

**. . . 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- STORAGE RM  
System : 1  
Contract : C17011  
Data File : MOTHERHOUSE-5TH FLR-STORAGE AREA.WXF

Hydraulic Design Information Sheet

Name - MOTHERHOUSE SENIOR HOUSING Date - 7/27/2017  
 Location - 5TH FLOOR- STORAGE RM  
 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 - VARIES  
 Occupancy - STORAGE ROOM

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

S Other

T Specific Ruling Made By Date

M	Area of Sprinkler Operation	- 514	System Type	Sprinkler/Nozzle
	Density	- .15	(X) Wet	Make VIKING
D	Area Per Sprinkler	- 100	( ) Dry	Model VK300
E	Elevation at Highest Outlet	- 173.25	( ) Deluge	Size 1/2"
S	Hose Allowance - Inside	-	( ) Preaction	K-Factor 5.6
I	Rack Sprinkler Allowance	-	( ) Other	Temp.Rat.155
G	Hose Allowance - Outside	- 250		

N Note

Calculation Flow Required - 122.55 Press Required - 56.75 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
S	Flow - 1061		Proof Flow
U	Elevation - 122		

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

L Source of Information - PORTLAND WATER DISTRICT

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

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

E Horizontal Barriers Provided:

# Water Supply Curve (C)

Residential Fire Protection  
MOTHERHOUSE SENIOR HOUSING

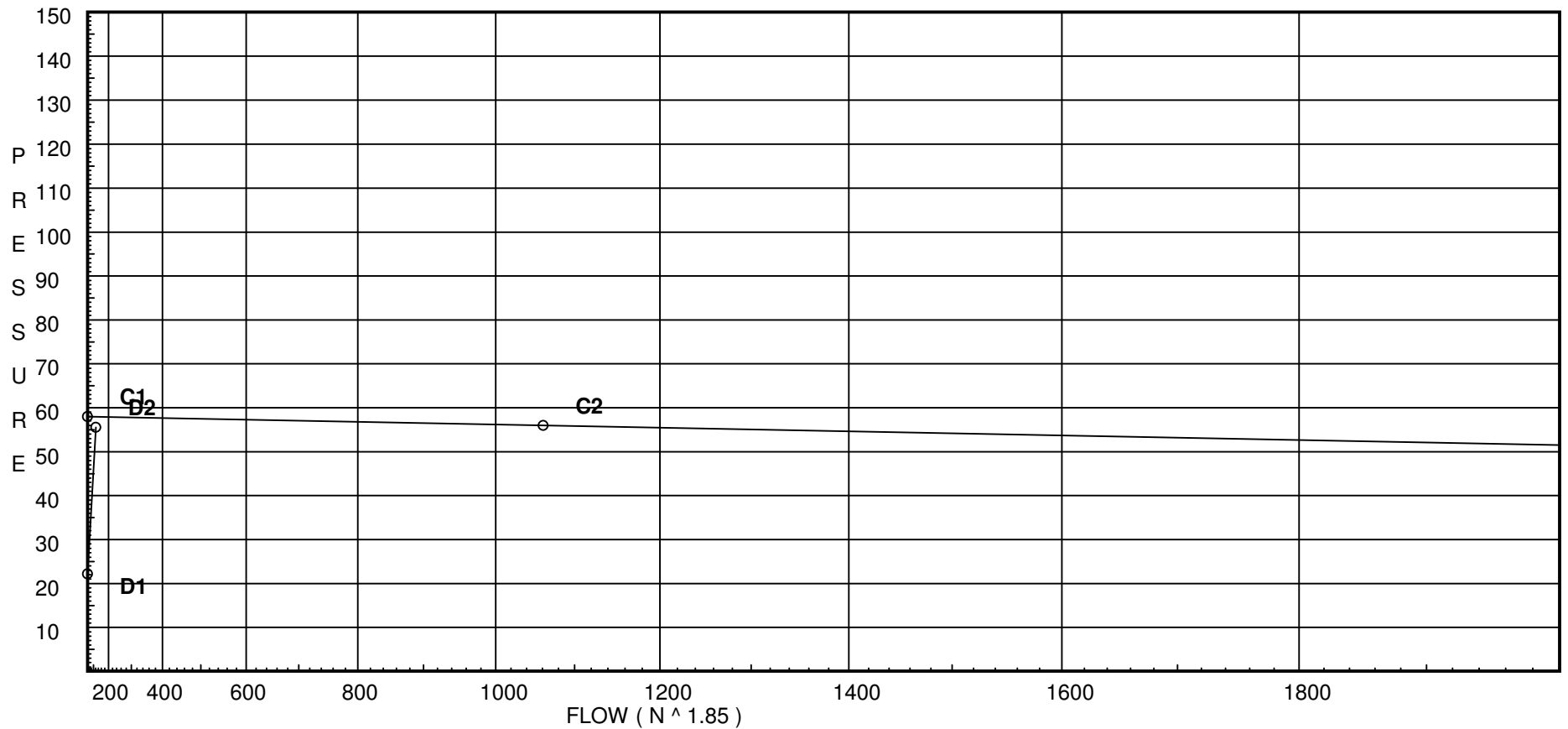
Page 2  
Date 7/27/2017

### City Water Supply:

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

### Demand:

D1 - Elevation : 22.196  
D2 - System Flow : 122.551  
D2 - System Pressure : 55.556  
Hose ( Adj City ) : \_\_\_\_\_  
Hose ( Demand ) : \_\_\_\_\_  
D3 - System Demand : 122.551  
Safety Margin : 2.407



# 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	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.
SP01	0.0	5.6	7.17	na	15.0	0.15	100	0.0
1	169.0	5.6	10.13	na	17.82	0.15	100	7.0
2	173.25	K = K @ EQ01	9.37	na	16.66			
501	173.25		9.73	na				
3	173.25	K = K @ EQ01	10.07	na	17.27			
4	173.25	5.6	9.16	na	16.95	0.15	113	7.0
5	173.25	5.6	9.88	na	17.6	0.15	113	7.0
502	173.25		11.29	na				
6	173.25	5.6	10.11	na	17.8	0.15	100	7.0
7	173.25	5.6	10.84	na	18.44	0.15	100	7.0
503	173.25		11.77	na				
504	173.25		15.35	na				
505	173.25		15.69	na				
506	173.25		18.36	na				
507	173.25		28.67	na				
508	173.25		29.35	na				
509	173.25		31.49	na				
600	173.25		32.32	na				
601	161.92		37.27	na				
602	150.58		42.23	na				
603	138.5		47.51	na				
604	126.42		52.88	na				
605	125.92		53.33	na				
TOR	122.58		54.94	na				
HDR	118.92		56.75	na				
6UG	117.42		57.42	na				
TEST	122.0		55.56	na				

The maximum velocity is 12.8 and it occurs in the pipe between nodes 2 and 501

# 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 Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
SP01 to EQ01	15.00 15.0 0.0 15.00	1.049 120 0.0764	1T 5.0 0.0 0.0	0.500 5.000 5.500	7.175 0.0 0.420			K Factor = 5.60 Vel = 5.57	
						7.595		K Factor = 5.44	
1 to 2	17.82 17.82	1.049 120 0.1052	2E 4.0 0.0 0.0	6.330 4.000 10.330	10.126 -1.841 1.087			K Factor = 5.60 Vel = 6.62	
2 to 501	16.66 34.48	1.049 120 0.3560	0.0 0.0 0.0	1.000 0.0 1.000	9.372 0.0 0.356			K Factor @ node EQ01 Vel = 12.80	
501 to 3	0.0 34.48	1.38 120 0.0937	0.0 0.0 0.0	3.670 0.0 3.670	9.728 0.0 0.344			Vel = 7.40	
3 to 502	17.28 51.76	1.61 120 0.0938	1T 8.0 0.0 0.0	5.000 8.000 13.000	10.072 0.0 1.220			K Factor @ node EQ01 Vel = 8.16	
	0.0 51.76					11.292		K Factor = 15.40	
4 to 5	16.95 16.95	1.049 120 0.0959	0.0 0.0 0.0	7.500 0.0 7.500	9.161 0.0 0.719			K Factor = 5.60 Vel = 6.29	
5 to 502	17.60 34.55	1.38 120 0.0941	2E 6.0 1T 6.0 0.0	3.000 12.000 15.000	9.880 0.0 1.412			K Factor = 5.60 Vel = 7.41	
502 to 503	51.76 86.31	2.157 120 0.0581	0.0 0.0 0.0	8.170 0.0 8.170	11.292 0.0 0.475			Vel = 7.58	
	0.0 86.31					11.767		K Factor = 25.16	
6 to 7	17.80 17.8	1.049 120 0.1050	0.0 0.0 0.0	7.000 0.0 7.000	10.107 0.0 0.735			K Factor = 5.60 Vel = 6.61	
7 to 503	18.44 36.24	1.38 120 0.1028	1T 6.0 0.0 0.0	3.000 6.000 9.000	10.842 0.0 0.925			K Factor = 5.60 Vel = 7.77	
503 to 504	86.31 122.55	2.157 120 0.1112	2T 24.613 0.0 0.0	7.580 24.613 32.193	11.767 0.0 3.580			Vel = 10.76	
504 to 505	0.0 122.55	2.157 120 0.1114	0.0 0.0 0.0	3.080 0.0 3.080	15.347 0.0 0.343			Vel = 10.76	
505 to 506	0.0 122.55	2.157 120 0.1112	3I 12.922 0.0 0.0	11.090 12.922 24.012	15.690 0.0 2.670			Vel = 10.76	
506 to 507	-60.50 62.05	1.682 120 0.1060	1J 9.9 0.0 0.0	87.330 9.900 97.230	18.360 0.0 10.310			Vel = 8.96	

# 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 Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
507	0.0	1.682		0.0	6.420	28.670				
to		120		0.0	0.0	0.0				
508	62.05	0.1059		0.0	6.420	0.680		Vel =	8.96	
	0.0									
	62.05					29.350		K Factor =	11.45	
506	60.50	1.682	1E	4.95	93.750	18.360				
to		120	1T	9.9	14.850	0.0				
508	60.5	0.1012		0.0	108.600	10.990		Vel =	8.74	
508	62.05	3.26	5I	33.599	75.540	29.350				
to		120	2J	34.943	68.542	0.0				
509	122.55	0.0149		0.0	144.082	2.145		Vel =	4.71	
509	0.0	3.26	1Z	9.408	3.000	31.495				
to		120	1S	21.503	52.414	0.0				
600	122.55	0.0149	1G	1.344	55.414	0.824		Vel =	4.71	
			1T	20.159						
600	0.0	4.26		0.0	11.330	32.319				
to		120		0.0	0.0	4.907				
601	122.55	0.0041		0.0	11.330	0.046		Vel =	2.76	
601	0.0	4.26		0.0	11.340	37.272				
to		120		0.0	0.0	4.911				
602	122.55	0.0041		0.0	11.340	0.046		Vel =	2.76	
602	0.0	4.26		0.0	12.080	42.229				
to		120		0.0	0.0	5.232				
603	122.55	0.0041		0.0	12.080	0.049		Vel =	2.76	
603	0.0	4.26	1J	21.067	12.580	47.510				
to		120		0.0	21.067	5.232				
604	122.55	0.0040		0.0	33.647	0.136		Vel =	2.76	
604	0.0	4.26	4I	36.868	20.170	52.878				
to		120		0.0	36.868	0.217				
605	122.55	0.0040		0.0	57.038	0.230		Vel =	2.76	
605	0.0	4.026	2F	8.0	14.000	53.325				
to		120	1E	10.0	18.000	1.447				
TOR	122.55	0.0053		0.0	32.000	0.170		Vel =	3.09	
TOR	0.0	4.026	1A	17.0	3.670	54.942				
to		120	1G	2.0	39.000	1.585				
HDR	122.55	0.0053	1T	20.0	42.670	0.227		Vel =	3.09	
HDR	0.0	7.981	1S	45.0	11.000	56.754				
to		120	1E	18.0	63.000	0.650				
6UG	122.55	0.0002		0.0	74.000	0.014		Vel =	0.79	
6UG	0.0	6.16	1L	12.911	180.000	57.418				
to		140	1G	4.304	60.252	-1.984				
TEST	122.55	0.0005	1T	43.037	240.252	0.122		Vel =	1.32	
	0.0									
	122.55					55.556		K Factor =	16.44	