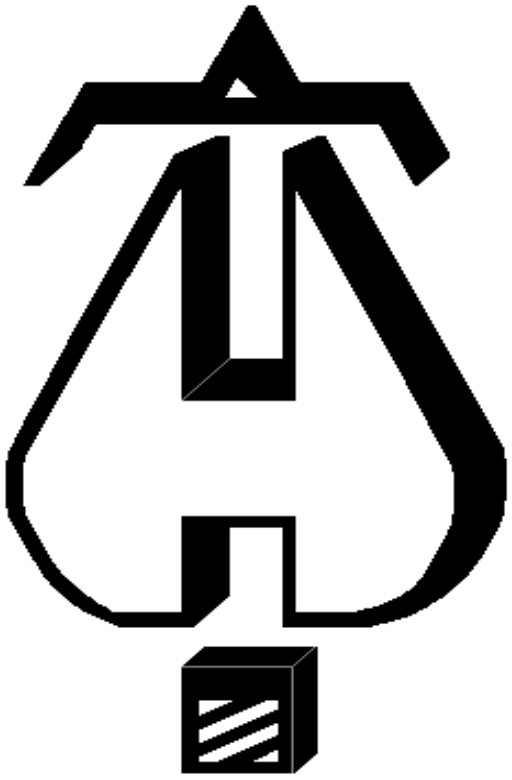


. . . Fire Protection by Computer Design

Residential Fire Protection
64 Daggett Hill Rd.
Greene, ME 04236
(207)946-343

Job Name	:	93 SAINT LAWRENCE STREET BLDG
Building	:	WOOD STRUCTURE
Location	:	1ST FLR UNIT
System	:	1 (WET)
Contract	:	C16014
Data File	:	93 ST LAWRENCE ST- 1ST FLR- HYD CALC.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 93 ST. LAWRENCE STREET — Date - 4/18/2016
Location - 1ST FLR UNIT
Building - WOOD STRUCTURE — System No. - 1 (WET)
Contractor - RESIDENTIAL FIRE PROTECTION — Contract No. - C16014
Calculated By - T. PRAY — Drawing No. - 1 OF 2
Construction: (X) Combustible ( ) Non-Combustible — Ceiling Height 8'-6"
OCCUPANCY - APARTMENT

SYSTEM DESIGN

Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )
( )Other
( )Specific Ruling — Made by — Date

DESIGN MATERIAL

Listed Flow at Start Point - 13 Gpm — System Type
Listed Pres. at Start Point - 7 Psi — (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16' x 16' — ( ) Deluge ( ) PreAction
Domestic Flow Added - Gpm — Sprinkler or Nozzle
Additional Flow Added - Gpm — Make VIKING Model VK468
Elevation at Highest Outlet - 109.08Feet — Size 7/16" K-Factor 4.9
Note: — Temperature Rating 155

Calculation Summary — Gpm Required 74.82 — Psi Required 45.94 — At Test
C-Factor Used: Overhead 150 Underground 140

WATER SUPPLY

Water Flow Test:		Pump Data:	Tank or Reservoir:
Date of Test	- 4/30/2014	Rated Cap.	Cap.
Time of Test	- N/A	@ Psi	Elev.
Static (Psi)	- 50	Elev.	
Residual (Psi)	- 44	Other	Well
Flow (Gpm)	- 919		Proof Flow Gpm
Elevation	- 100		

Location: TEST HYDRANT AT THE CORNER OF MONUMENT ST AND ST LAWRENCE ST,
SEE PLOT PLAN FOR MORE INFORMATION
Source of Information: PORTLAND WATER DISTRICT

Water Supply Curve (C)

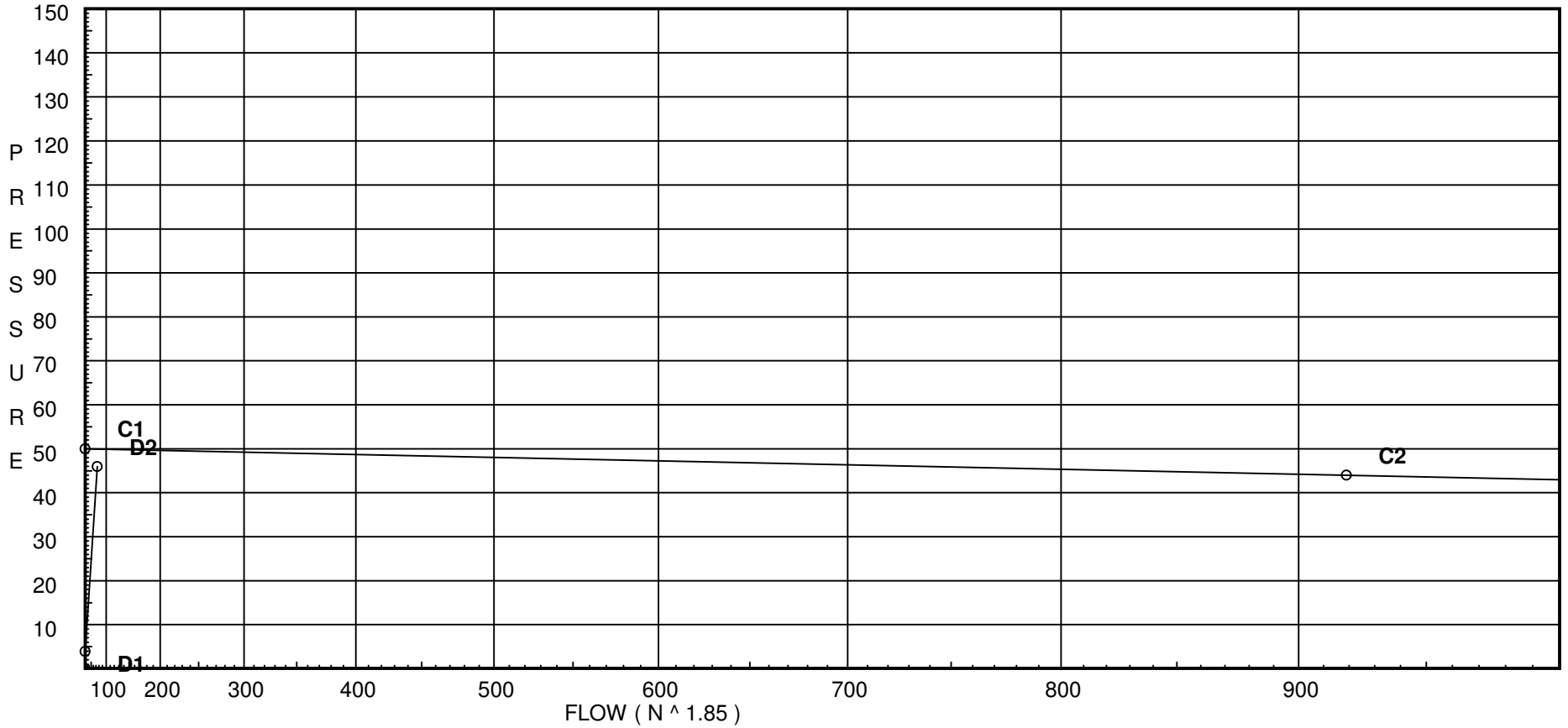
Residential Fire Protection
93 SAINT LAWRENCE STREET BLDG

Date 4/18/16

City Water Supply:
- C1 - Static Pressure : 50
- C2 - Residual Pressure: 44
- C2 - Residual Flow : 919

Demand:

D1 - Elevation	:	3.933
D2 - System Flow	:	74.8219
D2 - System Pressure	:	45.942
Hose (Adj City)	:	_____
Hose (Demand)	:	_____
D3 - System Demand	:	74.8219
Safety Margin	:	4.000



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
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	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
L	Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DO01	0.0	4.9	12.05	na	17.01	0.0525	324	12.0
DO02	0.0	4.9	12.05	na	17.01	0.0525	324	12.0
40	109.08	K = K @ EQ01	12.75	na	17.01			
41	109.08	K = K @ EQ02	14.41	na	17.65			
42	109.08	K = K @ EQ01	17.14	na	19.72			
43	109.08	K = K @ EQ02	19.32	na	20.44			
53	109.08		26.52	na				
54	109.08		26.75	na				
55	109.08		27.33	na				
AD	109.08		27.9	na				
TOR	108.5		31.82	na				
BOR	102.08		37.48	na				
BFP	102.08		37.8	na				
6UG	101.0		45.47	na				
TEST	100.0		45.94	na				

The maximum velocity is 21.48 and it occurs in the pipe between nodes 43 and 53

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DO01	17.01	0.874	1E	4.026	0.500	12.051		K Factor = 4.90
to		150		0.0	4.026	0.0		
EQ01	17.01	0.1551		0.0	4.526	0.702		Vel = 9.10
	0.0							
	17.01					12.753		K Factor = 4.76
DO02	17.01	0.874	1T	8.053	0.500	12.051		K Factor = 4.90
to		150		0.0	8.052	0.0		
EQ02	17.01	0.1552		0.0	8.552	1.327		Vel = 9.10
	0.0							
	17.01					13.378		K Factor = 4.65
40	17.01	0.874		0.0	10.670	12.753		K Factor @ node EQ01
to		150		0.0	0.0	0.0		
41	17.01	0.1553		0.0	10.670	1.657		Vel = 9.10
41	17.65	0.874	2E	8.053	14.250	14.410		K Factor @ node EQ02
to		150		0.0	8.052	0.0		
55	34.66	0.5794		0.0	22.302	12.922		Vel = 18.54
	0.0							
	34.66					27.332		K Factor = 6.63
42	19.72	0.874		0.0	10.670	17.139		K Factor @ node EQ01
to		150		0.0	0.0	0.0		
43	19.72	0.2040		0.0	10.670	2.177		Vel = 10.55
43	20.44	0.874	1T	8.053	1.420	19.316		K Factor @ node EQ02
to		150		0.0	8.052	0.0		
53	40.16	0.7608		0.0	9.472	7.206		Vel = 21.48
53	0.0	1.598		0.0	5.790	26.522		
to		150		0.0	0.0	0.0		
54	40.16	0.0402		0.0	5.790	0.233		Vel = 6.42
54	0.0	1.598	1T	11.656	2.670	26.755		
to		150		0.0	11.656	0.0		
55	40.16	0.0403		0.0	14.326	0.577		Vel = 6.42
55	34.66	1.598		0.0	4.500	27.332		
to		150		0.0	0.0	0.0		
AD	74.82	0.1271		0.0	4.500	0.572		Vel = 11.97
AD	0.0	1.61	2E	8.0	3.750	27.904		
to		120	1T	8.0	16.000	0.251		
TOR	74.82	0.1856		0.0	19.750	3.665		Vel = 11.79
TOR	0.0	1.61	1Z	4.0	3.500	31.820		
to		120	1T	8.0	12.000	2.780		
BOR	74.82	0.1855		0.0	15.500	2.875		Vel = 11.79
BOR	0.0	2.469	2I	12.0	2.000	37.475		
to		120		0.0	12.000	0.0		
BFP	74.82	0.0231		0.0	14.000	0.324		Vel = 5.01
BFP	0.0	2.469	1I	6.0	3.000	37.799		
to		120		0.0	6.000	7.468		* Fixed loss = 7
6UG	74.82	0.0231		0.0	9.000	0.208		Vel = 5.01
6UG	0.0	6.16	2L	25.822	95.000	45.475		
to		140	1G	4.304	73.163	0.433		
TEST	74.82	0.0002	1T	43.037	168.163	0.034		Vel = 0.81

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******
	0.0								
	74.82				45.942		K Factor = 11.04		