



... Fire Protection by Computer Design

DEAN & ALLYN, INC.  
PO BOX 709  
116 LEWISTON ROAD  
GRAY, MAINE 04039  
207-657-5646

Job Name : 12 VESPER STREET 2 HEAD CALC  
Building :  
Location : 12 VESPER STREET PORTLAND MAINE  
System : ONE  
Contract : C111035  
Data File : VESPER 2 HEAD .WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 12 VESPER STREET Date - 1-22-12  
Location - 12 VESPER STREET PORTLAND MAINE  
Building - System No. - ONE  
Contractor - DEAN AND ALLYN, INC. Contract No. - C111035  
Calculated By - H. KING Drawing No. - 1 OF 1  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8'  
OCCUPANCY - RESIDENCE

S Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D  
Y Number of Sprinklers Flowing: ( )1 (X)2 ( )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 VIKING Model FREEDOM  
I Elevation at Highest Outlet - 20' Feet Size K-Factor 4.9  
G Note:CUSHION 13.24PSI Temperature Rating 155  
N

Calculation Gpm Required 26.7 Psi Required 40.2 PUMP  
Summary C-Factor Used: Overhead 120 Underground 120

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - Rated Cap. Cap.  
T Time of Test - @ Psi Elev.  
E Static (Psi) - 55 Elev.  
R Residual (Psi) - 50 Other Well  
Flow (Gpm) - 50 Proof Flow Gpm  
S Elevation - 0

P Location: GOULDS PUMP CURVE

P  
L Source of Information:  
Y

## Fittings Used Summary

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Fitting Legend		½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Abbrev.	Name																				
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
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
2	20.0	4.9	7.0	na	12.96	0.09	144	7.0
3	20.0	4.9	7.92	na	13.79	0.05	256	7.0
16	20.0		7.7	na				
17	20.0		8.46	na				
11	20.0		11.8	na				
12	20.0		14.92	na				
13	10.0		22.15	na				
14	10.0		25.38	na				
15	10.0		29.17	na				
TR	8.0		31.37	na				
FF	0.0		38.63	na				
PUMP	0.0		40.19	na				

The maximum velocity is 9.93 and it occurs in the pipe between nodes 17 and 11

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	*****
2	12.96	1.049	1T	5.0	7.000	7.000			K Factor = 4.90	
to		120.0		0.0	5.000	0.0				
16	12.96	0.0583		0.0	12.000	0.700			Vel = 4.81	
	0.0									
	12.96					7.700			K Factor = 4.67	
3	13.79	1.049	1T	5.0	3.300	7.916			K Factor = 4.90	
to		120.0		0.0	5.000	0.0				
17	13.79	0.0654		0.0	8.300	0.543			Vel = 5.12	
	0.0									
	13.79					8.459			K Factor = 4.74	
16	12.96	1.049		0.0	13.000	7.700				
to		120.0		0.0	0.0	0.0				
17	12.96	0.0584		0.0	13.000	0.759			Vel = 4.81	
17	13.79	1.049	1T	5.0	10.000	8.459				
to		120.0		0.0	5.000	0.0				
11	26.75	0.2229		0.0	15.000	3.343			Vel = 9.93	
11	0.0	1.049	1E	2.0	12.000	11.802				
to		120.0		0.0	2.000	0.0				
12	26.75	0.2229		0.0	14.000	3.120			Vel = 9.93	
12	0.0	1.049	1E	2.0	11.000	14.922				
to		120.0		0.0	2.000	4.331				
13	26.75	0.2228		0.0	13.000	2.897			Vel = 9.93	
13	0.0	1.049	1E	2.0	7.500	22.150				
to		120.0	1T	5.0	7.000	0.0				
14	26.75	0.2229		0.0	14.500	3.232			Vel = 9.93	
14	0.0	1.049	1E	2.0	10.000	25.382				
to		120.0	1T	5.0	7.000	0.0				
15	26.75	0.2228		0.0	17.000	3.788			Vel = 9.93	
15	0.0	1.049	1E	2.0	4.000	29.170				
to		120.0		0.0	2.000	0.866				
TR	26.75	0.2230		0.0	6.000	1.338			Vel = 9.93	
TR	0.0	1.049	2S	10.0	7.000	31.374				
to		120.0		0.0	10.000	3.465				
FF	26.75	0.2228		0.0	17.000	3.788			Vel = 9.93	
FF	0.0	1.049	2E	4.0	3.000	38.627				
to		120.0		0.0	4.000	0.0				
PUMP	26.75	0.2230		0.0	7.000	1.561			Vel = 9.93	
	0.0									
	26.75					40.188			K Factor = 4.22	

# Water Supply Curve (C)

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City Water Supply:  
C1 - Static Pressure : 55  
C2 - Residual Pressure: 50  
C2 - Residual Flow : 50

Demand:  
D1 - Elevation : 8.662  
D2 - System Flow : 26.751  
D2 - System Pressure : 40.188  
Hose ( Demand ) :  
D3 - System Demand : 26.751  
Safety Margin : 13.241

