



... Fire Protection by Computer Design

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

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

Hydraulic Design Information Sheet

Name - WEST PORT LOFTS CONDOMINIUMS Date - 7/18/16
 Location - PORTLAND, MAINE
 Building - DRY System No. - DRY
 Contractor - DEAN & ALLYN INC Contract No. - C161349
 Calculated By - S. COTE Drawing No. - 1 OF 2
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 12'
 Occupancy - CARPORT

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. (X) 1 () 2 () 3 () Ex.Haz.
 Y () NFPA 231 () NFPA 231C () Figure Curve

S Other

T Specific Ruling Made By Date

Specific Ruling	Made By	Date
M Area of Sprinkler Operation - 761 SQ FT	System Type	Sprinkler/Nozzle
Density - .10	(X) Wet	Make RELIABLE
D Area Per Sprinkler - 108 SQ FT	() Dry	Model F1FR56
E Elevation at Highest Outlet - 12'	() 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 11.10

Calculation Flow Required - 236.039 Press Required - 48.508
 Summary C-Factor Used: 120 Overhead 150 Underground

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 Location - TATE & DANFORTH STREET

P Source of Information - CITY OF PORTLAND WATER DISTRICT

Commodity	Class	Location
Storage Ht.	Area	Aisle W.
Storage Method:	Solid Piled %	Palletized % Rack
() Single Row	() Conven. Pallet	() Auto. Storage () Encap.
S R () Double Row	() Slave Pallet	() Solid Shelf () Non
T A () Mult. Row		() Open Shelf

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

E Horizontal Barriers Provided:

Fittings Used Summary

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WEST PORT CONDOS

Page 2
Date 7/15/16

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						
Dge	Dry Gem DPV-1							2.2	4.9		8.9		22									
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	

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

DEAN & ALLYN INC
WEST PORT CONDOS

Page 3
Date 7/15/16

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
50	108.0	5.6	10.48	na	18.13	0.15	108	7.0
51	108.0	5.6	10.9	na	18.49	0.15	108	7.0
52	108.0	5.6	8.84	na	16.65	0.15	108	7.0
53	108.0	5.6	9.19	na	16.98	0.15	108	7.0
54	108.0	5.6	8.55	na	16.37	0.15	108	7.0
55	108.0	5.6	8.89	na	16.7	0.15	108	7.0
56	108.0	5.6	8.37	na	16.2	0.15	108	7.0
57	108.0	5.6	8.71	na	16.53	0.15	108	7.0
58	108.0		9.58	na				
59	108.0		9.78	na				
60	108.0		10.11	na				
61	108.0		11.97	na				
TDV	108.0		12.18	na				
BR2	98.0		19.06	na				
15	107.791		19.12	na				
16	107.79		25.93	na				
TR	107.79		29.42	na				
BR	96.999		39.88	na				
ST	95.0		48.25	na				
TEST	95.0		48.51	na	100.0			

The maximum velocity is 14.1 and it occurs in the pipe between nodes BR and ST

Final Calculations - Hazen-Williams

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WEST PORT CONDOS

Page 4
Date 7/15/16

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
50 to 51	18.13	1.38 100.0		0.0	10.500	10.480 0.0			K Factor = 5.60	
51 to 61	18.13	0.0400		0.0	10.500	0.420			Vel = 3.89	
51 to 61	18.49	1.61 100.0	E T	2.855 5.71	6.875 8.565	10.900 0.0			K Factor = 5.60	
	36.62	0.0693		0.0	15.440	1.070			Vel = 5.77	
	0.0 36.62					11.970			K Factor = 10.58	
52 to 53	16.65	1.38 100.0		0.0	10.500	8.835 0.0			K Factor = 5.60	
53 to 60	16.65	0.0342		0.0	10.500	0.359			Vel = 3.57	
53 to 60	16.98	1.61 100.0	E T	2.855 5.71	6.875 8.565	9.194 0.0			K Factor = 5.60	
	33.63	0.0592		0.0	15.440	0.914			Vel = 5.30	
	0.0 33.63					10.108			K Factor = 10.58	
54 to 55	16.37	1.38 100.0		0.0	10.500	8.545 0.0			K Factor = 5.60	
55 to 59	16.37	0.0331		0.0	10.500	0.348			Vel = 3.51	
55 to 59	16.70	1.61 100.0	E T	2.855 5.71	6.875 8.565	8.893 0.0			K Factor = 5.60	
	33.07	0.0574		0.0	15.440	0.886			Vel = 5.21	
	0.0 33.07					9.779			K Factor = 10.58	
56 to 57	16.20	1.38 100.0		0.0	10.500	8.369 0.0			K Factor = 5.60	
57 to 58	16.2	0.0325		0.0	10.500	0.341			Vel = 3.47	
57 to 58	16.53	1.61 100.0	E T	2.855 5.71	6.875 8.565	8.710 0.0			K Factor = 5.60	
	32.73	0.0563		0.0	15.440	0.869			Vel = 5.16	
	0.0 32.73					9.579			K Factor = 10.58	
58 to 59	32.73	2.067 100.0		0.0	12.000	9.579 0.0				
59 to 60	32.73	0.0167		0.0	12.000	0.200			Vel = 3.13	
59 to 60	33.07	2.067 100.0		0.0	5.416	9.779 0.0				
60 to TDV	65.8	0.0607		0.0	5.416	0.329			Vel = 6.29	
60 to TDV	33.62	2.067 100.0	T	7.137 0.0	8.791 7.137	10.108 0.0				
	99.42	0.1302		0.0	15.928	2.074			Vel = 9.51	
	0.0 99.42					12.182			K Factor = 28.48	
61 to TDV	36.62	2.067 100.0	T	7.137 0.0	3.208 7.137	11.970 0.0				
	36.62	0.0205		0.0	10.345	0.212			Vel = 3.50	

Final Calculations - Hazen-Williams

DEAN & ALLYN INC
WEST PORT CONDOS

Page 5
Date 7/15/16

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 36.62					12.182		K Factor = 10.49	
TDV to BR2	136.04	2.635 100.0 0.0713	Dge 2.156 Bvca 5.879 E 5.879 T 11.758	10.000 25.670 35.670	12.182 4.331 2.544			Vel = 8.00	
BR2 to 15	0.0 136.04	2.157 120.0 0.1349	E 6.153 T 12.307 0.0	13.458 18.460 31.918	19.057 -4.240 4.306			Vel = 11.94	
15 to 16	0.0 136.04	2.067 120.0 0.1660	2T 20.0 0.0 0.0	21.000 20.000 41.000	19.123 0.0 6.808			Vel = 13.01	
	0.0 136.04					25.931		K Factor = 26.72	
16 to TR	136.04	2.067 120.0 0.1660	2T 20.0 0.0 0.0	1.000 20.000 21.000	25.931 0.0 3.487			Vel = 13.01	
TR to BR	0.0 136.04	2.067 120.0 0.1660	Bvca 6.0 Fsp 0.0 0.0	10.791 6.000 16.791	29.418 7.674 2.788			** Fixed Loss = 3 Vel = 13.01	
BR to ST	0.0 136.04	1.985 150.0 0.1338	2E 12.407 T 12.407 G 1.241	30.000 26.055 56.055	39.880 0.866 7.501			Vel = 14.10	
ST to TEST	0.0 136.04	4.1 140.0 0.0045	T 29.067 E 14.534 0.0	15.000 43.601 58.601	48.247 0.0 0.261			Vel = 3.31	
	100.00 236.04					48.508		Qa = 100.00 K Factor = 33.89	

Water Supply Curve C

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WEST PORT CONDOS

Page 6
Date 7/15/16

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

Demand:
D1 - Elevation : 5.630
D2 - System Flow : 136.039
D2 - System Pressure : 48.508
Hose (Demand) : 100
D3 - System Demand : 236.039
Safety Margin : 11.103

