

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

EASTERN FIRE PROTECTION  
170 KITTYHAWK AVE  
P.O. BOX 1390  
AUBURN MAINE, 04210  
207-784-1507

Job Name : 5564 CROSSROADS  
Building : WOOD CONSTRUCTION  
Location : 735 WASHINGTON STREET, PORTLAND MAINE  
System : WET  
Contract : 5564  
Data File : 5564 cross roads SECOND FLOOR BEDROOM.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 5564 CROSSROADS Date - 12/12/2016  
Location - 735 WASHINGTON STREET, PORTLAND MAINE  
Building - WOOD CONSTRUCTION System No. - WET  
Contractor - EASTERN FIRE PROTECTION Contract No. - 5564  
Calculated By - JML Drawing No. - 1  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES  
OCCUPANCY - RESIDENTIAL

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 - 18 Gpm System Type  
Listed Pres. at Start Point - 16.8 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 16 x 18 ( ) Deluge ( ) PreAction  
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle  
S Additional Flow Added - 0 Gpm Make RELIABLE Model F1RES44  
I Elevation at Highest Outlet - 125.96Feet Size 1/2" K-Factor 4.4  
G Note: Temperature Rating 155  
N

Calculation Gpm Required 36.700 Psi Required 47.807 AT PUMP  
Summary C-Factor Used: Overhead 120 Underground 120

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - Rated Cap. 20 Cap. MIN. 1101 GALLONS  
T Time of Test - @ Psi 54.13 Elev.  
E Static (Psi) - Elev. 101  
R Residual (Psi) - Other Well  
Flow (Gpm) - Proof Flow Gpm  
S Elevation -

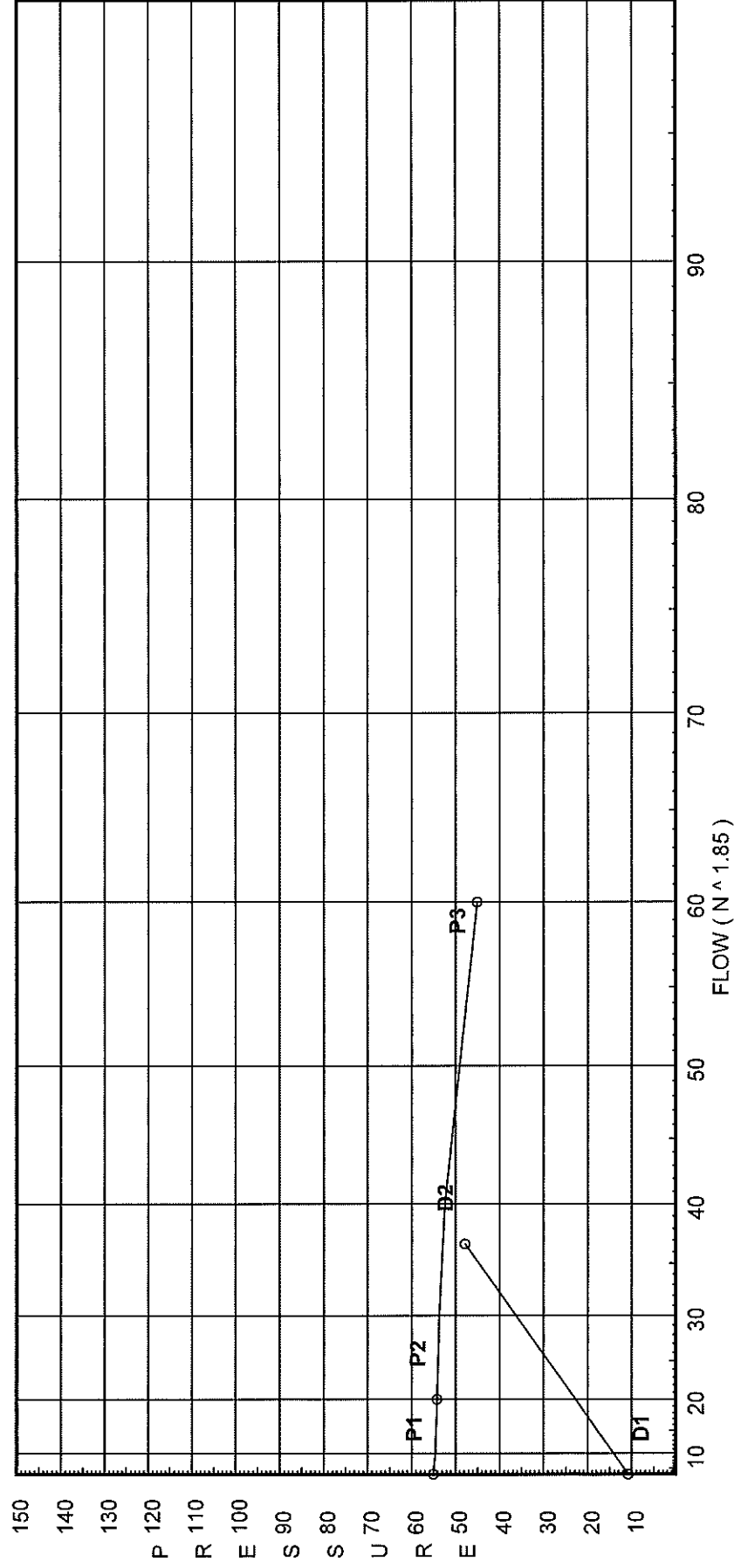
P Location: PUMP LOCATED IN BASEMENT  
P  
L Source of Information: PUMP MANUFACTURER'S TECH DATA  
Y

# Water Supply Curve C

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**Pump Data:**  
 P1 - Pump Churn Pressure : 54.99  
 P2 - Pump Rated Pressure : 54.13  
 P2 - Pump Rated Flow : 20  
 P3 - Pump Pressure @ Max Flow : 45.03  
 P3 - Pump Max Flow : 60

**Demand:**  
 D1 - Elevation : 10.810  
 D2 - System Flow : 36.7  
 D2 - System Pressure : 47.807  
 Hose ( Demand ) :  
 D3 - System Demand : 36.7  
 Safety Margin : 5.036



# Fittings Used Summary

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Fitting Legend Abbrev. Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/4	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
E NFFPA 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																			
S NFFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T NFFPA 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.
30	125.96	4.4	16.8	na	18.03	0.05	1	16.8
31	125.96	4.4	18.0	na	18.67	0.05	1	7.0
32	125.96		21.55	na				
7	125.96		23.38	na				
8	116.46		28.81	na				
9	106.25		35.74	na				
10	106.25		38.79	na				
11	106.25		41.0	na				
TOR	106.25		41.79	na				
PUMP	101.0		47.81	na				

The maximum velocity is 13.62 and it occurs in the pipe between nodes 31 and 32

# 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	*****
30	18.03	1.049	T	5.0	6.125	16.800		K Factor = 4.40	
to		120.0		0.0	5.000	0.0			
31	18.03	0.1075		0.0	11.125	1.196		Vel = 6.69	
31	18.67	1.049	T	5.0	3.875	17.996		K Factor = 4.40	
to		120.0		0.0	5.000	0.0			
32	36.7	0.4000		0.0	8.875	3.550		Vel = 13.62	
32	0.0	1.38	E	3.0	14.420	21.546			
to		120.0		0.0	3.000	0.0			
7	36.7	0.1052		0.0	17.420	1.833		Vel = 7.87	
7	0.0	1.38	E	3.0	9.500	23.379			
to		120.0		0.0	3.000	4.114			
8	36.7	0.1052		0.0	12.500	1.315		Vel = 7.87	
8	0.0	1.38	T	6.0	17.875	28.808			
to		120.0		0.0	6.000	4.422			
9	36.7	0.1052		0.0	23.875	2.512		Vel = 7.87	
9	0.0	1.38	2E	6.0	16.950	35.742			
to		120.0	T	6.0	12.000	0.0			
10	36.7	0.1052		0.0	28.950	3.046		Vel = 7.87	
10	0.0	1.38	E	3.0	12.000	38.788			
to		120.0	T	6.0	9.000	0.0			
11	36.7	0.1052		0.0	21.000	2.210		Vel = 7.87	
11	0.0	1.61	2E	8.0	7.920	40.998			
to		120.0		0.0	8.000	0.0			
TOR	36.7	0.0496		0.0	15.920	0.790		Vel = 5.78	
TOR	0.0	1.61	S	9.0	6.000	41.788			
to		120.0	Fsp	0.0	9.000	5.274		** Fixed Loss = 3	
PUMP	36.7	0.0497		0.0	15.000	0.745		Vel = 5.78	
	0.0								
	36.70					47.807		K Factor = 5.31	