

Hydraulic Design Information Sheet

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

M	Area of Sprinkler Operation	- 950	System Type	Sprinkler/Nozzle
	Density	- .10	(x) Wet	Make Viking
D	Area Per Sprinkler	- 73-108	( ) Dry	Model VK302
E	Elevation at Highest Outlet	- 16	( ) 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: 9.714

Calculation Flow Required - 261.835 Press Required - 59.889  
 Summary C-Factor Used: 150 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
	Flow - 604		Proof Flow
S	Elevation - 0		

U Location -

P 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

G Horizontal Barriers Provided:

# Water Supply Curve (C)

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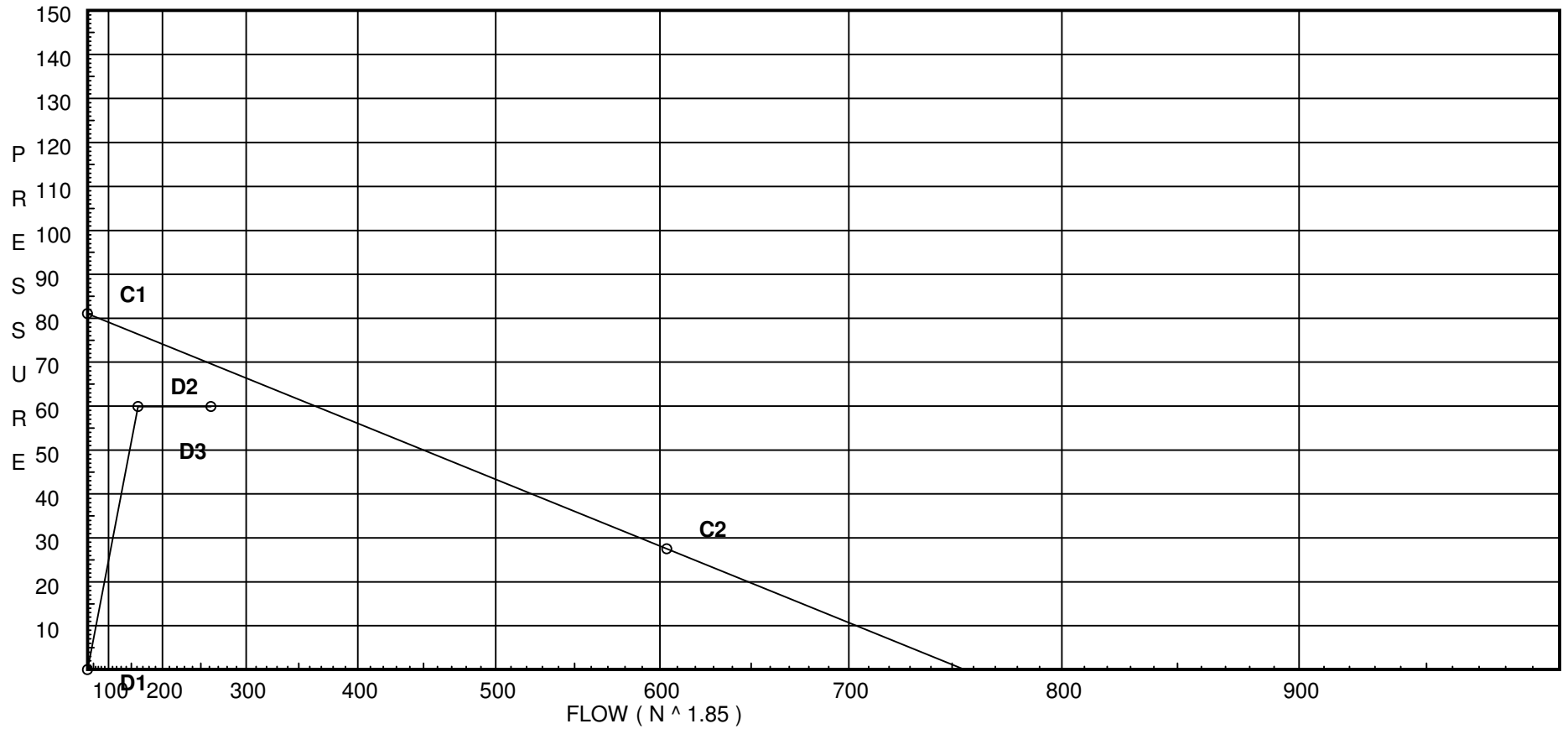
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### City Water Supply:

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

### Demand:

D1 - Elevation : \_\_\_\_\_  
D2 - System Flow : 161.835  
D2 - System Pressure : 59.889  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : 100  
D3 - System Demand : 261.835  
Safety Margin : 9.714



# 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
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'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
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
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	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		46.55	na				
14	0.0		43.59	na				
31	0.0		50.77	na				
41	0.0		52.75	na				
40	0.0		47.83	na				
42	8.75		49.87	na				
TR	1.0		55.51	na				
HDR	-4.0		58.1	na				
BR	0.0		59.49	na				
UG1	0.0		59.84	na	100.0			
TEST	0.0		59.89	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 Ftng'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 0.0	6.000 8.000 14.000	20.185 0.0 2.694			K Factor @ node DRP4 Vel = 13.72	
11 to 12	0.0 65.29	1.598 150 0.0989		0.0 0.0 0.0	9.450 0.0 9.450	22.879 0.0 0.935			Vel = 10.44	
12 to 13	0.0 65.29	1.598 150 0.0990	1O	8.0 0.0 0.0	3.600 8.000 11.600	23.814 0.0 1.148			Vel = 10.44	
13 to 14	96.55 161.84	2.003 150 0.1766	2N 2O	22.0 20.0 0.0	63.500 42.000 105.500	24.962 0.0 18.630			Vel = 16.48	
	0.0 161.84					43.592			K Factor = 24.51	
30 to 14	-71.40 -71.4	2.003 150 -0.0389	1N	11.0 0.0 0.0	65.000 11.000 76.000	46.546 0.0 -2.954			Vel = 7.27	
14 to 31	161.84 90.44	2.003 150 0.0602	1N 2O	11.0 20.0 0.0	88.250 31.000 119.250	43.592 0.0 7.176			Vel = 9.21	
	0.0 90.44					50.768			K Factor = 12.69	
30 to 40	71.40 71.4	2.003 150 0.0388	2O	20.0 0.0 0.0	13.000 20.000 33.000	46.546 0.0 1.282			Vel = 7.27	
	0.0 71.40					47.828			K Factor = 10.32	
31 to 41	90.44 90.44	2.003 150 0.0602	2O	20.0 0.0 0.0	13.000 20.000 33.000	50.768 0.0 1.986			Vel = 9.21	
41 to 42	0.0 90.44	2.003 150 0.0602	1O	10.0 0.0 0.0	5.000 10.000 15.000	52.754 -3.790 0.903			Vel = 9.21	
	0.0 90.44					49.867			K Factor = 12.81	
40 to 42	71.40 71.4	2.003 150 0.0389	1O	10.0 0.0 0.0	140.000 10.000 150.000	47.828 -3.790 5.829			Vel = 7.27	
42 to TR	90.44 161.84	3.26 120 0.0249	2E 1T	18.815 20.159 0.0	52.750 38.974 91.724	49.867 3.357 2.283			Vel = 6.22	
TR to HDR	0.0 161.84	4.26 120 0.0068	1B 1S 1Z	15.8 28.968 13.167	6.000 57.935 63.935	55.507 2.166 0.432			Vel = 3.64	
HDR to BR	0.0 161.84	4.26 120 0.0067	1Zia 1E	0.0 13.167 0.0	4.000 13.167 17.167	58.105 1.268 0.115			* Fixed loss = 3 Vel = 3.64	

# 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	*****
BR	0.0	4.1	1G 2.907	25.000	59.488				
to		140	1T 29.067	31.974	0.0				
UG1	161.84	0.0061	0.0	56.974	0.350		Vel = 3.93		
UG1	99.99	6.16	0.0	25.000	59.838		Qa = 100		
to		140	0.0	0.0	0.0				
TEST	261.83	0.0020	0.0	25.000	0.051		Vel = 2.82		
	0.0								
	261.83				59.889		K Factor = 33.83		