	8.000	17.571				
to		120		0.0	0.0	-3.248				
57	0.0	0.0		0.0	8.000	0.0			Vel = 0	
57	21.19	1.38		0.0	8.000	14.323			K Factor = 5.60	
to		120		0.0	0.0	0.0				
58	21.19	0.0381		0.0	8.000	0.305			Vel = 4.55	
58	21.42	1.38		0.0	8.000	14.628			K Factor = 5.60	
to		120		0.0	0.0	0.0				
59	42.61	0.1388		0.0	8.000	1.110			Vel = 9.14	
59	22.22	1.61	1T	8.0	1.940	15.738			K Factor = 5.60	
to		120		0.0	8.000	3.248				
26	64.83	0.1423		0.0	9.940	1.414			Vel = 10.22	
	0.0									
	64.83					20.400			K Factor = 14.35	
60	0.0	1.38		0.0	8.000	22.779				
to		120		0.0	0.0	0.0				
61	0.0	0.0		0.0	8.000	0.0			Vel = 0	
61	0.0	1.38		0.0	8.000	22.779				
to		120		0.0	0.0	0.0				
62	0.0	0.0		0.0	8.000	0.0			Vel = 0	
62	0.0	1.61		0.0	1.940	22.779				
to		120		0.0	0.0	0.0				
63	0.0	0.0		0.0	1.940	0.0			Vel = 0	
	0.0									
	0.0					22.779			K Factor = 0	
65	82.75	1.61		0.0	14.000	17.271				
to		120		0.0	0.0	0.0				
26	82.75	0.2235		0.0	14.000	3.129			Vel = 13.04	

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	*****
26 to 64	64.83 147.58	1.61 120 0.6518	0.0 0.0 0.0	3.650 0.0 3.650	20.400 0.0 2.379			Vel = 23.26	
	0.0 147.58				22.779			K Factor = 30.92	
63 to 64	0.0 0.0	1.61 120 0.0	0.0 0.0 0.0	11.360 0.0 11.360	22.779 0.0 0.0			Vel = 0	
64 to TR	147.58 147.58	1.61 120 0.6518	1T 8.0 1E 4.0 0.0	1.830 12.000 13.830	22.779 0.0 9.015			Vel = 23.26	
TR to BR	0.0 147.58	2.067 120 0.1930	1Z 5.0 1Zaa 0.0 0.0	4.000 5.000 9.000	31.794 6.000 1.737			* Fixed loss = 6 Vel = 14.11	
BR to UG1	0.0 147.58	1.72 150 0.3126	1G 0.617 1T 6.174 0.0	35.000 6.792 41.792	39.531 0.0 13.066			Vel = 20.38	
UG1 to TEST	0.0 147.58	8.27 140 0.0002	0.0 0.0 0.0	1000.000 0.0 1000.000	52.597 9.095 0.169			Vel = 0.88	
	100.00 247.58				61.861			Qa = 100.00 K Factor = 31.48	