



. . . 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 : 1ST FLOOR- MECHANICAL ROOM
System : 1
Contract : C17011
Data File : MOTHERHOUSE-1ST FLR-MECHANICAL.WXF

Hydraulic Design Information Sheet

Name - MOTHERHOUSE SENIOR HOUSING Date - 7/27/2017
 Location - 1ST FLOOR- MECHANICAL ROOM
 Building - WOOD FRAMED System No. - 1
 Contractor - RESIDENTIAL FIRE PROTECTION Contract No. - C17011
 Calculated By - T. PRAY Drawing No. - 1 OF 5
 Construction: (X) Combustible () Non-Combustible Ceiling Height - 9'-7"
 Occupancy - ORDINARY GROUP I HAZARD

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	- 1061	System Type	Sprinkler/Nozzle
	Density	- .15	(X) Wet	Make VIKING
D	Area Per Sprinkler	- 126	() Dry	Model VK300
E	Elevation at Highest Outlet	- 126.25	() 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 - 214.8 Press Required - 48.56 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 - 123		

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)

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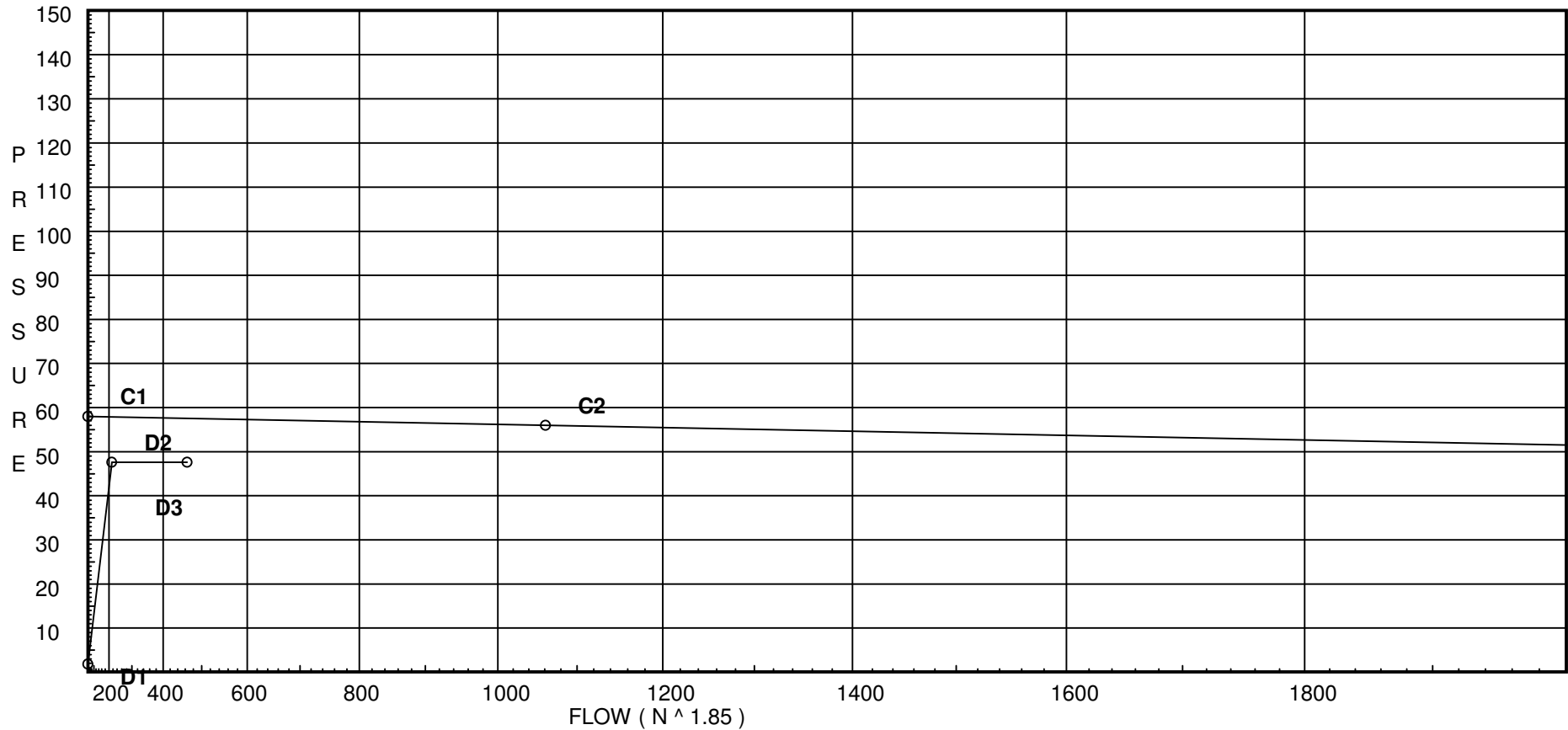
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City Water Supply:

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

Demand:

D1 - Elevation : 1.841
D2 - System Flow : 214.804
D2 - System Pressure : 47.623
Hose (Adj City) : _____
Hose (Demand) : 250
D3 - System Demand : 464.804
Safety Margin : 9.943



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
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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
80	126.25	5.6	10.73	na	18.34	0.15	100	7.0
81	126.25	5.6	11.39	na	18.9	0.15	126	7.0
82	126.25	5.6	12.69	na	19.95	0.15	126	7.0
83	126.25	5.6	15.56	na	22.09	0.15	126	7.0
84	126.25	5.6	19.35	na	24.63	0.15	126	7.0
85	126.25	5.6	19.41	na	24.67	0.15	126	7.0
86	126.25	5.6	12.42	na	19.74	0.15	126	7.0
87	126.25	5.6	13.95	na	20.91	0.15	126	7.0
88	126.25	5.6	15.47	na	22.03	0.15	126	7.0
89	126.25	5.6	17.68	na	23.55	0.15	126	7.0
116	126.25		17.31	na				
117	126.25		18.65	na				
118	126.25		17.31	na				
114	126.25		20.49	na				
115	126.25		20.56	na				
119	126.25		20.82	na				
106	126.25		37.83	na				
604	126.42		43.55	na				
605	125.92		44.42	na				
TOR	122.58		46.35	na				
HDR	118.92		48.57	na				
6UG	117.42		49.26	na				
TEST	122.0		47.62	na	250.0			

The maximum velocity is 13.59 and it occurs in the pipe between nodes 117 and 119

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
80	18.34	1.049		0.0	6.000	10.726			K Factor = 5.60	
to		120		0.0	0.0	0.0				
81	18.34	0.1108		0.0	6.000	0.665			Vel = 6.81	
81	18.90	1.38		0.0	12.000	11.391			K Factor = 5.60	
to		120		0.0	0.0	0.0				
82	37.24	0.1081		0.0	12.000	1.297			Vel = 7.99	
82	19.95	1.38		0.0	12.000	12.688			K Factor = 5.60	
to		120		0.0	0.0	0.0				
83	57.19	0.2390		0.0	12.000	2.868			Vel = 12.27	
83	22.08	1.61	1T	8.0	0.500	15.556			K Factor = 5.60	
to		120		0.0	8.000	0.0				
118	79.27	0.2065		0.0	8.500	1.755			Vel = 12.49	
	0.0									
	79.27					17.311			K Factor = 19.05	
84	24.63	1.049	1T	5.0	1.000	19.346			K Factor = 5.60	
to		120		0.0	5.000	0.0				
114	24.63	0.1913		0.0	6.000	1.148			Vel = 9.14	
	0.0									
	24.63					20.494			K Factor = 5.44	
85	24.67	1.049	1T	5.0	1.000	19.411			K Factor = 5.60	
to		120		0.0	5.000	0.0				
115	24.67	0.1918		0.0	6.000	1.151			Vel = 9.16	
	0.0									
	24.67					20.562			K Factor = 5.44	
86	19.74	1.049		0.0	12.000	12.423			K Factor = 5.60	
to		120		0.0	0.0	0.0				
87	19.74	0.1270		0.0	12.000	1.524			Vel = 7.33	
87	20.91	1.38		0.0	12.000	13.947			K Factor = 5.60	
to		120		0.0	0.0	0.0				
88	40.65	0.1271		0.0	12.000	1.525			Vel = 8.72	
88	22.03	1.38	1T	6.0	0.500	15.472			K Factor = 5.60	
to		120		0.0	6.000	0.0				
116	62.68	0.2832		0.0	6.500	1.841			Vel = 13.44	
	0.0									
	62.68					17.313			K Factor = 15.06	
89	23.55	1.049	1T	5.0	0.500	17.682			K Factor = 5.60	
to		120		0.0	5.000	0.0				
117	23.55	0.1760		0.0	5.500	0.968			Vel = 8.74	
	0.0									
	23.55					18.650			K Factor = 5.45	
116	62.68	1.61		0.0	10.000	17.313				
to		120		0.0	0.0	0.0				
117	62.68	0.1337		0.0	10.000	1.337			Vel = 9.88	
117	23.55	1.61	1T	8.0	1.000	18.650				
to		120		0.0	8.000	0.0				
119	86.23	0.2411		0.0	9.000	2.170			Vel = 13.59	
	0.0									
	86.23					20.820			K Factor = 18.90	

Final Calculations - Standard

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
118 to 119	79.27	1.61 120	1T	8.0 0.0	9.000 8.000	17.311 0.0				
	79.27	0.2064		0.0	17.000	3.509			Vel = 12.49	
	0.0 79.27						20.820		K Factor = 17.37	
114 to 115	24.63	2.157 120		0.0 0.0	12.000 0.0	20.494 0.0				
	24.63	0.0057		0.0	12.000	0.068			Vel = 2.16	
115 to 119	24.67	2.157 120		0.0 0.0	12.500 0.0	20.562 0.0				
	49.3	0.0206		0.0	12.500	0.258			Vel = 4.33	
119 to 106	165.50	2.635 120	2J 2I	29.654 16.474	80.960 62.602	20.820 0.0				
	214.8	0.1185	1T	16.474	143.562	17.013			Vel = 12.64	
106 to 604	0.0	2.635 120	1Z 1S	8.237 19.22	3.580 45.304	37.833 -0.074				
	214.8	0.1185	1G 2I	1.373 16.474	48.884	5.793			Vel = 12.64	
604 to 605	0.0	4.26 120	4I	36.868 0.0	20.170 36.868	43.552 0.217				
	214.8	0.0114		0.0	57.038	0.651			Vel = 4.84	
605 to TOR	0.0	4.026 120	2F 1E	8.0 10.0	14.000 18.000	44.420 1.447				
	214.8	0.0150		0.0	32.000	0.481			Vel = 5.41	
TOR to HDR	0.0	4.026 120	1A 1G	17.0 2.0	3.670 39.000	46.348 1.585				
	214.8	0.0150	1T	20.0	42.670	0.642			Vel = 5.41	
HDR to 6UG	0.0	7.981 120	1S 1E	45.0 18.0	11.000 63.000	48.575 0.650				
	214.8	0.0005		0.0	74.000	0.039			Vel = 1.38	
6UG to TEST	0.0	6.16 140	1L 1G	12.911 4.304	180.000 60.252	49.264 -1.984				
	214.8	0.0014	1T	43.037	240.252	0.343			Vel = 2.31	
	250.00 464.80						47.623		Qa = 250.00 K Factor = 67.35	