

... Fire Protection by Computer Design

FIRE PROTECTION SPRINKLER SER.
278 HARRIS RD
MINOT, MAINE
04258
207-393-7422

Job Name : 74-76 MUNJOY STREET PORTLAND
Building : FP-1
Location : 74-76 MUNJOY STREET PORTLAND
System : #1
Contract :
Data File : 2ND FLOOR CALC.WXF

HYDRAULIC CALCULATIONS
for

Project name: 74-76 MUNJOY STREET PORTLAND
Location: 74-76 MUNJOY STREET PORTLAND
Drawing no: FP-1
Date: 10-19-17

Design

Remote area number: #1
Remote area location: SECONND FLOOR LIVING RM
Occupancy classification:
Density: - Gpm/SqFt
Area of application: 570 - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: RELIABLE RFC-49 CONCEALED
No. of sprinklers calculated: 4
In-rack demand: - GPM
Hose streams: 0 - GPM
Total water required (including hose streams): 53.2601 - GPI@ 42.4405 - Psi
Type of system: NFPA 13R
Volume of dry or preaction system: - Gal

Water supply information

Date: 6/9/2017
Location: MUNJOY AND CONGRESS ST
Source: PORTLAND WATER DEPT.

Name of contractor: FIRE PROTECTION SPRINKLER SER.
Address: 278 HARRIS RD / MINOT, MAINE / 04258
Phone number: 207-393-7422
Name of designer: TIM FORITN
Authority having jurisdiction: STATE OF MAINE/ CITY OF PORTLAND
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve (C)

FIRE PROTECTION SPRINKLER SER.
74-76 MUNJOY STREET PORTLAND

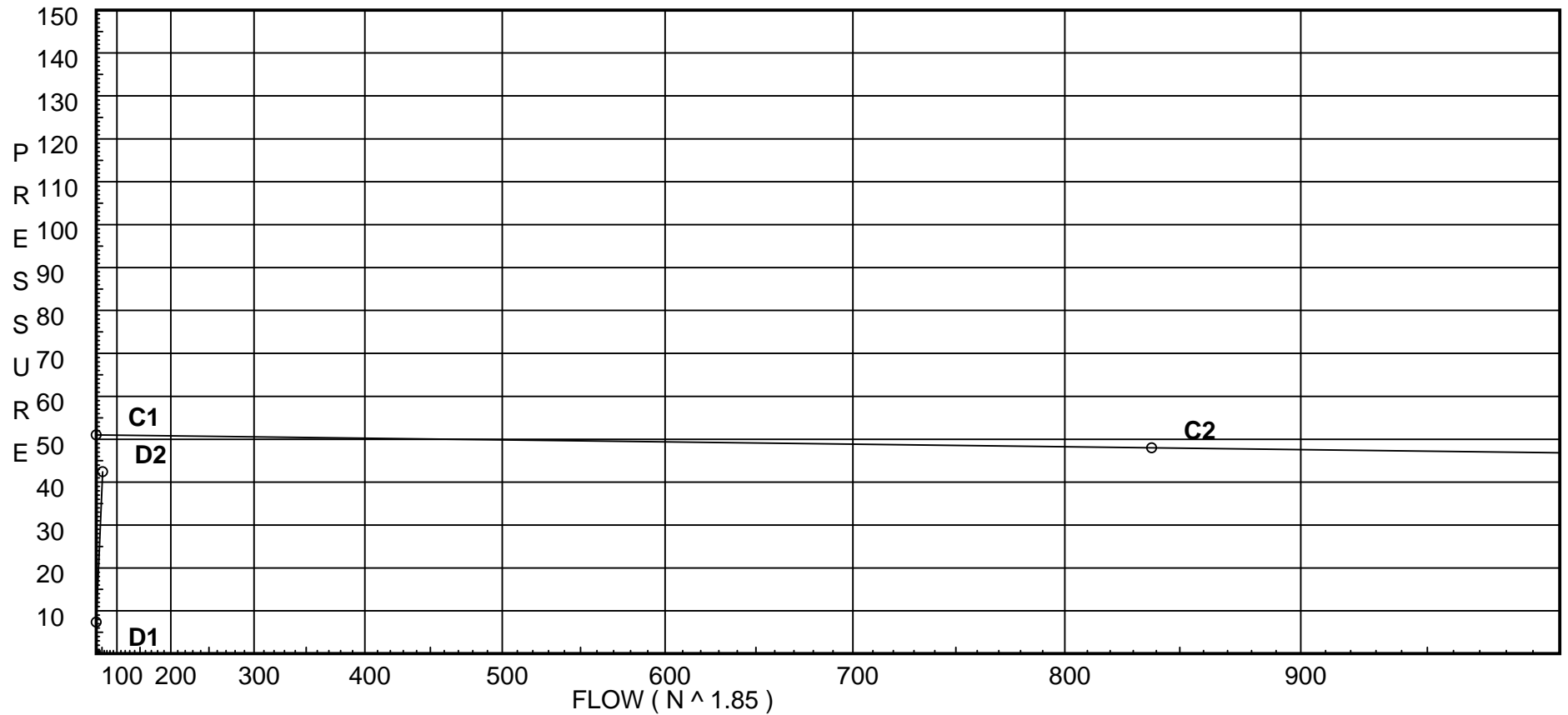
Page 2
Date 10-19-17

City Water Supply:

C1 - Static Pressure : 51
C2 - Residual Pressure: 48
C2 - Residual Flow : 838

Demand:

D1 - Elevation : 7.363
D2 - System Flow : 53.2601
D2 - System Pressure : 42.440
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 53.2601
Safety Margin : 8.541



Fittings Used Summary

FIRE PROTECTION SPRINKLER SER.
74-76 MUNJOY STREET PORTLAND

Page 3
Date 10-19-17

Fitting Legend		½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Abbrev.	Name																				
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	0	0	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'EII Harvel-Spears	7	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
T	90' Flow Thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zil	Wilkins 975XL	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

FIRE PROTECTION SPRINKLER SER.
74-76 MUNJOY STREET PORTLAND

Page 4
Date 10-19-17

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	-1.0	4.9	7.0	na	12.96	0.05	256	7.0
DP2	-1.0	4.9	7.0	na	12.96	0.05	256	7.0
1	27.0	K = K @ EQ01	6.81	na	12.96			
2	27.0	K = K @ EQ02	7.12	na	13.31			
3	27.0		7.91	na				
4	27.0	K = K @ EQ01	7.18	na	13.31			
5	27.0	K = K @ EQ02	7.5	na	13.67			
6	27.0		8.33	na				
7	27.0		13.48	na				
8	9.0		24.71	na				
TOR	9.0		27.33	na				
FLO	6.0		28.87	na				
BOR	0.0		45.01	na				
UG1	0.0		46.76	na				
UG2	0.0		46.77	na				
TEST	10.0		42.44	na				

The maximum velocity is 11.2 and it occurs in the pipe between nodes 6 and 7

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	12.96	1.101	1N	7.0	1.000	7.000			K Factor = 4.90	
to		150.0		0.0	7.000	-0.433				
EQ01	12.96	0.0305		0.0	8.000	0.244			Vel = 4.37	
	0.0									
	12.96					6.811			K Factor = 4.97	
DP2	12.96	1.101	1O	5.0	1.000	7.000			K Factor = 4.90	
to		150.0		0.0	5.000	-0.433				
EQ02	12.96	0.0305		0.0	6.000	0.183			Vel = 4.37	
	0.0									
	12.96					6.750			K Factor = 4.99	
1	12.96	1.101		0.0	10.000	6.811			K Factor @ node EQ01	
to		150.0		0.0	0.0	0.0				
2	12.96	0.0305		0.0	10.000	0.305			Vel = 4.37	
2	13.32	1.101	1O	5.0	2.000	7.116			K Factor @ node EQ02	
to		150.0		0.0	5.000	0.0				
3	26.28	0.1127		0.0	7.000	0.789			Vel = 8.86	
3	0.0	1.394		0.0	12.000	7.905				
to		150.0		0.0	0.0	0.0				
6	26.28	0.0357		0.0	12.000	0.429			Vel = 5.52	
	0.0									
	26.28					8.334			K Factor = 9.10	
4	13.31	1.101		0.0	10.000	7.184			K Factor @ node EQ01	
to		150.0		0.0	0.0	0.0				
5	13.31	0.0321		0.0	10.000	0.321			Vel = 4.49	
5	13.67	1.101	1O	5.0	2.000	7.505			K Factor @ node EQ02	
to		150.0		0.0	5.000	0.0				
6	26.98	0.1184		0.0	7.000	0.829			Vel = 9.09	
6	26.28	1.394	2O	12.0	27.000	8.334				
to		150.0		0.0	12.000	0.0				
7	53.26	0.1320		0.0	39.000	5.149			Vel = 11.20	
7	0.0	1.394	1N	8.0	18.000	13.483				
to		150.0		0.0	8.000	7.796				
8	53.26	0.1320		0.0	26.000	3.432			Vel = 11.20	
8	0.0	2.003	4N	44.0	62.000	24.711				
to		150.0	1O	10.0	54.000	0.0				
TOR	53.26	0.0226		0.0	116.000	2.621			Vel = 5.42	
TOR	0.0	2.067	1Z	5.0	3.000	27.332				
to		120.0		0.0	5.000	1.299				
FLO	53.26	0.0294		0.0	8.000	0.235			Vel = 5.09	
FLO	0.0	2.067	1Zil	0.0	5.000	28.866				
to		120.0		0.0	0.0	15.999			* Fixed loss = 13.4	
BOR	53.26	0.0292		0.0	5.000	0.146			Vel = 5.09	

Final Calculations - Hazen-Williams

FIRE PROTECTION SPRINKLER SER.
74-76 MUNJOY STREET PORTLAND

Page 6
Date 10-19-17

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
BOR	0.0	1.72	1G 0.617	30.000	45.011				
to		150.0	1T 6.174	6.792	0.0				
UG1	53.26	0.0475	0.0	36.792	1.746		Vel =	7.35	
UG1	0.0	8.27	1T 55.354	500.000	46.757				
to		140.0	0.0	55.354	0.0				
UG2	53.26	0.0	0.0	555.354	0.014		Vel =	0.32	
UG2	0.0	12.34	1G 9.377	110.000	46.771				
to		140.0	1E 42.195	51.572	-4.331				
TEST	53.26	0.0	0.0	161.572	0.0		Vel =	0.14	
	0.0								
	53.26				42.440		K Factor =	8.18	