

HYDRAULIC DESIGN INFORMATION SHEET

Name - Inn at Diamond Cove Date - 7-11-14
Location - 3rd floor dwelling unit
Building - System No. - 2 of 2
Contractor - Residential Fire Protection Contract No. - C13015
Calculated By - JAL Drawing No. - 4 of 5
Construction: (X) Combustible () Non-Combustible Ceiling Height 6'-7"
OCCUPANCY - Residential

S Type of Calculation: ()NFPA 13 Residential (X)NFPA 13R ()NFPA 13D
Y Number of Sprinklers Flowing: ()1 ()2 ()4 (X)3
S ()Other
T ()Specific Ruling Made by Date
E
M Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 10.6 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16 x 16 () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - 100 Gpm Make Viking Model VK468
I Elevation at Highest Outlet - 41.250Feet Size 1/2" K-Factor 4.9
G Note:Safety Margin: 26.809 Temperature Rating 155
N

Calculation Gpm Required 142.746 Psi Required 50.481 At Test
Summary C-Factor Used: Overhead 150 Underground 140

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

P Location:
P
L Source of Information:
Y

Water Supply Curve (C)

Residential Fire Protection
Inn At Diamond Island 3RD FLOOR

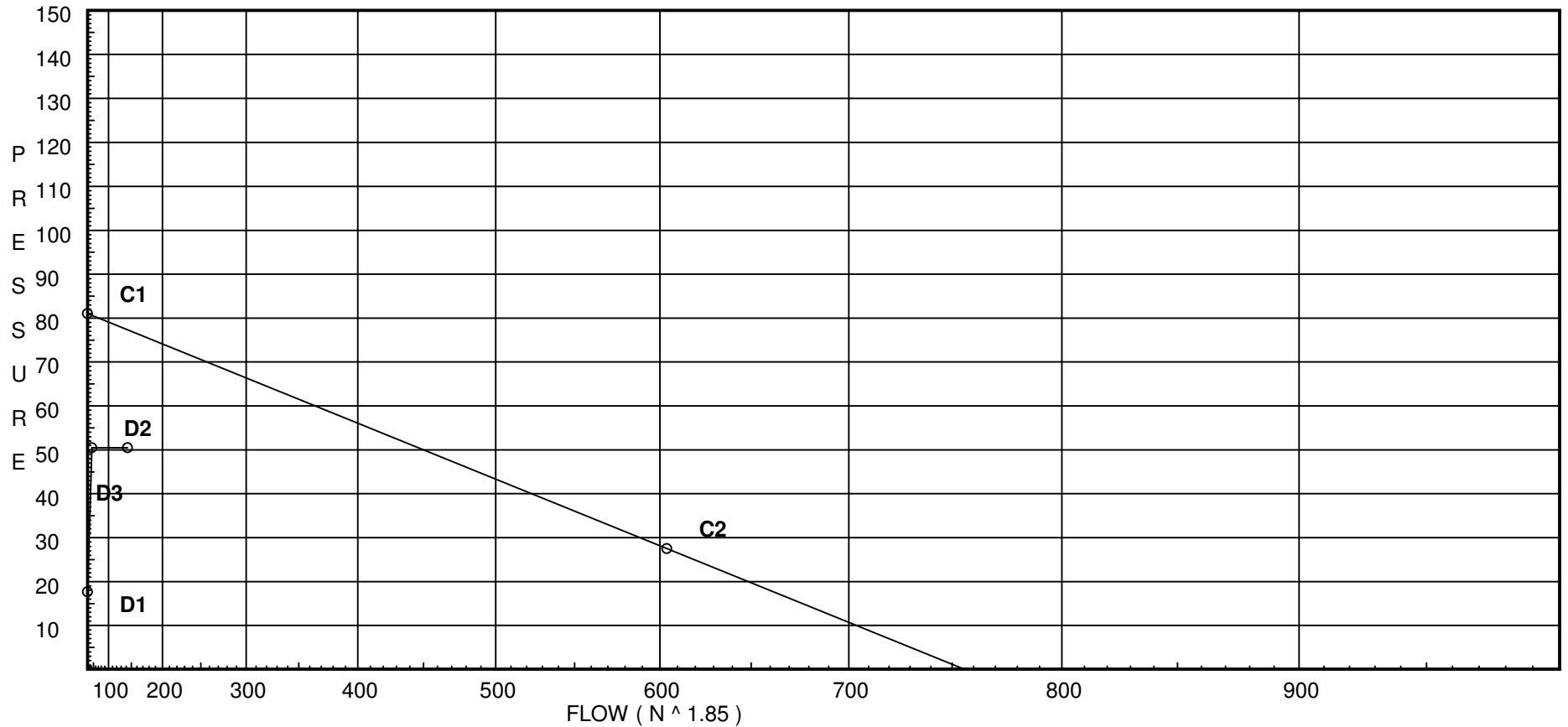
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City Water Supply:

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

Demand:

D1 - Elevation : 17.649
D2 - System Flow : 42.746
D2 - System Pressure : 50.481
Hose (Adj City) : _____
Hose (Demand) : 100
D3 - System Demand : 142.746
Safety Margin : 26.808



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.
1	40.75	4	10.6	na	13.02	0.1	130	10.6
2	41.25	4.9	10.46	na	15.85	0.1	130	7.0
3	40.75	4	12.03	na	13.87	0.1	130	10.6
4	0.0		39.53	na				
21	0.0		41.19	na				
20	0.0		41.77	na				
30	0.0		42.58	na				
31	0.0		42.64	na				
41	0.0		42.82	na				
40	0.0		42.62	na				
42	8.75		39.2	na				
TR	1.0		42.76	na				
HDR	-4.0		44.96	na				
BR	0.0		50.44	na				
UG1	0.0		50.46	na	100.0			
TEST	0.0		50.48	na				

The maximum velocity is 14.41 and it occurs in the pipe between nodes 3 and 4

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	*****
1	13.02	1.101		0.0	2.500	10.600			K Factor = 4.00	
to		150		0.0	0.0	-0.217				
2	13.02	0.0308		0.0	2.500	0.077			Vel = 4.39	
2	15.85	1.101		0.0	10.100	10.460			K Factor = 4.90	
to		150		0.0	0.0	0.217				
3	28.87	0.1342		0.0	10.100	1.355			Vel = 9.73	
3	13.88	1.101	2N	14.0	16.500	12.032			K Factor = 4.00	
to		150	1O	5.0	19.000	17.649				
4	42.75	0.2774		0.0	35.500	9.846			Vel = 14.41	
4	-18.06	1.394	2O	12.0	40.250	39.527				
to		150		0.0	12.000	0.0				
21	24.69	0.0318		0.0	52.250	1.664			Vel = 5.19	
	0.0									
	24.69					41.191			K Factor = 3.85	
4	18.05	1.394	2O	12.0	113.500	39.527				
to		150		0.0	12.000	0.0				
20	18.05	0.0178		0.0	125.500	2.239			Vel = 3.79	
	0.0									
	18.05					41.766			K Factor = 2.79	
21	24.69	1.394	2N	16.0	17.580	41.191				
to		150	2O	12.0	28.000	0.0				
31	24.69	0.0318		0.0	45.580	1.451			Vel = 5.19	
	0.0									
	24.69					42.642			K Factor = 3.78	
20	18.05	1.394	2N	16.0	17.580	41.766				
to		150	2O	12.0	28.000	0.0				
30	18.05	0.0178		0.0	45.580	0.813			Vel = 3.79	
30	-12.98	2.003	2N	22.0	153.250	42.579				
to		150	4O	40.0	62.000	0.0				
31	5.07	0.0003		0.0	215.250	0.063			Vel = 0.52	
	0.0									
	5.07					42.642			K Factor = 0.78	
30	12.98	2.003	1O	10.0	13.000	42.579				
to		150		0.0	10.000	0.0				
40	12.98	0.0017		0.0	23.000	0.039			Vel = 1.32	
	0.0									
	12.98					42.618			K Factor = 1.99	
31	29.76	2.003	1O	10.0	13.000	42.642				
to		150		0.0	10.000	0.0				
41	29.76	0.0077		0.0	23.000	0.177			Vel = 3.03	
41	0.0	2.003	1O	10.0	5.000	42.819				
to		120		0.0	10.000	-3.790				
42	29.76	0.0117		0.0	15.000	0.175			Vel = 3.03	
	0.0									
	29.76					39.204			K Factor = 4.75	
40	12.98	2.003	1O	10.0	140.000	42.618				
to		120		0.0	10.000	-3.790				
42	12.98	0.0025		0.0	150.000	0.376			Vel = 1.32	

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	*****
42 to TR	29.77 42.75	3.26 120 0.0021	2E 18.815 1T 20.159 0.0	52.750 38.974 91.724	39.204 3.357 0.194		Vel = 1.64		
TR to HDR	0.0 42.75	4.26 120 0.0006	1B 15.8 1S 28.968 1Z 13.167	6.000 57.935 63.935	42.755 2.166 0.037		Vel = 0.96		
HDR to BR	0.0 42.75	4.26 120 0.0005	1Zia 0.0 1E 13.167 0.0	4.000 13.167 17.167	44.958 5.468 0.009		* Fixed loss = 7.2 Vel = 0.96		
BR to UG1	0.0 42.75	4.1 140 0.0005	1G 2.907 1T 29.067 0.0	25.000 31.974 56.974	50.435 0.0 0.030		Vel = 1.04		
UG1 to TEST	100.00 142.75	6.16 140 0.0006	0.0 0.0 0.0	25.000 0.0 25.000	50.465 0.0 0.016		Qa = 100 Vel = 1.54		
	0.0 142.75				50.481		K Factor = 20.09		