



... 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 corridor #7B
Drawing : FP-05
Location : 119 Exchange Street Portland
Remote Area : 7B
Contract : 110713-1
Data File : Calc #7B 7th floor Corridor (new h2o).W XF

HYDRAULIC CALCULATIONS
for

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

Design

Remote area number: 7B
Remote area location: 7th floor Corridor
Occupancy classification: Residential / light hazard
Density: .1 - Gpm/SqFt
Area of application: 418 - SqFt
Coverage per sprinkler: 224 - SqFt
Type of sprinklers calculated: Residential Pendants
No. of sprinklers calculated: 5
In-rack demand: n/a - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 214 - GPM @ 73 - 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.)

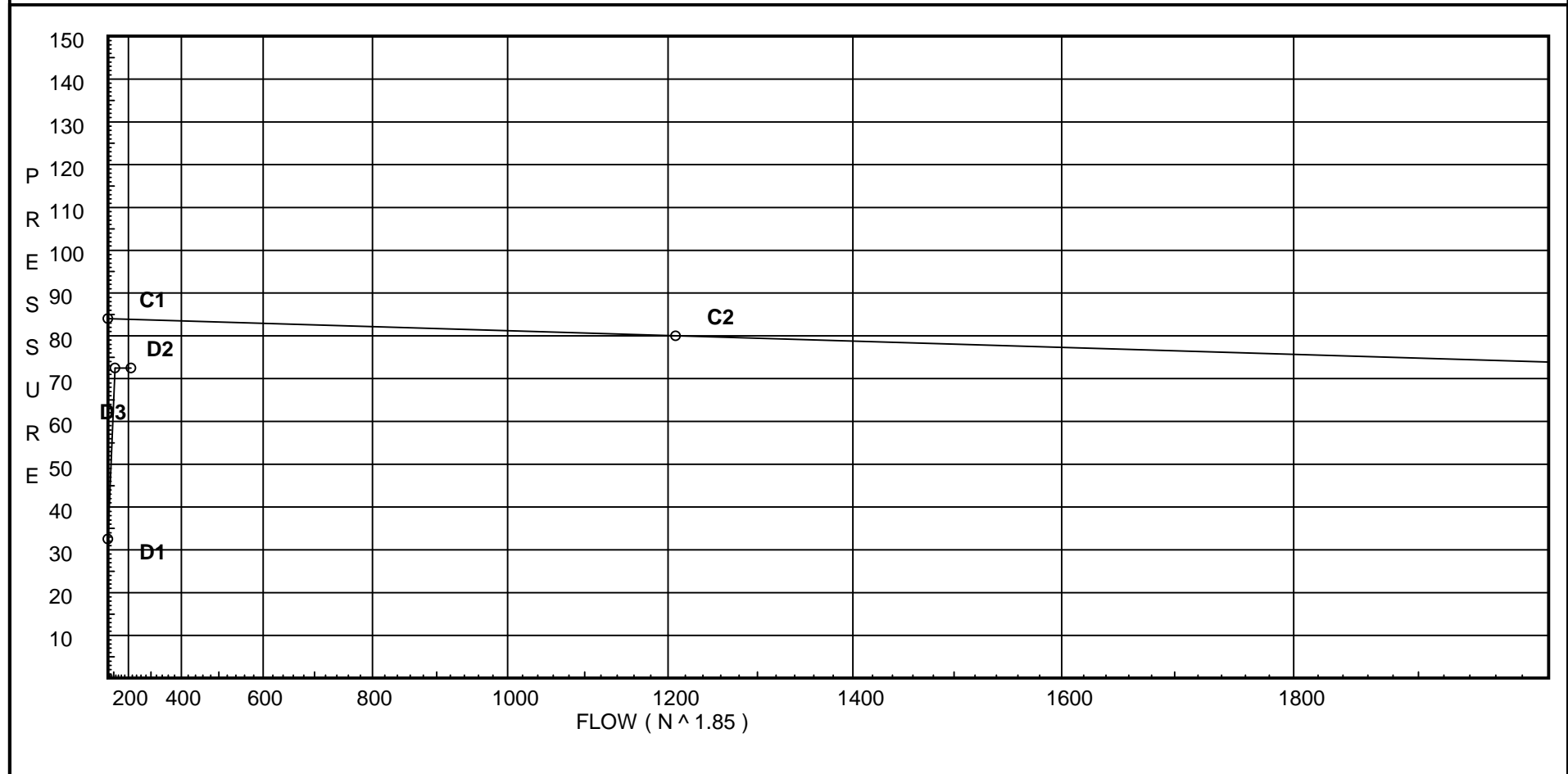
Water Supply Curve (C)

HIGH TECH FIRE PROTECTION
Press Hotel 7th floor corridor #7B

Page 2
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 : 113.797
D2 - System Pressure : 72.486
Hose (Demand) : 100
D3 - System Demand : 213.797
Safety Margin : 11.352



Fittings Used Summary

HIGH TECH FIRE PROTECTION
Press Hotel 7th floor corridor #7B

Page 3
Date 3/20/14

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
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'EI 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' EI 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

HIGH TECH FIRE PROTECTION
 Press Hotel 7th floor corridor #7B

Page 4
 Date 3/20/14

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	7.0
DP2	-1.0	5.8	14.92	na	22.4	0.1	224	7.0
709	78.0	K = K @ EQ01	15.68	na	22.42			
710	78.0	K = K @ EQ02	15.7	na	22.4			
711	78.0		15.75	na				
712	78.0	K = K @ EQ02	15.94	na	22.57			
713	78.0	K = K @ EQ02	16.43	na	22.91			
714	78.0	K = K @ EQ02	17.27	na	23.49			
715	78.0		18.93	na				
716	78.0		21.05	na				
717	78.0		24.52	na				
SR7	78.0		30.06	na				
SR61	67.5		34.68	na				
SR6	57.0		39.27	na				
SR51	57.0		39.34	na				
SR5	14.0		58.24	na				
SR1	14.0		58.63	na				
SR11	14.0		58.84	na				
SR0	0.0		64.97	na				
SR01	0.0		65.5	na				
SR02	0.0		66.51	na				
SR03	0.0		66.59	na				
TOR	-4.0		68.74	na				
BOR	-6.0		72.62	na				
BASE	-6.0		76.13	na				
HS1	-4.0		75.31	na				
HS2	-4.0		75.34	na				
HS3	-4.0		75.46	na	100.0			
TEST	3.0		72.49	na				

The maximum velocity is 11.59 and it occurs in the pipe between nodes 714 and 715

Final Calculations - Hazen-Williams

HIGH TECH FIRE PROTECTION
Press Hotel 7th floor corridor #7B

Page 5
Date 3/20/14

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 to EQ01	22.40 22.4	1.101 150.0 0.0839	1N 1O	7.0 5.0 0.0	2.000 12.000 14.000	14.916 -0.433 1.174			K Factor = 5.80 Vel = 7.55	
	0.0 22.40						15.657		K Factor = 5.66	
DP2 to EQ02	22.40 22.4	1.101 150.0 0.0839	1N 1O	7.0 5.0 0.0	2.500 12.000 14.500	14.916 -0.433 1.216			K Factor = 5.80 Vel = 7.55	
	0.0 22.40						15.699		K Factor = 5.65	
709 to 711	22.42 22.42	2.003 150.0 0.0046		0.0 0.0 0.0	15.500 0.0 15.500	15.681 0.0 0.071			K Factor @ node EQ01 Vel = 2.28	
	0.0 22.42						15.752		K Factor = 5.65	
710 to 711	22.40 22.4	2.003 150.0 0.0046	1O	10.0 0.0 0.0	1.500 10.000 11.500	15.699 0.0 0.053			K Factor @ node EQ02 Vel = 2.28	
711 to 712	22.42 44.82	2.003 150.0 0.0163		0.0 0.0 0.0	11.500 0.0 11.500	15.752 0.0 0.188			Vel = 4.56	
712 to 713	22.57 67.39	2.003 150.0 0.0349		0.0 0.0 0.0	14.000 0.0 14.000	15.940 0.0 0.489			K Factor @ node EQ02 Vel = 6.86	
713 to 714	22.91 90.3	2.003 150.0 0.0600		0.0 0.0 0.0	14.000 0.0 14.000	16.429 0.0 0.840			K Factor @ node EQ02 Vel = 9.19	
714 to 715	23.50 113.8	2.003 150.0 0.0921		0.0 0.0 0.0	18.000 0.0 18.000	17.269 0.0 1.657			K Factor @ node EQ02 Vel = 11.59	
715 to 716	0.0 113.8	2.067 120.0 0.1200		0.0 0.0 0.0	1.000 0.0 1.000	18.926 2.000 0.120			* Fixed loss = 2 Vel = 10.88	
716 to 717	0.0 113.8	2.157 120.0 0.0970	1V	4.307 0.0 0.0	31.500 4.307 35.807	21.046 0.0 3.472			Vel = 9.99	
717 to SR7	0.0 113.8	2.157 120.0 0.0970	1B 1Fsp 1S 1V	7.384 0.0 13.537 4.307	1.000 25.228 26.228	24.518 3.000 2.543			* Fixed loss = 3 Vel = 9.99	
SR7 to SR61	0.0 113.8	4.26 120.0 0.0035	1V	8.954 0.0 0.0	10.500 8.954 19.454	30.061 4.548 0.068			Vel = 2.56	
SR61 to SR6	0.0 113.8	4.26 120.0 0.0035	1V	8.954 0.0 0.0	5.100 8.954 14.054	34.677 4.548 0.049			Vel = 2.56	
SR6 to SR51	0.0 113.8	4.26 120.0 0.0035	1V	8.954 0.0 0.0	10.500 8.954 19.454	39.274 0.0 0.069			Vel = 2.56	

Final Calculations - Hazen-Williams

HIGH TECH FIRE PROTECTION
 Press Hotel 7th floor corridor #7B

Page 6
 Date 3/20/14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
SR51 to SR5	0.0 113.8	4.26 120.0 0.0035	4V	35.814 0.0	41.000 35.814 76.814	39.343 18.623 0.271		Vel = 2.56		
SR5 to SR1	0.0 113.8	4.26 120.0 0.0035	7V	62.675 0.0	50.000 62.675 112.675	58.237 0.0 0.397		Vel = 2.56		
SR1 to SR11	0.0 113.8	4.26 120.0 0.0035	3V	26.861 0.0	32.000 26.861 58.861	58.634 0.0 0.208		Vel = 2.56		
SR11 to SR0	0.0 113.8	4.26 120.0 0.0035	1V	8.954 0.0	10.000 8.954 18.954	58.842 6.063 0.067		Vel = 2.56		
SR0 to SR01	0.0 113.8	4.26 120.0 0.0035	3V 1B 1X 1F	26.861 15.8 21.067 5.267	81.500 68.995 150.495	64.972 0.0 0.531		Vel = 2.56		
SR01 to SR02	0.0 113.8	4.26 120.0 0.0030		0.0 0.0	1.000 0.0 1.000	65.503 1.000 0.003		* Fixed loss = 1 Vel = 2.56		
SR02 to SR03	0.0 113.8	4.26 120.0 0.0036	1X	21.067 0.0	2.000 21.067 23.067	66.506 0.0 0.082		Vel = 2.56		
SR03 to TOR	0.0 113.8	4.26 120.0 0.0035	2V 1X	17.907 21.067	81.000 38.974 119.974	66.588 1.732 0.423		Vel = 2.56		
TOR to BOR	0.0 113.8	4.26 120.0 0.0038	1Fsp	0.0 0.0	4.000 0.0 4.000	68.743 3.866 0.015		* Fixed loss = 3 Vel = 2.56		
BOR to BASE	0.0 113.8	4.26 120.0 0.0030	1Zia	0.0 0.0	1.000 0.0 1.000	72.624 3.502 0.003		* Fixed loss = 3.502 Vel = 2.56		
BASE to HS1	0.0 113.8	6.14 100.0 0.0008	1G 1E 1T	2.273 10.608 22.732	25.000 35.613 60.613	76.129 -0.866 0.051		Vel = 1.23		
HS1 to HS2	0.0 113.8	8.23 100.0 0.0002	1T	29.011 0.0	90.000 29.010 119.010	75.314 0.0 0.023		Vel = 0.69		
HS2 to HS3	0.0 113.8	6.14 100.0 0.0008	1T	22.732 0.0	120.000 22.732 142.732	75.337 0.0 0.119		Vel = 1.23		
HS3 to TEST	100.0 213.8	6.14 100.0 0.0027	1G 1E	2.273 10.608	10.000 12.881 22.881	75.456 -3.032 0.062		Qa = 100 Vel = 2.32		
	0.0 213.80					72.486		K Factor = 25.11		