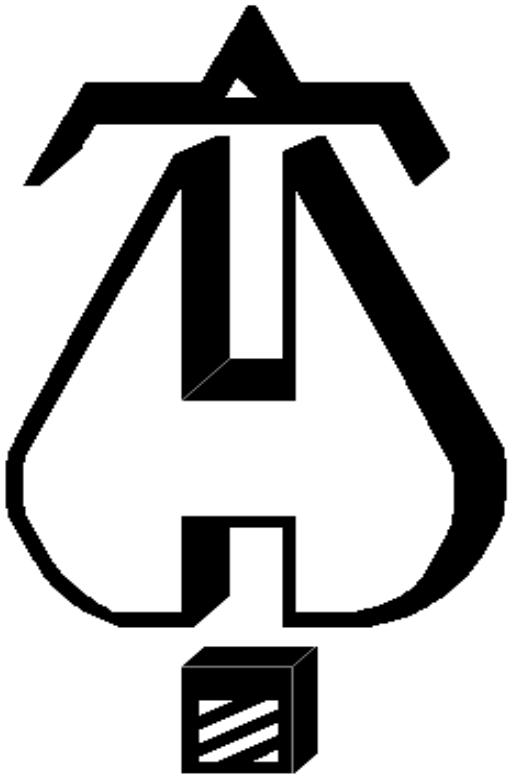


. . . Fire Protection by Computer Design

FREEDOM FIRE PROTECTION
209 QUAKER RIDGE ROAD
CASCO, MAINE 04015
(207) 627-4109

Job Name	:	380 DANFORTH STREET
Drawing	:	380 DANFORTH STREET
Location	:	PORTLAND, MAINE 04102
Remote Area	:	#1 AREA #1
Contract	:	
Data File	:	380 DANFORTH STREET HC.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 380 DANFORTH STREET Date - 12/15/16
Location - PORTLAND, MAINE 04102
Building - 380 DANFORTH STREET System No. - #1 AREA #1
Contractor - FREEDOM FIRE PROTECTION Contract No. -
Calculated By - MIKE NOBLIT Drawing No. - FP-2
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 10'-0"
OCCUPANCY - HOUSE

SYSTEM DESIGN

Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: ( )1 (X)2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 16 Gpm System Type
Listed Pres. at Start Point - 13.2 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16' x 16' ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
Additional Flow Added - 0 Gpm Make TYCO Model LFII
Elevation at Highest Outlet - 33 Feet Size 1/2" K-Factor 4.4
Note: Temperature Rating 155

Calculation Summary: Gpm Required 32.437 Psi Required 55.247 At Test
C-Factor Used: Overhead 150 Underground 140

Water Flow Test:		Pump Data:		Tank or Reservoir:	
Date of Test	2/1/2016	Rated Cap.		Cap.	
Time of Test		@ Psi		Elev.	
Static (Psi)	66	Elev.			
Residual (Psi)	0	Other			Well
Flow (Gpm)	691			Proof Flow Gpm	
Elevation					

Location:

Source of Information: PORTLAND WATER DISTRICT

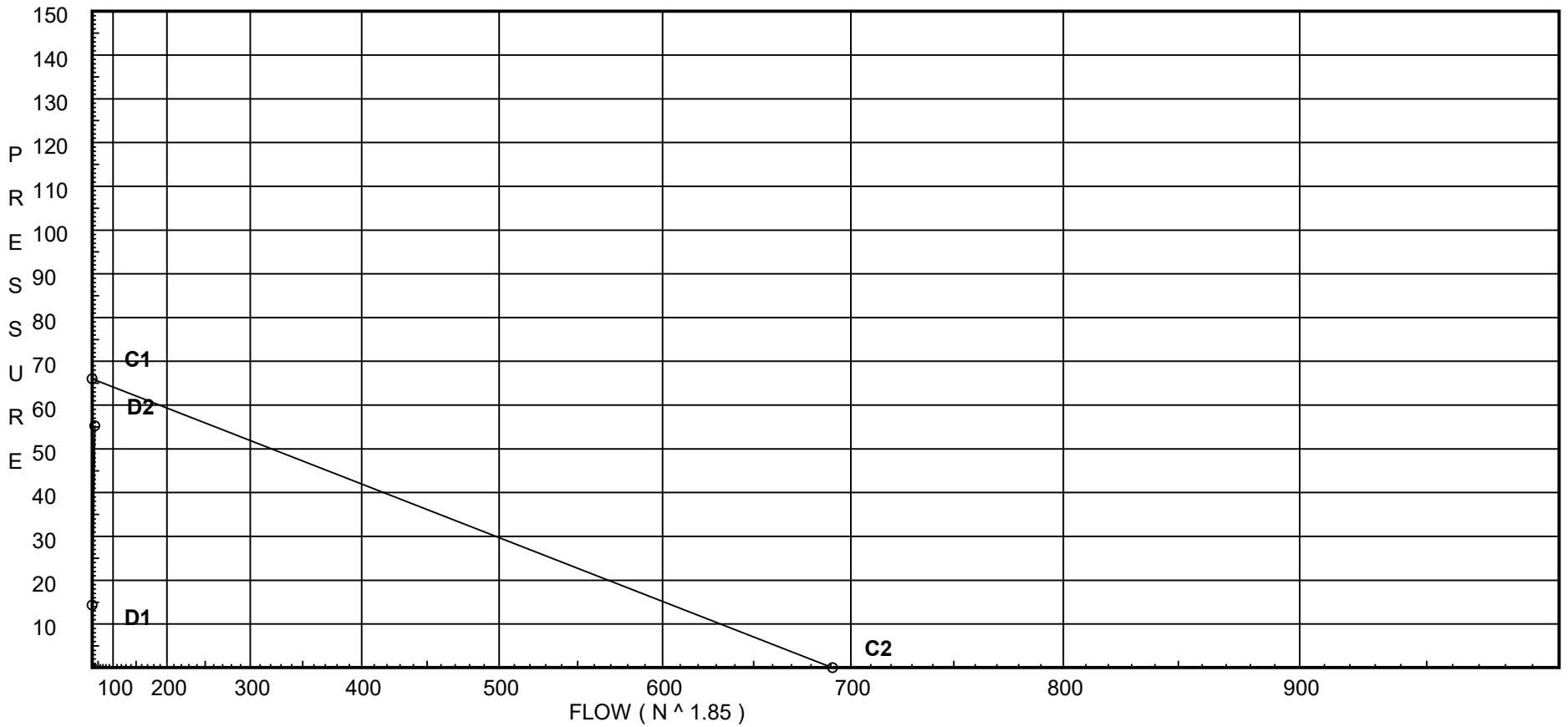
Water Supply Curve C

FREEDOM FIRE PROTECTION
380 DANFORTH STREET

Date 12/15/16

City Water Supply:
- C1 - Static Pressure : 66
- C2 - Residual Pressure: 0
- C2 - Residual Flow : 691

Demand:
- D1 - Elevation : 14.292
- D2 - System Flow : 32.437
- D2 - System Pressure : 55.247
- Hose (Demand) : _____
- D3 - System Demand : 32.437
- Safety Margin : 10.523



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
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
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
Zaa	Ames 2000B	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.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
101	33.0	4.4	13.2	na	15.99	0.05	0.001	13.2
12	33.0		13.65	na				
11	22.0		19.08	na				
10	22.0		19.73	na				
102	33.0	4.4	13.98	na	16.45	0.05	0.001	13.2
9	33.0		14.18	na				
8	22.0		19.65	na				
7	22.0		20.44	na				
6	22.0		23.5	na				
5	22.0		24.9	na				
4	10.33		33.52	na				
3	10.33		35.42	na				
2	0.0		48.08	na				
1	0.0		50.31	na				
0	0.0		52.57	na				
TEST	0.0		55.25	na				

The maximum velocity is 12.04 and it occurs in the pipe between nodes 3 and 2

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 ******
101	33	4.40	15.99	1	T	9.563	0.500	150	13.200	
to						0.0	9.562		0.0	
12	33		15.99	1.101		0.0	10.062	0.0449	0.452	Vel = 5.39
12	33		0.0	1	E	3.825	11.000	150	13.652	
to						0.0	3.825		4.764	
11	22		15.99	1.101		0.0	14.825	0.0450	0.667	Vel = 5.39
11	22		0.0	1	T	9.563	4.830	150	19.083	
to						0.0	9.562		0.0	
10	22		15.99	1.101		0.0	14.392	0.0450	0.647	Vel = 5.39
10	22		0.0	1	T	9.563	6.166	150	19.730	
to						0.0	9.562		0.0	
7	22		15.99	1.101		0.0	15.728	0.0450	0.707	Vel = 5.39
			0.0							
7			15.99						20.437	K Factor = 3.54
102	33	4.40	16.45	1	E	3.825	0.500	150	13.979	
to						0.0	3.825		0.0	
9	33		16.45	1.101		0.0	4.325	0.0474	0.205	Vel = 5.54
9	33		0.0	1	E	3.825	11.000	150	14.184	
to						0.0	3.825		4.764	
8	22		16.45	1.101		0.0	14.825	0.0474	0.703	Vel = 5.54
8	22		0.0	1		0.0	16.583	150	19.651	
to						0.0	0.0		0.0	
7	22		16.45	1.101		0.0	16.583	0.0474	0.786	Vel = 5.54
7	22		15.99	1	T	9.563	8.830	150	20.437	
to						0.0	9.562		0.0	
6	22		32.44	1.101		0.0	18.392	0.1664	3.061	Vel = 10.93
6	22		0.0	1	E	3.825	4.583	150	23.498	
to						0.0	3.825		0.0	
5	22		32.44	1.101		0.0	8.408	0.1665	1.400	Vel = 10.93
5	22		0.0	1	E	2.531	11.660	120	24.898	
to						0.0	2.531		5.054	
4	10.330		32.44	1.101		0.0	14.191	0.2515	3.569	Vel = 10.93
4	10.330		0.0	1	E	2.531	5.000	120	33.521	
to						0.0	2.531		0.0	
3	10.330		32.44	1.101		0.0	7.531	0.2515	1.894	Vel = 10.93
3	10.330		0.0	1	E	2.0	10.330	120	35.415	
to					Zaa	0.0	2.000		8.741	* * Fixed Loss = 4.267
2	0		32.44	1.049		0.0	12.330	0.3183	3.925	Vel = 12.04
2	0		0.0	1	T	5.0	2.000	120	48.081	
to						0.0	5.000		0.0	
1	0		32.44	1.049		0.0	7.000	0.3184	2.229	Vel = 12.04
1	0		0.0	1.5	3E	10.627	40.000	140	50.310	
to						0.0	10.627		0.0	
0	0		32.44	1.481		0.0	50.627	0.0446	2.259	Vel = 6.04
0	0		0.0	1.5		0.0	60.000	140	52.569	
to						0.0	0.0		0.0	
TEST	0		32.44	1.481		0.0	60.000	0.0446	2.678	Vel = 6.04
			0.0							

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	******
TEST			32.44						55.247	K Factor =	4.36	