

Hydraulic Design Information Sheet

Name - Inn at Diamond Cove Date - 7-11-14
 Location - Second Floor Balconies
 Building - System No. - 1 of 2
 Contractor - Residential Fire Protection Contract No. - C14017
 Calculated By - JAL Drawing No. - 3 of 5
 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

M	Area of Sprinkler Operation - 1020	System Type	Sprinkler/Nozzle
	Density - .10	() Wet	Make Viking
D	Area Per Sprinkler - 170	(X) Dry	Model VK176
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: 7.015

Calculation Flow Required - 212.646 Press Required - 66.230
 Summary C-Factor Used: 100 Overhead 140 Underground

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

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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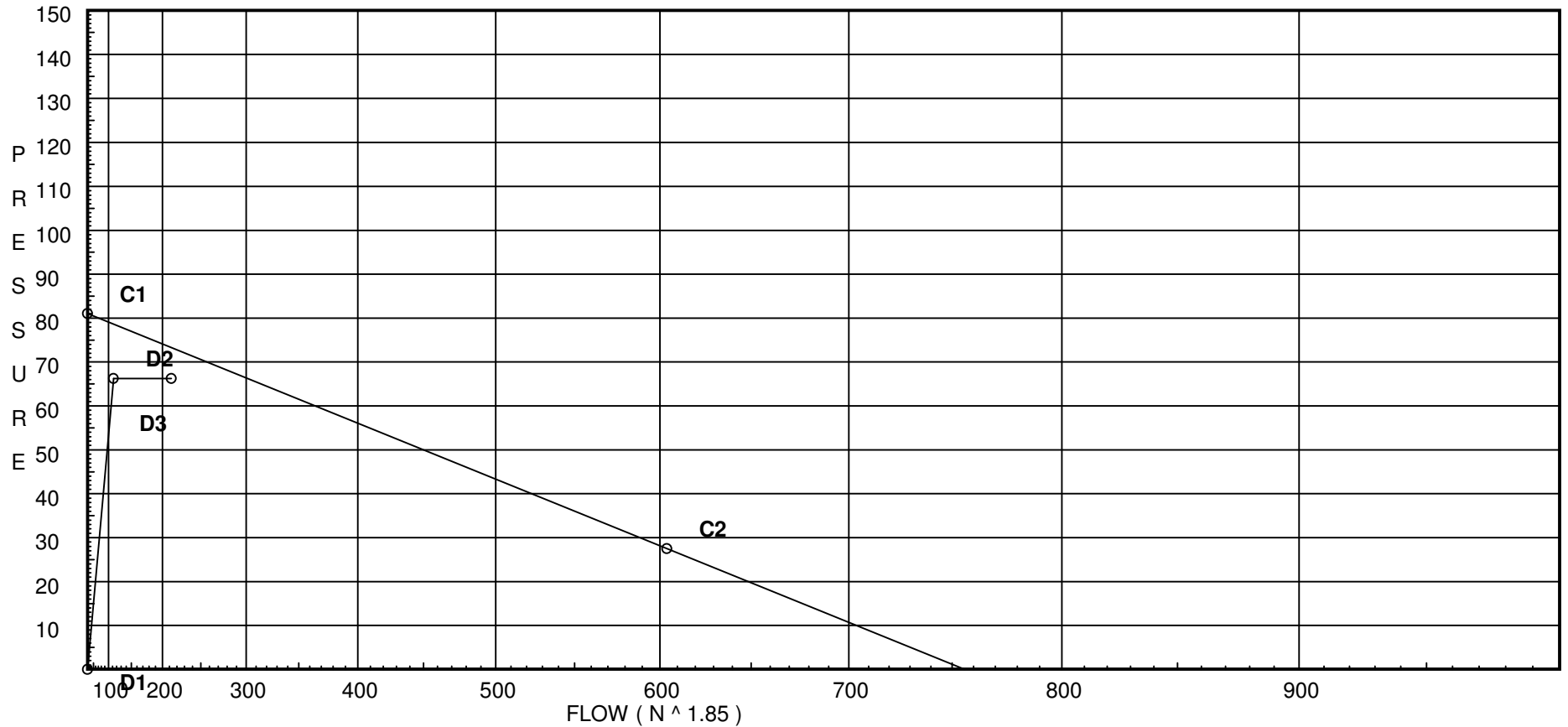
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City Water Supply:

C1 - Static Pressure : 81
C2 - Residual Pressure: 27.5
C2 - Residual Flow : 604

Demand:

D1 - Elevation : _____
D2 - System Flow : 112.646
D2 - System Pressure : 66.230
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 212.646
Safety Margin : 7.015



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
B	Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
D	Generic Dry Pipe Valve	0	0	0	0	0	0	9.5	17	0	28	0	47	0	0	0	0	0	0	0	0
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
Zia	Wilkins 350	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	9.22	na	17.0	0.1	170	7.0
HD2	30.7	5.6	9.22	na	17.0	0.1	170	7.0
100	0.0	K = K @ DRP1	22.84	na	17.0			
101	0.0	K = K @ DRP2	24.37	na	17.45			
102	0.0	K = K @ DRP2	25.85	na	17.97			
103	0.0	K = K @ DRP2	29.09	na	19.06			
104	0.0	K = K @ DRP2	31.79	na	19.93			
105	0.0	K = K @ DRP2	36.06	na	21.23			
110	0.0		49.01	na				
111	0.0		51.15	na				
112	0.0		54.04	na				
11	0.0		60.8	na				
TR	1.0		61.72	na				
HDR	0.0		62.47	na				
BR	-4.0		67.75	na				
UG1	0.0		66.19	na	100.0			
TEST	0.0		66.23	na				

The maximum velocity is 17.75 and it occurs in the pipe between nodes 105 and 110

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	17.00 17.0	1.049 100 0.1347	1E	1.427 0.0	1.000 1.427 2.427	9.216 13.296			K Factor = 5.60	
	0.0 17.00						22.839		K Factor = 3.56	
HD2 to DRP2	17.00 17.0	1.049 100 0.1349	1T	3.568 0.0	1.000 3.568 4.568	9.216 13.296			K Factor = 5.60	
	0.0 17.00						23.128		K Factor = 3.53	
100 to 101	17.00 17.0	1.049 100 0.1350		0.0 0.0	11.330 0.0 11.330	22.839 0.0			K Factor @ node DRP1	
				0.0	11.330	1.530			Vel = 6.31	
101 to 102	17.45 34.45	1.38 100 0.1311		0.0 0.0	11.330 0.0 11.330	24.369 0.0			K Factor @ node DRP2	
				0.0	11.330	1.485			Vel = 7.39	
102 to 103	17.97 52.42	1.38 100 0.2852		0.0 0.0	11.330 0.0 11.330	25.854 0.0			K Factor @ node DRP2	
				0.0	11.330	3.231			Vel = 11.24	
103 to 104	19.07 71.49	1.61 100 0.2389		0.0 0.0	11.330 0.0 11.330	29.085 0.0			K Factor @ node DRP2	
				0.0	11.330	2.707			Vel = 11.27	
104 to 105	19.93 91.42	1.61 100 0.3765		0.0 0.0	11.330 0.0 11.330	31.792 0.0			K Factor @ node DRP2	
				0.0	11.330	4.266			Vel = 14.41	
105 to 110	21.23 112.65	1.61 100 0.5541	2E	5.71 0.0	17.670 5.710 23.380	36.058 0.0			K Factor @ node DRP2	
				0.0	23.380	12.954			Vel = 17.75	
110 to 111	0.0 112.65	2.067 100 0.1642		0.0 0.0	13.000 0.0 13.000	49.012 0.0				
				0.0	13.000	2.134			Vel = 10.77	
111 to 112	0.0 112.65	2.067 100 0.1641	1T	7.137 0.0	10.500 7.137 17.637	51.146 0.0				
				0.0	17.637	2.894			Vel = 10.77	
112 to 11	0.0 112.65	2.067 100 0.1641	1E 1T	3.568 7.137 0.0	30.500 10.705 41.205	54.040 0.0				
				0.0	41.205	6.762			Vel = 10.77	
11 to TR	0.0 112.65	4.26 100 0.0048	9E	84.576 0.0	195.000 84.576 279.576	60.802 -0.433				
				0.0	279.576	1.355			Vel = 2.54	
TR to HDR	0.0 112.65	4.26 100 0.0049	1D 1B 1T	26.313 11.277 18.795	7.500 56.384 63.884	61.724 0.433				
				0.0	63.884	0.310			Vel = 2.54	
HDR to BR	0.0 112.65	4.26 120 0.0034	1Zia 1E	0.0 13.167 0.0	4.000 13.167 17.167	62.467 5.222			* Fixed loss = 3.49	
				0.0	17.167	0.059			Vel = 2.54	
BR to UG1	0.0 112.65	4.1 140 0.0031	1G 1T	2.907 29.067 0.0	25.000 31.974 56.974	67.748 -1.732				
				0.0	56.974	0.179			Vel = 2.74	

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	66.195		Qa = 100		
to		140	0.0	0.0	0.0				
TEST	212.65	0.0014	0.0	25.000	0.035		Vel = 2.29		
	0.0								
	212.65				66.230		K Factor = 26.13		