



... **Fire Protection by Computer Design**

DEAN & ALLYN INC
116 LEWISTON ROAD
GRAY, MAINE 04039
207-657-5646

Job Name : WEST PORT CONDOS
Building : AREA 1
Location : PORTLAND, MAINE
System : WET
Contract : C161349
Data File : C1349 AREA 1.WXF

Hydraulic Design Information Sheet

Name - WEST PORT LOFTS CONDOMINIUMS Date - 7/18/16
 Location - PORTLAND, MAINE
 Building - AREA 1 System No. - WET
 Contractor - DEAN & ALLYN INC Contract No. - C161349
 Calculated By - S. COTE Drawing No. - 2 OF 2
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 9'
 Occupancy - RESIDENTIAL

S () NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve
 S Other NFPA 13R
 T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 4 HEADS	System Type	Sprinkler/Nozzle
	Density	- .05	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 256 MAX	() Dry	Model RFC49
E	Elevation at Highest Outlet	- 9'	() Deluge	Size 1/2"
S	Hose Allowance - Inside	- -	() Preaction	K-Factor 4.9
I	Rack Sprinkler Allowance	- -	() Other	Temp.Rat.165
G	Hose Allowance - Outside	- 100		
N	Note SAFETY MARGIN 12.69			

Calculation Flow Required - 154.702 Press Required - 47.127
 Summary C-Factor Used: 120 Overhead 150 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 6/08/2016		Cap. -
T	Time of Test - 12:30 PM	Rated Cap.-	Elev.-
E	Static Press - 64	@ Press -	
R	Residual Press - 52	Elev. -	Well
	Flow - 1209		Proof Flow
S	Elevation - 95'		

U
 P Location - TATE & DANFORTH STREET
 P
 L Source of Information - CITY OF PORTLAND WATER DISTRICT
 Y

C	Commodity	Class	Location
O	Storage Ht.	Area	Aisle W.
M	Storage Method:	Solid Piled %	Palletized % Rack
M	() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S	() Double Row	() Slave Pallet	() Solid Shelf () Non
T	() Mult. Row		() Open Shelf
O	C		
R	K	Flue Spacing	Clearance:Storage to Ceiling
A		Longitudinal	Transverse
G			
E	Horizontal Barriers Provided:		

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	
Bvca	B Fly Vic 705						6	6	7		8	12	14	16	18	19						
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61	
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																				
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121	
Zaa	Ames 2000B	Fitting generates a Fixed Loss Based on Flow																				

Units Summary

Diameter Units Inches
 Length Units Feet
 Flow Units US Gallons per Minute
 Pressure Units Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1A	127.833	4.9	7.0	na	12.96	0.05	197	7.0
2A	127.833	4.9	7.18	na	13.13	0.05	201	7.0
3A	127.833	4.9	8.29	na	14.11	0.05	43	7.0
4A	127.833	4.9	8.75	na	14.49	0.05	52	7.0
1	128.333		6.93	na				
2	128.333		7.3	na				
3	128.333		8.25	na				
4	128.333		8.93	na				
10	128.333		11.25	na				
11	128.333		13.48	na				
12	128.333		15.75	na				
13	107.791		27.2	na				
14	107.791		28.44	na				
15	107.791		28.95	na				
16	107.79		30.22	na				
TR	107.79		30.86	na				
BR1	100.79		37.41	na				
BR2	96.999		44.82	na				
ST	95.0		47.08	na				
TEST	95.0		47.13	na	100.0			

The maximum velocity is 11.73 and it occurs in the pipe between nodes 11 and 12

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	*****
1A to 1	12.96	1.049 120.0	E	2.0 0.0	0.500 2.000	7.000 -0.217			K Factor = 4.90	
	12.96	0.0584		0.0	2.500	0.146			Vel = 4.81	
	0.0 12.96						6.929		K Factor = 4.92	
2A to 2	13.13	1.049 120.0	T	5.0 0.0	0.500 5.000	7.184 -0.217			K Factor = 4.90	
	13.13	0.0598		0.0	5.500	0.329			Vel = 4.87	
	0.0 13.13						7.296		K Factor = 4.86	
3A to 3	14.11	1.049 120.0	E	2.0 0.0	0.500 2.000	8.292 -0.217			K Factor = 4.90	
	14.11	0.0684		0.0	2.500	0.171			Vel = 5.24	
	0.0 14.11						8.246		K Factor = 4.91	
4A to 4	14.49	1.049 120.0	T	5.0 0.0	0.500 5.000	8.750 -0.217			K Factor = 4.90	
	14.49	0.0718		0.0	5.500	0.395			Vel = 5.38	
	0.0 14.49						8.928		K Factor = 4.85	
1 to 2	12.96	1.049 120.0		0.0 0.0	6.291 0.0	6.929 0.0				
	12.96	0.0583		0.0	6.291	0.367			Vel = 4.81	
2 to 10	13.14	1.049 120.0	T	5.0 0.0	13.583 5.000	7.296 0.0				
	26.1	0.2129		0.0	18.583	3.957			Vel = 9.69	
	0.0 26.10						11.253		K Factor = 7.78	
3 to 4	14.11	1.049 120.0		0.0 0.0	10.000 0.0	8.246 0.0				
	14.11	0.0682		0.0	10.000	0.682			Vel = 5.24	
4 to 11	14.49	1.049 120.0	T	5.0 0.0	13.041 5.000	8.928 0.0				
	28.6	0.2523		0.0	18.041	4.552			Vel = 10.62	
	0.0 28.60						13.480		K Factor = 7.79	
10 to 11	26.10	1.049 120.0		0.0 0.0	10.458 0.0	11.253 0.0				
	26.1	0.2129		0.0	10.458	2.227			Vel = 9.69	
11 to 12	28.60	1.38 120.0	T	6.0 0.0	4.333 6.000	13.480 0.0				
	54.7	0.2201		0.0	10.333	2.274			Vel = 11.73	
12 to 13	0.0	1.61 120.0	E	4.0 0.0	20.541 4.000	15.754 8.897				
	54.7	0.1039		0.0	24.541	2.551			Vel = 8.62	

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	*****
13	0.0	1.61	T 8.0	3.916	27.202				
to		120.0	0.0	8.000	0.0				
14	54.7	0.1039	0.0	11.916	1.238		Vel = 8.62		
14	0.0	2.067	T 10.0	6.708	28.440				
to		120.0	0.0	10.000	0.0				
15	54.7	0.0308	0.0	16.708	0.514		Vel = 5.23		
15	0.0	2.067	2T 20.0	21.000	28.954				
to		120.0	0.0	20.000	0.0				
16	54.7	0.0308	0.0	41.000	1.263		Vel = 5.23		
	0.0								
	54.70				30.217		K Factor = 9.95		
16	54.70	2.067	2T 20.0	1.000	30.217				
to		120.0	0.0	20.000	0.0				
TR	54.7	0.0308	0.0	21.000	0.646		Vel = 5.23		
TR	0.0	2.067	Fsp 0.0	10.791	30.863				
to		120.0	Bvca 6.0	6.000	6.032		** Fixed Loss = 3		
BR1	54.7	0.0308	0.0	16.791	0.517		Vel = 5.23		
BR1	0.0	2.067	Zaa 0.0	1.583	37.412				
to		120.0	0.0	0.0	7.362		** Fixed Loss = 5.72		
BR2	54.7	0.0303	0.0	1.583	0.048		Vel = 5.23		
BR2	0.0	1.985	2E 12.407	30.000	44.822				
to		150.0	T 12.407	26.055	0.866				
ST	54.7	0.0248	G 1.241	56.055	1.390		Vel = 5.67		
ST	0.0	4.1	T 29.067	15.000	47.078				
to		140.0	E 14.534	43.601	0.0				
TEST	54.7	0.0008	0.0	58.601	0.049		Vel = 1.33		
	100.00						Qa = 100.00		
	154.70				47.127		K Factor = 22.53		

Water Supply Curve C

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City Water Supply:
C1 - Static Pressure : 60
C2 - Residual Pressure: 52
C2 - Residual Flow : 1209

Demand:
D1 - Elevation : 14.220
D2 - System Flow : 54.702
D2 - System Pressure : 47.127
Hose (Demand) : 100
D3 - System Demand : 154.702
Safety Margin : 12.695

