

**. . . Fire Protection by Computer Design**

Residential Fire Protection  
64 Daggett Hill Rd.  
Greene, ME 04236  
946-3473

Job Name : MOTHERHOUSE SENIOR HOUSING  
Building : WOOD FRAMED  
Location : 5TH FLOOR- APARTMENT UNIT (AREA #2)  
System : 1  
Contract : C17011  
Data File : MOTHERHOUSE-5TH FLR-UNIT.WXF

Hydraulic Design Information Sheet

Name - MOTHERHOUSE SENIOR HOUSING Date - 7/27/2017  
 Location - 5TH FLOOR- APARTMENT UNIT (AREA #2)  
 Building - WOOD FRAMED System No. - 1  
 Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - C17011  
 Calculated By - T. PRAY Drawing No. - 5 OF 5  
 Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - 9'-0"  
 Occupancy - RESIDENTIAL

S (X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.  
 Y ( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve

S Other RESIDENTIAL SPRINKLERS

T Specific Ruling Made By Date

E  
 M Area of Sprinkler Operation - 4 SPRK'S System Type Sprinkler/Nozzle  
 Density - .0508 (X) Wet Make VIKING  
 D Area Per Sprinkler - 256 ( ) Dry Model VK486  
 E Elevation at Highest Outlet - 173.58 ( ) Deluge Size 7/16"  
 S Hose Allowance - Inside - ( ) Preaction K-Factor 4.0  
 I Rack Sprinkler Allowance - ( ) Other Temp.Rat.155  
 G Hose Allowance - Outside - 100

N Note

Calculation Flow Required - 52.74 Press Required - 39.4 AT BOR  
 Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:  
 A Date of Test - 6/2/2017 Cap. -  
 T Time of Test - 6:30 AM Rated Cap.- Elev.-  
 E Static Press - 58 @ Press -  
 R Residual Press - 56 Elev. - Well  
 Flow - 1061 Proof Flow  
 S Elevation - 122

U Location - HYDRANTS ARE LOCATED ON STEVENS AVE, SEE PLOT PLAN

P Source of Information - PORTLAND WATER DISTRICT

C Commodity Class Location  
 O Storage Ht. Area Aisle W.  
 M Storage Method: Solid Piled % Palletized % Rack  
 M  
 ( ) Single Row ( ) Conven. Pallet ( ) Auto. Storage ( ) Encap.  
 S R ( ) Double Row ( ) Slave Pallet ( ) Solid Shelf ( ) Non  
 T A ( ) Mult. Row ( ) Open Shelf  
 O C

R K Flue Spacing Clearance:Storage to Ceiling  
 A Longitudinal Transverse

G Horizontal Barriers Provided:  
 E

# Water Supply Curve (C)

Residential Fire Protection  
MOTHERHOUSE SENIOR HOUSING

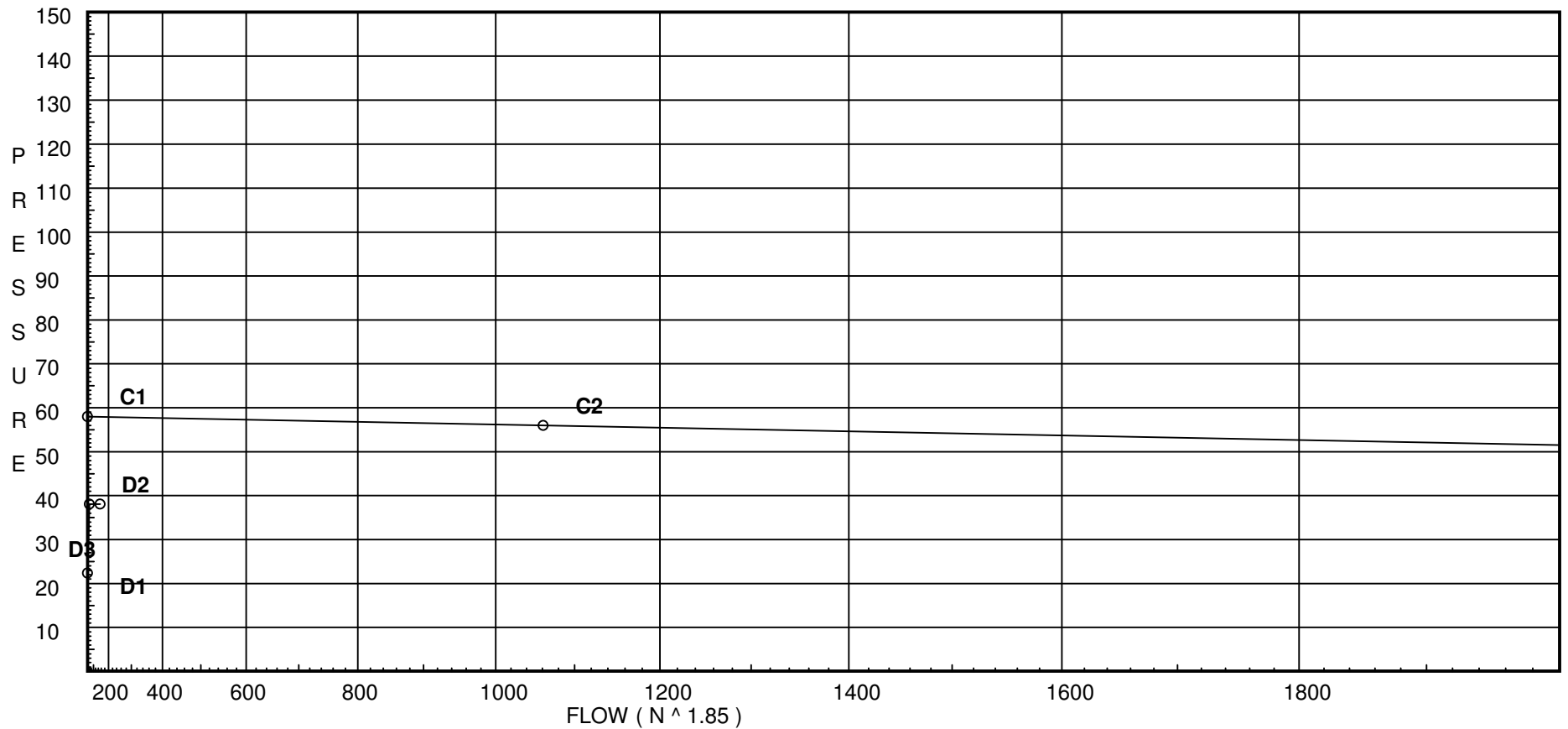
Page 2  
Date 7/27/2017

### City Water Supply:

C1 - Static Pressure : 58  
C2 - Residual Pressure: 56  
C2 - Residual Flow : 1061

### Demand:

D1 - Elevation : 22.339  
D2 - System Flow : 52.735  
D2 - System Pressure : 38.092  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : 100  
D3 - System Demand : 152.735  
Safety Margin : 19.852



# Fittings Used Summary

Residential Fire Protection  
MOTHERHOUSE SENIOR HOUSING

Page 3  
Date 7/27/2017

## 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
A	Generic Alarm Valve	0	0	0	0	0	0	7.7	21.5	0	17	17	27	29	0	0	0	0	0	0	0
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
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
J	90'Tee-Branch Grv Vic #20	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120
L	Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
S	Generic Swing Check Valve	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
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

Residential Fire Protection  
MOTHERHOUSE SENIOR HOUSING

Page 4  
Date 7/27/2017

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
10	173.58	4	10.98	na	13.25	0.0508	256	10.6
500	169.0		13.45	na				
501	173.25		11.93	na				
3	173.25		11.99	na				
502	173.25		12.09	na				
503	173.25		12.1	na				
11	173.25	4	11.27	na	13.43	0.0508	256	10.6
504	173.25		12.16	na				
12	173.58	4	10.61	na	13.03	0.0508	256	10.6
13	173.58	4	10.6	na	13.02	0.0508	256	10.6
505A	173.58		10.91	na				
505	173.25		12.18	na				
506	173.25		12.74	na				
507	173.25		14.91	na				
508	173.25		15.05	na				
509	173.25		15.5	na				
600	173.25		15.68	na				
601	161.92		20.59	na				
602	150.58		25.52	na				
603	138.5		30.76	na				
604	126.42		36.02	na				
605	125.92		36.28	na				
TOR	122.58		37.76	na				
HDR	118.92		39.4	na				
6UG	117.42		40.05	na				
TEST	122.0		38.09	na	100.0			

The maximum velocity is 9.67 and it occurs in the pipe between nodes 505A and 505

# Final Calculations - Hazen-Williams

Residential Fire Protection  
MOTHERHOUSE SENIOR HOUSING

Page 5  
Date 7/27/2017

Hyd. Ref. Point	Qa  Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
10	13.25	1.049	1E	2.0	1.120	10.978			K Factor = 4.00	
to		120	1T	5.0	7.000	1.984				
500	13.25	0.0607		0.0	8.120	0.493			Vel = 4.92	
500	0.0	1.38	3E	9.0	4.910	13.455				
to		120	1T	6.0	15.000	-1.841				
501	13.25	0.0160		0.0	19.910	0.318			Vel = 2.84	
501	0.0	1.38		0.0	3.670	11.932				
to		120		0.0	0.0	0.0				
3	13.25	0.0161		0.0	3.670	0.059			Vel = 2.84	
3	0.0	1.61	1T	8.0	5.000	11.991				
to		120		0.0	8.000	0.0				
502	13.25	0.0075		0.0	13.000	0.098			Vel = 2.09	
502	0.0	2.157		0.0	8.170	12.089				
to		120		0.0	0.0	0.0				
503	13.25	0.0018		0.0	8.170	0.015			Vel = 1.16	
503	0.0	2.157	2T	24.613	7.580	12.104				
to		120		0.0	24.613	0.0				
504	13.25	0.0018		0.0	32.193	0.059			Vel = 1.16	
	0.0									
	13.25					12.163			K Factor = 3.80	
11	13.43	1.049	2E	4.0	5.290	11.272			K Factor = 4.00	
to		120	1T	5.0	9.000	0.0				
504	13.43	0.0624		0.0	14.290	0.891			Vel = 4.99	
504	13.25	2.157		0.0	3.080	12.163				
to		120		0.0	0.0	0.0				
505	26.68	0.0065		0.0	3.080	0.020			Vel = 2.34	
	0.0									
	26.68					12.183			K Factor = 7.64	
12	13.03	1.049	1T	5.0	0.079	10.610			K Factor = 4.00	
to		120		0.0	5.000	0.0				
505A	13.03	0.0589		0.0	5.079	0.299			Vel = 4.84	
	0.0									
	13.03					10.909			K Factor = 3.95	
13	13.02	1.049	1T	5.0	0.250	10.600			K Factor = 4.00	
to		120		0.0	5.000	0.0				
505A	13.02	0.0589		0.0	5.250	0.309			Vel = 4.83	
505A	13.03	1.049	1T	5.0	0.330	10.909				
to		120		0.0	5.000	0.143				
505	26.05	0.2122		0.0	5.330	1.131			Vel = 9.67	
505	26.69	2.157	3I	12.922	11.090	12.183				
to		120		0.0	12.922	0.0				
506	52.74	0.0234		0.0	24.012	0.561			Vel = 4.63	
506	-26.04	1.682	1J	9.9	87.330	12.744				
to		120		0.0	9.900	0.0				
507	26.7	0.0223		0.0	97.230	2.166			Vel = 3.86	
507	0.0	1.682		0.0	6.420	14.910				
to		120		0.0	0.0	0.0				
508	26.7	0.0224		0.0	6.420	0.144			Vel = 3.86	

# Final Calculations - Standard

Residential Fire Protection  
MOTHERHOUSE SENIOR HOUSING

Page 6  
Date 7/27/2017

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 26.70					15.054			K Factor = 6.88	
506 to 508	26.04	1.682 120 0.0213	1E 1T	4.95 9.9 0.0	93.750 14.850 108.600	12.744 0.0 2.310			Vel = 3.76	
508 to 509	26.70	3.26 120 0.0031	5I 2J	33.599 34.943 0.0	75.540 68.542 144.082	15.054 0.0 0.450			Vel = 2.03	
509 to 600	0.0 52.74	3.26 120 0.0031	1Z 1S 1G 1T	9.408 21.503 1.344 20.159	3.000 52.414 55.414	15.504 0.0 0.173			Vel = 2.03	
600 to 601	0.0 52.74	4.26 120 0.0009		0.0 0.0 0.0	11.330 0.0 11.330	15.677 4.907 0.010			Vel = 1.19	
601 to 602	0.0 52.74	4.26 120 0.0009		0.0 0.0 0.0	11.340 0.0 11.340	20.594 4.911 0.010			Vel = 1.19	
602 to 603	0.0 52.74	4.26 120 0.0008		0.0 0.0 0.0	12.080 0.0 12.080	25.515 5.232 0.010			Vel = 1.19	
603 to 604	0.0 52.74	4.26 120 0.0009	1J	21.067 0.0 0.0	12.580 21.067 33.647	30.757 5.232 0.029			Vel = 1.19	
604 to 605	0.0 52.74	4.26 120 0.0008	4I	36.868 0.0 0.0	20.170 36.868 57.038	36.018 0.217 0.048			Vel = 1.19	
605 to TOR	0.0 52.74	4.026 120 0.0011	2F 1E	8.0 10.0 0.0	14.000 18.000 32.000	36.283 1.447 0.035			Vel = 1.33	
TOR to HDR	0.0 52.74	4.026 120 0.0011	1A 1G 1T	17.0 2.0 20.0	3.670 39.000 42.670	37.765 1.585 0.048			Vel = 1.33	
HDR to 6UG	0.0 52.74	7.981 120 0.0	1S 1E	45.0 18.0 0.0	11.000 63.000 74.000	39.398 0.650 0.002			Vel = 0.34	
6UG to TEST	0.0 52.74	6.16 140 0.0001	1L 1G 1T	12.911 4.304 43.037	180.000 60.252 240.252	40.050 -1.984 0.026			Vel = 0.57	
	100.00 152.74					38.092			Qa = 100.00 K Factor = 24.75	