



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

HIGH TECH FIRE PROTECTION  
84 HACKETT MILLS ROAD  
P.O. BOX 156  
POLAND, ME 04274  
207-998-2551

Job Name : paris farmers union wet sales floor  
Drawing : FP-01  
Location : 55 WARREN AVE PORTLAND, ME  
Remote Area : #1  
Contract : 100114-1  
Data File : sales floor calc.WXF

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**HYDRAULIC CALCULATIONS**  
*for*

**Project name:** PARIS FARMERS UNION SALES FLOOR  
**Location:** 55 WARREN AVE PORTLAND, ME  
**Drawing no:** FP-01  
**Date:** 2/3/15

**Design**

**Remote area number:** #1  
**Remote area location:** SALES FLOOR  
**Occupancy classification:** ORDINARY HAZARD GROUP 2  
**Density:** .2 - Gpm/SqFt  
**Area of application:** 1500 - SqFt  
**Coverage per sprinkler:** 324 - SqFt  
**Type of sprinklers calculated:** EXTENDED COVERAGE ORDINARY HAZARD  
**No. of sprinklers calculated:** 5  
**In-rack demand:** NA - GPM  
**Hose streams:** 250 - GPM  
**Total water required (including hose streams):** 592 - GPM @ 56 - Psi  
**Type of system:** WET SYSTEM  
**Volume of dry or preaction system:** NA - Gal

**Water supply information**

**Date:** 5-2-13  
**Location:** WARREN AVE 1000' FROM SITE  
**Source:** PORTAND WATER DISTRICT

**Name of contractor:** HIGH TECH FIRE PROTECTION  
**Address:** 84 HACKETT MILLS ROAD / P.O. BOX 156 / POLAND, ME 04274  
**Phone number:** 207-998-2551  
**Name of designer:** ED POULIN  
**Authority having jurisdiction:** STATE OF MAINE / CITY OF PORTLAND  
**Notes: (Include peaking information or gridded systems here.)**

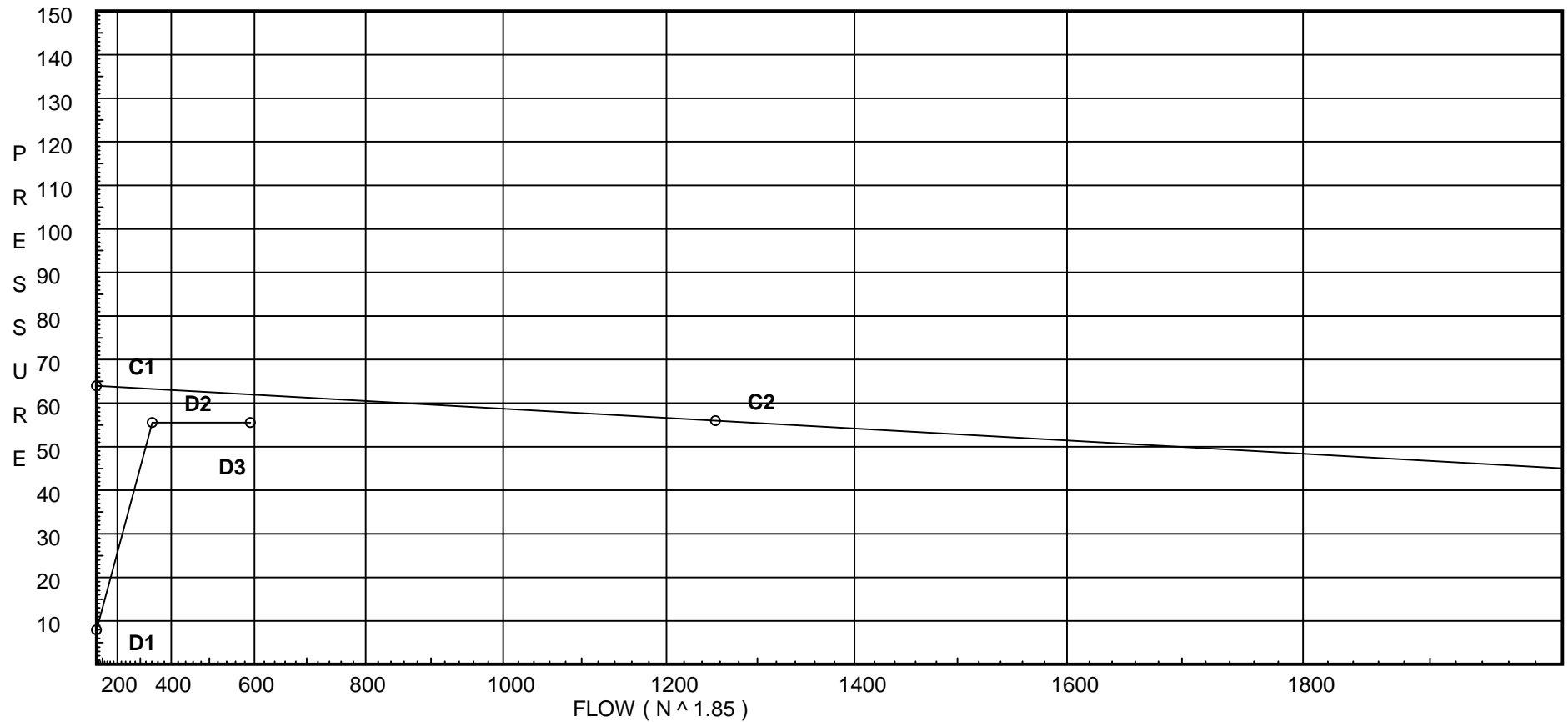
# Water Supply Curve (C)

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City Water Supply:  
C1 - Static Pressure : 64  
C2 - Residual Pressure: 56  
C2 - Residual Flow : 1255

Demand:  
D1 - Elevation : 7.926  
D2 - System Flow : 341.308  
D2 - System Pressure : 55.563  
Hose ( Demand ) : 250  
D3 - System Demand : 591.308  
Safety Margin : 6.449



# Fittings Used Summary

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## Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	0	0	0	0	0	0	0
Zia	Wilkins 350	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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
10	14.3	14	21.6	na	65.07	0.2	324	21.6
11	14.3	14	22.19	na	65.94	0.2	324	21.6
12	14.3	14	24.45	na	69.23	0.2	324	21.6
20	14.3	14	23.76	na	68.25	0.2	324	21.6
21	14.3		26.42	na				
22	14.3	14	27.06	na	72.82	0.2	324	21.6
A	14.3		35.02	na				
B	14.3		35.18	na				
C	14.3		36.68	na				
TOR	14.3		38.42	na				
BOR	4.0		47.17	na				
BASE	1.0		52.64	na				
H1	0.0		53.25	na				
H2	0.0		53.77	na	250.0			
TEST	-4.0		55.56	na				

The maximum velocity is 17.58 and it occurs in the pipe between nodes 12 and A

# 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	*****
10 to 11	65.07	2.157 120.0		0.0	17.000	21.600			K Factor = 14.00	
11 to 12	65.07	0.0345		0.0	17.000	0.586			Vel = 5.71	
11 to 12	65.94	2.157 120.0		0.0	18.000	22.186			K Factor = 14.00	
12 to A	131.01	0.1258		0.0	18.000	2.265			Vel = 11.50	
12 to A	69.23	2.157 120.0	1T	12.307	26.000	24.451			K Factor = 14.00	
	200.24	0.2759		0.0	12.307	0.0			Vel = 17.58	
	0.0 200.24						35.018		K Factor = 33.84	
20 to 21	68.25	1.38 120.0	1T	6.0	2.000	23.765			K Factor = 14.00	
21 to 22	68.25	0.3315		0.0	6.000	0.0			Vel = 14.64	
21 to 22	0.0	2.157 120.0		0.0	17.000	26.417				
22 to B	68.25	0.0376		0.0	0.0	0.0			Vel = 5.99	
22 to B	72.82	2.157 120.0	1T	12.307	44.000	27.057			K Factor = 14.00	
	141.07	0.1443		0.0	12.307	0.0			Vel = 12.39	
	0.0 141.07						35.182		K Factor = 23.78	
A to B	200.24	4.26 120.0		0.0	16.400	35.018				
B to C	200.24	0.0100		0.0	0.0	0.0			Vel = 4.51	
B to C	141.07	4.26 120.0	1X	21.067	34.750	35.182				
C to TOR	341.31	0.0269		0.0	21.067	0.0			Vel = 7.68	
C to TOR	0.0	4.26 120.0	1V	8.954	55.500	36.684				
TOR to BOR	341.31	0.0269		0.0	8.954	0.0			Vel = 7.68	
TOR to BOR	0.0	4.26 120.0	1T	26.334	6.000	38.418				
BOR to BASE	341.31	0.0269	1Fsp	0.0	42.134	7.461			* Fixed loss = 3	
BOR to BASE	0.0	4.26 120.0	1B	15.8	48.134	1.294			Vel = 7.68	
BOR to BASE	0.0	4.26 120.0	1Zia	0.0	2.000	47.173				
BASE to H1	341.31	0.0269	1E	13.167	13.167	5.058			* Fixed loss = 3.758	
BASE to H1	0.0	6.16 140.0	2E	40.168	10.000	52.639			Vel = 7.68	
H1 to H2	341.31	0.0034	1G	4.304	44.472	0.433				
H1 to H2	0.0	6.16 140.0	1T	43.037	110.000	53.255			Vel = 3.67	
H2 to TEST	341.31	0.0034		0.0	43.037	0.0			Vel = 3.67	
H2 to TEST	250.00	20.36 100.0	1G	11.533	1050.000	53.768			Qa = 250	
TEST to TEST	591.31	0.0001	1E	52.421	169.847	1.732			Vel = 0.58	
	0.0 591.31		1T	105.891	1219.847	0.063			Vel = 0.58	
							55.563		K Factor = 79.33	

# 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	*****
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