



**... 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 dry cold storage  
Drawing : FP-01  
Location : 55 WARREN AVE PORTLAND, ME  
Remote Area : #2  
Contract : 100114-1  
Data File : cold storage calc .WXF

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**HYDRAULIC CALCULATIONS**  
*for*

**Project name:** paris farmers union dry cold storage  
**Location:** 55 WARREN AVE PORTLAND, ME  
**Drawing no:** FP-01  
**Date:** 2/3/15

**Design**

**Remote area number:** #2  
**Remote area location:** COLD STORAGE AREA  
**Occupancy classification:** ORDINARY HAZARD GROUP 2  
**Density:** .2 - Gpm/SqFt  
**Area of application:** 1950 - SqFt  
**Coverage per sprinkler:** 256 - SqFt  
**Type of sprinklers calculated:** EXTENDED COVERAGE ORDINARY HAZARD  
**No. of sprinklers calculated:** 8  
**In-rack demand:** NA - GPM  
**Hose streams:** 250 - GPM  
**Total water required (including hose streams):** 693 - GPM @ 52 - Psi  
**Type of system:** DRY SYSTEM  
**Volume of dry or preaction system:** 300 - 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.)**

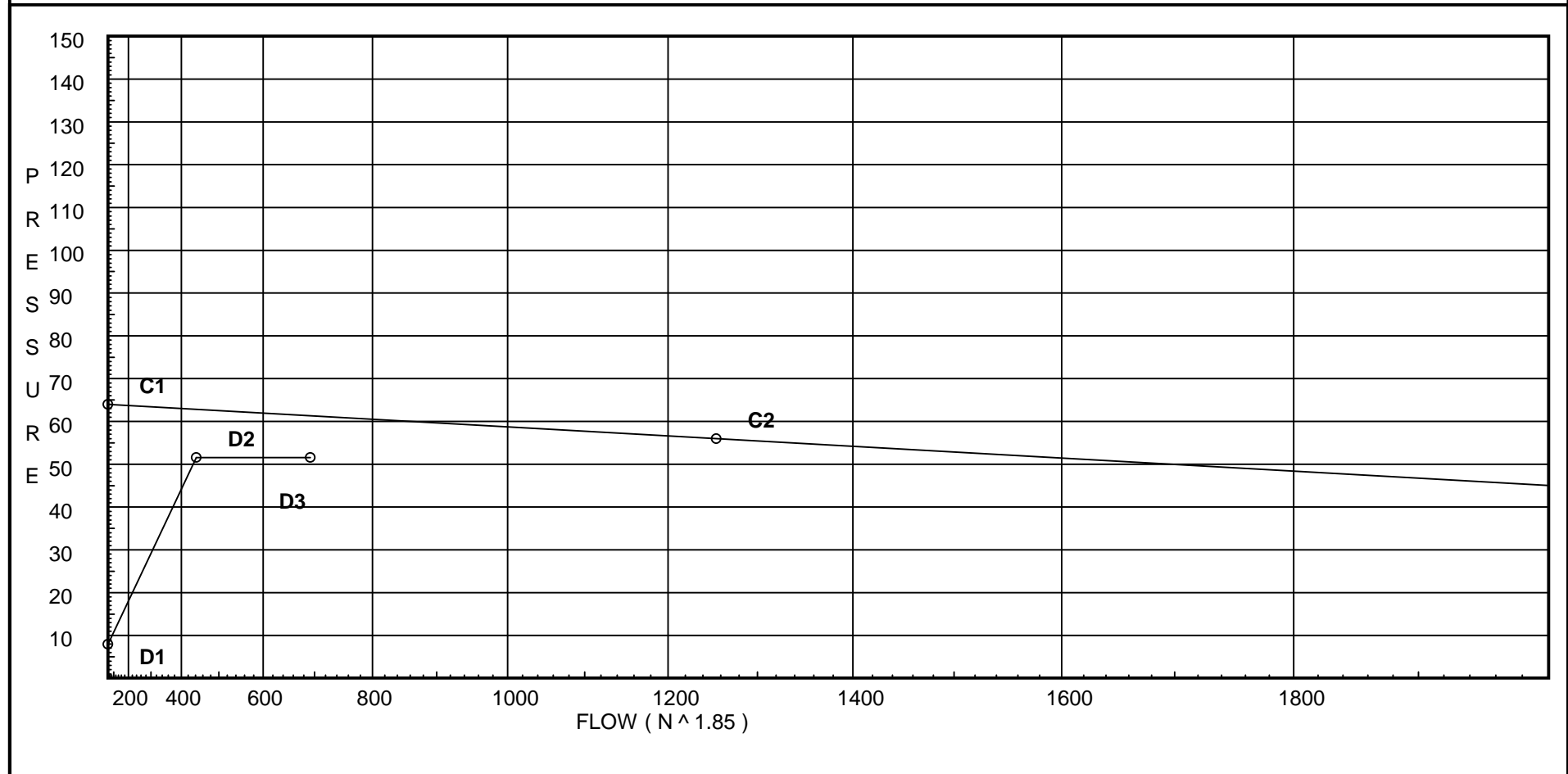
# Water Supply Curve (C)

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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 : 442.152  
D2 - System Pressure : 51.576  
Hose ( Demand ) : 250  
D3 - System Demand : 692.152  
Safety Margin : 9.764



# 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
Bvca	B Fly Vic 705						6	6	7		8	12	14	16	18	19					
Dvc	Dry Vic 768 NXT					3	9	8	17		21		22	50							
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	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.
100	14.3	14	13.37	na	51.2	0.2	256	13.3
101	14.3	14	13.87	na	52.14	0.2	256	13.3
102	14.3	14	15.58	na	55.25	0.2	256	13.3
103	14.3	14	19.59	na	61.97	0.2	256	13.3
110	14.3	14	13.5	na	51.44	0.2	256	13.3
111	14.3	14	14.0	na	52.38	0.2	256	13.3
112	14.3	14	15.72	na	55.51	0.2	256	13.3
113	14.3	14	19.77	na	62.25	0.2	256	13.3
AA	14.3		24.1	na				
AB	14.3		24.32	na				
AC	14.3		25.6	na				
AD	14.3		31.15	na				
TOD	14.3		33.97	na				
BOD	6.0		40.85	na				
BASE	1.0		48.2	na				
H1	0.0		48.93	na				
H2	0.0		49.76	na	250.0			
TEST	-4.0		51.58	na				

The maximum velocity is 13.99 and it occurs in the pipe between nodes 112 and 113

# Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftn'g's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
100 to 101	51.20 51.2	2.157 100.0 0.0310	0.0 0.0 0.0	16.000 0.0 16.000	13.375 0.0 0.496		K Factor = 14.00 Vel = 4.50		
101 to 102	52.14 103.34	2.157 100.0 0.1137	0.0 0.0 0.0	15.000 0.0 15.000	13.871 0.0 1.705		K Factor = 14.00 Vel = 9.07		
102 to 103	55.25 158.59	2.157 100.0 0.2511	0.0 0.0 0.0	16.000 0.0 16.000	15.576 0.0 4.017		K Factor = 14.00 Vel = 13.92		
103 to AA	61.97 220.56	2.635 100.0 0.1744	1T 11.758 0.0 0.0	14.100 11.757 25.857	19.593 0.0 4.509		K Factor = 14.00 Vel = 12.98		
	0.0 220.56				24.102		K Factor = 44.93		
110 to 111	51.44 51.44	2.157 100.0 0.0313	0.0 0.0 0.0	16.000 0.0 16.000	13.500 0.0 0.501		K Factor = 14.00 Vel = 4.52		
111 to 112	52.38 103.82	2.157 100.0 0.1147	0.0 0.0 0.0	15.000 0.0 15.000	14.001 0.0 1.720		K Factor = 14.00 Vel = 9.12		
112 to 113	55.51 159.33	2.157 100.0 0.2532	0.0 0.0 0.0	16.000 0.0 16.000	15.721 0.0 4.052		K Factor = 14.00 Vel = 13.99		
113 to AB	62.26 221.59	2.635 100.0 0.1759	1T 11.758 0.0 0.0	14.100 11.757 25.857	19.773 0.0 4.548		K Factor = 14.00 Vel = 13.04		
	0.0 221.59				24.321		K Factor = 44.93		
AA to AB	220.56 220.56	4.26 100.0 0.0168	0.0 0.0 0.0	13.000 0.0 13.000	24.102 0.0 0.219		Vel = 4.96		
AB to AC	221.59 442.15	4.26 100.0 0.0608	1X 15.036 0.0 0.0	6.000 15.035 21.035	24.321 0.0 1.279		Vel = 9.95		
AC to AD	0.0 442.15	4.26 100.0 0.0609	3V 19.171 0.0 0.0	72.000 19.170 91.170	25.600 0.0 5.548		Vel = 9.95		
AD to TOD	0.0 442.15	4.26 100.0 0.0608	1V 6.39 0.0 0.0	40.000 6.390 46.390	31.148 0.0 2.822		Vel = 9.95		
TOD to BOD	0.0 442.15	4.26 100.0 0.0608	1Dvc 19.734 1Bvca 7.518 1T 18.795	8.000 46.048 54.048	33.970 3.595 3.288		Vel = 9.95		
BOD to BASE	0.0 442.15	4.26 120.0 0.0434	1Zia 0.0 1E 13.167	2.000 13.167 15.167	40.853 6.690 0.659		* Fixed loss = 4.525 Vel = 9.95		
BASE to H1	0.0 442.15	6.16 140.0 0.0054	2E 40.168 1G 4.304	10.000 44.472 54.472	48.202 0.433 0.295		Vel = 4.76		

# 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	*****
H1 to H2	0.0 442.15	6.16 140.0 0.0054	1T 43.037 0.0	110.000 43.037 153.037	48.930 0.0 0.830		Vel = 4.76		
H2 to TEST	250.00 692.15	20.36 100.0 0.0001	1G 11.533 1E 52.421 1T 105.891	1050.000 169.847 1219.847	49.760 1.732 0.084		Qa = 250 Vel = 0.68		
	0.0 692.15				51.576		K Factor = 96.38		