

MAINE FIRE PROTECTION SYSTEMS

MAINE FIRE PROTECTION SYSTEMS
6 DOWD RD
BANGOR, MAINE
207-942-8809

Job Name : 1337-1- CALC
Drawing : 1337-1
Location : 124 COTTAGE ST, BAR HARBOR, ME 04609
Remote Area : 1
Contract :
Data File : 1337-1- CALC Area 1.WXF

HYDRAULIC CALCULATIONS
for

Project name: DESTINATION HEALTH APARTMENTS
Location: 124 COTTAGE ST, BAR HARBOR, ME 04609
Drawing no: 1337-1
Date: 5/11/2020

Design

Remote area number: 1
Remote area location: SECOND FLOOR BEDROOM #3
Occupancy classification: 13R
Density: 0.1 - Gpm/SqFt
Area of application: 2 HEAD - SqFt
Coverage per sprinkler: 122 - SqFt
Type of sprinklers calculated: COMMERCIAL
No. of sprinklers calculated: 4
In-rack demand: N/A - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 181.257 - GPM @ 72.6813 - Psi
Type of system: WET
Volume of dry or preaction system: N/A - Gal

Water supply information

Date: 2012
Location: CORNER OF COTTAGE ST AND EDEN ST
Source: CITY WATER

Name of contractor: MAINE FIRE PROTECTION SYSTEMS
Address: 6 DOWD RD / / BANGOR, MAINE
Phone number: 207-942-8809
Name of designer: CHRIS MAHEUX
Authority having jurisdiction: STATE FIRE MARSHALL
Notes: (Include peaking information or gridded systems here.)

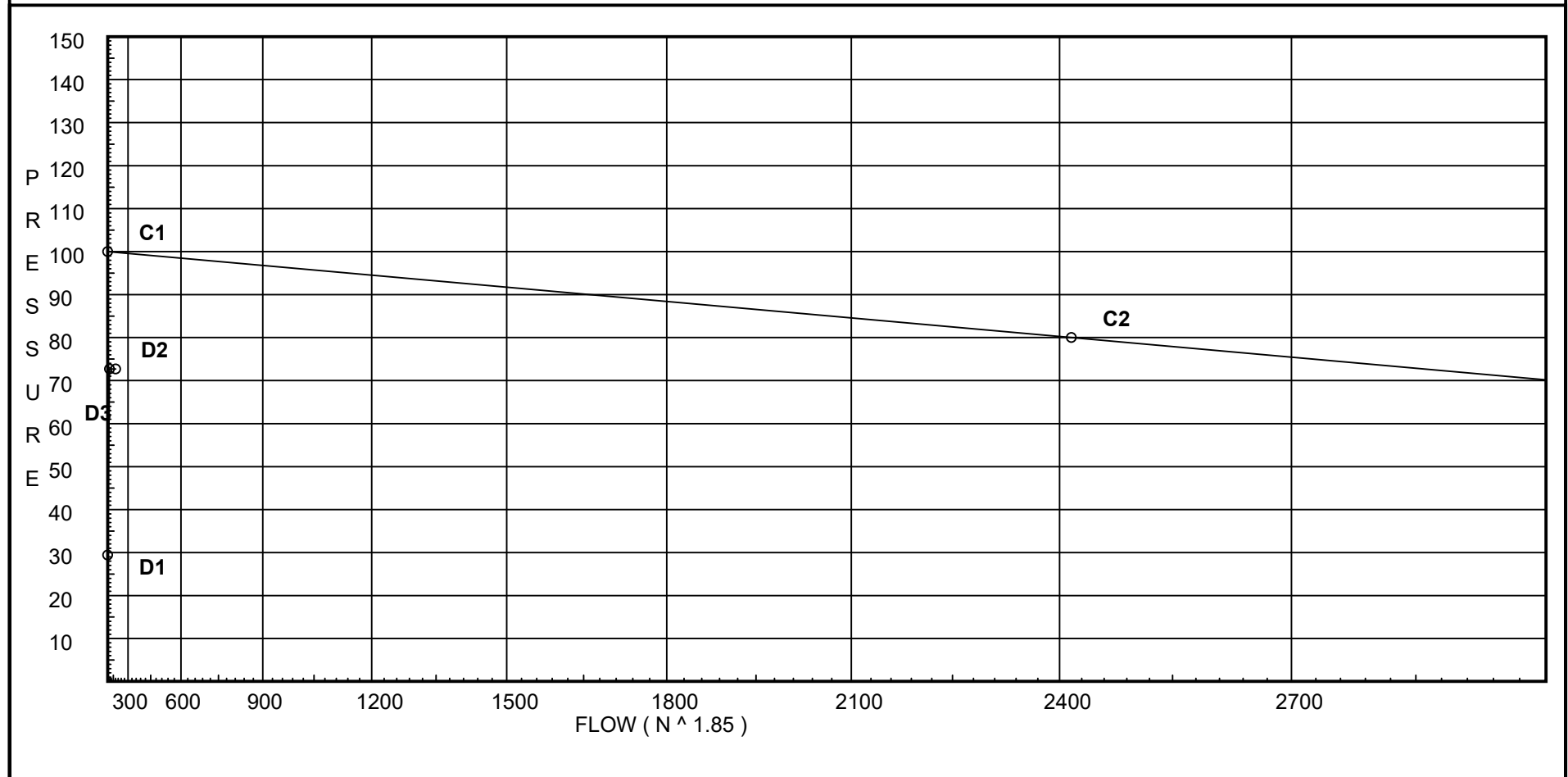
Water Supply Curve C

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City Water Supply:
C1 - Static Pressure : 100
C2 - Residual Pressure: 80
C2 - Residual Flow : 2416

Demand:
D1 - Elevation : 29.415
D2 - System Flow : 81.257
D2 - System Pressure : 72.681
Hose (Demand) : 100
D3 - System Demand : 181.257
Safety Margin : 27.153



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
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																			
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
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.
2	67.917	5.8	9.6	na	17.97	0.1	122	9.6
2F2	67.917		10.16	na				
1F2	58.667		23.74	na				
CS2	48.5		36.5	na				
4	48.5		36.9	na				
5	48.5		37.12	na				
6	48.5		39.69	na				
TOR	48.5		42.78	na				
BOR	48.5		49.79	na				
1023	48.5		51.66	na				
8210	48.5		51.66	na				
TEST	0.0		72.68	na	100.0			
7	67.917	5.8	10.13	na	18.46	0.1	122	9.6
8	67.917	5.8	14.41	na	22.02	0.1	32	9.6
2F1	58.667		20.03	na				
1F1	48.5		29.79	na				
CS1	48.5		35.68	na				
9	67.917	5.8	15.46	na	22.8	0.1	53	9.6

The maximum velocity is 16.64 and it occurs in the pipe between nodes 2F1 and 1F1

Final Calculations : Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
2 to 2F2	67.917 67.917	5.80	17.97 17.97	1 1.049	T	5.0 0.0 0.0	0.270 5.000 5.270	120 0.1068	9.600 0.0 0.563			Vel = 6.67
2F2 to 1F2	67.917 58.667		18.46 36.43	1 1.049	T 5E	5.0 10.0 0.0	9.250 15.000 24.250	120 0.3947	10.163 4.006 9.571			Vel = 13.52
1F2 to CS2	58.667 48.500		0.0 36.43	1 1.049	3E T	6.0 5.0 0.0	10.167 11.000 21.167	120 0.3947	23.740 4.403 8.354			Vel = 13.52
CS2 to 4	48.500 48.500		0.0 36.43	2 2.157	T E	12.307 6.153 0.0	15.380 18.460 33.840	120 0.0118	36.497 0.0 0.399			Vel = 3.20
4 to 5	48.500 48.500		0.0 36.43	2 2.157	T	12.307 0.0 0.0	6.960 12.307 19.267	120 0.0118	36.896 0.0 0.227			Vel = 3.20
5 to 6	48.500 48.500		44.83 81.26	2 2.157	2T E	24.613 6.153 0.0	18.600 30.766 49.366	120 0.0520	37.123 0.0 2.567			Vel = 7.13
6 to TOR	48.500 48.500		0.0 81.26	2 2.157	Fsp	0.0 0.0 0.0	1.750 0.0 1.750	120 0.0526	39.690 3.000 0.092		** Fixed Loss = 3	Vel = 7.13
TOR to BOR	48.500 48.500		0.0 81.26	2 2.157	Zik E	0.0 6.153 0.0	5.000 6.153 11.153	120 0.0520	42.782 6.424 0.580		** Fixed Loss = 6.424	Vel = 7.13
BOR to 1023	48.500 48.500		0.0 81.26	3 3.26	2E	18.815 0.0 0.0	250.200 18.815 269.015	120 0.0070	49.786 0.0 1.872			Vel = 3.12
1023 to 8210	48.500 48.500		0.0 81.26	10 10.28	E	33.148 0.0 0.0	176.440 33.148 209.588	140 0	51.658 0.0 0.004			Vel = 0.31
8210 to TEST	48.500 0		0.0 81.26	8 8.27	3E	85.404 0.0 0.0	164.060 85.404 249.464	140 0.0001	51.662 21.005 0.014			Vel = 0.49
TEST			100.00 181.26						72.681		Qa = 100.00 K Factor = 21.26	
7 to 2F2	67.917 67.917	5.80	18.46 18.46	1 1.049		0.0 0.0 0.0	0.270 0.0 0.270	120 0.1148	10.132 0.0 0.031			Vel = 6.85
2F2			0.0 18.46						10.163			K Factor = 5.79
8 to 2F1	67.917 58.667	5.80	22.02 22.02	1 1.049	E T	2.0 5.0 0.0	3.390 7.000 10.390	120 0.1554	14.413 4.006 1.615			Vel = 8.17
2F1 to 1F1	58.667 48.500		22.80 44.82	1 1.049		0.0 0.0 0.0	9.250 0.0 9.250	120 0.5792	20.034 4.403 5.358			Vel = 16.64
1F1 to CS1	48.500 48.500		0.0 44.82	1 1.049		0.0 0.0 0.0	10.167 0.0 10.167	120 0.5790	29.795 0.0 5.887			Vel = 16.64

Final Calculations : Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
CS1 to 5	48.500 48.500		0.0 44.82	2	E 4T	6.153 49.227	27.890 55.380	120	35.682 0.0		
			0.0 44.82							Vel = 3.94	
5									37.123	K Factor = 7.36	
9 to 2F1	67.917 58.667	5.80	22.80	1	E	2.0 0.0	1.430 2.000	120	15.459 4.006		
			22.8	1.049		0.0	3.430	0.1659	0.569	Vel = 8.46	
2F1			0.0 22.80						20.034	K Factor = 5.09	