

... Fire Protection by Computer Design

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

Job Name : TEMPLE STREET MUSIC VENUE CALC  
Building : FP-1  
Location : 25 TEMPLE ST  
System : #1  
Contract :  
Data File : TEMPLE ST MUSIC VENUE CALC.WXF

**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** TEMPLE STREET MUSIC VENUE CALC  
**Location:** 25 TEMPLE ST  
**Drawing no:** FP-1  
**Date:** 3-31-15

**Design**

**Remote area number:** #1  
**Remote area location:** MUSIC VENUE  
**Occupancy classification:** LIGHT HAZARD  
**Density:** .1 - Gpm/SqFt  
**Area of application:** - SqFt  
**Coverage per sprinkler:** 225 - SqFt  
**Type of sprinklers calculated:** RELIABLE F1FR56 PENDENT  
**No. of sprinklers calculated:** 8  
**In-rack demand:** N/A - GPM  
**Hose streams:** 100 - GPM  
**Total water required (including hose streams):** 284.484 - GPI@ 48.3849 - Psi  
**Type of system:** NFPA 13 WET SYS  
**Volume of dry or preaction system:** N/A - Gal

**Water supply information**

**Date:** 5-12-14  
**Location:** FEDERAL ST AND CORNER OF MARKET 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 FORTIN  
**Authority having jurisdiction:** STATE OF MAIN / CITY OF PORTLAND  
**Notes:** (Include peaking information or gridded systems here.)

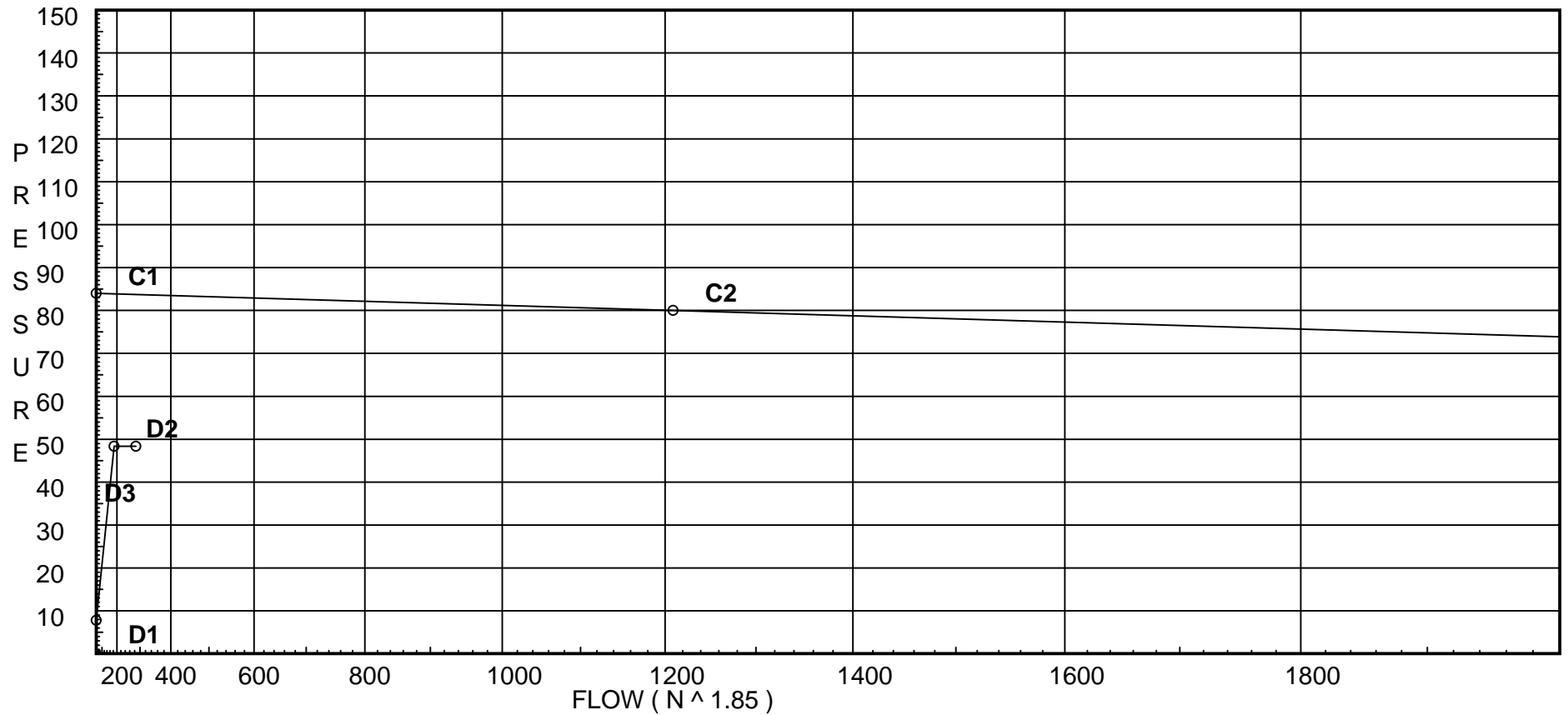
# Water Supply Curve (C)

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

Demand:  
D1 - Elevation : 7.796  
D2 - System Flow : 184.484  
D2 - System Pressure : 48.385  
Hose ( Adj City ) :  
Hose ( Demand ) : 100  
D3 - System Demand : 284.484  
Safety Margin : 35.340



## Fittings Used Summary

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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
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

## 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.
DP1	17.0	5.6	16.14	na	22.5	0.1	225	7.0
1	18.0	K = K @ EQ01	25.45	na	22.5			
2	18.0	K = K @ EQ01	25.64	na	22.59			
3	18.0	K = K @ EQ01	26.35	na	22.89			
4	18.0	K = K @ EQ01	27.85	na	23.54			
10	18.0	K = K @ EQ01	26.26	na	22.86			
11	18.0	K = K @ EQ01	26.46	na	22.94			
12	18.0	K = K @ EQ01	27.19	na	23.26			
13	18.0	K = K @ EQ01	28.74	na	23.91			
A1	18.0		30.9	na				
A2	18.0		31.87	na				
A3	18.0		37.61	na				
TOR	10.0		41.95	na				
BOR	0.0		48.18	na				
UG	-3.0		49.5	na				
TEST	0.0		48.38	na	100.0			

The maximum velocity is 16.2 and it occurs in the pipe between nodes A2 and A3

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	22.50	1.049	2T	10.0	2.000	16.143			K Factor = 5.60	
to		120.0		0.0	10.000	7.363				
EQ01	22.5	0.1618		0.0	12.000	1.942			Vel = 8.35	
	0.0									
	22.50					25.448			K Factor = 4.46	
1	22.50	1.682		0.0	12.000	25.448			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
2	22.5	0.0162		0.0	12.000	0.194			Vel = 3.25	
2	22.59	1.682		0.0	12.000	25.642			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
3	45.09	0.0588		0.0	12.000	0.705			Vel = 6.51	
3	22.89	1.682		0.0	12.000	26.347			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
4	67.98	0.1256		0.0	12.000	1.507			Vel = 9.82	
4	23.54	1.682		0.0	14.000	27.854			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
A1	91.52	0.2176		0.0	14.000	3.046			Vel = 13.21	
	0.0									
	91.52					30.900			K Factor = 16.46	
10	22.86	1.682		0.0	12.000	26.259			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
11	22.86	0.0168		0.0	12.000	0.201			Vel = 3.30	
11	22.94	1.682		0.0	12.000	26.460			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
12	45.8	0.0604		0.0	12.000	0.725			Vel = 6.61	
12	23.25	1.682		0.0	12.000	27.185			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
13	69.05	0.1292		0.0	12.000	1.551			Vel = 9.97	
13	23.91	1.682		0.0	14.000	28.736			K Factor @ node EQ01	
to		120.0		0.0	0.0	0.0				
A2	92.96	0.2240		0.0	14.000	3.136			Vel = 13.42	
	0.0									
	92.96					31.872			K Factor = 16.47	
A1	91.52	2.157		0.0	15.000	30.900				
to		120.0		0.0	0.0	0.0				
A2	91.52	0.0648		0.0	15.000	0.972			Vel = 8.04	
A2	92.96	2.157		0.0	24.200	31.872				
to		120.0		0.0	0.0	0.0				
A3	184.48	0.2371		0.0	24.200	5.737			Vel = 16.20	
A3	0.0	2.157		0.0	3.700	37.609				
to		120.0		0.0	0.0	3.465				
TOR	184.48	0.2370		0.0	3.700	0.877			Vel = 16.20	

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 *****
TOR	0.0	2.157	0.0	8.000	41.951		
to		120.0	0.0	0.0	4.331		
BOR	184.48	0.2370	0.0	8.000	1.896		Vel = 16.20
BOR	0.0	6.357	0.0	20.000	48.178		
to		120.0	0.0	0.0	1.299		
UG	184.48	0.0012	0.0	20.000	0.025		Vel = 1.86
UG	0.0	7.981	0.0	450.000	49.502		
to		120.0	0.0	0.0	-1.299		
TEST	184.48	0.0004	0.0	450.000	0.182		Vel = 1.18
	100.00						Qa = 100.00
	284.48				48.385		K Factor = 40.90