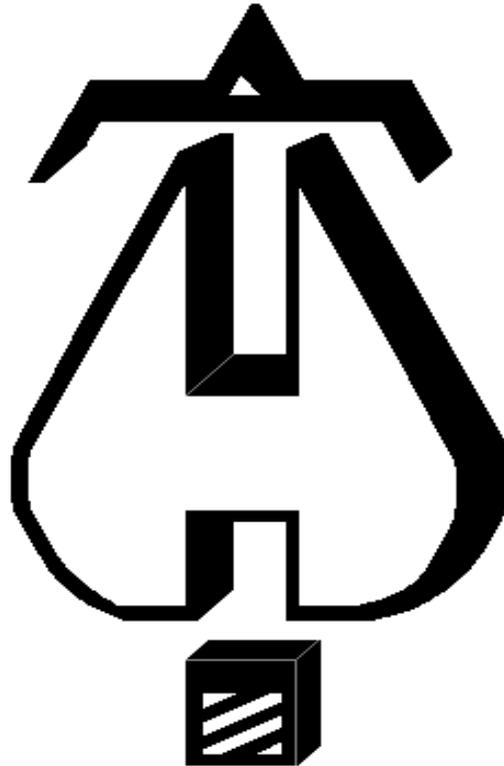




Reviewed for Code Compliance  
Inspections Division  
Approved with Conditions

Date: 01/20/16



... Fire Protection by Computer Design

ALTERNATIVE SPRINKLER  
39 JACKSON RD.  
POLAND SPRING, ME  
04274  
207-838-8930

Job Name : 98 WASHINGTON AVE 1ST FL CALC  
Building : FP-01  
Location : 98 WASHINGTON AVE  
System : #1  
Contract :  
Data File : 98 WAHSINGTON AVE 1ST FL CALC.WXF



**HYDRAULIC CALCULATIONS**  
**for**

Date: 01/20/16

**Project name:** 98 WASHINGTON AVE 1ST FL CALC  
**Location:** 98 WASHINGTON AVE  
**Drawing no:** FP-01  
**Date:** 12-2-15

**Design**

**Remote area number:** #1  
**Remote area location:** 1ST FLOOR OFFICE SPACE  
**Occupancy classification:** LIGHT HAZARD  
**Density:** .1 - Gpm/SqFt  
**Area of application:** 374 - SqFt  
**Coverage per sprinkler:** 225 - SqFt  
**Type of sprinklers calculated:** RELIABLE F1FR56 HSW  
**No. of sprinklers calculated:** 4  
**In-rack demand:** N/A - GPM  
**Hose streams:** 100 - GPM  
**Total water required (including hose streams):** 199.048 - GPM @ 58.1033 - Psi  
**Type of system:** NFPA 13 WET SYSTEM  
**Volume of dry or preaction system:** N/A - Gal

**Water supply information**

**Date:** 5-23-15  
**Location:** WASHINGTON AVE  
**Source:** PORTLAND WATER DEPT.

**Name of contractor:** ALTERNATIVE SPRINKLER  
**Address:** 39 JACKSON RD. / POLAND SPRING, ME / 04274  
**Phone number:** 207-838-8930  
**Name of designer:** TIM FORTIN  
**Authority having jurisdiction:**  
**Notes:** (Include peaking information or gridded systems here.)

# Water Supply Curve (C)

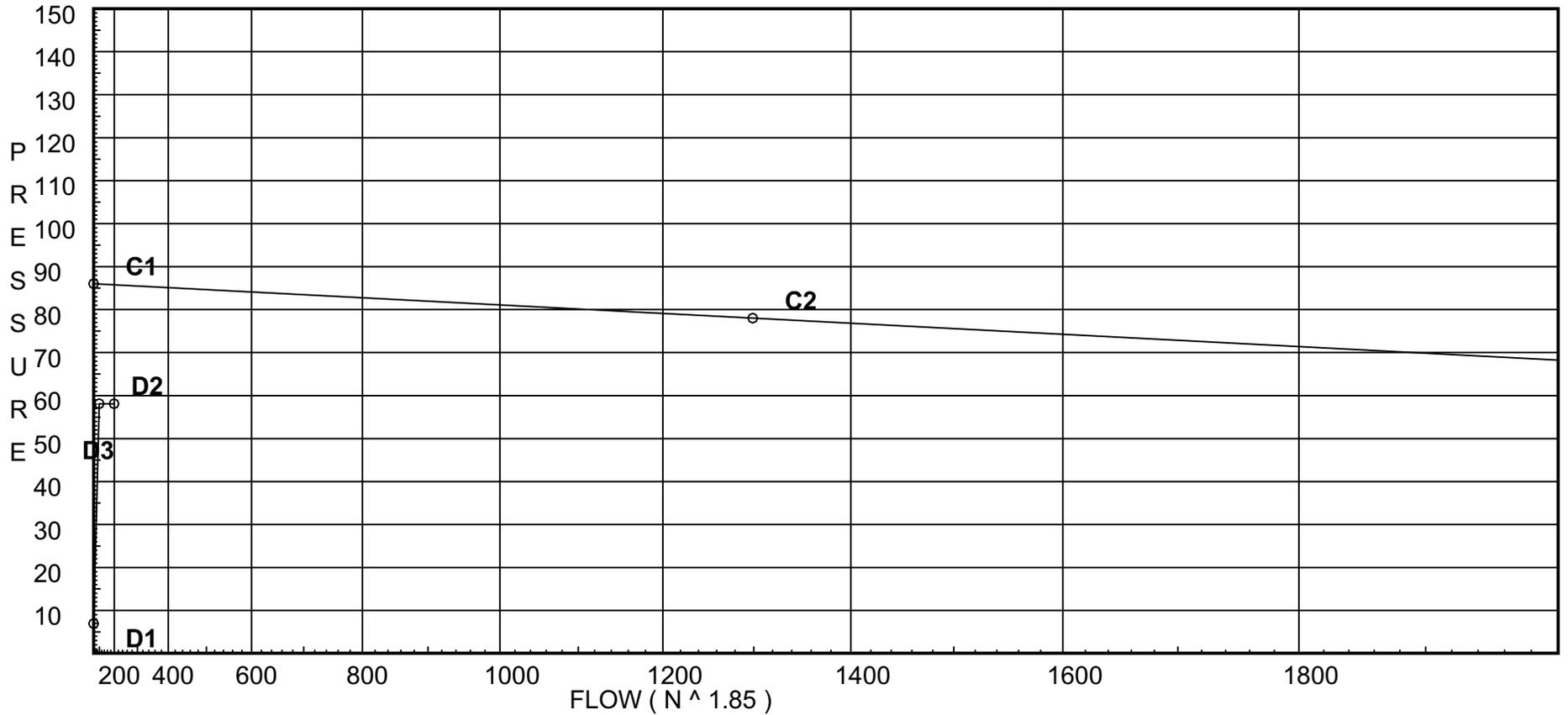
ALTERNATIVE SPRINKLER  
98 WASHINGTON AVE 1ST FL CALC



City Water Supply:  
C1 - Static Pressure : 86  
C2 - Residual Pressure: 78  
C2 - Residual Flow : 1299

Demand:  
D1 - El  
D2 - S  
D2 - S  
Hose ( Date: 01/20/16 )  
Hose ( Demand ) : 100  
D3 - System Demand : 199.048  
Safety Margin : 27.648

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# Fittings Used Summary

ALTERNATIVE SPRINKLER  
98 WASHINGTON AVE 1ST FL CALC



## 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	1	4
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	2	1
G	Generic Gate Valve	0	0	1	1	1	1	1	1	1	2	2	3	4	5	6	3
T	90' Flow Thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	6	21
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35
Zik	Wilkins 950XL	Fitting generates a Fixed Loss Based on Flow															61

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## 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

## ALTERNATIVE SPRINKLER 98 WASHINGTON AVE 1ST FL CALC



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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density
20	16.0	5.6	21.67	na	26.07	0.1
21	16.0	5.6	24.43	na	27.68	0.1
15	16.0		34.56	na		
30	16.0	5.6	16.14	na	22.5	0.1
32	16.0	5.6	16.57	na	22.8	0.1
31	16.0		17.49	na		
33	16.0		20.79	na		
34	16.0		25.34	na		
35	8.0		30.51	na		
36	8.0		36.42	na		
37	8.0		40.76	na		
16	16.0		35.25	na		
17	8.0		40.32	na		
TOR	8.0		41.36	na		
BOR	1.0		52.28	na		
UG	1.0		57.66	na		
TEST	0.0		58.1	na	100.0	

Date: 01/20/16

225	14.0
225	14.0

The maximum velocity is 19.95 and it occurs in the pipe between nodes 21 and 15

Final Calculations - Hazen-Williams

ALTERNATIVE SPRINKLER  
98 WASHINGTON AVE 1ST FL CALC



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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	**
20	26.07	1.049	1E	2.0	11.000	21.670		K Factor = 5.60
to		120.0		0.0	2.000	0.0		
21	26.07	0.2125		0.0	13.000	2.762		Vel = 9.68
21	27.68	1.049	1T	5.0	7.500	24.432		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
15	53.75	0.8104		0.0	12.500	10.130		Vel = 19.95
15	0.0	1.61	1E	4.0	2.800	34.562		
to		120.0		0.0	4.000	0.0		
16	53.75	0.1006		0.0	6.800	0.684		Vel = 8.47
	0.0							
	53.75					35.246		K Factor = 9.05
30	22.50	1.049	1T	5.0	3.300	16.143		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
31	22.5	0.1618		0.0	8.300	1.343		Vel = 8.35
	0.0							
	22.50					17.486		K Factor = 5.38
32	22.80	1.049	1T	5.0	0.500	16.574		K Factor = 5.60
to		120.0		0.0	5.000	0.0		
31	22.8	0.1658		0.0	5.500	0.912		Vel = 8.46
31	22.50	1.049	1E	2.0	3.600	17.486		
to		120.0		0.0	2.000	0.0		
33	45.3	0.5905		0.0	5.600	3.307		Vel = 16.82
33	0.0	1.049	1E	2.0	5.700	20.793		
to		120.0		0.0	2.000	0.0		
34	45.3	0.5905		0.0	7.700	4.547		Vel = 16.82
34	0.0	1.38	1E	3.0	8.000	25.340		
to		120.0		0.0	3.000	3.465		
35	45.3	0.1553		0.0	11.000	1.708		Vel = 9.72
35	0.0	1.38	1E	3.0	35.000	30.513		
to		120.0		0.0	3.000	0.0		
36	45.3	0.1553		0.0	38.000	5.902		Vel = 9.72
36	0.0	1.38	1T	6.0	22.000	36.415		
to		120.0		0.0	6.000	0.0		
37	45.3	0.1553		0.0	28.000	4.349		Vel = 9.72
37	0.0	2.067	1E	5.0	12.600	40.764		
to		120.0	1T	10.0	15.000	0.0		
TOR	45.3	0.0217		0.0	27.600	0.599		Vel = 4.33
	0.0							
	45.30					41.363		K Factor = 7.04
16	53.75	1.61	1T	8.0	8.000	35.246		
to		120.0		0.0	8.000	3.465		
17	53.75	0.1006		0.0	16.000	1.609		Vel = 8.47

Date: 01/20/16

Final Calculations - Hazen-Williams

ALTERNATIVE SPRINKLER  
98 WASHINGTON AVE 1ST FL CALC



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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	**
17	0.0	2.067	1T	10.0	25.000	40.320		
to		120.0		0.0	10.000	0.0		
TOR	53.75	0.0298		0.0	35.000	1.043		Vel = 5.14
TOR	45.30	2.067	1G	1.0	7.000	41.363		
to		120.0	1Z	5.0	6.000	9.717		* Fixed loss = 6.685
BOR	99.05	0.0923	1Zik	0.0	13.000	1.200		Vel = 9.47
BOR	0.0	1.917	1E	3.464	30.000	52.280		
to		120.0	1T	6.929	10.393	0.0		
UG	99.05	0.1332		0.0	40.393	5.381		Vel = 11.01
UG	0.0	11.938	1E	27.0	400.000	57.661		
to		120.0	1T	60.0	87.000	0.433		
TEST	99.05	0.0		0.0	487.000	0.009		Vel = 0.28
	100.00							Qa = 100.00
	199.05					58.103		K Factor = 26.11

Date: 01/20/16