



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

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

Job Name : PAMELA HAWKES 90 MORNING STREET BASEMENT  
Building :  
Location : 90 MORNING STREET PORTLAND MAINE  
System : ONE  
Contract : 161333  
Data File : MORNING STREET BASEMENT.WXF

Hydraulic Design Information Sheet

Name - PAMELA HAWKES Date - 3-28-16  
 Location - 90 MORNING STREET PORTLAND MAINE  
 Building - System No. - ONE  
 Contractor - DEAN AND ALLYN, INC. Contract No. - 161333  
 Calculated By - H. KING Drawing No. - 1 OF 1  
 Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - 9'  
 Occupancy - APARTMENT BUILDING BASEMENT

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

S Other

T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 900	System Type	Sprinkler/Nozzle
	Density	- .15	(X) Wet	Make RELIABLE
D	Area Per Sprinkler	- 100	( ) Dry	Model F1FR56
E	Elevation at Highest Outlet	- 8	( ) 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 CUSHION 9.3 PSI

Calculation Flow Required - 354.2 Press Required - 54.4  
 Summary C-Factor Used: 120 Overhead 140 Underground

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test - 4-12-2014		Cap. -
T	Time of Test -	Rated Cap.-	Elev.-
E	Static Press - 64	@ Press -	
R	Residual Press - 56	Elev. -	Well
	Flow - 1984		Proof Flow
S	Elevation - 0		

U Location - MORNING STREET

P Source of Information - PORTLAND WATER DIST.  
 L  
 Y

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:  
 E

# Final Calculations - Hazen-Williams

DEAN AND ALLYN, INC.  
 PAMELA HAWKES 90 MORNING STREET BASEMENT

Page 2  
 Date 3-27-16

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
01	15.60	1.049		0.0	14.000	7.757			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
02	15.6	0.0821		0.0	14.000	1.150			Vel = 5.79	
02	16.71	1.049		0.0	7.800	8.907			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
03	32.31	0.3160		0.0	7.800	2.465			Vel = 11.99	
03	18.88	1.38	2E	6.0	6.700	11.372			K Factor = 5.60	
to		120.0		0.0	6.000	0.0				
04	51.19	0.1948		0.0	12.700	2.474			Vel = 10.98	
04	20.84	1.38	2E	6.0	4.000	13.846			K Factor = 5.60	
to		120.0		0.0	6.000	0.0				
20	72.03	0.3663		0.0	10.000	3.663			Vel = 15.45	
	0.0									
	72.03					17.509			K Factor = 17.21	
05	15.00	1.38	2E	6.0	11.300	7.175			K Factor = 5.60	
to		120.0		0.0	6.000	0.0				
06	15.0	0.0201		0.0	17.300	0.347			Vel = 3.22	
06	15.36	1.38		0.0	6.300	7.522			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
07	30.36	0.0741		0.0	6.300	0.467			Vel = 6.51	
07	15.83	1.38		0.0	6.000	7.989			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
08	46.19	0.1610		0.0	6.000	0.966			Vel = 9.91	
08	16.76	1.38		0.0	6.000	8.955			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
09	62.95	0.2855		0.0	6.000	1.713			Vel = 13.50	
09	18.29	1.61	E	4.0	7.000	10.668			K Factor = 5.60	
to		120.0		0.0	4.000	0.0				
10	81.24	0.2160		0.0	11.000	2.376			Vel = 12.80	
10	20.22	1.61	T	8.0	8.000	13.044			K Factor = 5.60	
to		120.0		0.0	8.000	0.0				
22	101.46	0.3259		0.0	16.000	5.214			Vel = 15.99	
	0.0									
	101.46					18.258			K Factor = 23.74	
11	16.93	1.049		0.0	9.400	9.141			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
12	16.93	0.0956		0.0	9.400	0.899			Vel = 6.28	
12	17.74	1.049		0.0	9.300	10.040			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
13	34.67	0.3601		0.0	9.300	3.349			Vel = 12.87	
13	20.50	1.049	T	5.0	3.200	13.389			K Factor = 5.60	
to		120.0		0.0	5.000	0.0				
24	55.17	0.8504		0.0	8.200	6.973			Vel = 20.48	
	0.0									
	55.17					20.362			K Factor = 12.23	
14	80.72	1.61	T	8.0	1.000	20.815			K Factor = 5.60	
to		120.0		0.0	8.000	0.0				
23	80.72	0.2134		0.0	9.000	1.921			Vel = 12.72	

# Final Calculations - Hazen-Williams

DEAN AND ALLYN, INC.  
 PAMELA HAWKES 90 MORNING STREET BASEMENT

Page 3  
 Date 3-27-16

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 80.72						22.736		K Factor = 16.93	
20 to 21	72.03	1.61 120.0		0.0	11.500	17.509 0.0				
	72.03	0.1730		0.0	11.500	1.989			Vel = 11.35	
	0.0 72.03						19.498		K Factor = 16.31	
22 to 21	101.46	2.157 120.0	T	12.307	3.500	18.258 0.0				
	101.46	0.0784		0.0	15.807	1.240			Vel = 8.91	
	0.0 101.46						19.498		K Factor = 22.98	
24 to 14	55.17	1.61 120.0		0.0	4.300	20.362 0.0				
	55.17	0.1053		0.0	4.300	0.453			Vel = 8.69	
	0.0 55.17						20.815		K Factor = 12.09	
21 to 23	173.49	2.157 120.0	T	12.307	3.000	19.498 0.0				
	173.49	0.2115		0.0	15.307	3.238			Vel = 15.23	
23 to TR	80.72	2.157 120.0	E	6.153	24.000	22.736 0.0				
	254.21	0.4289		0.0	30.153	12.934			Vel = 22.32	
TR to FF	0.0	2.157 120.0	S	13.537	8.000	35.670 8.465			** Fixed Loss = 5	
	254.21	0.4290		0.0	21.537	9.239			Vel = 22.32	
FF to CTY	0.0	4.1 120.0	T G	21.855	30.000	53.374 0.0				
	254.21	0.0188		0.0	54.041	1.015			Vel = 6.18	
	100.00 354.21						54.389		Qa = 100.00 K Factor = 48.03	

# Pressure / Flow Summary - STANDARD

DEAN AND ALLYN, INC.  
 PAMELA HAWKES 90 MORNING STREET BASEMENT

Page 4  
 Date 3-27-16

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
01	8.0	5.6	7.76	na	15.6	0.15	100	7.0
02	8.0	5.6	8.91	na	16.71	0.15	100	7.0
03	8.0	5.6	11.37	na	18.88	0.15	100	7.0
04	8.0	5.6	13.85	na	20.84	0.15	100	7.0
05	8.0	5.6	7.17	na	15.0	0.15	100	7.0
06	8.0	5.6	7.52	na	15.36	0.15	100	7.0
07	8.0	5.6	7.99	na	15.83	0.15	100	7.0
08	8.0	5.6	8.96	na	16.76	0.15	100	7.0
09	8.0	5.6	10.67	na	18.29	0.15	100	7.0
10	8.0	5.6	13.04	na	20.23	0.15	100	7.0
11	8.0	5.6	9.14	na	16.93	0.15	100	7.0
12	8.0	5.6	10.04	na	17.74	0.15	100	7.0
13	8.0	5.6	13.39	na	20.49	0.15	100	7.0
14	8.0	5.6	20.82	na	25.55	0.15	100	7.0
20	8.0		17.51	na				
22	8.0		18.26	na				
24	8.0		20.36	na				
21	8.0		19.5	na				
23	8.0		22.74	na				
TR	8.0		35.67	na				
FF	0.0		53.37	na				
CTY	0.0		54.39	na	100.0			

The maximum velocity is 22.32 and it occurs in the pipe between nodes 23 and TR

# Water Supply Curve C

DEAN AND ALLYN, INC.  
PAMELA HAWKES 90 MORNING STREET BASEMENT

Page 5  
Date 3-27-16

City Water Supply:  
C1 - Static Pressure : 64  
C2 - Residual Pressure: 56  
C2 - Residual Flow : 1984

Demand:  
D1 - Elevation : 3.465  
D2 - System Flow : 254.209  
D2 - System Pressure : 54.389  
Hose ( Demand ) : 100  
D3 - System Demand : 354.209  
Safety Margin : 9.281

