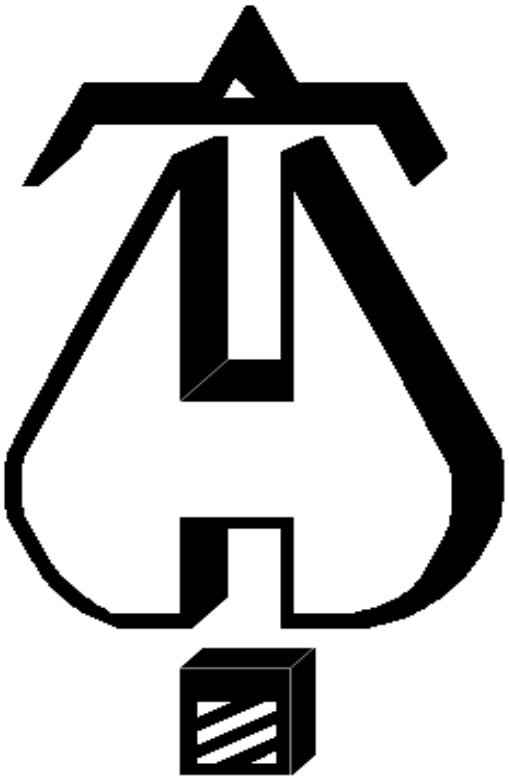


. . . Fire Protection by Computer Design

Dean & Allyn, Inc.
116 Lewiston Road
Gray, ME 04039
(207) 657-5646

Job Name	:	96 Federal Street
Drawing	:	
Location	:	96 Federal Street, Portland, ME 04101
Remote Area	:	Second Floor
Contract	:	C161372
Data File	:	Second Floor.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 96 FEDERAL STREET Date - 3/30/2017
Location - 96 Federal Street, Portland, ME 04101
Building - System No. - Second Floor
Contractor - Dean & Allyn, Inc. Contract No. - C161372
Calculated By - Chris Stewart Drawing No. - 1 of 1
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height ~9'-0"
OCCUPANCY - Residential

SYSTEM DESIGN

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

Listed Flow at Start Point	- 13 Gpm		System Type
Listed Pres. at Start Point	- 9.1 Psi	(X) Wet	( ) Dry
MAXIMUM LISTED SPACING	20 x 20	( ) Deluge	( ) PreAction
Domestic Flow Added	- Gpm	Sprinkler or Nozzle	
Additional Flow Added	- Gpm	Make Reliable	Model RFC 43
Elevation at Highest Outlet	- 26.35Feet	Size 3/8"	K-Factor 4.3
Note:*36.21psi Safety Margin		Temperature Rating 155F	

Calculation Summary: Gpm Required 59.30 Psi Required 58.78 At Test
C-Factor Used: Overhead 120 Underground 140

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - OCT 2016	Rated Cap.	Cap.
Time of Test -	@ Psi	Elev.
Static (Psi) - 95	Elev.	
Residual (Psi) - 91	Other	Well
Flow (Gpm) - 1519		Proof Flow Gpm
Elevation - 1.5		

Location: 35' down street from 96 Federal Street

Source of Information: Portland Water District

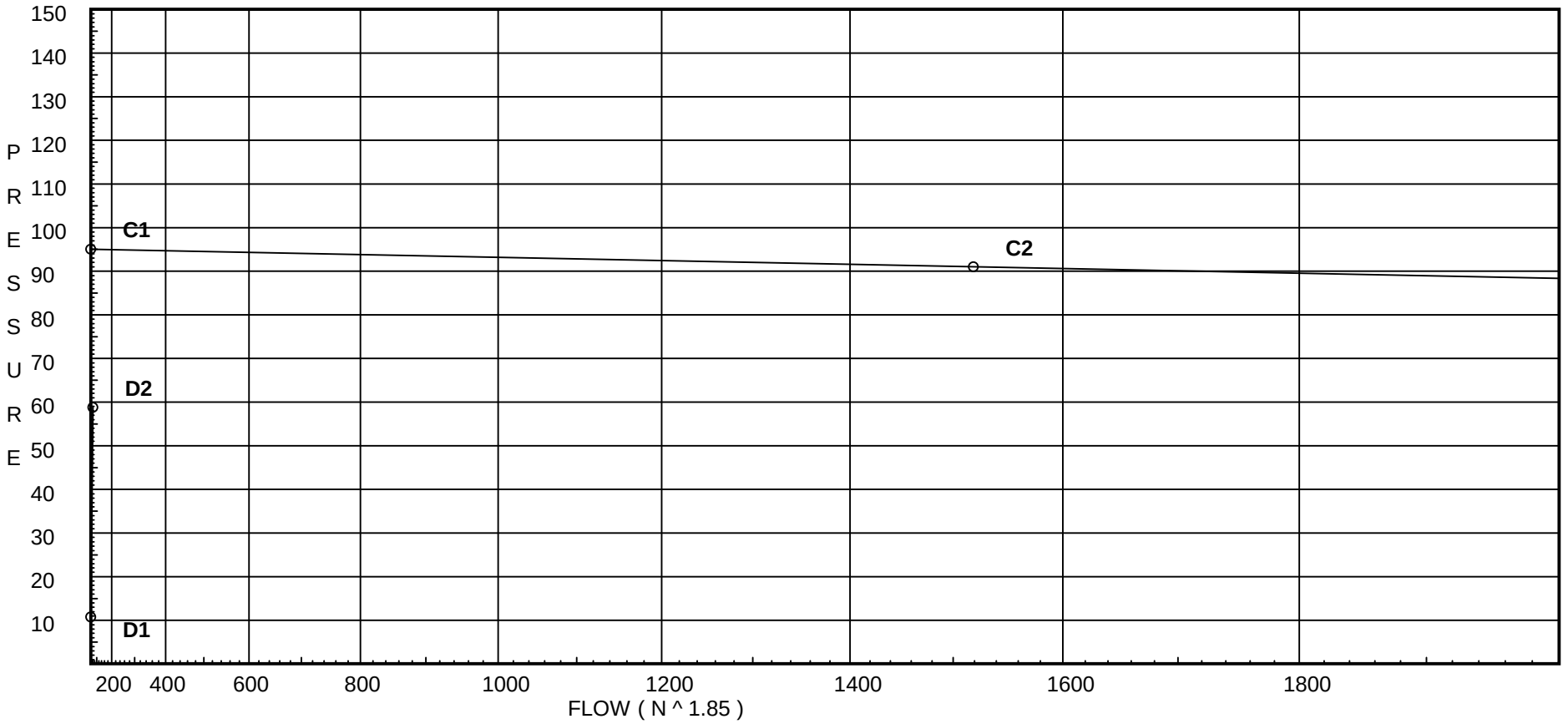
Water Supply Curve C

Dean & Allyn, Inc.
96 Federal Street

Date 3/30/2017

City Water Supply:
- C1 - Static Pressure : 95
- C2 - Residual Pressure: 91
- C2 - Residual Flow : 1519

Demand:
- D1 - Elevation : 10.763
- D2 - System Flow : 59.299
- D2 - System Pressure : 58.778
- Hose (Demand) : _____
- D3 - System Demand : 59.299
- Safety Margin : 36.212



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	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zca	Colt C200 Horz Butt	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.

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
201	26.35	4.3	9.14	na	13.0	0.05	260	9.1
202	26.35	4.3	9.49	na	13.25	0.05	260	9.1
20	26.64		10.93	na				
21	26.64		13.26	na				
203	26.35	4.3	13.49	na	15.79	0.05	260	9.1
22	26.64		15.23	na				
204	26.35	4.3	16.11	na	17.26	0.05	260	9.1
23	26.64		17.26	na				
24	26.64		23.69	na				
25	26.64		26.56	na				
13	5.42		43.18	na				
TR	5.42		44.75	na				
BR	1.0		51.84	na				
FF	-6.0		61.94	na				
UG1	-6.0		62.02	na				
TEST	1.5		58.78	na				

The maximum velocity is 15.61 and it occurs in the pipe between nodes 203 and 22

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
201	26.350	4.30	13.00	1	E	2.0	4.000	120	9.140	
to						0.0	2.000		0.0	
202	26.350		13.0	1.049		0.0	6.000	0.0587	0.352	Vel = 4.83
202	26.350	4.30	13.25	1	E	2.0	5.250	120	9.492	
to						0.0	2.000		-0.126	
20	26.640		26.25	1.049		0.0	7.250	0.2152	1.560	Vel = 9.74
20	26.640		0.0	1	T	5.0	5.830	120	10.926	
to						0.0	5.000		0.0	
21	26.640		26.25	1.049		0.0	10.830	0.2152	2.331	Vel = 9.74
21	26.640		0.0	1		0.0	0.500	120	13.257	
to						0.0	0.0		0.126	
203	26.350		26.25	1.049		0.0	0.500	0.2140	0.107	Vel = 9.74
203	26.350	4.30	15.79	1		0.0	3.620	120	13.490	
to						0.0	0.0		-0.126	
22	26.640		42.04	1.049		0.0	3.620	0.5144	1.862	Vel = 15.61
22	26.640		0.0	1.25		0.0	5.580	120	15.226	
to						0.0	0.0		0.126	
204	26.350		42.04	1.38		0.0	5.580	0.1353	0.755	Vel = 9.02
204	26.350	4.30	17.26	1.25		0.0	5.000	120	16.107	
to						0.0	0.0		-0.126	
23	26.640		59.3	1.38		0.0	5.000	0.2556	1.278	Vel = 12.72
23	26.640		0.0	1.25	T	6.0	19.160	120	17.259	
to						0.0	6.000		0.0	
24	26.640		59.3	1.38		0.0	25.160	0.2556	6.431	Vel = 12.72
24	26.640		0.0	1.25	T	6.0	5.220	120	23.690	
to						0.0	6.000		0.0	
25	26.640		59.3	1.38		0.0	11.220	0.2556	2.868	Vel = 12.72
25	26.640		0.0	1.5	2E	8.0	37.600	120	26.558	
to					2T	16.0	24.000		9.190	
13	5.420		59.3	1.61		0.0	61.600	0.1207	7.433	Vel = 9.35
13	5.420		0.0	1.5	2E	8.0	5.000	120	43.181	
to						0.0	8.000		0.0	
TR	5.420		59.3	1.61		0.0	13.000	0.1207	1.569	Vel = 9.35
TR	5.420		0.0	2.5	S	14.0	3.000	120	44.750	
to					Fsp	0.0	20.000		6.744	* * Fixed Loss = 4.83
BR	1		59.3	2.469	I	6.0	23.000	0.0150	0.346	Vel = 3.97
BR	1		0.0	2.5	Zca	0.0	1.000	120	51.840	
to					I	6.0	6.000		9.998	* * Fixed Loss = 6.967
FF	-6		59.3	2.469		0.0	7.000	0.0150	0.105	Vel = 3.97
FF	-6		0.0	4	T	29.067	50.000	140	61.943	
to						0.0	29.067		0.0	
UG1	-6		59.3	4.1		0.0	79.067	0.0010	0.076	Vel = 1.44
UG1	-6		0.0	8	3T	166.063	35.000	140	62.019	
to					E	28.468	194.531		-3.248	
TEST	1.5		59.3	8.27		0.0	229.531	0	0.007	Vel = 0.35
TEST			0.0 59.30						58.778	K Factor = 7.73