



... Fire Protection by Computer Design

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

Job Name : JEFFREY BANKER MASTER BED RM.
Building : F-1
Location : 14 BLYTHE ST
System : AREA#2
Contract :
Data File : BANKER 2ND FL CALC 16X16.WXF

HYDRAULIC CALCULATIONS
for

Project name: JEFFREY BANKER
Location: 14 BLYTHE ST
Drawing no: F-1
Date: 6-17-14

Design

Remote area number: AREA#2
Remote area location: MASTER BEDROOM
Occupancy classification: LIGHT HAZARD
Density: .05 - Gpm/SqFt
Area of application: 293 - SqFt
Coverage per sprinkler: 256 - SqFt
Type of sprinklers calculated: RELIABLE RES 44 HSW K=4.4
No. of sprinklers calculated: 2
In-rack demand: - GPM
Hose streams: 0 - GPM
Total water required (including hose streams): 37.42 - GPM @ 48.7785 - Psi
Type of system: NFPA 13D
Volume of dry or preaction system: - Gal

Water supply information

Date: 4-25-14
Location: HYD LOCATED ON BRAKETT ST.
Source: PORTLAND WATER DIST.

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

Water Supply Curve (C)

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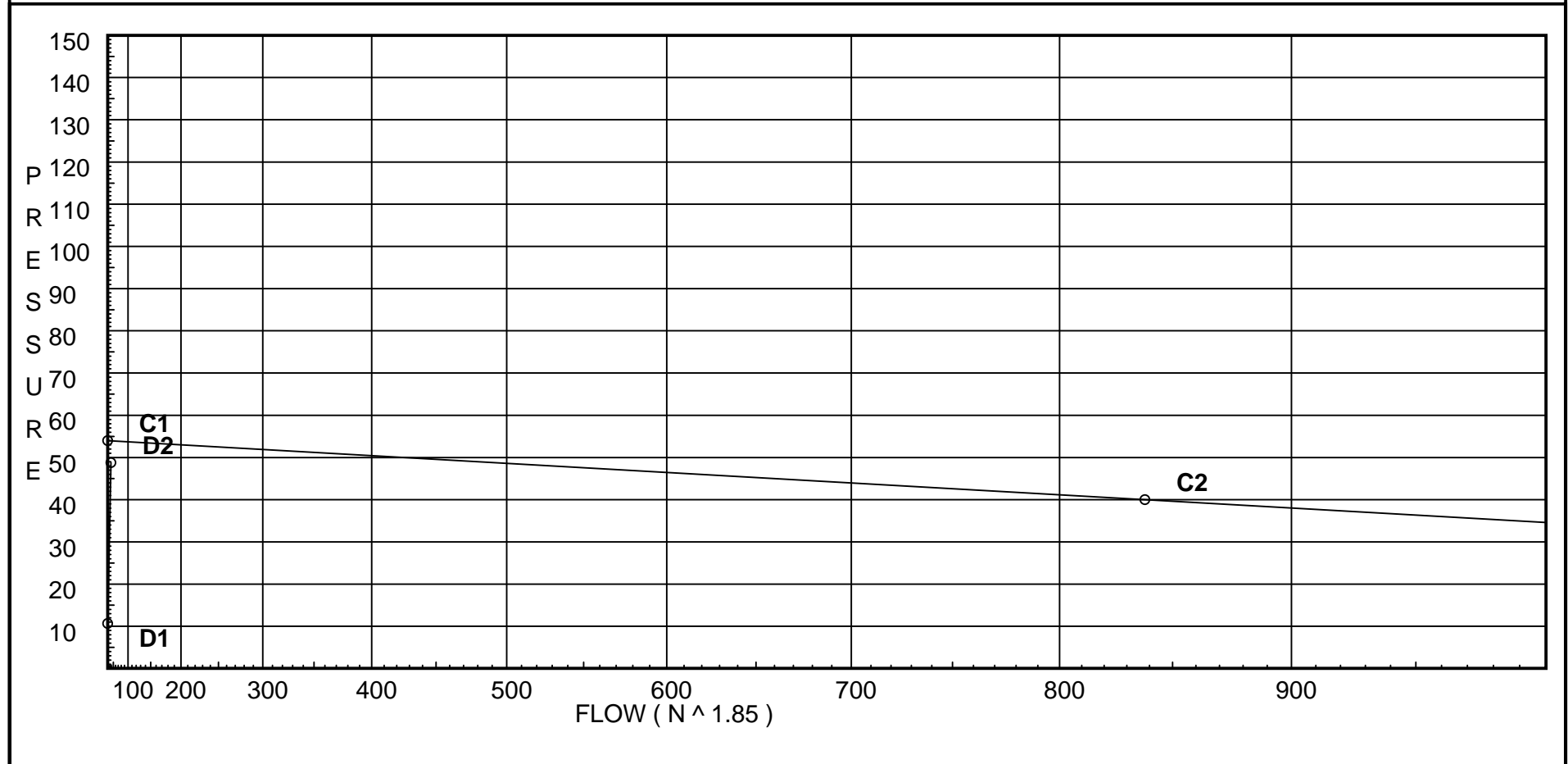
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City Water Supply:

C1 - Static Pressure : 54
C2 - Residual Pressure: 40
C2 - Residual Flow : 838

Demand:

D1 - Elevation : 10.654
D2 - System Flow : 37.42
D2 - System Pressure : 48.778
Hose (Adj City) : _____
Hose (Demand) : _____
D3 - System Demand : 37.42
Safety Margin : 5.177



Fittings Used Summary

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Fitting Legend																					
Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
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'Ell 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
R *	CPVC Coupling Tee-Run	1	1	1	1	1	1	2	2	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
Zik	Wilkins 950XL	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.
30	24.6	4.4	13.85	na	16.37	0.05	256	13.3
31	8.6		21.02	na				
32	8.6		22.1	na				
33	8.6		22.34	na				
34	8.0		22.69	na				
20	24.6	4.4	13.3	na	16.05	0.05	256	13.3
21	16.6		17.0	na				
22	8.6		21.05	na				
23	8.6		21.36	na				
24	8.6		22.04	na				
25	8.6		22.15	na				
26	8.6		22.39	na				
27	8.0		22.74	na				
11	8.0		22.89	na				
TOR	8.0		23.7	na				
BOR	8.0		31.48	na	5.0			
UG	0.0		44.23	na				
UG1	-2.0		49.6	na				
TEST	0.0		48.78	na				

The maximum velocity is 13.84 and it occurs in the pipe between nodes BOR and UG

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
30	16.37	1.101	1O	5.0	0.200	13.848			K Factor = 4.40	
to		150.0		0.0	5.000	6.930				
31	16.37	0.0469		0.0	5.200	0.244			Vel = 5.52	
31	0.0	1.101	1N	7.0	16.000	21.022				
to		150.0		0.0	7.000	0.0				
32	16.37	0.0470		0.0	23.000	1.081			Vel = 5.52	
32	0.0	1.394	1N	8.0	7.800	22.103				
to		150.0		0.0	8.000	0.0				
33	16.37	0.0149		0.0	15.800	0.235			Vel = 3.44	
33	0.0	1.394	1O	6.0	0.500	22.338				
to		150.0		0.0	6.000	0.260				
34	16.37	0.0149		0.0	6.500	0.097			Vel = 3.44	
34	0.0	1.394	1N	8.0	4.200	22.695				
to		150.0	1R	1.0	9.000	0.0				
11	16.37	0.0148		0.0	13.200	0.196			Vel = 3.44	
	0.0									
	16.37					22.891			K Factor = 3.42	
20	16.05	1.101	1O	5.0	0.200	13.300			K Factor = 4.40	
to		150.0		0.0	5.000	3.465				
21	16.05	0.0452		0.0	5.200	0.235			Vel = 5.41	
21	0.0	1.101	1O	5.0	8.000	17.000				
to		150.0		0.0	5.000	3.465				
22	16.05	0.0453		0.0	13.000	0.589			Vel = 5.41	
22	0.0	1.101	1O	5.0	1.700	21.054				
to		150.0		0.0	5.000	0.0				
23	16.05	0.0452		0.0	6.700	0.303			Vel = 5.41	
23	0.0	1.101	1N	7.0	8.000	21.357				
to		150.0		0.0	7.000	0.0				
24	16.05	0.0453		0.0	15.000	0.679			Vel = 5.41	
24	0.0	1.394	1O	6.0	1.900	22.036				
to		150.0		0.0	6.000	0.0				
25	16.05	0.0143		0.0	7.900	0.113			Vel = 3.37	
25	0.0	1.394	1R	1.0	7.900	22.149				
to		150.0	1N	8.0	9.000	0.0				
26	16.05	0.0144		0.0	16.900	0.243			Vel = 3.37	
26	0.0	1.394	1O	6.0	0.500	22.392				
to		150.0		0.0	6.000	0.260				
27	16.05	0.0143		0.0	6.500	0.093			Vel = 3.37	
27	0.0	1.394	1N	8.0	2.200	22.745				
to		150.0		0.0	8.000	0.0				
11	16.05	0.0143		0.0	10.200	0.146			Vel = 3.37	

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	*****
11 to TOR	16.37 32.42	1.394 150.0 0.0527	1N	8.0 0.0 0.0	7.300 8.000 15.300	22.891 0.0 0.807			Vel = 6.82	
TOR to BOR	0.0 32.42	1.394 150.0 0.0527	1N 1Zik	8.0 0.0 0.0	7.000 8.000 15.000	23.698 6.993 0.790			* Fixed loss = 6.993 Vel = 6.82	
BOR to UG	5.00 37.42	1.051 150.0 0.2719	1T 1G	7.626 1.525 0.0	25.000 9.150 34.150	31.481 3.465 9.285			Qa = 5.00 Vel = 13.84	
UG to UG1	0.0 37.42	2.067 120.0 0.0153	1T	10.0 0.0 0.0	285.000 10.000 295.000	44.231 0.866 4.499			Vel = 3.58	
UG1 to TEST	0.0 37.42	6.065 120.0 0.0001	1T	30.0 0.0 0.0	580.000 30.000 610.000	49.596 -0.866 0.048			Vel = 0.42	
	0.0 37.42									K Factor = 5.36