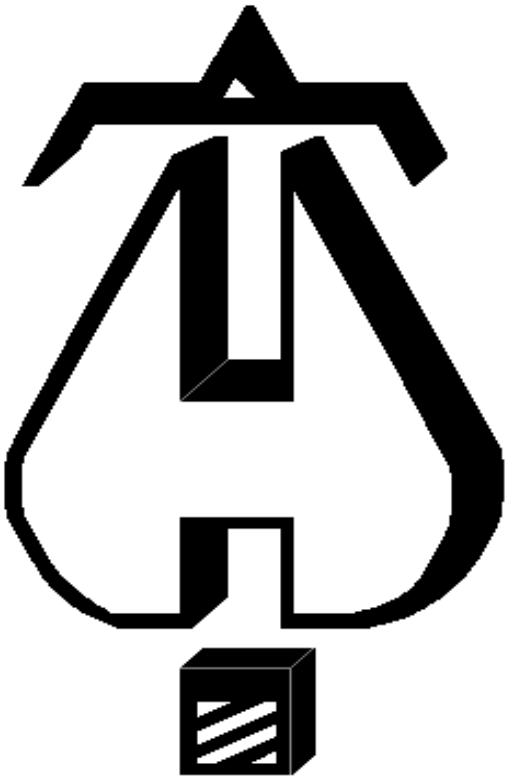


. . . Fire Protection by Computer Design

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

Job Name	:	Press Hotel 4th floor room 401 #4A
Drawing	:	FP-03
Location	:	119 Exchange Street Portland
Remote Area	:	4A
Contract	:	110713-1
Data File	:	Calc #4A 4th floor Unit 401 (new h2o).WXF

HYDRAULIC CALCULATIONS
for

Project name: Press Hotel 4th floor room 401 #4A
Location: 119 Exchange Street Portland
Drawing no: FP-03
Date: 3/20/14

Design

Remote area number: 4A
Remote area location: 4th floor Unit 401
Occupancy classification: Residential / light hazard
Density: .1 - Gpm/SqFt
Area of application: 233 - SqFt
Coverage per sprinkler: 224 - SqFt
Type of sprinklers calculated: Residential Pendents
No. of sprinklers calculated: 4
In-rack demand: n/a - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 193 - GPM @ 71 - Psi
Type of system: Wet NFPA 13
Volume of dry or preaction system: n/a - Gal

Water supply information

Date: 5-12-2014
Location: Corner of Exchange Street and Federal St.
Source: Portland Water District

Name of contractor: High Tech Fire Protection
Address: 84 Hackett Mills Road Poland / P.O. Box 154 Minot, ME / Pola
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.)

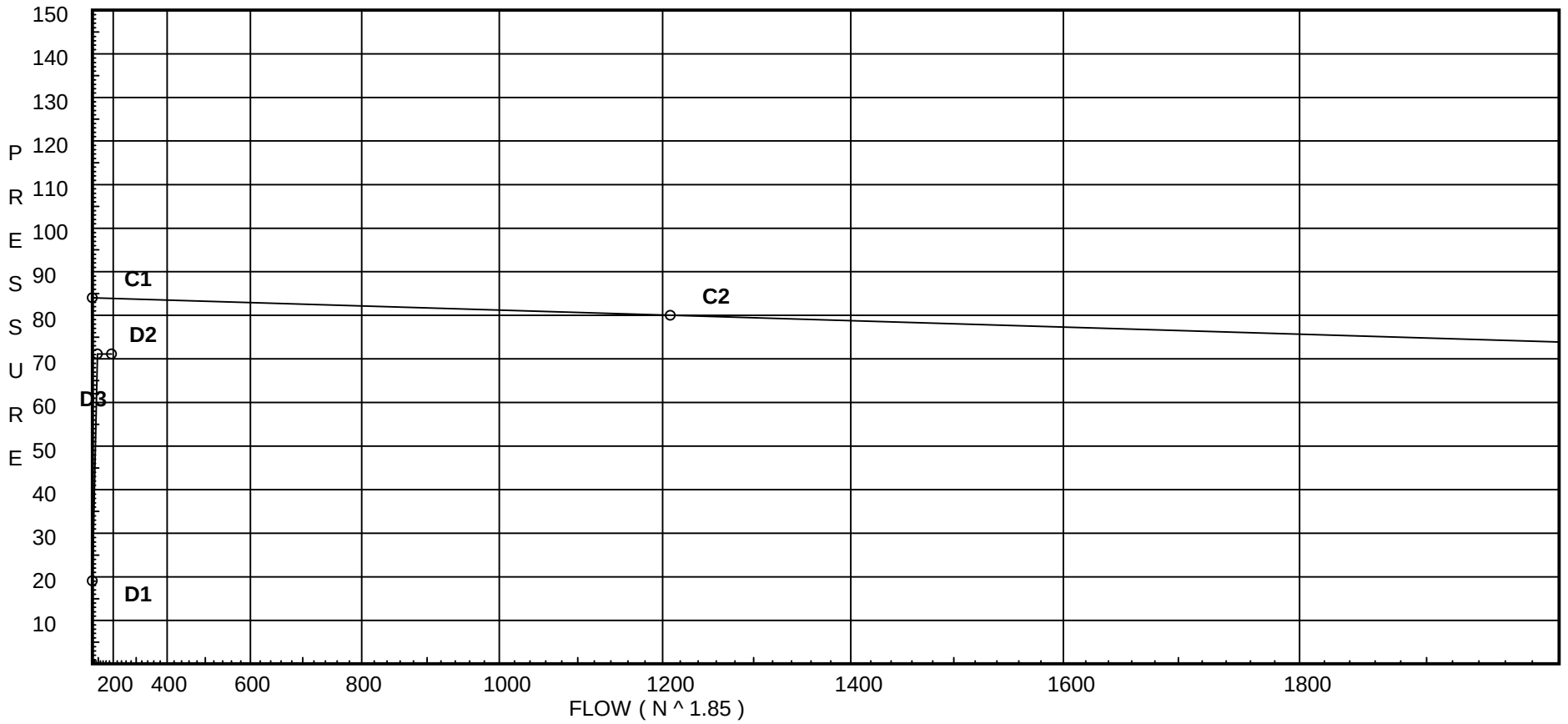
Water Supply Curve (C)

HIGH TECH FIRE PROTECTION
Press Hotel 4th floor room 401 #4A

Date 3/20/14

City Water Supply:
- C1 - Static Pressure : 84
- C2 - Residual Pressure: 80
- C2 - Residual Flow : 1209

Demand:
- D1 - Elevation : 19.056
- D2 - System Flow : 92.302
- D2 - System Pressure : 71.119
- Hose (Demand) : 100
- D3 - System Demand : 192.302
- Safety Margin : 12.748



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
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
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
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
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

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	-1.0	5.8	14.92	na	22.4	0.1	224	7.6
400	47.0	K = K @ EQ01	17.06	na	23.9			
401	47.0	5.8	16.54	na	23.59	0.1	224	13.2
402	47.0		17.11	na				
403	47.0	5.8	14.92	na	22.4	0.1	224	13.2
404	47.0	K = K @ EQ01	15.01	na	22.42			
405	47.0		17.73	na				
406	47.0		21.66	na				
407	47.0		22.78	na				
408	47.0		29.09	na				
409	47.0		31.18	na				
410	47.0		36.71	na				
SR4	47.0		42.38	na				
SR1	14.0		56.92	na				
SR11	14.0		57.06	na				
SR0	0.0		63.17	na				
SR01	0.0		63.53	na				
SR02	0.0		64.53	na				
SR03	0.0		64.59	na				
TOR	-4.0		66.61	na				
BOR	-6.0		70.49	na				
BASE	-6.0		74.84	na				
HS1	-4.0		74.0	na				
HS2	-4.0		74.02	na				
HS3	-4.0		74.1	na	100.0			
TEST	3.0		71.12	na				

The maximum velocity is 19.4 and it occurs in the pipe between nodes 405 and 406

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DP1	22.40	1.101	1O	5.0	1.000	14.916		K Factor = 5.80
to		150.0		0.0	5.000	-0.433		
EQ01	22.4	0.0838		0.0	6.000	0.503		Vel = 7.55
	0.0							
	22.40					14.986		K Factor = 5.79
400	23.90	1.101		0.0	0.600	17.056		K Factor @ node EQ01
to		150.0		0.0	0.0	0.0		
402	23.9	0.0950		0.0	0.600	0.057		Vel = 8.05
	0.0							
	23.90					17.113		K Factor = 5.78
401	23.59	1.101	1O	5.0	1.200	16.540		K Factor = 5.80
to		150.0		0.0	5.000	0.0		
402	23.59	0.0924		0.0	6.200	0.573		Vel = 7.95
402	23.90	1.394		0.0	5.800	17.113		
to		150.0		0.0	0.0	0.0		
405	47.49	0.1067		0.0	5.800	0.619		Vel = 9.98
	0.0							
	47.49					17.732		K Factor = 11.28
403	22.40	1.101		0.0	1.100	14.916		K Factor = 5.80
to		150.0		0.0	0.0	0.0		
404	22.4	0.0836		0.0	1.100	0.092		Vel = 7.55
404	22.42	1.101	1O	5.0	4.000	15.008		K Factor @ node EQ01
to		150.0		0.0	5.000	0.0		
405	44.82	0.3027		0.0	9.000	2.724		Vel = 15.10
405	47.48	1.394	1N	8.0	2.750	17.732		
to		150.0		0.0	8.000	0.0		
406	92.3	0.3651		0.0	10.750	3.925		Vel = 19.40
406	0.0	2.003		0.0	18.000	21.657		
to		150.0		0.0	0.0	0.0		
407	92.3	0.0625		0.0	18.000	1.125		Vel = 9.40
407	0.0	2.003	1N	11.0	80.000	22.782		
to		150.0	1O	10.0	21.000	0.0		
408	92.3	0.0625		0.0	101.000	6.312		Vel = 9.40
408	0.0	2.067		0.0	1.000	29.094		
to		120.0		0.0	0.0	2.000		* Fixed loss = 2
409	92.3	0.0810		0.0	1.000	0.081		Vel = 8.82
409	0.0	2.003	2N	22.0	66.500	31.175		
to		150.0		0.0	22.000	0.0		
410	92.3	0.0625		0.0	88.500	5.531		Vel = 9.40
410	0.0	2.157	1B	7.384	5.000	36.706		
to		120.0	1Fsp	0.0	35.689	3.000		* Fixed loss = 3
SR4	92.3	0.0658	1S	13.537	40.689	2.678		Vel = 8.10
			1X	10.461				
			1V	4.307				
SR4	0.0	4.26	7V	62.675	40.000	42.384		
to		120.0		0.0	62.675	14.292		
SR1	92.3	0.0024		0.0	102.675	0.246		Vel = 2.08
SR1	0.0	4.26	3V	26.861	32.000	56.922		
to		120.0		0.0	26.861	0.0		
SR11	92.3	0.0024		0.0	58.861	0.141		Vel = 2.08

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
SR11	0.0	4.26	1V	8.954	10.000	57.063		
to		120.0		0.0	8.954	6.063		
SR0	92.3	0.0024		0.0	18.954	0.046		Vel = 2.08
SR0	0.0	4.26	3V	26.861	81.500	63.172		
to		120.0	1B	15.8	68.995	0.0		
SR01	92.3	0.0024	1X	21.067	150.495	0.360		Vel = 2.08
			1F	5.267				
SR01	0.0	4.26		0.0	1.000	63.532		
to		120.0		0.0	0.0	1.000		* Fixed loss = 1
SR02	92.3	0.0030		0.0	1.000	0.003		Vel = 2.08
SR02	0.0	4.26	1X	21.067	2.000	64.535		
to		120.0		0.0	21.067	0.0		
SR03	92.3	0.0024		0.0	23.067	0.055		Vel = 2.08
SR03	0.0	4.26	2V	17.907	81.000	64.590		
to		120.0	1X	21.067	38.974	1.732		
TOR	92.3	0.0024		0.0	119.974	0.288		Vel = 2.08
TOR	0.0	4.26	1Fsp	0.0	4.000	66.610		
to		120.0		0.0	0.0	3.866		* Fixed loss = 3
BOR	92.3	0.0022		0.0	4.000	0.009		Vel = 2.08
BOR	0.0	4.26	1Zia	0.0	1.000	70.485		
to		120.0		0.0	0.0	4.348		* Fixed loss = 4.348
BASE	92.3	0.0020		0.0	1.000	0.002		Vel = 2.08
BASE	0.0	6.14	1G	2.273	25.000	74.835		
to		100.0	1E	10.608	35.613	-0.866		
HS1	92.3	0.0006	1T	22.732	60.613	0.035		Vel = 1.00
HS1	0.0	8.23	1T	29.011	90.000	74.004		
to		100.0		0.0	29.010	0.0		
HS2	92.3	0.0001		0.0	119.010	0.016		Vel = 0.56
HS2	0.0	6.14	1T	22.732	120.000	74.020		
to		100.0		0.0	22.732	0.0		
HS3	92.3	0.0006		0.0	142.732	0.080		Vel = 1.00
HS3	100.00	6.14	1G	2.273	10.000	74.100		Qa = 100
to		100.0	1E	10.608	12.881	-3.032		
TEST	192.3	0.0022		0.0	22.881	0.051		Vel = 2.08
	0.0							
	192.30					71.119		K Factor = 22.80