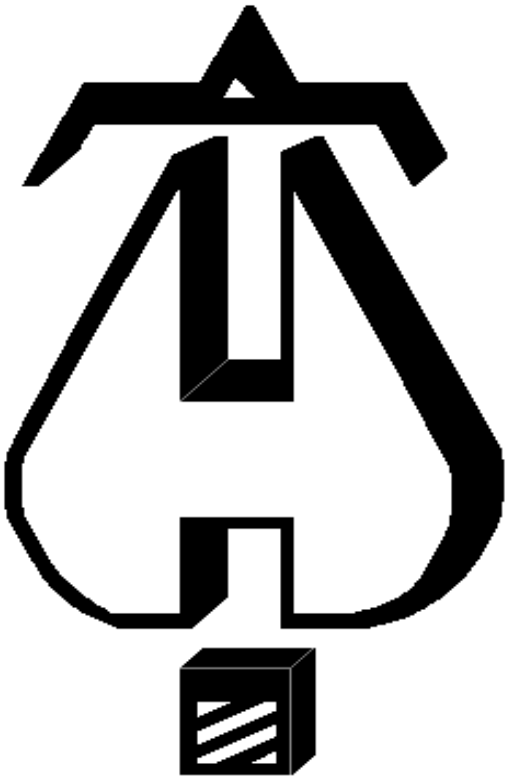


. . . Fire Protection by Computer Design

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

Job Name	:	Press Hotel 7th floor room 701 #7A
Drawing	:	FP-05
Location	:	119 Exchange Street Portland
Remote Area	:	7A
Contract	:	110713-1
Data File	:	Calc #7A 7th floor Unit 701 (new h2o).WXF

HYDRAULIC CALCULATIONS
for

Project name: Press Hotel 7th floor room 701 #7A
Location: 119 Exchange Street Portland
Drawing no: FP-05
Date: 3/20/14

Design

Remote area number: 7A
Remote area location: 7th floor Unit 701
Occupancy classification: Residential / ligth hazard
Density: .1 - Gpm/SqFt
Area of application: 483 - 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 @ 76 - 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.)

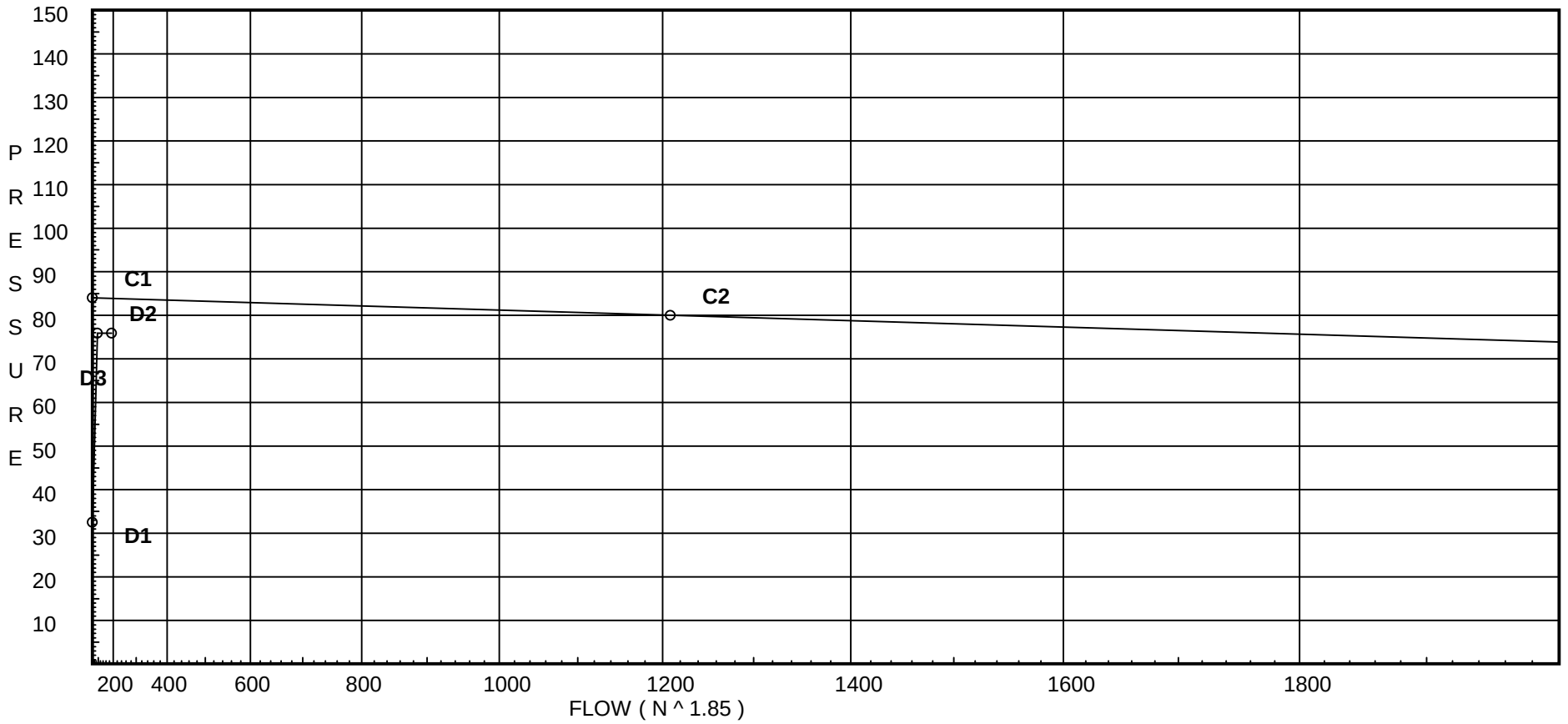
Water Supply Curve (C)

HIGH TECH FIRE PROTECTION
Press Hotel 7th floor room 701 #7A

Date 3/20/14

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

Demand:
- D1 - Elevation : 32.482
- D2 - System Flow : 92.484
- D2 - System Pressure : 75.910
- Hose (Demand) : 100
- D3 - System Demand : 192.484
- Safety Margin : 7.957



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	7.5
DP2	-1.0	5.8	14.92	na	22.4	0.1	224	7.5
700	78.0	K = K @ EQ01	15.39	na	22.57			
701	78.0	5.8	14.92	na	22.4	0.1	224	13.2
702	78.0		15.59	na				
703	78.0	K = K @ EQ02	16.53	na	23.52			
704	78.0	5.8	17.1	na	23.98	0.1	224	13.2
705	78.0		17.95	na				
706	78.0		19.66	na				
715	78.0		24.91	na				
716	78.0		26.99	na				
717	78.0		28.66	na				
SR7	78.0		33.39	na				
SR61	67.5		37.98	na				
SR6	57.0		42.56	na				
SR51	57.0		42.61	na				
SR5	14.0		61.42	na				
SR1	14.0		61.69	na				
SR11	14.0		61.83	na				
SR0	0.0		67.94	na				
SR01	0.0		68.3	na				
SR02	0.0		69.3	na				
SR03	0.0		69.38	na				
TOR	-4.0		71.4	na				
BOR	-6.0		75.28	na				
BASE	-6.0		79.63	na				
HS1	-4.0		78.79	na				
HS2	-4.0		78.81	na				
HS3	-4.0		78.89	na	100.0			
TEST	3.0		75.91	na				

The maximum velocity is 14.4 and it occurs in the pipe between nodes 703 and 705

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	1N	7.0	1.000	14.916		K Factor = 5.80
to		150.0		0.0	7.000	-0.433		
EQ01	22.4	0.0839		0.0	8.000	0.671		Vel = 7.55
	0.0							
	22.40					15.154		K Factor = 5.75
DP2	22.40	1.101	1O	5.0	1.000	14.916		K Factor = 5.80
to		150.0		0.0	5.000	-0.433		
EQ02	22.4	0.0838		0.0	6.000	0.503		Vel = 7.55
	0.0							
	22.40					14.986		K Factor = 5.79
700	22.57	1.101		0.0	2.300	15.391		K Factor @ node EQ01
to		150.0		0.0	0.0	0.0		
702	22.57	0.0852		0.0	2.300	0.196		Vel = 7.61
	0.0							
	22.57					15.587		K Factor = 5.72
701	22.40	1.101	1O	5.0	3.000	14.916		K Factor = 5.80
to		150.0		0.0	5.000	0.0		
702	22.4	0.0839		0.0	8.000	0.671		Vel = 7.55
702	22.57	1.394		0.0	9.750	15.587		
to		150.0		0.0	0.0	0.0		
703	44.97	0.0965		0.0	9.750	0.941		Vel = 9.45
703	23.53	1.394	1O	6.0	0.750	16.528		K Factor @ node EQ02
to		150.0		0.0	6.000	0.0		
705	68.5	0.2104		0.0	6.750	1.420		Vel = 14.40
	0.0							
	68.50					17.948		K Factor = 16.17
704	23.98	1.101	1O	5.0	3.900	17.100		K Factor = 5.80
to		150.0		0.0	5.000	0.0		
705	23.98	0.0953		0.0	8.900	0.848		Vel = 8.08
705	68.50	2.003	1N	11.0	16.300	17.948		
to		150.0		0.0	11.000	0.0		
706	92.48	0.0627		0.0	27.300	1.712		Vel = 9.42
706	0.0	2.003		0.0	83.750	19.660		
to		150.0		0.0	0.0	0.0		
715	92.48	0.0627		0.0	83.750	5.253		Vel = 9.42
715	0.0	2.067		0.0	1.000	24.913		
to		120.0		0.0	0.0	2.000		* Fixed loss = 2
716	92.48	0.0810		0.0	1.000	0.081		Vel = 8.84
716	0.0	2.157	1V	6.509	31.500	26.994		
to		150.0		0.0	6.509	0.0		
717	92.48	0.0437		0.0	38.009	1.662		Vel = 8.12
717	0.0	2.157	1B	7.384	1.000	28.656		
to		120.0	1Fsp	0.0	25.228	3.000		* Fixed loss = 3
SR7	92.48	0.0661	1S	13.537	26.228	1.733		Vel = 8.12
			1V	4.307				
SR7	0.0	4.26	1V	8.954	10.500	33.389		
to		120.0		0.0	8.954	4.548		
SR61	92.48	0.0024		0.0	19.454	0.046		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 ******
SR61	0.0	4.26	1V	8.954	5.100	37.983		
to		120.0		0.0	8.954	4.548		
SR6	92.48	0.0024		0.0	14.054	0.034		Vel = 2.08
SR6	0.0	4.26	1V	8.954	10.500	42.565		
to		120.0		0.0	8.954	0.0		
SR51	92.48	0.0024		0.0	19.454	0.047		Vel = 2.08
SR51	0.0	4.26	4V	35.814	41.000	42.612		
to		120.0		0.0	35.814	18.623		
SR5	92.48	0.0024		0.0	76.814	0.184		Vel = 2.08
SR5	0.0	4.26	7V	62.675	50.000	61.419		
to		120.0		0.0	62.675	0.0		
SR1	92.48	0.0024		0.0	112.675	0.271		Vel = 2.08
SR1	0.0	4.26	3V	26.861	32.000	61.690		
to		120.0		0.0	26.861	0.0		
SR11	92.48	0.0024		0.0	58.861	0.141		Vel = 2.08
SR11	0.0	4.26	1V	8.954	10.000	61.831		
to		120.0		0.0	8.954	6.063		
SR0	92.48	0.0024		0.0	18.954	0.046		Vel = 2.08
SR0	0.0	4.26	3V	26.861	81.500	67.940		
to		120.0	1B	15.8	68.995	0.0		
SR01	92.48	0.0024	1X	21.067	150.495	0.362		Vel = 2.08
			1F	5.267				
SR01	0.0	4.26		0.0	1.000	68.302		
to		120.0		0.0	0.0	1.000		* Fixed loss = 1
SR02	92.48	0.0020		0.0	1.000	0.002		Vel = 2.08
SR02	0.0	4.26	1S	28.968	2.000	69.304		
to		120.0		0.0	28.968	0.0		
SR03	92.48	0.0024		0.0	30.968	0.075		Vel = 2.08
SR03	0.0	4.26	2V	17.907	81.000	69.379		
to		120.0	1X	21.067	38.974	1.732		
TOR	92.48	0.0024		0.0	119.974	0.288		Vel = 2.08
TOR	0.0	4.26	1Fsp	0.0	4.000	71.399		
to		120.0		0.0	0.0	3.866		* Fixed loss = 3
BOR	92.48	0.0025		0.0	4.000	0.010		Vel = 2.08
BOR	0.0	4.26	1Zia	0.0	1.000	75.275		
to		120.0		0.0	0.0	4.348		* Fixed loss = 4.348
BASE	92.48	0.0020		0.0	1.000	0.002		Vel = 2.08
BASE	0.0	6.14	1G	2.273	25.000	79.625		
to		100.0	1E	10.608	35.613	-0.866		
HS1	92.48	0.0006	1T	22.732	60.613	0.035		Vel = 1.00
HS1	0.0	8.23	1T	29.011	90.000	78.794		
to		100.0		0.0	29.010	0.0		
HS2	92.48	0.0001		0.0	119.010	0.016		Vel = 0.56
HS2	0.0	6.14	1T	22.732	120.000	78.810		
to		100.0		0.0	22.732	0.0		
HS3	92.48	0.0006		0.0	142.732	0.081		Vel = 1.00
HS3	100.00	6.14	1G	2.273	10.000	78.891		Qa = 100
to		100.0	1E	10.608	12.881	-3.032		
TEST	192.48	0.0022		0.0	22.881	0.051		Vel = 2.09

Final Calculations - Hazen-Williams

HIGH TECH FIRE PROTECTION
Press Hotel 7th floor room 701 #7A

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
	0.0									
	192.48					75.910		K Factor = 22.09		