

Hydraulic Design Information Sheet

Name - Inn at Diamond Cove Date - 7-16-13
 Location - Lobby Entrance
 Building - System No. - 1 of 1
 Contractor - Residential Fire Protection Contract No. - C13015
 Calculated By - JAL Drawing No. - 2 of 4
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 10'9"
 Occupancy - Hotel Lobby

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

Area of Sprinkler Operation	Density	Area Per Sprinkler	Elevation at Highest Outlet	Hose Allowance - Inside	Rack Sprinkler Allowance	Hose Allowance - Outside	System Type	Sprinkler/Nozzle
- 950	- .10	- 73-108	- 16	-	-	- 100	(x) Wet	Make Viking
							() Dry	Model VK302
							() Deluge	Size 1/2"
							() Preaction	K-Factor 5.6
							() Other	Temp.Rat.155

N Note Safety Margin: 6.264

Calculation Flow Required - 261.835 Press Required - 63.339
 Summary C-Factor Used: 150 Overhead 150 Underground

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
Flow - 604		Proof Flow
S Elevation - 0		

U Location -

P
 L Source of Information -
 Y

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

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

G
 E Horizontal Barriers Provided:

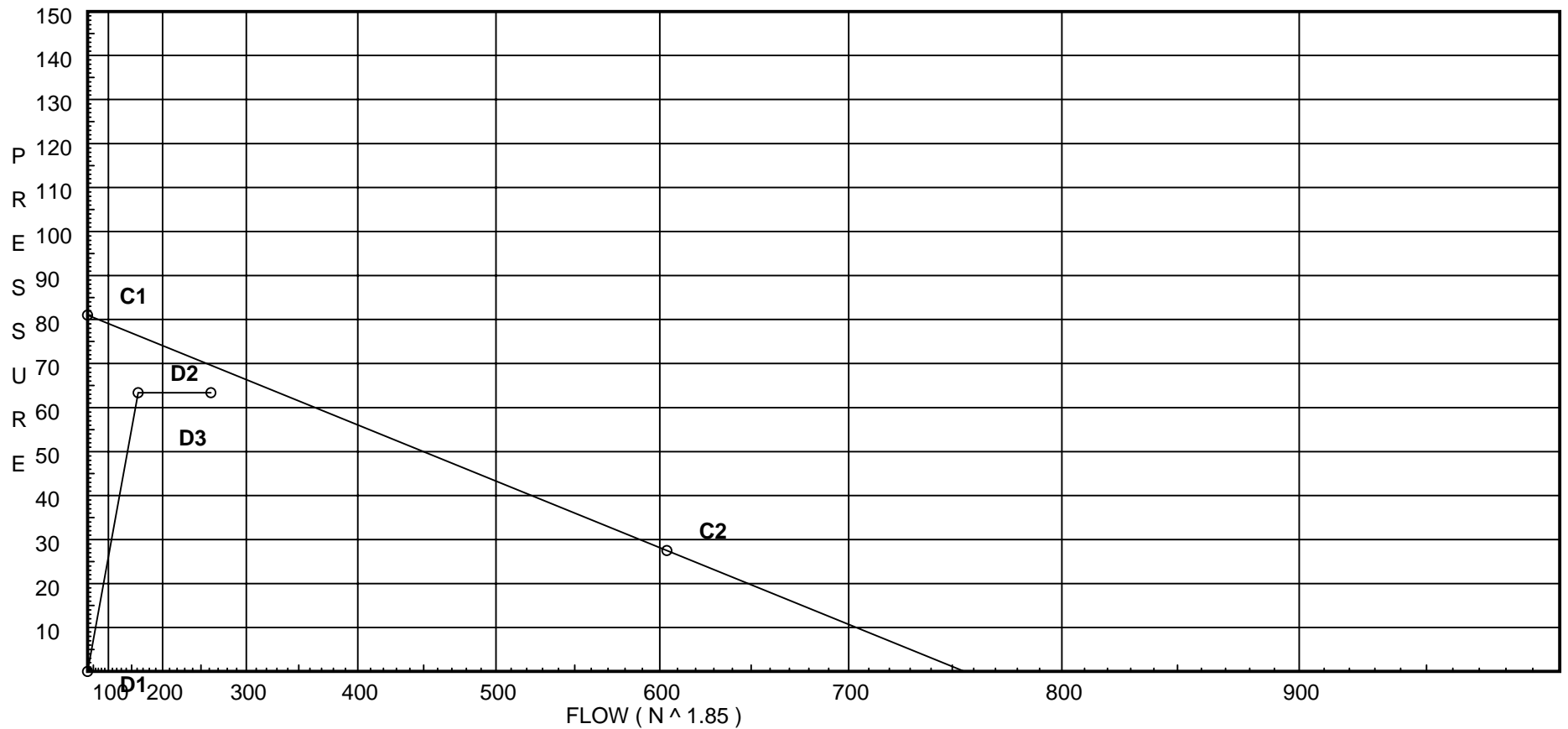
Water Supply Curve (C)

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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 : 161.835
D2 - System Pressure : 63.339
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 261.835
Safety Margin : 6.264



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
N	CPVC 90'El 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
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	16.0	5.6	7.0	na	14.82	0.1	98	7.0
HD2	16.0	5.6	7.0	na	14.82	0.1	108	7.0
HD3	16.0	5.6	7.0	na	14.82	0.1	73	7.0
HD4	16.0	5.6	7.0	na	14.82	0.1	106	7.0
1	0.0	K = K @ DRP1	14.26	na	14.82			
2	0.0	K = K @ DRP2	15.27	na	15.37			
3	0.0	K = K @ DRP3	16.34	na	15.9			
4	0.0	K = K @ DRP3	17.08	na	16.26			
5	0.0	K = K @ DRP3	18.37	na	16.86			
6	0.0	K = K @ DRP2	19.41	na	17.33			
7	0.0	K = K @ DRP1	14.62	na	15.0			
8	0.0	K = K @ DRP2	15.08	na	15.28			
9	0.0	K = K @ DRP4	19.41	na	17.33			
10	0.0	K = K @ DRP4	20.19	na	17.68			
11	0.0		22.88	na				
12	0.0		23.81	na				
13	0.0		24.96	na				
30	0.0		50.66	na				
14	0.0		47.08	na				
31	0.0		53.71	na				
41	0.0		56.11	na				
40	0.0		51.64	na				
42	8.75		54.29	na				
TR	1.0		59.93	na				
BR	-4.0		64.67	na				
UG1	0.0		63.29	na	100.0			
TEST	0.0		63.34	na				

The maximum velocity is 16.48 and it occurs in the pipe between nodes 13 and 14

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	14.82	1.101 150	1N	7.0 0.0	1.500 7.000	7.000 6.930			K Factor = 5.60	
	14.82	0.0391		0.0	8.500	0.332			Vel = 4.99	
	0.0 14.82						14.262		K Factor = 3.92	
HD2 to DRP2	14.82	1.101 150	1O	5.0 0.0	1.500 5.000	7.000 6.930			K Factor = 5.60	
	14.82	0.0391		0.0	6.500	0.254			Vel = 4.99	
	0.0 14.82						14.184		K Factor = 3.94	
HD3 to DRP3	14.82	1.101 150	1O	5.0 0.0	1.500 5.000	7.000 6.930			K Factor = 5.60	
	14.82	0.0391		0.0	6.500	0.254			Vel = 4.99	
	0.0 14.82						14.184		K Factor = 3.94	
HD4 to DRP4	14.82	1.101 150	1O	5.0 0.0	1.500 5.000	7.000 6.930			K Factor = 5.60	
	14.82	0.0391		0.0	6.500	0.254			Vel = 4.99	
	0.0 14.82						14.184		K Factor = 3.94	
1 to 2	14.82	1.101 150	2N	14.0 0.0	11.830 14.000	14.262 0.0			K Factor @ node DRP1	
	14.82	0.0390		0.0	25.830	1.008			Vel = 4.99	
2 to 3	15.37	1.101 150		0.0 0.0	7.330 0.0	15.270 0.0			K Factor @ node DRP2	
	30.19	0.1458		0.0	7.330	1.069			Vel = 10.17	
3 to 4	15.90	1.394 150		0.0 0.0	7.330 0.0	16.339 0.0			K Factor @ node DRP3	
	46.09	0.1011		0.0	7.330	0.741			Vel = 9.69	
4 to 5	16.26	1.394 150		0.0 0.0	7.330 0.0	17.080 0.0			K Factor @ node DRP3	
	62.35	0.1767		0.0	7.330	1.295			Vel = 13.11	
5 to 6	16.86	1.598 150		0.0 0.0	7.330 0.0	18.375 0.0			K Factor @ node DRP3	
	79.21	0.1415		0.0	7.330	1.037			Vel = 12.67	
6 to 13	17.34	1.598 150	1N	9.0 0.0	18.200 9.000	19.412 0.0			K Factor @ node DRP2	
	96.55	0.2040		0.0	27.200	5.550			Vel = 15.45	
	0.0 96.55						24.962		K Factor = 19.32	
7 to 8	15.00	1.101 150		0.0 0.0	11.600 0.0	14.620 0.0			K Factor @ node DRP1	
	15.0	0.0400		0.0	11.600	0.464			Vel = 5.05	
8 to 9	15.28	1.101 150	2N	14.0 0.0	15.500 14.000	15.084 0.0			K Factor @ node DRP2	
	30.28	0.1466		0.0	29.500	4.324			Vel = 10.20	
9 to 10	17.33	1.394 150		0.0 0.0	7.250 0.0	19.408 0.0			K Factor @ node DRP4	
	47.61	0.1072		0.0	7.250	0.777			Vel = 10.01	

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
10 to 11	17.68 65.29	1.394 150 0.1924	1N	8.0 0.0	6.000 8.000	20.185 0.0			K Factor @ node DRP4	
11 to 12	0.0 65.29	1.598 150 0.0989		0.0 0.0	9.450 0.0	22.879 0.0			Vel = 13.72	
12 to 13	0.0 65.29	1.598 150 0.0990	1O	8.0 0.0	3.600 8.000	23.814 0.0			Vel = 10.44	
13 to 14	96.55 161.84	2.003 150 0.1766	2N 4O	22.0 40.0 0.0	63.250 62.000 125.250	24.962 0.0 22.118			Vel = 16.48	
	0.0 161.84					47.080			K Factor = 23.59	
30 to 14	-61.56 -61.56	2.003 150 -0.0295	2N	22.0 0.0	99.250 22.000	50.661 0.0			Vel = 6.27	
14 to 31	161.84 100.28	2.003 150 0.0728	2N	22.0 0.0	69.000 22.000 91.000	47.080 0.0 6.629			Vel = 10.21	
	0.0 100.28					53.709			K Factor = 13.68	
30 to 40	61.56 61.56	2.003 150 0.0295	2O	20.0 0.0	13.000 20.000 33.000	50.661 0.0 0.975			Vel = 6.27	
	0.0 61.56					51.636			K Factor = 8.57	
31 to 41	100.28 100.28	2.003 150 0.0728	2O	20.0 0.0	13.000 20.000 33.000	53.709 0.0 2.403			Vel = 10.21	
41 to 42	0.0 100.28	2.003 120 0.1101	1E 1T	4.29 8.58 0.0	5.000 12.870 17.870	56.112 -3.790 1.968			Vel = 10.21	
	0.0 100.28					54.290			K Factor = 13.61	
40 to 42	61.56 61.56	2.157 120 0.0311	5E 1T	30.767 12.307 0.0	164.000 43.074 207.074	51.636 -3.790 6.444			Vel = 5.40	
42 to TR	100.28 161.84	3.26 120 0.0249	2E 1T	18.815 20.159 0.0	52.750 38.974 91.724	54.290 3.357 2.283			Vel = 6.22	
TR to BR	0.0 161.84	3.26 120 0.0249	1Zac 1Z	0.0 9.408 0.0	7.500 9.408 16.908	59.930 4.320 0.421			* Fixed loss = 2.155 Vel = 6.22	
BR to UG1	0.0 161.84	4.1 140 0.0061	1G 1T	2.907 29.067 0.0	25.000 31.974 56.974	64.671 -1.732 0.349			Vel = 3.93	
UG1 to TEST	99.99 261.83	6.16 140 0.0020		0.0 0.0 0.0	25.000 0.0 25.000	63.288 0.0 0.051			Qa = 100 Vel = 2.82	

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	*****
	0.0								
	261.83				63.339			K Factor =	32.90