

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

Eastern Fire Protection  
170 Kitty Hawk Ave.  
P.O. Box 1390  
Auburn, Maine, 04211  
207-784-1507

Job Name : 118 MUNJOY HILL RESIDENTIAL 3RD  
Drawing : Wood Frame  
Location : 118 Congress St., Portland, Maine  
Remote Area : Wet  
Contract : 5174  
Data File : 1-5174RESIDENTIAL3RDsubmittal.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 118 Munjoy Hill Third Floor Residential Date - 08/08/14  
Location - 118 Congress St., Portland, Maine  
Building - Wood Frame System No. - Wet  
Contractor - Eastern Fire Protection Contract No. - 5174  
Calculated By - WAF Drawing No. - 2 of 2  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 10'-1"  
OCCUPANCY - Dwelling Unit, Light Hazard, Residential

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 - 7.0 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction  
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle  
S Additional Flow Added - 0 Gpm Make Tyco Model LF-II  
I Elevation at Highest Outlet - 182.46Feet Size 1/2" K-Factor 4.9  
G Note: Temperature Rating 155  
N

Calculation Gpm Required 56 Psi Required 43.4 At Test  
Summary C-Factor Used: Overhead 150 Underground 140

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 4/30/14 Rated Cap. Cap.  
T Time of Test - 11:30 AM @ Psi Elev.  
E Static (Psi) - 50 Elev.  
R Residual (Psi) - 44 Other Well  
Flow (Gpm) - 919 Proof Flow Gpm  
S Elevation - 149

P Location: Hydrant located on the corner of Congress and St.Lawrence

P  
L Source of Information: Portland Water District  
Y

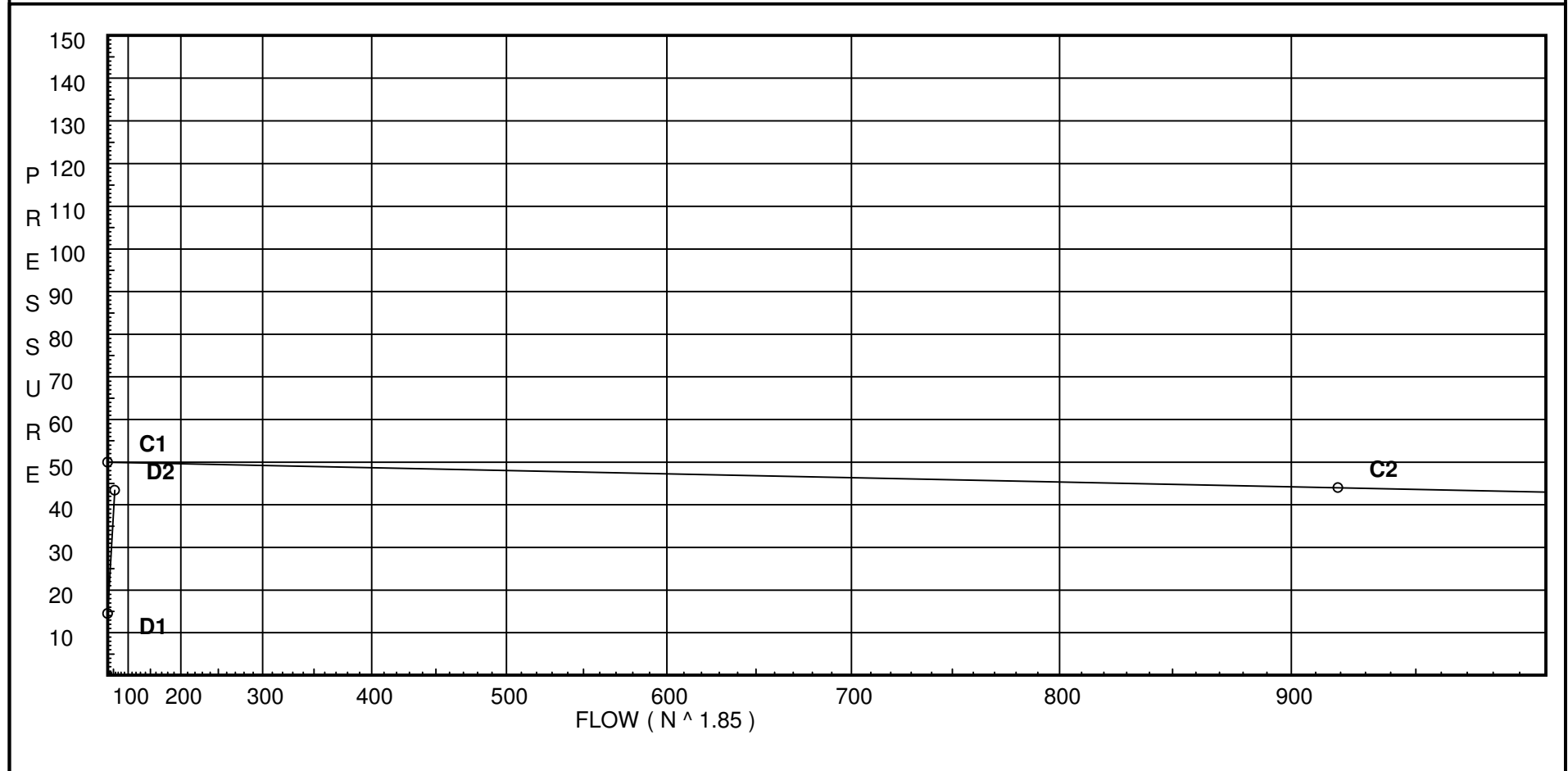
# Water Supply Curve C

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City Water Supply:  
C1 - Static Pressure : 50  
C2 - Residual Pressure: 44  
C2 - Residual Flow : 919

Demand:  
D1 - Elevation : 14.492  
D2 - System Flow : 55.989  
D2 - System Pressure : 43.422  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 55.989  
Safety Margin : 6.544



# Fittings Used Summary

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Fitting Legend		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
Abbrev.	Name																				
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
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
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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
Zcc	Colt C200N Butt	Fitting generates a Fixed Loss Based on Flow																			

## 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.

**SUPPLY ANALYSIS**

<b>Node at Source</b>	<b>Static Pressure</b>	<b>Residual Pressure</b>	<b>Flow</b>	<b>Available Pressure</b>	<b>Total Demand</b>	<b>Required Pressure</b>
TEST	50.0	44	919.0	49.966	55.99	43.422

**NODE ANALYSIS**

<b>Node Tag</b>	<b>Elevation</b>	<b>Node Type</b>	<b>Pressure at Node</b>	<b>Discharge at Node</b>	<b>Notes</b>
D001	194.62	4.9	7.0	12.96	
DO02	194.62	4.9	7.0	12.96	
68	182.46	4.85	8.4	14.05	K=K @ EQ02
66	182.46	4.85	7.26	13.07	K=K @ EQ02
61	182.46	4.85	7.15	12.96	K=K @ EQ02
67	182.46		7.68		
62	182.46		8.85		
63	182.46	4.79	11.02	15.9	K=K @ EQ01
64	182.46		16.56		
65	182.46		20.31		
65M	182.46		20.87		
HDR1	151.5		34.56		
FLG	148.5		43.62		
TEST	149.0		43.42		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv. Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
D001 to EQ01	194.620 194.620	4.90	12.96 12.96	1 1.101	T 0.0	9.563 0.0	1.000 9.562	150 0.0305	7.000 0.0	Vel = 4.37	
EQ01			0.0 12.96						7.322	K Factor = 4.79	
DO02 to EQ02	194.620 194.620	4.90	12.96 12.96	1 1.101	E 0.0	3.825 0.0	1.000 3.825	150 0.0305	7.000 0.0	Vel = 4.37	
EQ02			0.0 12.96						7.147	K Factor = 4.85	
68 to 62	182.460 182.46	4.85	14.05 14.05	1 1.101	T 0.0	9.563 0.0	3.170 9.562	150 0.0354	8.400 0.0	K = K @ EQ02 Vel = 4.73	
62			0.0 14.05						8.851	K Factor = 4.72	
66 to 67	182.46 182.46	4.85	13.07 13.07	1 1.101	T 0.0	9.563 0.0	4.000 9.562	150 0.0310	7.263 0.0	K = K @ EQ02 Vel = 4.40	
67			0.0 13.07						7.683	K Factor = 4.72	
61 to 67	182.46 182.46	4.85	12.96 12.96	1 1.101	T 0.0	9.563 0.0	8.000 9.562	150 0.0305	7.147 0.0	K = K @ EQ02 Vel = 4.37	
67 to 62	182.46 182.46		13.07 26.03	1 1.101		0.0 0.0	10.540 0.0	150 0.1108	7.683 1.168	Vel = 8.77	
62 to 63	182.46 182.46		14.06 40.09	1 1.101		0.0 0.0	8.790 0.0	150 0.2463	8.851 2.165	Vel = 13.51	
63 to 64	182.46 182.46	4.79	15.90 55.99	1.25 1.394	2E T	9.523 9.523	19.210 19.046	150 0.1448	11.016 0.0	K = K @ EQ01 Vel = 11.77	
64 to 65	182.46 182.46		0.0 55.99	2 2.003	4T 3E	51.859 19.447	80.000 71.306	150 0.0248	16.556 0.0	Vel = 5.70	
65 to 65M	182.46 182.46		0.0 55.99	2.5 2.469	S B T	14.0 7.0 12.0	9.000 33.000 42.000	120 0.0135	20.306 0.0 0.568	Vel = 3.75	
65M to HDR1	182.46 151.500		0.0 55.99	4 4.26	2B 5L S 2T	31.601 39.501 28.968 52.668	135.000 152.738 287.738	120 0.0009	20.874 13.409 0.272	Vel = 1.26	
HDR1 to FLG	151.500 148.500		0.0 55.99	4 4.26	Zcc	0.0 0.0 0.0	1.500 0.0 1.500	120 0.0013	34.555 9.068 0.002	* * Fixed Loss = 7.769 Vel = 1.26	

# Final Calculations - Hazen-Williams

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Node1	Elev1	K	Qa	Nom	Fitting	Pipe	CFact	Pt			
to					or	Ftng's		Pe	*****	Notes	*****
Node2	Elev2	Fact	Qt	Act	Eqv.	Ln.	Total	Pf/Ft	Pf		
FLG	148.500		0.0	6	2L	25.822	40.000	140	43.625		
to					G	4.304	73.163		-0.217		
TEST	149		55.99	6.16	T	43.037	113.163	0.0001	0.014	Vel =	0.60
			0.0								
TEST			55.99						43.422	K Factor =	8.50