

Hydraulic Design Information Sheet

Name - Inn at Diamond Cove Date - 7-16-13
 Location - Second Floor Balconies
 Building - System No. - 1 of 1
 Contractor - Residential Fire Protection Contract No. - C13015
 Calculated By - JAL Drawing No. - 3 of 4
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 9'-8"
 Occupancy - Residential Balconies

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

Specific Ruling	Made By	Date
M Area of Sprinkler Operation - 840	System Type	Sprinkler/Nozzle
Density - .10	(X) Wet	Make Viking
D Area Per Sprinkler - 210	() Dry	Model VK302
E Elevation at Highest Outlet - 30.7	() 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 - 100		

N Note Safety Margin: 5.766

Calculation Flow Required - 187.630 Press Required - 69.082
 Summary C-Factor Used: 150 Overhead 150 Underground

Water Flow Test:	Pump Data:	Tank or Reservoir:
A Date of Test - 6-24-13	Rated Cap.-	Cap. -
T Time of Test -	@ Press -	Elev.-
E Static Press - 81	Elev. -	Well
R Residual Press - 27.5		Proof Flow
Flow - 604		
S Elevation - 0		

U Location -

P Source of Information -

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

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

G Horizontal Barriers Provided:

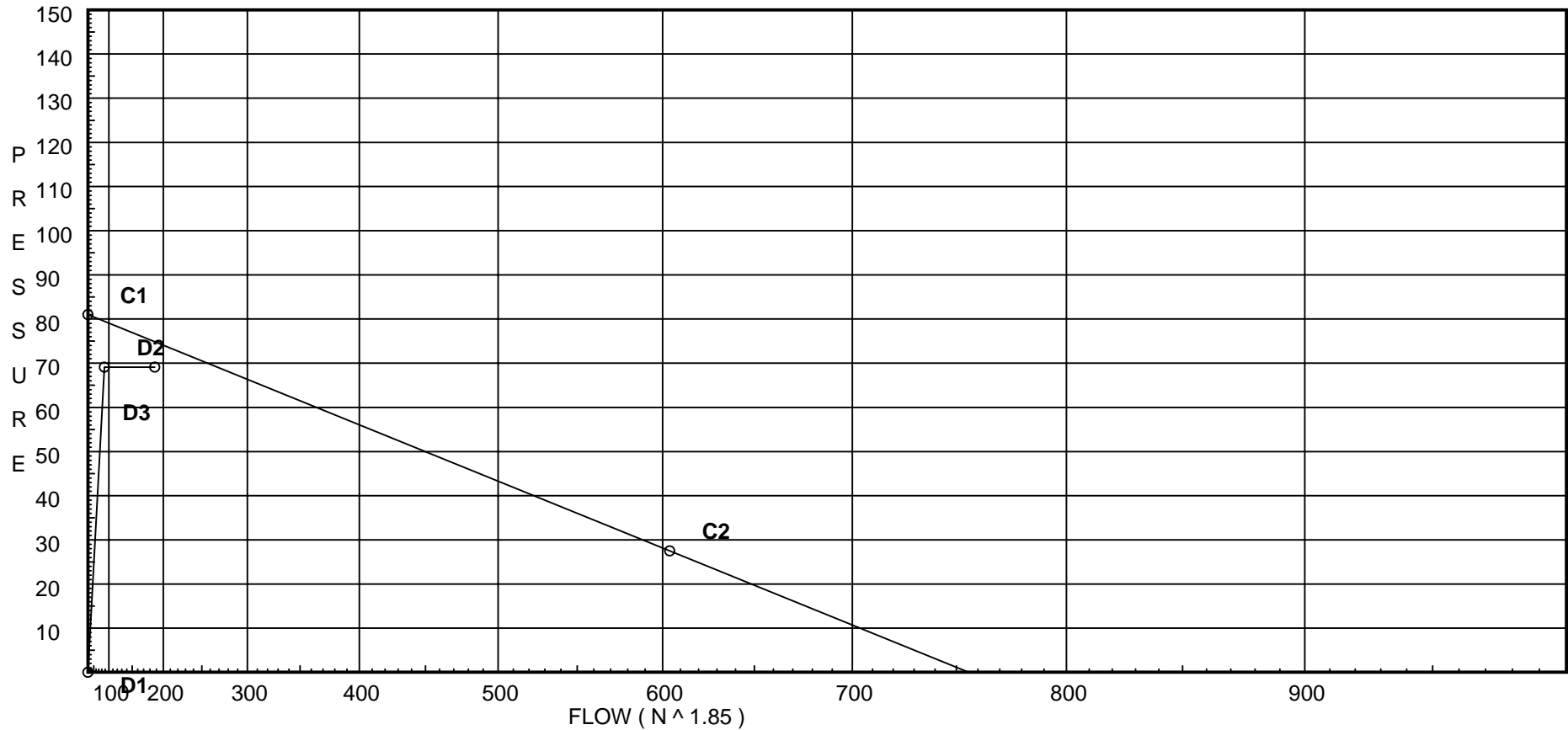
Water Supply Curve (C)

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City Water Supply:
C1 - Static Pressure : 81
C2 - Residual Pressure: 27.5
C2 - Residual Flow : 604

Demand:
D1 - Elevation : _____
D2 - System Flow : 87.63
D2 - System Pressure : 69.082
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 187.63
Safety Margin : 5.766



Fittings Used Summary

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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	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
S	Generic Swing Check Valve	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
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
Zac	Ames 2000SS	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.
HD1	30.7	5.6	14.06	na	21.0	0.1	210	7.0
HD2	30.7	5.6	14.06	na	21.0	0.1	210	7.0
100	0.0	K = K @ DRP1	27.79	na	21.0			
101	0.0	K = K @ DRP2	29.42	na	21.45			
102	0.0	K = K @ DRP2	30.96	na	22.0			
103	0.0	K = K @ DRP2	34.39	na	23.19			
104	0.0		37.21	na				
105	0.0		39.98	na				
110	0.0		44.08	na				
111	0.0		44.98	na				
112	0.0		46.65	na				
113	0.0		57.38	na				
114	0.0		62.55	na				
TR	1.0		65.65	na				
BR	-4.0		70.67	na				
UG1	0.0		69.05	na	100.0			
TEST	0.0		69.08	na				

The maximum velocity is 13.82 and it occurs in the pipe between nodes 102 and 103

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	*****
HD1 to DRP1	21.00 21.0	1.049 120 0.1427	1E	2.0 0.0 0.0	1.000 2.000 3.000	14.062 13.296 0.428			K Factor = 5.60 Vel = 7.80	
	0.0 21.00					27.786			K Factor = 3.98	
HD2 to DRP2	21.00 21.0	1.049 120 0.1425	1T	5.0 0.0 0.0	1.000 5.000 6.000	14.062 13.296 0.855			K Factor = 5.60 Vel = 7.80	
	0.0 21.00					28.213			K Factor = 3.95	
100 to 101	21.00 21.0	1.049 120 0.1424		0.0 0.0 0.0	11.500 0.0 11.500	27.786 0.0 1.638			K Factor @ node DRP1 Vel = 7.80	
101 to 102	21.45 42.45	1.38 120 0.1377		0.0 0.0 0.0	11.170 0.0 11.170	29.424 0.0 1.538			K Factor @ node DRP2 Vel = 9.11	
102 to 103	21.99 64.44	1.38 120 0.2982		0.0 0.0 0.0	11.500 0.0 11.500	30.962 0.0 3.429			K Factor @ node DRP2 Vel = 13.82	
103 to 104	23.19 87.63	1.61 120 0.2485		0.0 0.0 0.0	11.330 0.0 11.330	34.391 0.0 2.815			K Factor @ node DRP2 Vel = 13.81	
104 to 105	0.0 87.63	1.61 120 0.2485		0.0 0.0 0.0	11.170 0.0 11.170	37.206 0.0 2.776			Vel = 13.81	
105 to 110	0.0 87.63	1.61 120 0.2485	2E	8.0 0.0 0.0	8.500 8.000 16.500	39.982 0.0 4.100			Vel = 13.81	
110 to 111	0.0 87.63	2.067 120 0.0736		0.0 0.0 0.0	12.250 0.0 12.250	44.082 0.0 0.902			Vel = 8.38	
111 to 112	0.0 87.63	2.067 120 0.0736	2E	10.0 0.0 0.0	12.580 10.000 22.580	44.984 0.0 1.662			Vel = 8.38	
112 to 113	0.0 87.63	2.067 120 0.0736	1E 1T	5.0 10.0 0.0	130.830 15.000 145.830	46.646 0.0 10.732			Vel = 8.38	
113 to 114	0.0 87.63	2.067 120 0.0736	1E	5.0 0.0 0.0	65.330 5.000 70.330	57.378 0.0 5.176			Vel = 8.38	
114 to TR	0.0 87.63	2.067 120 0.0736	5E 1S	25.0 11.0 0.0	12.000 36.000 48.000	62.554 -0.433 3.533			Vel = 8.38	
TR to BR	0.0 87.63	3.26 120 0.0079	1Zac 1Z	0.0 9.408 0.0	7.500 9.408 16.908	65.654 4.886 0.134			* Fixed loss = 2.72 Vel = 3.37	
BR to UG1	0.0 87.63	4.1 140 0.0020	1G 1T	2.907 29.067 0.0	25.000 31.974 56.974	70.674 -1.732 0.112			Vel = 2.13	

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	*****
UG1	100.00	6.16	0.0	25.000	69.054		Qa = 100		
to		140	0.0	0.0	0.0				
TEST	187.63	0.0011	0.0	25.000	0.028		Vel = 2.02		
	0.0								
	187.63				69.082		K Factor = 22.57		