



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

DEAN AND ALLYN, INC.  
116 LEWISTON ROAD  
GRAY MAINE  
207 657 5646

Job Name : 732 FOREST AVE THIRD FLOOR  
Building :  
Location : 732 FOREST AVE PORTLAND MAINE  
System : ONE  
Contract : C171466  
Data File : 732 FOREST AVE THIRD FLOOR.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 732 FOREST AVE THIRD FLOOR Date - 10-16-17  
 Location - 732 FOREST AVE PORTLAND MAINE  
 Building - System No. - ONE  
 Contractor - DEAN AND ALLYN, INC. Contract No. - C171466  
 Calculated By - H. KING Drawing No. - 1 OF 1  
 Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8'  
 OCCUPANCY - APARTMENTS

S Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D  
 Y Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )  
 S ( )Other  
 T ( )Specific Ruling Made by Date  
 E  
 M Listed Flow at Start Point - 13 Gpm System Type  
 Listed Pres. at Start Point - 7 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 - Gpm Make RELIABLE Model F1RES49  
 I Elevation at Highest Outlet - 27 Feet Size 7/16" K-Factor 4.9  
 G Note:CUSHION 50.18 PSI Temperature Rating 155  
 N

Calculation Gpm Required 52.7 Psi Required 31.8 AT CITY  
 Summary C-Factor Used: Overhead 120 Underground 120

W Water Flow Test: Pump Data: Tank or Reservoir:  
 A Date of Test - 6-22-17 Rated Cap. Cap.  
 T Time of Test - @ Psi Elev.  
 E Static (Psi) - 82 Elev.  
 R Residual (Psi) - 80 Other Well  
 Flow (Gpm) - 1209 Proof Flow Gpm  
 S Elevation - 0

P Location: IN FRONT OF BUILDING ON 16" CITY MAIN

P Source of Information: PORTLAND WATER DEPT.  
 L  
 Y

# Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftn'g's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
50 to 60	12.96	1.049 120.0	2T	10.0 0.0	4.300 10.000	7.000 0.0			K Factor = 4.90	
	12.96	0.0583		0.0	14.300	0.834			Vel = 4.81	
	0.0						7.834		K Factor = 4.63	
51 to 62	13.17	1.049 120.0	T	5.0 0.0	1.800 5.000	7.227 0.0			K Factor = 4.90	
	13.17	0.0601		0.0	6.800	0.409			Vel = 4.89	
	0.0						7.636		K Factor = 4.77	
52 to 64	13.10	1.049 120.0	T	5.0 0.0	7.700 5.000	7.147 0.0			K Factor = 4.90	
	13.1	0.0594		0.0	12.700	0.755			Vel = 4.86	
	0.0						7.902		K Factor = 4.66	
53 to 66	13.49	1.049 120.0	T	5.0 0.0	11.000 5.000	7.583 0.0			K Factor = 4.90	
	13.49	0.0629		0.0	16.000	1.006			Vel = 5.01	
	0.0						8.589		K Factor = 4.60	
60 to 61	12.96	1.049 120.0	E	2.0 0.0	27.000 2.000	7.834 11.694				
	12.96	0.0583		0.0	29.000	1.692			Vel = 4.81	
61 to 68	0.0	1.049 120.0	T	5.0 0.0	2.700 5.000	21.220 0.0				
	12.96	0.0584		0.0	7.700	0.450			Vel = 4.81	
68 to 4	0.0	1.049 120.0		0.0 0.0	5.300 0.0	21.670 0.0				
	12.96	0.0583		0.0	5.300	0.309			Vel = 4.81	
4 to 20	0.0	1.38 120.0	E T	3.0 6.0	8.300 9.000	21.979 0.0				
	12.96	0.0153		0.0	17.300	0.265			Vel = 2.78	
20 to 6	0.0	1.61 120.0		0.0 0.0	15.000 0.0	22.244 0.0				
	12.96	0.0073		0.0	15.000	0.109			Vel = 2.04	
6 to 21	0.0	2.067 120.0	T E	10.0 5.0	9.000 15.000	22.353 0.0				
	12.96	0.0022		0.0	24.000	0.052			Vel = 1.24	
21 to 23	0.0	2.067 120.0		0.0 0.0	9.100 0.0	22.405 0.0				
	12.96	0.0021		0.0	9.100	0.019			Vel = 1.24	
	0.0						22.424		K Factor = 2.74	
62 to 63	13.17	1.049 120.0	E	2.0 0.0	27.000 2.000	7.636 11.694				
	13.17	0.0601		0.0	29.000	1.743			Vel = 4.89	
63 to 69	0.0	1.049 120.0	T	5.0 0.0	3.300 5.000	21.073 0.0				
	13.17	0.0601		0.0	8.300	0.499			Vel = 4.89	

# 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	*****
69 to 9	0.0 13.17	1.38 120.0 0.0155		0.0 0.0 0.0	2.000 0.0 2.000	21.572 0.0 0.031		Vel =	2.82	
9 to 70	0.0 13.17	1.61 120.0 0.0075		0.0 0.0 0.0	6.000 0.0 6.000	21.603 0.0 0.045		Vel =	2.08	
	0.0 13.17					21.648		K Factor =	2.83	
64 to 65	13.10 13.1	1.049 120.0 0.0595	E	2.0 0.0 0.0	27.000 2.000 29.000	7.902 11.694 1.725		Vel =	4.86	
65 to 70	0.0 13.1	1.049 120.0 0.0595	T	5.0 0.0 0.0	0.500 5.000 5.500	21.321 0.0 0.327		Vel =	4.86	
70 to 23	13.17 26.27	1.61 120.0 0.0268	2T	16.0 0.0 0.0	13.000 16.000 29.000	21.648 0.0 0.776		Vel =	4.14	
23 to 71	12.97 39.24	2.067 120.0 0.0167		0.0 0.0 0.0	2.700 0.0 2.700	22.424 0.0 0.045		Vel =	3.75	
	0.0 39.24					22.469		K Factor =	8.28	
66 to 67	13.49 13.49	1.049 120.0 0.0628	E	2.0 0.0 0.0	27.000 2.000 29.000	8.589 11.694 1.822		Vel =	5.01	
67 to 71	0.0 13.49	1.049 120.0 0.0628	T	5.0 0.0 0.0	0.800 5.000 5.800	22.105 0.0 0.364		Vel =	5.01	
71 to 26	39.24 52.73	2.067 120.0 0.0288	T	10.0 0.0 0.0	5.300 10.000 15.300	22.469 0.0 0.440		Vel =	5.04	
26 to TR	0.0 52.73	2.067 120.0 0.0288	E	5.0 0.0 0.0	5.000 5.000 10.000	22.909 0.0 0.288		Vel =	5.04	
TR to FF	0.0 52.73	2.067 120.0 0.0287	S	11.0 0.0 0.0	7.000 11.000 18.000	23.197 5.000 0.517		** Fixed Loss = 5 Vel =	5.04	
FF to CTY	0.0 52.73	1.72 120.0 0.0704	T	4.086 0.0 0.0	40.000 4.086 44.086	28.714 0.0 3.103		Vel =	7.28	
	0.0 52.73					31.817		K Factor =	9.35	

# Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
50	27.0	4.9	7.0	na	12.96	0.05	256	7.0
51	27.0	4.9	7.23	na	13.17	0.05	256	7.0
52	27.0	4.9	7.15	na	13.1	0.05	256	7.0
53	27.0	4.9	7.58	na	13.49	0.05	256	7.0
60	27.0		7.83	na				
61	0.0		21.22	na				
68	0.0		21.67	na				
4	0.0		21.98	na				
20	0.0		22.24	na				
6	0.0		22.35	na				
21	0.0		22.4	na				
62	27.0		7.64	na				
63	0.0		21.07	na				
69	0.0		21.57	na				
9	0.0		21.6	na				
64	27.0		7.9	na				
65	0.0		21.32	na				
70	0.0		21.65	na				
23	0.0		22.42	na				
66	27.0		8.59	na				
67	0.0		22.1	na				
71	0.0		22.47	na				
26	0.0		22.91	na				
TR	0.0		23.2	na				
FF	0.0		28.71	na				
CTY	0.0		31.82	na				

The maximum velocity is 7.28 and it occurs in the pipe between nodes FF and CTY

# Water Supply Curve C

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City Water Supply:  
C1 - Static Pressure : 82  
C2 - Residual Pressure: 80  
C2 - Residual Flow : 1209

Demand:  
D1 - Elevation : 11.694  
D2 - System Flow : 52.73  
D2 - System Pressure : 31.817  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 52.73  
Safety Margin : 50.177

